Personality Development and Its Contingencies in Two Major Environmental Contexts of Emerging Adulthood: Social Relationships and Work

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Laß den Himmel sich auf der Erde widerspiegeln,
auf daß die Erde zum Himmel werden möge.

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Rumi

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Zusammenfassung

Einleitung

Unter dem Begriff *Persönlichkeit* werden verschiedene, zeitlich und situationsübergreifend relativ stabile Merkmale einer Person, die generelle Tendenzen des Erlebens und Verhaltens abbilden, zusammengefasst (Roberts, 2009). Dabei werden Persönlichkeitseigenschaften seit jeher in verschiedenen Epochen, Kulturen und Religionen herangezogen, um Menschen untereinander anhand weniger, charakteristischer Eigenschaften zu beschreiben, zu vergleichen und ihr Verhalten zu erklären (Newen, 2011; Precht, 2017). Überwiegend wird Persönlichkeit im Rahmen des Fünf-Faktoren-Modells (*Big Five*; McCrae & Costa, 1999) erfasst (Roberts & DelVecchio, 2000; Roberts, Walton & Viechtbauer, 2006). Dieses umschließt die Faktoren Emotionale Stabilität, Extraversion, Offenheit für Erfahrungen, Verträglichkeit und Gewissenhaftigkeit (McCrae & Costa, 1999). Entgegen der frühen Annahme, dass sich Persönlichkeitseigenschaften bis zum Alter von 30 Jahren entwickeln und anschließend Stabilität erreichen (McCrae & Costa, 1999), konnten neuere Forschungsarbeiten Persönlichkeitsentwicklung über die gesamte Lebensspanne hinweg zeigen (Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000; Roberts, Walton, & Viechtbauer, 2006; Soto, John, Gosling, & Potter, 2011). Dabei sind zwei Aspekte zentral: Zum einen werden Persönlichkeitsmerkmale über die Zeit stabiler (i.e., *kumulatives Kontinuitätsprinzip*; e.g., Anusic & Schimack, 2016; Borghuis et al., 2017; Roberts & DelVecchio, 2000), und zum anderen entwickeln sich die meisten Menschen in ihren Persönlichkeitseigenschaften substantiell in Richtung des sogenannten *Reifungsprinzips*, d. h. sie werden tendenziell emotional stabiler, verträglicher und gewissenhafter (Roberts et al., 2006). Persönlichkeitsmerkmale sind demnach sowohl stabil als auch veränderbar über die Lebensspanne hinweg.

Frühere Studien konnten zeigen, dass substantielle Veränderungen der Persönlichkeit vor allem in der Lebensspanne des *aufstrebenden Erwachsenenalters* (= *emerging adulthood*, Alter 18-25; Arnett, 2000, 2015) zu beobachten sind (Bleidorn, 2015; Roberts & Davis, 2016). Diese Lebensphase zeichnet sich durch das Auftreten vielfältiger biologischer, psychologischer und psychosozialer Herausforderungen und Entwicklungsaufgaben in einer relativ kurzen Zeitspanne aus (Arnett, 2006; Schwaba & Bleidorn, 2017). Die hohe Dichte an Entwicklungsumwelten ist aus theoretischer Perspektive zentral für die weitere Entwicklung der Persönlichkeit (Erikson, 1968; Havighurst, 1972). Das *Dynamisch-transaktionistische Entwicklungsmodell* (= *Dynamic Transactionism*; Endler & Magnusson, 1976; Magnusson,

1990) postuliert Persönlichkeitsentwicklung als Prozess kontinuierlicher Wechselwirkungen zwischen Person und Umwelt. Dementsprechend konnten als zentrale Faktoren der Persönlichkeitsentwicklung sowohl genetisch, biologisch fundierte Prozesse als auch verschiedene Umweltkontexte ermittelt werden (Bleidorn, Kandler, & Caspi, 2014; Briley & Tucker-Drob, 2014; Kandler, 2012; McCrae et al., 2000). Im Hinblick auf die Bedeutsamkeit von Umweltkontexten zeigten sich Aspekte sozialer Beziehungen und des Arbeitslebens als weitreichend für die weitere Persönlichkeitsentwicklung (Finn, Zimmermann, & Neyer, 2017; Lodi-Smith & Roberts, 2007; Roberts, Caspi, & Moffitt, 2001; Selfhout, Burk, Branje, Denissen, Van Aken, & Meeus, 2010; Watson & Humrichouse, 2006). So konnten verschiedene qualitative und quantitative Merkmale sozialer Beziehungen (Finn et al., 2017; Wrzus & Neyer, 2016), Lebensübergänge (Lüdtke, Roberts, Trautwein, & Nagy, 2011) sowie Lebensereignisse (Bleidorn, Hopwood, & Lucas, 2016; Specht, 2017) als zentral herausgestellt werden. Allerdings blieben wichtige Fragen offen.

Erstens, die bisherigen Befunde zur Persönlichkeitsentwicklung im aufstrebenden Erwachsenenalter basieren primär auf studentischen Stichproben (Asendorpf & Wilpers, 1998; Helson & Moane, 1987; Zimmermann & Neyer, 2013). Dadurch werden Informationen über einen Großteil der Bevölkerung (*forgotten half*; Arnett, 2000), die einen anderen Weg nach ihrem Schulaustritt verfolgen, nicht abgebildet. Dies ist aufgrund der bedeutenden Rolle von Umweltkontexten für Persönlichkeitsentwicklung als problematisch für die Generalisierbarkeit des kumulativen Kontinuitätsprinzips und des Reifungsprinzips zu bewerten (Bleidorn, Klimstra, Denissen, Rentfrow, Potter, & Gosling, 2013; Hudson, Roberts, & Lodi-Smith, 2012; Magnusson, 1990; Roberts, Wood, & Caspi, 2008).

Zweitens, das empirische Bild zur Rolle von sozialen Beziehungen für Persönlichkeitsentwicklung ist gemischt (Finn et al., 2017; Specht, 2017). Dabei zeigt die Mehrheit der bisherigen Studien eine höhere Bedeutsamkeit der Persönlichkeit für die Entwicklung sozialer Beziehungen als für die reziproke Richtung (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Sturaro, Denissen, Van Aken, & Asendorpf, 2008). Allerdings konnten neuere Befunde im Erwachsenenalter eine Ausbalancierung von Persönlichkeits- und Beziehungseffekten zeigen (Mund & Neyer, 2014) und somit die Theorie des Dynamischen Transaktionismus untermauern (Magnusson, 1990). Hierbei stellt sich die Frage, inwiefern sich die Rolle sozialer Beziehungen in unterschiedlichen Lebensphasen differentiell auswirkt. Insbesondere ist die Rolle sozialer Beziehungen in wichtigen Transitionen des jungen Erwachsenenalters unklar geblieben. Methodische und analytische Neuerungen bieten einen vielversprechenden Ansatz, um die zugrundeliegenden theoretischen Annahmen abzubilden

(Grimm, An, McArdle, Zonderman, & Resnick, 2012; Mund & Neyer, 2014), und die Bedeutsamkeit von Persönlichkeit-Beziehungstransaktionen im aufstrebenden Erwachsenenalter explizit zu testen.

Drittens, ein dezidiertes Verständnis zu den grundlegenden Mechanismen und Prozessen der Persönlichkeitsentwicklung fehlt bisher (Bleidorn, 2015; Wrzus & Roberts, 2017).

Um die aufgeführten Lücken und Fragestellung des Forschungsfeldes zu bearbeiten, wurden in dieser Arbeit drei längsschnittliche, empirische Untersuchungen vorgenommen. Studie 1 untersuchte die Persönlichkeitsentwicklung bei einer Teilgruppe der „forgotten half" (Arnett, 2000): Junge Auszubildende wurden über die Dauer der 3-jährigen beruflichen Erstausbildung hinweg befragt. Studie 2 untersuchte Persönlichkeit-Beziehungs Transaktionen in aufstrebenden Erwachsenen im Übergang aus der Schule an die Universität oder in den Arbeitskontext mit Hilfe methodischer und analytischer Neuerungen. Studie 3 stellte einen ersten Entwurf dar, Teilaspekte möglicher Prozesse der Persönlichkeitsentwicklung im Arbeitskontext abzubilden. Hierbei wurde das Zusammenspiel zwischen Person und Umwelt auf die Persönlichkeitsentwicklung auf Basis der Wichtigkeit und der Befriedigung der *psychologischen Grundbedürfnisse* (Ryan & Deci, 2008) untersucht.

Zusammenfassend war es das Ziel der vorliegenden Arbeit, Persönlichkeitsentwicklung und seine bedingenden Faktoren in zwei bedeutsamen Kontexten des aufstrebenden Erwachsenenalters (soziale Beziehungen und Arbeit) zu identifizieren und erste Prozesskomponenten abzubilden. Dabei wird immer auf das Verständnis von Persönlichkeit als kontinuierlichen, reziproken Prozess zwischen Merkmalen der Person und ihrer Umwelt zurückgegriffen (Endler & Magnusson, 1976; Magnusson, 1990).

Theoretischer und Empirischer Hintergrund

Das Neo-Sozioanalytische Modell der Persönlichkeit

Um die vorliegende Arbeit im Forschungsfeld verorten zu können, wird im Folgenden kurz das Neo-Sozioanalytische Modell der Persönlichkeit (NSM, *Neo-Socioanalytic Model*; Roberts & Nickel, 2017; Roberts & Wood, 2006) beschrieben. Das NSM lässt sich in zwei Teilbereiche gliedern: Auf der einen Seite organisiert das NSM die verschiedenen Konstrukte und Domänen der Persönlichkeitsforschung zu einem ineinandergreifenden Netzwerk, und zum Anderen beinhaltet es eine Reihe von Prinzipien, die auf Basis empirischer Befunde und theoretischer Annahmen formuliert wurden (Roberts & Nickel, 2017). Auf der Organisationsebene werden drei Domänen unterschieden: Distale Faktoren, Analyseebene und

Erhebungseinheit. *Distale Faktoren* fassen gesellschaftliche sowie biologische, genetische und physiologische Bedinungsfaktoren der Persönlichkeit zusammen. Mit Hilfe der *Analyseebene* werden verschiedene Persönlichkeitskonstrukte in eine hierarchische Struktur gebracht. *Persönlichkeitseigenschaften* stehen an der Spitze der Hierarchie und umfassen theoretisch die weiteren Analyseebenen der *Motive und Werte*, *Fähigkeiten* und *Narrative*.

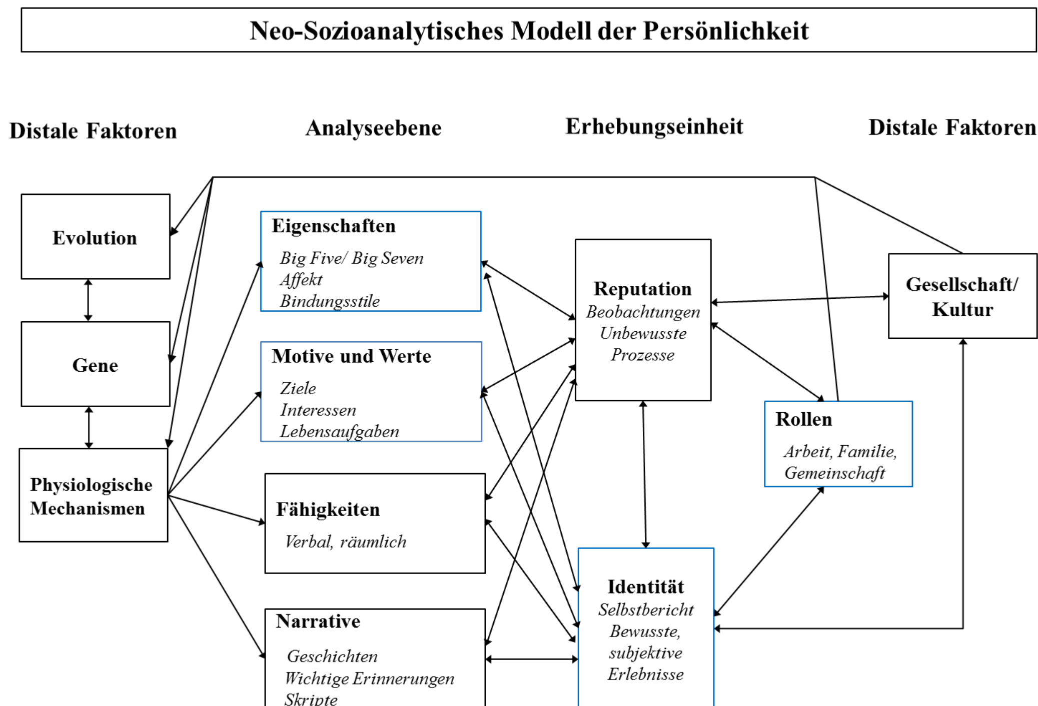

Figure Z.1. Neo-Sozioanalytisches Modell der Persönlichkeitspsychologie nach Roberts & Nickel (2017). Die Studien der vorliegenden Arbeit fokussieren sich auf die blau-umrandeten Domänen.

Die Entwicklung von Persönlichkeitseigenschaften in bedeutsamen Kontexten des jungen Erwachsenenalters ist das zentrale Interesse der vorliegenden Arbeit. Diese wurden mittels der oben skizzierten und charakterisierten Fünf Faktoren (*Big Five*; McCrae & Costa, 1999) aus der *Identitätsperspektive* (d.h., die bewusste, subjektive Repräsentation der Personeneigenschaften; Cramer, 2017) betrachtet. Die Bedeutung der Umweltkontexte wird im NSM unter dem Aspekt *Rollen* zusammengefasst. Diese lassen sich in zwei größere Bereiche aufspannen: Rollen der *sozialen Eingebundenheit (= belongingness roles*; Roberts & Nickel, 2017), welche primär soziale Beziehungen reflektieren, und *statusbezogene Rollen (= status roles*; Roberts & Nickel, 2017), die sich auf Rollen der gesellschaftlichen Stellung oder der Arbeit beziehen. Darüber hinaus konnten persönliche Ziele und die Befriedigung psychologischer Grundbedürfnisse, welche dem Konstrukt „Motive und Werte“ zuzuordnen sind, als bedeutsam für Persönlichkeitsentwicklung gezeigt werden (Deci & Ryan, 2000;

Denissen, Van Aken, Penke, & Wood, 2013; Fishbach, Zhang, & Koo, 2009; Hennecke, Bleidorn, Denissen, & Wood, 2014; Koo & Fishbach, 2008; Ryan & Deci, 2008). Zentral ist hierbei die Annahme, dass Ziele und Bedürfnisse Prozesse der Selbstregulation bedingen (Denissen et al., 2013; Hennecke et al., 2014), welche das Verhalten auf die Zielerreichung ausrichten. Folglich umfasst die vorliegende Arbeit auch den Bereich der Motive und Werte und testet, inwiefern das NSM um eine direkte Verbindung zwischen „Motive und Werte" und „Eigenschaften" erweitert werden müsste.

Hinsichtlich der Prinzipien der Persönlichkeitsentwicklung im NSM, wurde im einleitenden Abschnitt bereits auf das kumulative Kontinuitätsprinzip (Roberts & DelVecchio, 2000; Roberts & Wood, 2006) und das Reifungsprinzip (Roberts et al., 2006; Roberts & Wood, 2006) als empirisch stark untermauerte Befunde verwiesen. Ein weiteres für die vorliegende Arbeit wichtiges Prinzip bezieht sich auf die Bedeutung sozialer Rollen für Persönlichkeitsentwicklung. Das *Soziale Investitionsprinzip (= Social Investment Principle*; Roberts et al., 2006; Roberts & Wood, 2006) nimmt an, dass Entwicklung insbesondere durch soziale Prozesse stattfindet, sodass die Konfrontation und anschließende Adaptation neuer sozialer Rollenanforderungen als zentrale Komponente der Persönlichkeitsentwicklung gesehen wird (Roberts & Nickel, 2017). Bisherige Befunde deuten darauf hin, dass das Soziale Investitionsprinzip insbesondere für den Arbeitskontext gilt (Hudson et al., 2012; Lehnart, Neyer, & Eccles, 2010; Lodi-Smith & Roberts, 2007), wohingegen sich die Befunde für andere Bereiche gemischt zeigten, bspw. für das Elternsein (Bleidorn et al., 2016; Galdiolo & Roskam, 2014; Jokela, Kivimäki, Elovainio, & Keltikangas-Järvinen, 2009; Specht, Egloff, & Schmukle, 2011; Van Scheppingen, Jackson, Specht, Hutteman, Denissen, & Bleidorn, 2016). Folglich gilt es auch für dieses Prinzip die bedingenden Faktoren und Kontexte zu bestimmen.

Empirischer Forschungsstand

Persönlichkeitsentwicklung kann auf unterschiedlichen Ebenen untersucht und abgebildet werden (Roberts et al., 2008). Dabei wird zwischen der Individual- vs. Populationsebene und der absoluten vs. relativen Erfassung unterschieden (Roberts et al., 2008). Daraus ergeben sich vier Indikatoren der Persönlichkeitsentwicklung: Rangordnungsstabilität, Mittelwertveränderungen, ipsative Veränderung und individuelle Unterschiede in der Veränderung. Da sich die Persönlichkeitspsychologie für Entwicklung auf der Populationsebene und individuelle Unterschiede in der Veränderung interessiert, stellt die ipsative Veränderung für diese Arbeit kein Interesse dar und wird im Folgenden nicht näher spezifiziert. *Rangordnungsstabilität* kennzeichnet die Stabilität der Persönlichkeitsmerkmale in Relation zur Gesamtpopulation. *Mittelwertveränderungen* beziehen sich auf die absoluten

Differenzen einer gesamten Population und *individuelle Unterschiede der Veränderung* geben Auskunft über das relative Maß der individuellen Entwicklung im Vergleich zum Mittel der Population.

Rangordnungsstabilität

Hinsichtlich der Entwicklung der Rangordnungsstabilität konnte eine erste Meta-Analyse von Roberts & DelVecchio (2000) zwei Hauptbefunde zeigen. Erstens, die Entwicklung der Rangordnungsstabilität zeigte sich für alle Fünf Faktoren sehr ähnlich über die gesamte Lebensspanne. Zweitens, es konnten drei konzentrierte Phasen der Entwicklung der Rangordnungsstabilität identifiziert werden: frühe Kindheit (Alter 3-6), aufstrebendes Erwachsenenalter (Alter 22-29) und mittleres Erwachsenenalter (Alter 40-49). Dabei konnte gezeigt werden, dass die Rangordnungsstabilität im Zeitraum der frühen Kindheit bis zum aufstrebenden Erwachsenenalter von ca. $r = .31$ auf ca. $r = .54$ steigt (Borghuis et al., 2017; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009; Pullmann, Raudsepp, & Allik, 2006). Weiterhin zeigte sich in verschiedenen Studien, dass die Rangordnungsstabilität bis zum Alter von 30 weiter ansteigt auf ca. $r = .64$ (Bleidorn, 2012; Hopwood, Donnellan, Blonigen, Krueger, McGue, Ianoco, & Burt, 2011; Lüdtke et al., 2011; Vaidya, Gray, Haig, & Watson, 2002). Es konnte für diese Phase allerdings auch festgestellt werden, dass die Rangordnungsstabilität während des frühen aufstrebenden Erwachsenenalters als eher moderat zu bewerten ist (e.g., Hopwood et al., 2011; Neyer & Asendorpf, 2001; Robins, Fraley, Roberts, & Trzesniewski, 2001; Wortman, Lucas, & Donnellan, 2012). Im weiteren Lebensverlauf scheint die Rangordnungsstabilität weiter anzusteigen (Billstedt et al., 2014; Kandler, Bleidorn, Riemann, Spinath, Thiel, & Angleitner, 2010; Van Aken, Denissen, Branje, Dubas, & Goossens, 2006) auf ca. $r = .74$ (age 70; Roberts & DelVecchio, 2000). Die Studie von Lucas & Donnellan (2011) deutete an, dass mit höherem Lebensalter und entsprechend unterschiedlicher, zeitlicher Verschlechterung der kognitiven Funktionen, die Rangordnungsstabilität wieder abnimmt.

Mittelwertveränderungen

Roberts und Kollegen (2006) fanden in ihrer Meta-Analyse über acht verschiedene Altersgruppen, dass sich Menschen hinsichtlich ihrer Persönlichkeit im Mittel substanziell über die gesamte Lebensspanne hinweg verändern (*Plastizitätsprinzip*; Roberts et al., 2008). Des Weiteren zeigte sich, dass die stärksten Veränderungen der Zeit des aufstrebenden Erwachsenenalters zuzuordnen sind (Roberts & Davis, 2016). Außerdem gestalteten sich die Veränderungen im Mittel in Richtung des Reifungsprinzips (d.h., Anstiege in Emotionaler

Stabilität, Verträglichkeit und Gewissenhaftigkeit; Roberts et al., 2006). Diese Befunde wurden in diversen Studien repliziert und erweitert (Lüdtke et al., 2011; Roberts et al., 2001; Wortmann et al., 2012). Bereits während der Adoleszenz konnten Entwicklungen in Richtung des Reifungsprinzips nachgewiesen werden (z.B., Soto, 2016; van den Akker, Deković, Asscher, & Prinzie, 2014; für Überblicksarbeiten, siehe Herzhoff, Kushner, & Tackett, 2017; Meeus, 2016; Soto & Tackett, 2015). Allerdings wurden dabei mehrfach sog. *Dips (= disruptions*; Luan, Hutteman, Denissen, Asendorpf, & van Aken, 2017; Soto, 2016; Soto & Tackett, 2015), d. h. kurzweilige Korrekturen, in der Entwicklung nachgewiesen. Im jungen Erwachsenenalter zeigten die meisten Studienbefunde in Richtung des Reifungsprinzips (z.B., Bleidorn et al., 2013; Helson & Moane, 1987; Hopwood et al., 2011; Lucas & Donnellan, 2011; Lüdtke et al., 2011; McGue, Bacon, & Lykken, 1993; Roberts et al., 2001; Vecchione, Alessandri, Barbaranelli, & Caprara, 2012; Zimmermann & Neyer, 2013).

Allerdings konnten einige Studien ein differenzierteres Bild aufwerfen. So berichteten bspw. Milojev and Sibley (2017) Abnahmen in Emotionaler Stabilität, Extraversion, Offenheit, und Verträglichkeit. Leikas und Salmela-Aro (2015) berichteten ebenfalls Abnahmen in Verträglichkeit und keine Veränderung in Gewissenhaftigkeit. Studenten im ersten Jahr zeigten ebenfalls keine Veränderungen in Verträglichkeit und Gewissenhaftigkeit (Asendorpf & Wilpers, 1998). Das Gesamtbild der Befunde zeigt, dass die bedingenden Faktoren für Persönlichkeitsentwicklung im jungen Erwachsenenalter noch nicht vollständig geklärt sind.

Individuelle Unterschiede der Veränderung

Individuelle Unterschiede in der Persönlichkeitsveränderung konnten in verschiedenen Studien für alle Altersbereiche aufgeführt werden (z.B., Allemand, Zimprich, & Hertzog, 2007; Mõttus, Soto, & Slobodskaya, 2017; Robins et al., 2001; Schwaba & Bleidorn, 2017; Schwaba et al., 2018; Scollon & Diener, 2006). Mõttus und Kollegen (2017) zeigten, dass individuelle Unterschiede in der Veränderung kulturübergreifend von der Adoleszenz zum aufstrebenden Erwachsenenalter zunehmen. Darüber hinaus konnten Schwaba und Bleidorn (2017) zeigen, dass die Unterschiede im aufstrebenden Erwachsenenalter im Vergleich zu 14 anderen Altersgruppen (Alter gesamt 16-84) am höchsten sind. Eine Besonderheit zeigte sich für Emotionale Stabilität, da die individuellen Unterschiede hier über die Lebensspanne hinweg relativ stabil blieben (Mõttus et al., 2017; Schwaba & Bleidorn, 2017).

Zusammenfassend ist zu sagen, dass das aufstrebende Erwachsenenalter über alle drei Indikatoren der Persönlichkeitsentwicklung hinweg Besonderheiten aufweist. So zeigten sich in der Phase nicht nur die Persönlichkeitsveränderungen am stärksten über die Lebensspanne hinweg ausgeprägt, sondern auch die größten interindividuellen Unterschiede in der

Veränderung und maßgebliche Veränderungen in der Rangordnungsstabilität. Deshalb bietet das aufstrebende Erwachsenenalter ein ideales Feld, um bedingende Faktoren der Persönlichkeitsentwicklung zu untersuchen. Im Folgenden wird kurz auf Charakteristika des aufstrebenden Erwachsenenalters eingegangen.

Aufstrebendes Erwachsenenalter

Der Begriff *aufstrebendes Erwachsenenalter* (= *emerging adulthood*) wurde von Arnett (2000) für die Lebensspanne zwischen der Adoleszenz und dem Erwachsenenalter geprägt. Diese Lebensphase zeichnet sich durch besondere Merkmale aus, da sich junge Menschen im Alter zwischen 20 und 30 einer Vielzahl von Herausforderungen, Möglichkeiten und Entscheidungen gegenüber sehen (Arnett, 2015). Traditionelle Aufgaben des Erwachsenenalters (bspw., Hochzeit, Elternsein, sicherer Arbeitsplatz; Erikson, 1968, Havighurst, 1972) haben sich auf spätere Jahre verschoben (Fishman, 2016; Oblinger, 2003), da die meisten jungen Menschen zunächst einer weiterführenden Bildung nachgehen (Statistisches Bundesamt, 2018; United States Census Bureau, 2018). Dabei explorieren sie auch verschiedene Möglichkeiten in diversen Lebensbereichen wie bspw. das Erleben der ersten Partnerschaft (Wagner, Becker, Lüdtke, & Trautwein, 2015) oder erste Arbeitserfahrungen (Lüdtke et al., 2011; Specht et al., 2011). Demnach repräsentiert das aufstrebende Erwachsenenalter eine einzigartige Lebensphase, die sich durch ein konzentriertes Auftreten neuer Entwicklungsaufgaben auszeichnet. Arnett (2006) identifizierte fünf Charakteristika des aufstrebenden Erwachsenenalters: Exploration der eigenen Identität, Instabilität, Selbstfokus, sich „dazwischen" fühlen, und Zeit der Möglichkeiten. Diese Aspekte beziehen sich insbesondere auf zwei zentrale Kontexte, unter die sich eine Vielzahl an Möglichkeiten und Erlebnissen eingruppieren lassen: soziale Beziehungen und Arbeit (Hutteman, Hennecke, Orth, Reitz, & Specht, 2014; McCrae & Costa, 1991; Roberts & Davis, 2016; Seiffge-Krenke, Luyckx, & Salmela-Aro, 2014).

Soziale Beziehungen

Das Bilden und Erhalten sozialer Beziehungen stellt eine zentrale Aufgabe dar, die dem Menschen nicht nur eigen ist, sondern auch von der Gesellschaft gefordert wird (Deci & Ryan, 2014). Demnach sind soziale Beziehungen ein zentraler Aspekt der Umwelt und sind als relevant für die Persönlichkeitsentwicklung zu bezeichnen (Finn et al., 2017; Reitz, Zimmermann, Hutteman, Specht, & Neyer, 2014; Wrzus, Zimmermann, Mund, & Neyer, 2017). In früheren Studien zeigten sich sowohl verschiedene Kontexte sozialer Beziehungen (Bleidorn et al., 2016; Specht et al., 2011; Specht, 2017), wie bspw. das Erleben der ersten

Partnerschaft (Wagner et al., 2015), als auch qualitative (z.B., Gefühle der Unsicherheit, Wärme, Nähe) und quantitative Merkmale (z.B., Konflikthäufigkeit, Anzahl der Freunde) sozialer Beziehungen als bedeutsam heraus (z.B., Asendorpf & Wilpers, 1998; Mund & Neyer, 2014; Neyer & Asendorpf, 2001; Sturaro et al., 2008).

Entgegen der Annahme des Dynamischen Transaktionismus dominierten allerdings Effekte der Persönlichkeit auf die Entwicklung sozialer Beziehungen (Asendorpf & Wilpers, 1998; Asendorpf & Van Aken, 2003; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Parker, Lüdtke, Trautwein, & Roberts, 2012; Scollon & Diener, 2006; für einen Überblick, siehe Wrzus & Neyer, 2016), sodass die Rolle der sozialen Beziehungen für Persönlichkeitsentwicklung im aufstrebenden Erwachsenenalter als unklar zu bezeichnen ist. Dabei konnten Mund und Neyer (2014) zeigen, dass methodische Adaptionen zur besseren Reflektion des Dynamischen Transaktionismus im Erwachsenenalter eine Balancierung der Effekte anzeigte. So wurde argumentiert, dass Persönlichkeit und soziale Beziehungen auf einem vergleichbaren Stabilitätsniveau abgebildet werden sollten, bspw. Aspekte sozialer Beziehungen und Facetten der Persönlichkeit. Außerdem sollten sog. *coupling effects* (d.h., change-to-change cross-lagged Effekte; Grimm et al., 2012) die theoretisch postulierte Reziprozität besser abbilden. Bisher ist allerdings offen geblieben, ob diese Änderungen auch im aufstrebenden Erwachsenenalter ein verändertes Effektbild bieten, oder ob andere Prozesse für die bisher erbrachten Befunde verantwortlich zu machen sind.

Arbeit

Der Arbeitskontext stellt eine wichtige Umwelt für den Menschen dar, da nicht nur ein hohes Maß an Lebenszeit am Arbeitsplatz verbracht wird, sondern auch finanzielle und soziale Aspekte bedeutungsvoll sind (Havighurst, 1972; McCrae & Costa, 1991). Dabei zeigte sich in früheren Studien, dass verschiedene Aspekte des Arbeitslebens mit Persönlichkeitsentwicklung verbunden sind (Lodi-Smith & Roberts, 2007). So konnte gezeigt werden, dass der Austritt aus der Schule mit einem Anstieg in Gewissenhaftigkeit (Bleidorn, 2012; Lüdtke et al., 2011) und die Jahre an der Universität mit einer Entwicklung in Richtung des Reifungsprinzips einhergehen (Asendorpf & Wilpers, 1998; Klimstra et al., 2009; Lehnart et al., 2010; Niehoff, Petersdotter, & Freund, 2017; Pullmann et al., 2006; Roberts & Chapman, 2000). Verschiedene Aspekte des Berufslebens wurden ebenfalls mit Persönlichkeitsentwicklung assoziiert (Bleidorn et al., 2016) wie bspw. Kündigungen (e.g., Boyce, Wood, Daly, & Sedikides, 2015; Specht et al., 2011) oder Jobveränderungen (e.g., Denissen, Ulferts, Lüdtke, Muck, & Gerstorf, 2014). Auch qualitative Aspekte wie Arbeitszufriedenheit, Leistung am Arbeitsplatz und finanzielle Sicherheit (Le, Donnellan, & Conger, 2014; Roberts, Caspi, & Moffitt, 2003), sowie

Stress am Arbeitsplatz (Wu, 2016), schlechte Arbeitsbedingungen (Sutin & Costa, 2010) oder Investitionen in die Arbeit (Hudson et al., 2012) konnten mit Persönlichkeitsentwicklung in Verbindung gebracht werden.

Obwohl gezeigt werden konnte, dass bestimmte Charakteristika sozialer Beziehungen und des Arbeitskontexts mit Persönlichkeitsentwicklung assoziiert sind, blieben die zugrundeliegenden Prozesse weitestgehend unklar.

Prozesse der Persönlichkeitsentwicklung

Konzeptualisierungen und methodische Annäherungen zur Untersuchung zugrundeliegender Prozesse der Persönlichkeitsentwicklung stehen erst seit Kurzem im Zentrum vieler Diskussionen (Bleidorn, 2015; Geukes, Van Zalk, & Back, 2018; Wrzus & Mehl, 2015; Wrzus & Roberts, 2017). Dabei wurde vor allem die Rolle des subjektiven Wahrnehmens und Erlebens diskutiert, da der Fokus in bisherigen Studien vor allem auf objektive Kontexte Bezug nahm (Bleidorn, 2015; Denissen et al., 2013; Hennecke et al., 2014; Lodi-Smith & Roberts, 2007). Frühere Studien hatten allerdings die Wichtigkeit dieser Komponenten für das weitere Erleben und Verhalten zeigen können (z.B., Aldrup, Klusmann, & Lüdtke, 2017; Deci, Olafsen, & Ryan, 2017; Deci & Ryan, 2000; Denissen et al., 2013; Fishbach et al., 2009; Gagné & Deci, 2005; Hennecke et al., 2014). Entsprechend berücksichtigt das mikroanalytische TESSERA Modell (Wrzus & Roberts, 2017) die individuellen Erwartungen und das Erleben der Umwelt als zentrale Komponenten für weiteres Verhalten (Wrzus & Roberts, 2017). Des Weiteren bilden die *psychologischen Grundbedürfnisse* (Deci & Ryan, 2008) nach Autonomie, Kompetenzerleben und sozialer Eingebundenheit sowie das Konzept der *Person-Umwelt Passung (= Person-environment fit*; *P–E fit*; Caplan, 1987) klassische Repräsentationen, um Effekte des Zusammenspiels der Person und ihrer Umwelt abzubilden.

Desiderata

Die bisherige Forschung im Bereich der Persönlichkeitsentwicklung konnte nicht nur zeigen, dass sich Persönlichkeit über die Lebensspanne entwickelt, sondern auch soziale Beziehungen und Arbeit als zentrale Kontexte und das aufstrebende Erwachsenenalter als wichtige Altersspanne ausweisen (Finn et al., 2017; Lodi-Smith & Roberts, 2007; Roberts & DelVecchio, 2000; Roberts et al., 2006). Allerdings basiert ein Großteil der Studien dieser Altersspanne auf studentischen Stichproben, sodass die Generalisierbarkeit der Befunde auf aufstrebende Erwachsene in anderen Umweltkontexten zu untersuchen ist. Des Weiteren stellt sich die Frage nach der Bedeutsamkeit der Rolle sozialer Beziehungen in wichtigen

Lebensübergängen im aufstrebenden Erwachsenenalter, da soziale Beziehungen wichtige Komponenten des Lebens und seiner Entwicklung darstellen (Wrzus, Hänel, Wagner, & Neyer, 2013). Außerdem scheinen sowohl das individuelle Erleben der Umwelt als auch die individuellen Bedürfnisse im Zusammenspiel zwischen Person und Umwelt relevant zu sein (Bleidorn, 2015; Denissen et al., 2013; Hennecke et al., 2014).

Teilstudie 1

In dieser Studie wurden 1.886 junge Auszubildende (M_{AlterT1} = 18.41) der Studie zur Mathematisch-naturwissenschaftlichen Kompetenzentwicklung in der Beruflichen Erstausbildung (ManKobE; Retelsdorf, Lindner, Nickolaus, Winther, & Köller, 2013) über die Dauer der 3-jährigen Ausbildung hinsichtlich ihrer Persönlichkeit befragt. Die berufliche Erstausbildung stellt einen besonderen Weiterbildungskontext dar und bot somit eine gute Möglichkeit, die Generalisierbarkeit des Reifungsprinzips und des Kumulativen Kontinuitätsprinzips in einer nicht-studentischen Stichprobe zu testen. Darüber hinaus konnten Schlussfolgerungen zum Sozialen Investitionsprinzip gezogen werden, da der Ausbildungskontext mit neuen sozialen Rollenanforderungen im Betrieb einhergeht (s. Gesamtdiskussion; Bleidorn et al., 2013; Lodi-Smith & Roberts, 2007; Roberts & Wood, 2006). Hinsichtlich des NSM bildet diese Studie Aspekte der sozialen Rollen im Arbeitskontext ab.

Zur Datenanalyse wurden Maße der latenten Veränderungsmessung in zwei Messintervallen herangezogen: Vom Beginn der Ausbildung bis zu den Zwischenprüfungen (1.5 Jahre) und nochmals bis zum Ende der Ausbildung (1.5 Jahre). Des Weiteren wurden zwei Indikatoren der Kontextevaluation abgebildet: Lebenszufriedenheit und Arbeitsstress. Die Ergebnisse bestätigten das Kumulative Kontinuitätsprinzip und zeigten eine Entwicklung entgegen des Reifungsprinzips über die Dauer der beruflichen Erstausbildung hinweg.

Teilstudie 2

Studie 2 untersuchte die Rolle sozialer Beziehungen für die Persönlichkeitsentwicklung im aufstrebenden Erwachsenenalter. Dabei wurden aufstrebende Erwachsene (N = 4.534; M_{AlterT1}= 19.60) in der Transition aus der Schule an die Universität, die berufliche Ausbildung oder in den Arbeitskontext untersucht. Es wurden drei Erhebungen in zwei Jahresabständen durchgeführt (TOSCA Studie; Trautwein, Neumann, Nagy, Lüdtke, & Maaz, 2010), wodurch nicht nur die Transition, sondern auch Informationen über die folgende Zeitspanne abgebildet werden konnten. Dabei wurde die Beziehung zwischen Aspekten sozialer Beziehungen (Nähe, Wichtigkeit, Unsicherheit, Konflikt- & Kontakthäufigkeit) in verschiedenen Beziehungstypen (Partner, Freunde, Verwandte, Andere) mit Persönlichkeitseigenschaften auf allen Fünf

Faktoren und ihren jeweiligen Facetten untersucht, und erweiterte bivariate Veränderungsmodellierungen durchgeführt (e.g., Grimm et al., 2012; Mund & Neyer, 2014).

Die Ergebnisse bestätigten frühere Befunde der Unbalanciertheit der Persönlichkeits-Beziehungstransaktionen (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001). Des Weiteren zeichnete sich ab, dass Effekte sozialer Beziehungen auf Persönlichkeit hauptsächlich im Intervall nach der Transition auftraten. Ein Effektmuster zeigte sich konsistent zwischen der erlebten Unsicherheit und Emotionaler Stabilität: Je unsicherer sich die aufstrebenden Erwachsenen mit dem jeweiligen Beziehungspartner fühlten, umso weniger emotional stabil wurden sie.

Teilstudie 3

Diese Studie basier ebenfalls auf den ManKobE Daten (Retelsdorf et al., 2013) und untersuchte das Zusammenspiel von Person und Umwelt im ersten Ausbildungsintervall auf Basis der psychologischen Grundbedürfnisse. Somit bildet diese Studie Prozesskomponenten mikroanalytischer Modelle (z.B., TESSERA; Wrzus & Roberts, 2017) in einer relativ kurzen Panel Studie ab. Dadurch bietet Studie 3 einen Versuch, Prozesse in einer vergleichsweise kurzen Panel Studie abzubilden, und Erkenntnisse über zugrundeliegende Mechanismen zu gewinnen. Mittels informationstheoretischem Ansatz (Burnham & Anderson, 2002) und *Response Surface Analysen* (RSA; Edwards, 2002) wurden auf Basis verschiedener Theorien entsprechende Hypothesen über das Zusammenspiel zwischen individueller Wichtigkeit der Grundbedürfnisse und Umwelterleben aufgestellt und empirisch miteinander verglichen.

Die Ergebnisse zeigen ein differenziertes Bild für die Fünf Faktoren der Persönlichkeit. Insgesamt waren sowohl das Umwelterleben als auch die individuelle Wichtigkeit der Grundbedürfnisse zentral. Insbesondere für Veränderungen der Emotionalen Stabilität und Extraversion, zeigte sich Inkongruenz zwischen Person und Umwelterleben als bedeutsam. Für Veränderungen in Verträglichkeit und Gewissenhaftigkeit war die individuelle Bedeutsamkeit der psychologischen Grundbedürfnisse prädiktiver als das Umwelterleben.

Gesamtdiskussion

Die vorliegende Arbeit untersuchte Persönlichkeitsentwicklung in zwei zentralen Kontexten des aufstrebenden Erwachsenenalters: soziale Beziehungen und Arbeit. Im Rahmen der Gesamtdiskussion wird an dieser Stelle auf die Bedeutsamkeit der Befunde für die bekannten Prinzipien der Persönlichkeitsentwicklung und einen Teilaspekt des NSM eingegangen, sowie auf die Rollen von Person und Umwelt.

Bezüglich der grundlegenden Prinzipien des NSM haben die vorliegenden Befunde insbesondere Implikationen für das Reifungsprinzip und das Soziale Investitionsprinzip. Studie 1 konnte zeigen, dass bisherige Befunde des Reifungsprinzips auf Basis studentischer Stichproben nicht zwangsläufig auf aufstrebende Erwachsene in anderen Umweltkontexten zu übertragen sind. Dies bedeutet für das Soziale Investitionsprinzip, dass der Eintritt in den Arbeitskontext und damit die Konfrontation mit neuen Rollenanforderungen nicht grundsätzlich mit Persönlichkeitsentwicklung in Richtung des Reifungsprinzips zusammenhängt. Die Arbeit weist darauf hin, dass weitere Aspekte der Person oder der Umwelt bedingen, unter welchen Umständen der Arbeitskontext mit Persönlichkeitsreifung zusammenhängt (Studie 1 & 3). So könnten beispielsweise frühere Erfahrungen, individuelle Erwartungen oder auch Entwicklungsstadien bedingende Faktoren darstellen (Erikson, 1968; Wrzus & Roberts, 2017). Weitere Studien müssen zeigen, welche Faktoren als relevant zu bezeichnen sind und somit die Bedeutsamkeit von Person und Umweltkontext näher bestimmen.

Bezüglich der Organisation des NSM konnte Studie 3 zeigen, dass hauptsächlich die individuelle Ausprägung psychologischer Grundbedürfnisse für die Veränderung einiger Faktoren der Persönlichkeit zentral ist, und diese initial nur gering mit den Persönlichkeitsfaktoren assoziiert sind. Somit leisten die individuellen Bedürfnisse einen substantiellen Beitrag zur Persönlichkeitsentwicklung. Dadurch wird die hierarchische Klassifizierung der Grundbedürfnisse als Komponente der Faktoren in Frage gestellt. Stattdessen wäre es auf Grundlage dieser Befunde sinnvoll, eine Assoziation zwischen den Konstrukten „Motive und Werte“ und „Eigenschaften“ im NSM zu implementieren.

Auf Basis dieser Arbeit lässt sich ableiten, dass die Rollen von Person und Umwelt weiter zu verstehen und zu untersuchen sind. Insbesondere werden durch die Befunde von Studie 1 und 2 Merkmale der Person als potentielle Erklärungsfaktoren für differentielle Befunde in verschiedenen Altersgruppen in den Vordergrund gerückt. Sowohl Effekte sozialer Beziehungen als auch Effekte des Arbeitskontexts scheinen sich im aufstrebenden Erwachsenenalter anders darzustellen als aus bisherigen Studien im Erwachsenenalter bekannt (Mund & Neyer, 2014; Lodi-Smith & Roberts, 2007). Dabei stellt sich weiterführend die Frage, welche Merkmale für die unterschiedlichen Befunde relevant sein könnten. Das aufstrebende Erwachsenenalter ist noch durch biologische und psychosoziale Prozesse der Adoleszenz gekennzeichnet (Blakemore, 2012a, 2012b; Masten & Cicchetti, 2010; Nurmi, 1993; Simmons, 2017), sodass sich Umweltkontexte in Abhängigkeit des Status dieser Prozesse differentiell auswirken könnten. In dem Zusammenhang wäre es bedeutsam die Befunde aus Studie 3 in

Stichproben des Erwachsenenalters zu untersuchen, um herauszufinden, ob sich die Bedeutung von Umweltperzeption und Personenmerkmalen in Richtung des Umweltkontexts verschiebt. Die Differenzierung und Bedeutsamkeit dieser Prozesse stellt einen wichtigen Ansatz für ein tieferes Verständnis der Persönlichkeitsentwicklung im aufstrebenden Erwachsenenalter dar.

Summary

Drawing on the theoretical framework of dynamic transactionism theory, personality is understood to engage in reciprocal transactional patterns of development with the environment. Thus, personality is seen to be formed by both person characteristics and features of the environment. Consequently, personality development research is concerned with the significance of the role of the person and the role of the environmental context for changes in personality. Thereby, previous research revealed two aspects as striking: First, the most pronounced development of personality occurs in the time of emerging adulthood, and second, the most impactful environmental contexts for personality development were shown to be the contexts of social relationships and work. With respect to the first point, emerging adults were not only shown to increase in the rank-order consistency of personality (*cumulative continuity principle*) but to also display mean-level changes with increases in emotional stability, agreeableness, and conscientiousness (*maturity principle*). Regarding the second point, the environmental contingencies and the underlying mechanisms that come to play in the respective environments are only about to be understood. Multiple studies investigated the confrontation with new social role demands as driving factor in the contexts of social relationships and work. The subsequent acceptance of these role demands should lead to behavioral and emotional adaptations, that is, personality development (*social investment principle*). In aiming to further reveal the contingencies and profound mechanisms of personality development, the present dissertation concerns Big Five personality trait development of emerging adults in the two major contexts of social relationships and work.

First, personality development was observed in young trainees undergoing vocational education and training (ManKobE study; $N = 1,886$; $M_{\text{ageT1}} = 18.41$). The investigation of trainees was important as they represent a specific part of the “forgotten half”, that is, emerging adults undergoing non-college post-secondary or non-educational pathways. As environmental contexts have been shown to be important for personality development, the generalizability of previous findings on college-bound emerging adults should be tested. The results indicated that emerging adults in non-college educational environments of work develop differently than previous studies of college students would suggest. The young trainees decreased in all Big Five personality traits of emotional stability, extraversion, openness, agreeableness, and conscientiousness across a three-year span. Thus, the two common principles of personality development, the maturity principle and the social investment principle, are challenged by these findings. The results call for a more in-depth understanding of the underlying processes and mechanisms.

Second, in order to get a better understanding of the role of social relationships for personality development in emerging adulthood, personality-relationships transactions were investigated in the normative life transition from high school to post-secondary ecuation or work (TOSCA study, N = 4,534; M_{ageT1} = 19.60 years). Confirming the large majority of previous findings in the time of emerging adulthood, personality was shown to be more strongly related to changes in the social relationship characteristics than vice versa. Together with the finding of balanced personality-relationship transactions in young to middle adulthood, the present work suggests that the role of social relationships unfolds differentially across life stages. In order to be able to explain these differences, this study calls for the investigation of the underlying processes and mechanisms.

Third, the present work took a first step in the investigation of components of personality processes. Components of processes have been seen in the expectancies that individuals contain towards a certain context as well as in their psychological perception. Following these arguments, both expectancies and perceptions of the environment were assessed from the basic psychological needs perspective. Drawing once more on the ManKobE study, it was shown that the individual's level of importance ascribed to need support at work was more strongly related to personality development than the level of need support provided by the environment of the first job. The findings call for a revised understanding of the role of the person and the role of the environment for subsequent personality development.

Chapter 1

Theoretical Background

Introduction

'Who am I? And if so, how many?' (Precht, 2017)

The title of the popular book by Precht (2017) captures timeless questions that people have been fascinated by irrespective of age, epoch, or culture: Who am I? Who was I in the past? Who will I be in the future? What is it that formed me and differentiates me from others? (e.g., Newen, 2011). All these questions can be grouped to be referring to a person's unique combination of specific characteristics or qualities, that is, one's personality (Oxford English Dictionary, 2018). In scientific terms, *personality* describes a person's relatively stable tendencies of feeling, thinking, and behaving across situations and time (e.g., Roberts, 2009). In the early stages of personality research, personality was theorized to only develop during childhood and adolescence to finally reach a stable, fixed stage in early adulthood (e.g., McCrae & Costa, 1999). Indeed, many studies were able to support the assumption that large parts of a person's personality are consistent across time (e.g., Anusic & Schimmack, 2016; Borghuis et al., 2017; Ferguson, 2010; Roberts & DelVecchio, 2000). However, empirical research also provided substantial evidence that personality does not only develop in the early stages of life but also through adulthood and even in old age (e.g., Kandler, Kornadt, Hagemeyer, & Neyer; 2015; Lucas & Donnellan, 2011; Roberts, Walton, & Viechtbauer, 2006; Soto, John, Gosling, & Potter, 2011). Thus, personality should be considered to be both stable and changing across the whole life span.

Previous research revealed the time of *emerging adulthood* (ages 18-25; Arnett, 2000) as the period of life in which personality development is most pronounced (e.g., Bleidorn, 2015; Roberts & Davis, 2016). From a theoretical perspective, emerging adulthood is prone for personality changes to take place due to the occurrence of numerous challenges and developmental tasks within a relatively dense period of time (Arnett, 2006; for an overview, see Schwaba & Bleidorn, 2017). When it comes to the driving factors of personality development in this important life stage, both genetic factors and aspects of the environment have been of interest and shown to be systematically associated with personality development (for systematic reviews, see Bleidorn, Kandler, & Caspi, 2014; Briley & Tucker-Drob, 2014; Kandler, 2012). Focusing on environmental contexts, previous theoretical claims as well as empirical studies suggested the two broader domains of social relationships and the working context as primary domains of interest. In this regard, various types of social relationships (for an overview, see Finn, Zimmermann, & Neyer, 2017), life transitions (e.g., Lüdtke, Roberts,

Trautwein, & Nagy, 2011), and life events (for an overview, see Bleidorn, Hopwood, & Lucas, 2016; Specht, 2017) were investigated and shown to be important for subsequent personality development. However, various open questions have remained.

First, personality development research on the time of emerging adulthood has mainly focused on college student samples, thereby, neglecting a large population of emerging adults that precede different educational pathways than college education (i.e., the *forgotten half*; Arnett, 2000). As environmental contexts have been shown to be important for personality development (e.g., Briley & Tucker-Drob, 2014; Kandler & Zapko-Willmes, 2017), the generalizability of the findings based on college-bound students has remained limited. The investigation of non-college emerging adults is beneficial in two ways: On the one hand, it allows for a more encompassing picture of personality development in this age span, and on the other hand, a more differentiated understanding of the role of environmental contexts is allowed for.

Second, the role of social relationships for personality development in emerging adulthood has not yet been sufficiently understood. Even though reciprocal effects of personality and social relationship characteristics on the respective other domain are expected theoretically (e.g., Magnusson, 1990), the majority of previous studies showed an imbalance in favor of personality effects (e.g., Asendorpf & Wilpers, 1998; Finn et al., 2017; Sturaro, Denissen, Van Aken, & Asendorpf, 2008). In order to better capture the theoretically postulated reciprocity of effects, recent theoretical and methodological arguments claimed for a revised, adapted methodological approach to study social relationships and personality development (Grimm, An, McArdle, Zonderman, & Resnick, 2012; Mund & Neyer, 2014). As a first implementation of the suggested approach revealed reciprocity between personality and social relationship effects (Mund & Neyer, 2014), the new methodological adaptations also seem promising to better understand the role of social relationships in the time of emerging adulthood.

Third, studies on the profound mechanisms and processes of personality development have only begun to be implemented (e.g., Bleidorn, 2015; Wrzus & Roberts, 2017). However, knowledge of the underlying mechanisms and processes of personality development would allow for a more profound understanding of the interindividual differences that have been observed in many studies (e.g., Lüdtke et al., 2011; Mõttus, Allik, Hřebíčková, Kööts-Ausmees, & Realo, 2016; Mõttus, Soto, & Slobodskaya, 2017; Schwaba & Bleidorn, 2017).

The present work aims to address the presented gaps in the research field within three empirical, longitudinal studies. The first study investigates personality development of

emerging adults undergoing a different educational pathway than college education, that is, vocational education and training (VET). The second study investigates personality-social relationship transactions in emerging adults undergoing the major life transition from high school to post-secondary education or work and implements new methodological adaptations (Mund & Neyer, 2014). The third study proposes and performs a first attempt to studying processes of personality development by investigating the role of the interplay between characteristics of the person and features of the environment for subsequent personality development. Thereby, both the characteristics of the person and the features of the environment were assessed from the basic psychological needs perspective (Deci & Ryan, 2014; Ryan & Deci, 2008).

Thus, the scope of the present work was to push personality development research forward by, on the one hand, addressing gaps that have remained unresolved from previous research, and on the other hand, drawing on current directions regarding the identification of processes and their contingencies. In order to provide a common ground for the basis of this work, I will first define personality development as a two-sided construct including stable and malleable aspects. Second, I will introduce a framework commonly used to organize the different concepts of personality development research, and the constructs used in this work will be classified therein. Third, I will present the current state of research in personality development and its major developmental contexts, to fourth, elaborate on the significant role of emerging adulthood for personality development. Based upon the information given, I will finally present the resulting research questions that drove the work conducted in this dissertation.

Continuity and Change in Personality Development – Two Sides of the Same Coin

Today's understanding of personality development is primarily based on the *dynamic interactional paradigm* which suggests continuous, reciprocal processes between the person and the environment to occur (e.g., Endler & Magnusson, 1976; Magnusson, 1990). That is, both processes located within the person (e.g., genetics) and aspects of the person's environment (e.g., social relationships) are understood to reciprocally interact over time and subsequently form personality and the environment respectively. Accordingly, the dynamic interaction paradigm comprehends personality to be constituted of both stable and malleable aspects. In their meta-analysis on personality stability, Roberts and DelVecchio (2000) demonstrated significant increases in personality stability from childhood over adolescence and emerging adulthood up to ages 50 to 70. At the same time, Roberts et al. (2006) showed that,

on average, people display remarkable changes in their personalities during the life course. As these two quantitative reviews exemplarily show, personality development indeed consists of two inseparably linked ‘sides of the same coin’ (e.g., Allemand, Zimprich, & Hendriks, 2008). Therefore, only by capturing stability and change of personality simultaneously, the whole picture of the two-sided medal of personality development can be revealed. When speaking of personality development in this present work, I always imply aspects of both continuity and change.

Capturing Personality Development

To examine personality development, four common statistical indicators that capture different aspects of personality continuity and personality change are relevant: rank-order consistency, mean-level change, ipsative consistency, and individual differences in change (e.g., Roberts, Wood, & Caspi, 2008). The indicators of personality development can be organized according to their level of reference (population level vs. individual level), and whether the information is considered in absolute or relative terms (Roberts et al., 2008). With respect to the population level, *rank-order consistency* refers to the relative ranking of individuals within the group of interest and is commonly measured as test-retest correlations. That is, rank-order consistency provides information on the degree to which individuals obtain the same placement on the personality trait of interest in the respective population across a given time period. *Mean-level change* provides absolute information on average increases or decreases that occur in the whole population in a given time period and is mostly expressed by standardized mean differences (e.g., Cohen’s *d*; Cohen, 1988). Referring to the individual level, *ipsative consistency* refers to the relative ordering of personality domains within the individual across time. *Individual differences in change* captures the individual’s absolute pattern of increases, decreases, or no change in the respective personality traits and provides information on patterns of change that derivate from the population mean-level changes (Roberts et al., 2008). The amount of variance observed in mean-level change serves as a good indicator of the extent of individual differences in change.

It is important to note that each of the four indicators addresses a unique aspect of personality development, and that these aspects are not necessarily theoretically or methodologically associated (Roberts & DelVecchio, 2000). They should be seen as different approaches to capture distinct research questions concerning personality development (Roberts et al., 2008). In this regard, this dissertation is interested in personality development (stability and change) at the population level and individual differences in change, and thus, does not include ipsative consistency.

Organizing the Field of Personality Development: The Neo-Socioanalytic Model

Over the past decades, personality has been understood, conceptualized, and assessed in many different ways (e.g., Schultz & Schultz, 2017). Because of the different approaches, a comprehensive organization of personality and its development was needed to allow for a common understanding of personality and its development across research traditions (Roberts & Wood, 2006). Based on dynamic transactionism, and therefore, considering personality development as a reflection of processes occurring between the person and the environment, the *Neo-Socioanalytic Model of Personality Psychology* (e.g., Roberts & Wood, 2006; Roberts & Nickel, 2017) provides a common ground for the different directions of personality development research by grouping the utilized constructs and relating them to each other in a graspable network. The framework consists of two aspects: First, it organizes the different constructs that are used to conceptualize, assess, and explain personality development (Figure 1.1). Second, based on previous empirical findings and theoretical assumptions, the model lists common principles of personality development. In the following, I will first present the central components and their theoretical background. Second, a brief introduction to the three most established principles of personality development that are included in the Neo-Socioanalytic Model will be given. Third, common research questions of the field will be classified to different levels of personality development research.

Components of the Neo-Socioanalytic Model

The Neo-Socioanalytic Model of Personality organizes personality and its developmental factors in three broad categories: unit of analysis, fulcrum of assessment, and distal causes – the latter being roughly subdivided in rather physiological aspects and environmental factors (Roberts & Nickel, 2017; Roberts & Wood, 2006). Regarding the units of analysis, personality is conceptualized in four, significantly different and hierarchically organized domains: traits, motives and values, abilities, and narratives. *Traits* constitute the top level and are largely considered to be inherent, biologically determined, and responsible for enduring patterns of thoughts, feelings, and behavior across situations and time (e.g., Allport, 1961; Hogan & Blickle, 2018; Roberts, 2009). In recent years, Five-Factor Theory (FFT; McCrae & Costa, 1991, 1999) prevailed as primary representative of trait theories. FFT considers personality as a result of inherent, endogenous developmental processes that are carried out during childhood and adolescence to reach a final stage before the age of 30 (e.g., McCrae & Costa, 1999). However, not only were personality traits shown to develop across the lifespan (e.g., Roberts et al., 2006), but also found to be systematically related to the occurrence

of certain environmental contexts (for reviews, see Bleidorn, 2015; Bleidorn et al., 2016; Hutteman, Hennecke, Orth, Reitz, & Specht, 2014; Specht, 2017). Correspondingly, studies in the field of epigenetics were able to show that the activity of genes changes in reaction to environmental contexts and specific life experiences (for an overview, see Kandler & Zapko-Willmes, 2017). Combining the theoretical assumptions and empirical findings, the Neo-Socioanalytic Model considers traits to be based on genetics and the respective physiological correlates in constant transactions with aspects of the environment. Because traits are considered the broadest and most encompassing reflection of personality (Roberts & Davis, 2006), they are also considered to comprise the remaining units of analysis that reflect more specific dimensions of personality. Due to the overarching conception of personality traits, personality development research has primarily focused on trait development with a consistent focus on the Big Five factors of emotional stability, extraversion, openness to experience, agreeableness, and conscientiousness (Costa & McCrae, 1988; Tubes & Christal, 1992; for meta-analyses, see Briley & Tucker-Drob, 2014; Lodi-Smith & Roberts, 2007; Roberts & DelVecchio, 2000; Roberts, Luo, Briley, Chow, Su, & Hill, 2017; Roberts et al., 2006). In order to allow for comparisons between studies and to facilitate the integration of new findings to the research field, the present work follows previous research and focuses on Big Five personality trait development. To support readability, I will consistently speak of emotional stability instead of neuroticism. Thus, when referring to previous findings, the results are presented in the direction of emotional stability.

Motives and values constitute the domain of personality that reflects what individuals actively aspire and strive for in their lives such as profound psychological needs (e.g., Ryan & Deci, 2000), as well as goals, interests, preferences, etc. (e.g., Roberts & Wood, 2006). In this regard, previous research suggests that individuals' goals and needs are key aspects for subsequent behavior (e.g., Denissen, van Aken, Penke, & Wood, 2013; Hennecke, Bleidorn, Denissen, & Wood, 2014). People seem to regulate and adapt their behavior in order to attain psychological or physical goals via processes of self-regulation, that is, adapting one's behavior to maximize the likelihood for goal attainment (e.g., Fishbach, Zhang, & Koo, 2009; Koo & Fishbach, 2008). The domain of *abilities* relates to all aspects of the individual's competencies. This domain has mostly been studied from the perspective of cognitive abilities, but could also be understood to include creativity, social competencies as well as emotional skills (Neyer & Asendorpf, 2018; Schmiedek, 2017). *Narratives* resembles the fourth domain referring to the personal stories and scripts individuals make use of to understand themselves, their

environments, and the experiences that result from the reciprocal interaction of the two (for an overview see: e.g., McAdams & Pals, 2006; McLean, 2017).

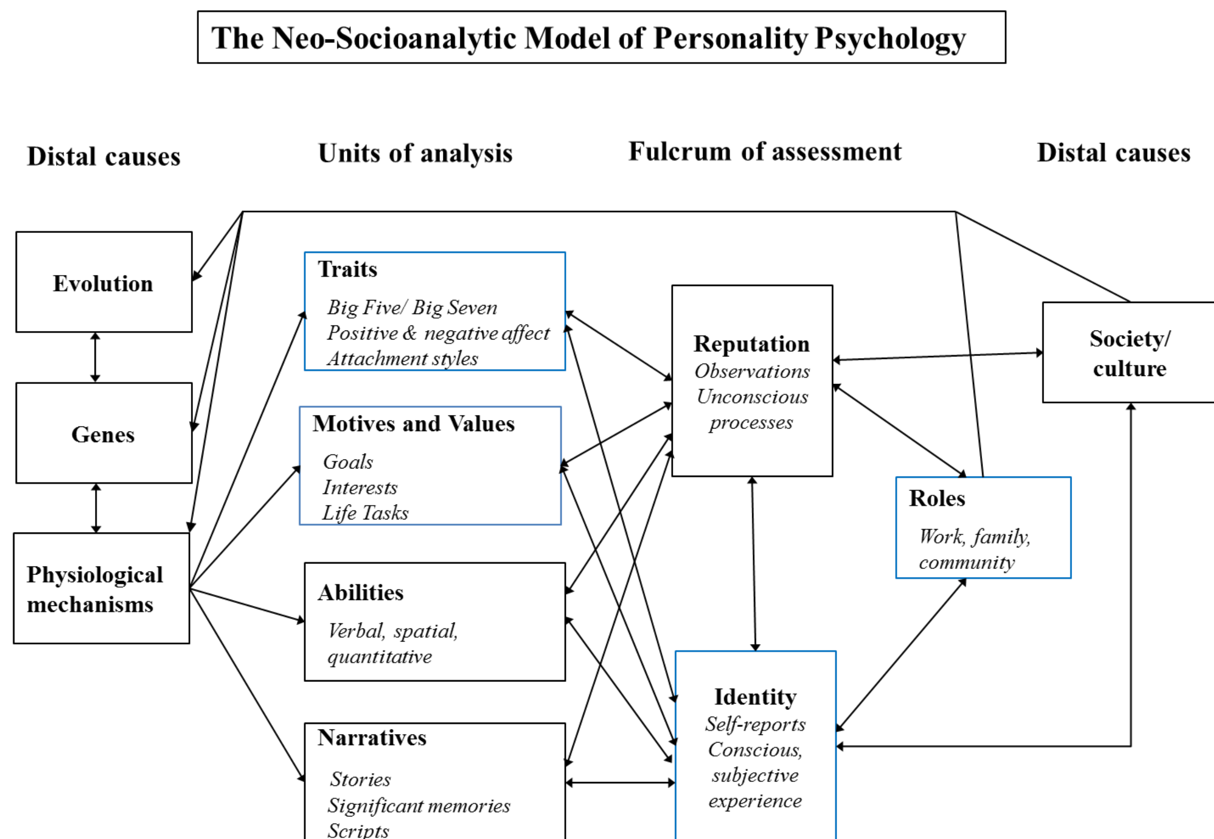

Figure 1.1 The Neo-Socioanalytic Model (adapted from Roberts & Nickel, 2017, p. 158). The blue framed boxes indicate the domains of interest of the present dissertation.

With respect to the fulcrums of assessment, each of the four personality domains can be assessed either from an observational, third person perspective or via self-reports. Obtaining information from an observational perspective reflects other's perceptions of a person's personality, that is, the person's *reputation*. Self-reports of personality comprise information of the self the person is consciously aware of, that is, the person's *identity* (Roberts & Nickel, 2017). Even though it is theoretically well delineated that both identity and reputation carry different information on personality, most studies on personality development have used identity reports, that is, self-report data; only few studies have included and compared self-reports to other-reports (e.g., Luan, Hutteman, Denissen, Asendorpf, & van Aken, 2017; Rohrer, Egloff, Kosinski, Stillwell, & Schmukle, 2017). Because identity development is a crucial developmental domain of adolescence and emerging adulthood (Erikson, 1968;

Havighurst, 1972; Klimstra, 2013; Marcia, 1966), this dissertation focuses on personality development from the identity-/ self-perspective.

Regarding the distal causes of personality development, the model follows previous research findings showing both physiological aspects (evolution, genes, and physiological mechanisms) and environmental factors as meaningful for personality development (e.g., Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2009; Bratko & Butkovic, 2007; Kandler, 2012; McCrae et al., 2000). The model follows the theoretical claims of dynamic transactionism including physiological aspects to engage in reciprocal transactions with the environment (e.g., Magnusson, 1990). Focusing on aspects of the environment, two main contexts are spanned that encompass the large majority of environmental contexts: social relationships and the context of work (in younger ages: the educational setting). *Liebe und Arbeit* (love and work) have long been considered the keys to well-being and a happy life (McCrae & Costa, 1991). The Neo-Socioanalytic Model strongly emphasizes the intake of *social roles* and the fulfillment of corresponding expectations in these two contexts. In this regard, the model distinguishes between status roles that are more closely associated with the context of work (e.g., working position, employer), and belongingness roles which refer to the context of social relationships in different life domains (e.g., colleagues, family, friendships, romantic partner).

The Large Three – Established Principles of Personality Development

The Neo-Socioanalytic-Model does not only organize the different research domains of personality psychology (Figure 1.1.), but also postulates principles of personality development that are derived on the basis of previous empirical findings (Roberts & Nickel, 2017). Among others, three principles have been empirically most established and will be presented in the following. First, the *cumulative continuity principle* refers to the finding that rank-order consistency increases steadily from adolescence over emerging adulthood and adulthood to old age (Roberts & DelVecchio, 2000; Roberts & Wood, 2006). Second, the *maturity principle* concerns the empirical observation that people increase in emotional stability, agreeableness, and conscientiousness across the life span (e.g., Roberts et al., 2006). Third, the *social investment principle* (SIP; Roberts & Wood, 2006) claims that societal and cultural norms work upon individuals to conform to social role demands leading individuals to adapt their personalities accordingly (e.g., Lehnart, Neyer, & Eccles, 2010; Lodi-Smith & Roberts, 2007; Roberts & Wood, 2006). There has been ample evidence for the cumulative continuity principle and the maturity principle across the life span (for further details, see the following sections). The SIP has also gained support as close associations between personality development and the occurrence of major life and social role transitions (e.g., Bleidorn, 2012; Lüdtke et al, 2011;

Neyer, Mund, Zimmermann, & Wrzus, 2014; Specht, Egloff, & Schmukle, 2011) such as entering the working context or parenthood (e.g., Bleidorn et al., 2016; Lodi-Smith & Roberts, 2007; Roberts, Caspi, & Moffitt, 2001; Specht et al., 2011) could be shown. However, few studies have explicitly investigated the development of personality traits and the applicability of the three common principles in important environmental contexts of emerging adulthood (e.g., Bleidorn, 2012; Lüdtke et al., 2011; Wagner, Becker, Lüdtke, & Trautwein, 2015; Zimmermann & Neyer, 2013).

Following previous research, the present work focuses on the role of environmental contexts and sets out to test three common principles of personality development. In this regard, special attention is paid to the contexts of social relationships and work. The significance and grounding of these two contexts in the study of personality development will be further explored in the section on the significant role of emerging adulthood.

Levels of Personality Development Research

The two sections above suggested that the different domains of personality development research encompass different research questions. From my perspective, the ultimate questions that drive personality development research can be grouped into four broad categories (Figure 1.2). Within studies, researchers mostly address different research questions ultimately tapping on the following levels. First, personality development research is interested in describing patterns of personality development. Specifically, it is intended to answer the question of how personality develops across a given time period (descriptive level). This question is mostly addressed with respect to population differences regarding age or cohort (e.g., Lucas & Donnellan, 2009, 2011; Soto et al., 2011; Srivastava, John, Potter, & Gosling, 2003). In longitudinal studies, a variety of models such as the latent difference score model or the latent growth curve model are used to address these questions (for overviews, see Hamaker, Kuiper, & Grasman, 2015; Little, 2013; McArdle, 2009). Second, researchers are interested in examining the environmental contexts and its driving factors associated with personality development (context level). Thereby, it is important to understand the environmental contexts that are associated with personality development such as the contexts of social relationships, work, life events, or phases of transitions (e.g., Mund & Neyer, 2014; Specht et al., 2014; Wrzus & Neyer, 2016). Besides others, correlated change scores are often used to analytically investigate whether two domains (e.g., change in the environment and change in personality) are significantly related (e.g., Allemand & Martin, 2016). Third, research of personality development seeks to reveal the patterns of interplay between personality characteristics and the respective environmental contexts (interplay level). In aiming to reveal the shape of the

interplay between aspects of the environment and personality, cross-lagged panel models are often used (e.g., Asendorpf, Denissen, Klimstra, & Lüdtke, 2017; Grimm et al., 2012; Little, 2013; McArdle, 2009). These models include cross-lagged effects with one domain (e.g., social relationships) predicting (change in) the other domain (e.g., personality).

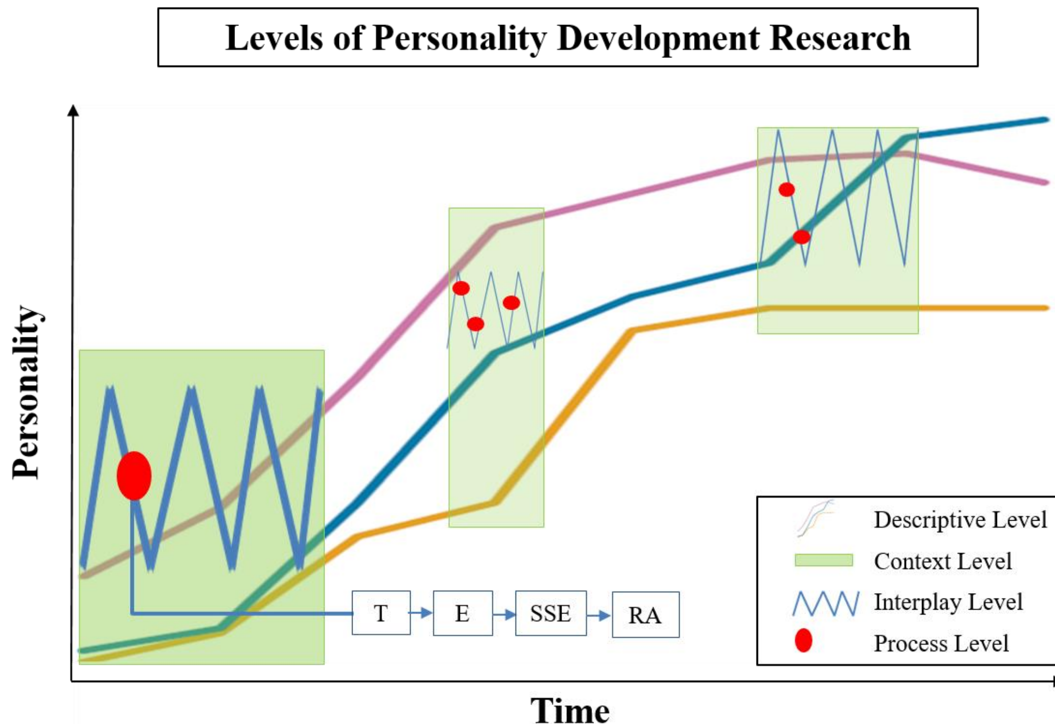

Figure 1.2. The figure presents a graphical representation of the four different levels of personality development research. The descriptive level is represented by the violet, blue, and yellow lines which capture personality development across time. The context level is represented by the green boxes to exemplarily demonstrate the occurrence of important life contexts (e.g., transitions or life events). The level of personality-environment interplay is graphically represented by the blue zigzag lines which indicate reciprocal effects between the descriptive lines and the green context boxes. The process level is represented by the red bullets which point to microanalytical, short-term sequences between the person and the environment (e.g., the TESSERA model with T = triggering situations, E = expectancy, SSE = state/ state expression, RA = reaction; Wrzus & Roberts, 2017). Note, that the graphs for the descriptive level were adapted from Bleidorn (2015).

Fourth, it is of major interest to understand the underlying processes and mechanisms as well as the contingencies of personality development (process level). On the process level, it is of interest to investigate the chronological sequence of person and environment

characteristics that determine personality development (e.g., Wrzus & Roberts, 2017). By revealing the profound mechanisms, it might not only be possible to explain individual differences in change but to also be able to actively shape one's personality at some point in the future (e.g., Back et al., 2011; Geukes, van Zalk, & Back, 2018; Wrzus & Roberts, 2017). Based on theory and previous research, Wrzus and Roberts (2017) delineated a microanalytical model (TESSERA) that will need to be tested in future research. TESSERA indicates environmental contexts to serve as triggering situations (T) for expectancies (E) within the person. The latter are thought to elicit state expressions (SSE) within the person that subsequently call for behavioral and emotional reactions (RA), that is, personality development. In Figure 1.2 the TESSERA model is exemplarily outlined as one possibility to conceptualize microanalytical processes.

The studies presented in this dissertation cover parts of all of the depicted levels of personality development research across different domains. In the next section, I will review the present state of research regarding the constructs of personality development focused on in this work.

Empirical Evidence of Personality Development

Previous research of personality development can be categorized to both broader and more specific aspects within the Neo-Socioanalytic Model. With respect to the presented levels of personality research, the majority of studies can be grouped to the levels of description, context, and interplay. Regarding research questions of the descriptive level, the primary interest lies in the empirical depiction of Big Five personality trait development, that is, information on rank-order consistency, mean-level change, and individual differences in change. With respect to the study of environmental contexts and their interplay with personality, the contexts with the most evident social role aspects have been most frequently considered, for example, different types of social relationships (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Mund & Neyer, 2014), life events (Bleidorn et al., 2016; Leikas & Salmela-Aro, 2015; Specht et al., 2011), or the working context (Hudson, Roberts, & Lodi-Smith, 2012; Lodi-Smith & Roberts, 2007). Thus, the extent to which aspects of the presented domains of the model are combined within studies depends on the research level of interest (i.e., descriptive level, context level, interplay level, process level). In the following, I will first present the current state of empirical evidence regarding the more descriptive level of Big Five personality trait development by focusing on rank-order consistency, mean-level change, and individual differences in change before considering the additional levels.

Rank-order Consistency

With respect to rank-order consistency, the first meta-analysis of longitudinal studies reported steady increases in rank-order consistency of the Big Five traits across the life span and suggested two key findings (Roberts & DelVecchio, 2000). First, the development of rank-order consistency was very similar for all Big Five personality traits across the life span. Second, three transitional age periods were revealed in which rank-order consistency increased remarkably: early childhood (ages 3 to 6), emerging adulthood (ages 22 to 29), and middle adulthood (ages 40 to 49). Briefly, from early childhood to emerging adulthood, test-retest correlations of rank-order consistency increased remarkably from .31 to about .54, followed by further increases till the age of 30 ($r = .64$). From early adulthood to old age, rank-order consistency increased further to finally reach a rather steady point between the ages of 50 and 70 ($r = .74$). Many studies provided additional support for the cumulative continuity principle (e.g., Hopwood, Donnellan, Blonigen, Krueger, McGue, Ianoco, & Burt, 2011; Kandler, Bleidorn, Riemann, Spinath, Thiel, & Angleitner, 2010; Lüdtke et al., 2011).

Regarding the time from adolescence to early emerging adulthood, studies provided support for major yearly increases in rank-order consistency (e.g., Borghuis et al., 2017; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009; Pullmann, Raudsepp, & Allik, 2006). Looking further into emerging adulthood, some studies provided support for the continuous increase in rank-order consistency. At the end of high school, German students were shown to increase in 1.5-year rank-order consistency (Bleidorn, 2012). The same pattern was revealed for all Big Five traits except for agreeableness in 2-year rank-order stabilities across four years (Lüdtke et al., 2011; Vaidya, Gray, Haig, & Watson, 2002). During the college years and further into emerging adulthood, rank-order stability of personality was found to be moderate (e.g., Neyer & Asendorpf, 2001; Robins, Fraley, Roberts, & Trzesniewski, 2001; Wortman, Lucas, & Donnellan, 2012). In a study looking at emerging adults from ages 17 to 24 and from 24 to 29 years of age, rank-order consistency was shown to increase more strongly from ages 24 to 29 years (Hopwood et al., 2011). The study confirmed that personality consistency increases steadily from emerging adulthood to early adulthood with less increases in rank-order consistency during early emerging adulthood (Hopwood et al., 2011). Across all studies, the rank-order consistencies for emotional stability and agreeableness were shown to be the lowest during emerging adulthood.

With respect to increases in rank-order consistency in middle adulthood and old age, Morizot and LeBlanc (2003) were able to show that stability of negative emotionality, which can be linked to emotional stability, and extraversion increased remarkably. In line with Roberts

and DelVecchio (2000), rank-order consistency of the Big Five across three years was higher in adulthood than would be expected during emerging adulthood (Van Aken, Denissen, Branje, Dubas, & Goossens, 2006). Even across eight (Mund & Neyer, 2014), ten (Sutin & Costa, 2010), and 24 years (Billstedt et al., 2014) respectively, personality consistency in middle adulthood was shown to be rather high (.60 to .77). Some studies suggest that it plateaus at some point in old age (e.g., Billstedt et al., 2014; Kandler et al., 2015; Mõttus, Johnson, & Deary, 2012) whereas others reported significant decreases beginning with the age of 70 (e.g., Lucas & Donnellan, 2011).

Overall, it was during the time of emerging adulthood that rank-order consistency increased most strongly compared to the whole life span. At the same time, individuals displayed less increases in rank-order consistency in the time of early compared to later emerging adulthood. Therefore, in aiming to understand personality development and its driving factors, emerging adulthood was shown to be prone to provide answers to these questions.

Mean-level Change

Information on mean-level change has been drawn from both longitudinal studies and cross-sectional panel studies (for an elaborated explanation, see Little, 2013, p. 37-69). Mean-level personality change in longitudinal studies provides information on the average change that the observed population reports (Roberts et al., 2008). In contrast, cross-sectional panel studies provide information on mean-level differences between different age groups or cohorts respectively (for details, see McArdle, 2009). Because of methodological challenges, it has to date been difficult to collect longitudinal data on personality variables in one group of people across the whole life span. In order to still depict a comprehensive picture of personality mean-level change across all age groups, I will combine information from cross-sectional as well as longitudinal studies restricted to a specific age span.

The first systematic revelation of mean-level changes in personality across the life span was presented in the meta-analysis of Roberts et al. (2006). The meta-analysis aggregated mean-level changes in eight age groups ranging from adolescence (10-18) to the college years (18-22), from late emerging adulthood to young adulthood (22-30), young adulthood (30-40), middle adulthood (40-50, 50-60), late adulthood (60-70), and old age (>70). Three main findings paved the way for subsequent research on mean-level personality change: First, people displayed significant mean-level changes at all ages across the whole life span. This finding is also referred to as the *plasticity principle* indicating that personality traits are “open systems” that can change at any age (Roberts et al., 2008, p. 376). Second, the most pronounced changes

occurred during emerging adulthood and young adulthood (Roberts & Davis, 2016). Third, change was primarily in the direction of the maturity principle, that is, increases in emotional stability, agreeableness, and conscientiousness (Roberts et al., 2006). The findings for extraversion and openness were more inconsistent (e.g., Schwaba, Luhmann, Denissen, Chung, & Bleidorn, 2018; Roberts et al., 2006; Scollon & Diener, 2006).

Regarding the three findings, follow-up studies were able to provide ample support for mean-level changes across all age groups. With respect to childhood and adolescence, large cross-sectional studies reported mean-level differences across this age span (e.g., Soto, 2016; Soto et al., 2011). Longitudinal studies (e.g., Soto, 2016; van den Akker, Deković, Asscher, & Prinzie, 2014) showed that mean-level changes do occur, but in an inconsistent manner (for reviews, see; Herzhoff, Kushner, & Tackett, 2017; Meeus, 2016; Soto & Tackett, 2015). In this time period, almost all Big Five traits were shown to decline or display “dips” before increases in these traits occurred in the following years of emerging adulthood (*disruption hypothesis*; Luan et al., 2017; Soto, 2016; Soto & Tackett, 2015). In the age span of emerging adulthood, most significant mean-level changes were revealed with ample evidence for the maturity principle (e.g., Lucas & Donnellan, 2011; Lüdtke et al., 2011; Roberts et al., 2001; Vecchione, Alessandri, Barbaranelli, & Caprara, 2012). Including studies interested in the context level of personality development, different contexts were shown to be meaningful. Numerous studies on emerging adulthood and young adulthood replicated the maturity principle in phases of transitions, for example, from high school to university or the working context (Bleidorn, 2012; Lüdtke et al., 2011), while staying abroad (Niehoff, Petersdotter, & Freund, 2017; Zimmermann & Neyer, 2013), during college education (e.g., Roberts et al., 2002; Robins et al., 2001; Selfhout, Burk, Branje, Denissen, van Aken, & Meeus, 2010; Vaidya et al., 2002), or more broadly during emerging adulthood and into young adulthood (e.g., Helson & Moane, 1987; Hopwood et al., 2011; McGue, Bacon, & Lykken, 1993; Roberts et al., 2001; Roberts & Chapman, 2000). Large cross-sectional panel studies displayed mean-level differences across this age span that conform to the maturity principle (e.g., Soto et al., 2011; Srivastava et al., 2003); even across different countries and cultures (e.g., Bleidorn, Klimstra, Denissen, Rentfrow, Potter, & Gosling, 2013; Galinha, Garcia-Martin, Oishi, Wirtz, & Esteves, 2016). Nevertheless, there are also studies indicating slightly different or deferred developmental trends than continuous positive development. For example, in their longitudinal, representative cohort sequential study from New Zealand, Milojev and Sibley (2017) reported decreases in emotional stability, extraversion, openness, and agreeableness in emerging adulthood. Only slight increases in conscientiousness were in line with the maturity principle. Similarly,

investigating personality development in shorter time intervals of emerging adulthood did not uniformly yield personality maturation: Young Finns between ages 20 and 23 significantly increased in conscientiousness, decreased in emotional stability, and additionally, did not display any changes in agreeableness (Leikas & Salmela-Aro, 2015). Likewise, German college students in their first year of college increased in emotional stability across 1.5 years with no changes in agreeableness and conscientiousness, thereby, displaying only slight tendencies of the maturity principle (Asendorpf & Wilpers, 1998). Thus, findings across the life span from both cross-sectional and longitudinal studies provide solid evidence for personality maturation in emerging adulthood and young adulthood, but studies with shorter time intervals clearly indicate that there is more to the overall linear trend.

Individual Differences in Change

Interindividual differences in intraindividual change (or *individual differences in change*) have been revealed for all Big Five personality traits across the life time (e.g., Allemand, Zimprich, & Hertzog, 2007; Mõttus et al., 2017; Robins et al., 2001; Schwaba & Bleidorn, 2017; Schwaba et al., 2018; Scollon & Diener, 2006). Two recent studies provided more detailed findings: First, Mõttus and colleagues (2017) were able to show that across cultures, individual differences in change increased steadily from early childhood over adolescence to early emerging adulthood. Second, a comparison of individual differences in change across 14 age groups (ages 16 to 84) revealed the most pronounced differences for the time of emerging adulthood with subsequent decreases until old age (Schwaba & Bleidorn, 2017). This finding was primarily true for extraversion, openness, agreeableness, and conscientiousness. However, individual differences in emotional stability were shown to be rather stable from emerging adulthood to old age (Mõttus et al., 2017; Schwaba & Bleidorn, 2017). Together, there is strong evidence that individual differences in change peak during emerging adulthood, that is, individuals differ with respect to their personality trait development most strongly in the time of emerging adulthood.

Summarizing the current state of research regarding the essential indicators of personality development across the life span, personality traits display significant developmental patterns in stability and change in all age groups. Thereby, the time of emerging adulthood was revealed as the time of life in which the most pronounced developments in rank-order stability, mean-level change, and individual differences in change were observed. During emerging adulthood, individuals were not only shown to increase in rank-order stability and display profound mean-level changes in the direction of the maturity principle, but individuals also become increasingly different from each other when passing this age span. In order to

understand the underlying factors accountable for these developmental trends, it is essentially important to understand the characteristic and unique environmental contexts of emerging adulthood. The following section presents emerging adulthood as a special period of life during which the two environmental contexts of social relationships and work emerge as central players for personality development.

Emerging Adulthood – A Special Time of Life

The term *emerging adulthood* (EA) was first characterized by Arnett (2000) for the age period 18 to 25. However, in current theoretical conceptions and empirical investigations, it is seen to be prolonged to roughly age 29 with many of the characteristic aspects of EA lasting to the late 20s and even early 30s (e.g., Arnett, 2015; Schwaba & Bleidorn, 2017). Based on the drastic changes that have taken place regarding the social requirements and social role expectations for the late teens and early 20s in Western societies, a new framework to study people in this time of life was proposed (for an overview, see Arnett, 2015). Typical developmental tasks of adulthood in the 1950s and 1960s (e.g., marriage, becoming a parent, starting a solid job; Bowlby, 1982; Erikson, 1968; Havighurst, 1972) have been deferred to the late 20s and early 30s (Fishman, 2016; Oblinger, 2003). Instead, emerging adults undergo post-secondary education (Statistisches Bundesamt, 2018; United States Census Bureau, 2018), live independently from their parents, explore themselves in the contexts of love and work/ education, and make their own choices in a variety of domains, such as, experiencing the first romantic relationship (Wagner et al., 2015) or entering the workforce (Lüdtke et al., 2011; Specht et al., 2011). Thus, EA represents a time period of developmental tasks and challenges unique to this life stage. Arnett (2006) identified five characteristic features of EA: identity exploration, instability, self-focus, feeling in-between, and possibilities.

Characteristics of Emerging Adulthood

Identity exploration and identity development have often been considered fundamental tasks in the transition from adolescence to adulthood (for reviews, see Klimstra & Van Doeselaar, 2017; Schwartz, Luyckx, & Vignoles, 2011). In line with the conceptualization of identity in the Neo-Socioanalytic Model (Roberts & Nickel, 2017), identity is a widely used term that refers to the cognitive representation of one's personal beliefs, values, and goals (Cramer, 2017). Identity exploration is commonly understood as the consideration and testing of potential commitments in relevant life domains (Marcia, 1966). This involves processes of figuring out who one is, that is, identifying personal preferences and interests or engaging in

critical evaluations of one's beliefs and social roles (Klimstra & Van Doeselaar, 2017). In this regard, identity exploration concerns fundamental questions concerning the exploration of personal life goals, values, needs, or desires (Arnett, 2006). Over the past 50 to 60 years, the time of identity exploration and development has changed substantially (Carlsson, Wängqvist, Frisén, 2015; Meeus, 2011; Schwartz, Zamboanga, Luyckx, Meca, & Ritchie, 2013). Whereas developmental tasks of young adulthood in the 1950s and 1960s were concerned with marriage, parenthood, and job start shortly after high school (National Center for Educational Statistics, 2016), the number of people attending post-secondary education is nowadays roughly 4 times as high as in the 1950s and 1960s (Schwartz et al., 2013). This prolonged time of education is accompanied by a postponed experience of the typical milestones to the late 20s or early 30s (Statista, 2018; United States Census Bureau, 2017). Consequently, there is more time for exploring oneself in different domains of social role expectations such as social relationships and work. As the traditional milestones have not only been theoretically linked to reaching adulthood (see above), but also empirically shown to be associated with, for example, stronger feelings of 'being an adult' (Luyckx, Schwartz, Goossens, & Pollock, 2008; Nelson & Barry, 2016), there seems to be more time in-between adolescence and adulthood for identity exploration nowadays (Carlsson et al., 2015; Meeus, 2011).

Emerging adulthood is also characterized by high *instability*. This does not only involve more frequent residential changes (Arnett, 2015), but also changes of interests, for example, trying out different college subjects before deciding on a specific pathway (Malgwi, Howe, & Burnaby, 2005; Shaw & Barbuti, 2010). Instability does also concern different types of social relationships. Especially in emerging adulthood, both overall social networks and the network of friends tend to undergo drastic changes (e.g., Selfhout et al., 2010; Wagner, Lüdtke, Roberts, & Trautwein, 2014). A meta-analysis on social network changes was able to show that during emerging adulthood both the personal network and the network of friends increase whereas the network of family seems to decrease (Wrzus, Hänel, Wagner, & Neyer, 2013). Even though the strength of ties to family members seem to become less important in this age span, relationships to kin are still characterized by strong emotional closeness (Wrzus et al., 2013). Thus, departing from one's core family implies both emotional and residential instabilities. Also, engaging in (the first) romantic relationships is commonly associated with emerging adulthood and involves important choices and emotional experiences (e.g., Shulman & Connolly, 2013; Wagner et al., 2015).

Self-focus is another typical feature of emerging adulthood. Living on one's own and lacking clear responsibilities or duties for others consequently leads emerging adults to make

independent choices based on their personal desires (Arnett, 2006). In line with the described social changes and the prolonged time of emerging adulthood, today's emerging adults were shown to be less concerned about others and less oriented towards civic interest than people of that age in the 1960s (Fishman, 2016; Twenge, Campbell, & Freeman, 2012). Even though some researchers came to call current emerging adults the 'generation me' due to their increased tendencies of narcissism compared to other generations (Twenge & Campbell, 2009; Twenge, Konrath, Foster, Campbell, & Bushman, 2008a, 2008b), Arnett (2000, 2006, 2015) argues that self-focus should not be confused with self-centering. Instead, focusing on the self might be even necessary for successful identity exploration. Only by focusing on and following one's inner tendencies, it might be possible to get to know one's personal likes and preferences to subsequently fully commit to the societal roles that fit one's identity (i.e., mastering identity development).

Feeling *in-between* concerns the typical emotional experience of emerging adults as no longer being an adolescent but not having reached the full status of adulthood yet (Arnett, 2000). Features of adulthood are often seen in three aspects: taking responsibility for the self, making independent decisions, and being financially independent of others (e.g., Arnett, 2006; Badger, Nelson, & Barry, 2006; Nelson, Badger, & Wu, 2004). However, as these accomplishments might require rather gradual developmental experiences in different domains of life instead of single life events (e.g., Baltes, Lindenberger, & Staudinger, 1998), emerging adults can significantly differ in their feelings of being in-between (e.g., Sirsch, Dreher, Mayr, & Willinger, 2009). Whereas some adults might perceive themselves as taking responsibility and making independent decisions already in high school or early in college, others might only feel as an adult when they take their first job and experience themselves as financially independent.

Emerging adulthood is considered to be the time of *possibilities* and opportunities (Arnett, 2006). Arnett (2000) argues emerging adults to no longer be dependent on their families and to be free to decide on the duties and responsibilities they engage in. They might marry early, later, or not at all; they may undergo post-secondary education, start a job, go abroad, or take a mission trip. They might move away from their home town or stay in their established communities – many options are feasible. According to Arnett (2006) emerging adults have high hopes for their future and believe the future to provide life at its best (e.g., Facio, Resett, Micocci, & Mistrorigo, 2007; Nelson et al., 2004; Sirsch et al., 2009). There are numerous possibilities in almost all life domains with emerging adults having the freedom to explore the different options, to engage in them, and subsequently commit or withdraw from them (e.g.,

Buhl & Lanz, 2007; Negru, 2012). This freedom to choose from various possibilities and to not be fully committed to either of the options ultimately aligns with feelings of in-between and insecurity. Thus, emerging adulthood requires self-focus to recognize personal preferences, to choose from the various possibilities in the different domains of life, and to finally commit and reach adult identity.

Summarizing, emerging adulthood is a time with various challenges and developmental tasks. Emerging adults are not only expected to make the first steps towards a solid working career but to also establish a supportive social network, find a romantic partner, and start a family on their own (e.g., Arnett, 2000; Facio et al., 2007; Nelson & Chen, 2007; Sirsch et al., 2009). This involves milestones such as graduation from high school, starting college or apprenticeship training, deciding on a work field of interest, leaving the parental home, making new friends, or experiencing the first romantic relationship (Arnett, 2000, 2006, 2015). As the mentioned examples nicely show, the life domains in which the features of emerging adulthood are most present can be subsumed to two major environmental contexts: The context of love life and the context of work (Mayseless & Keren, 2014; McCrae & Costa, 1991). Thereby, love life considers the broader domain of belongingness, such as, bonds, ties, and relationships (e.g., relationships with the romantic partner, parents, siblings, grandparents, children, friends, colleagues, etc.) which are also represented in the Neo-Socioanalytic Model (Roberts & Nickel, 2017). The working context refers to the job context as well as different types of educational settings, such as college education, apprenticeship training, or subsequent professional development. As presented in the Neo-Socioanalytic Model, the working context refers to more status related aspects (Roberts & Nickel, 2017). With respect to personality development, various aspects of the context of love and the context of work have been shown to be differentially meaningful. In the following section, I will provide an empirical overview on the special importance of these two environmental contexts for personality development.

Major Environmental Contexts and their Significance for Personality Development

The environmental contexts of love and work have long been proposed as the two life domains of emerging adulthood that are rich of developmental tasks and are filled with new social role demands (e.g., Arnett, 2015; Havighurst, 1972; McCrae & Costa, 1991; Roberts & Wood, 2006). Both of them are commonly thought to set the ground for subsequent personality development (e.g., Hutteman et al., 2014; Roberts & Davis, 2016; Seiffge-Krenke, Luyckx, & Salmela-Aro, 2014).

Social Relationships

With respect to love life, forming and maintaining social relationships is a crucial task not only inherent of human nature but also strongly demanded by society (Deci & Ryan, 2014). A *social relationship* is understood as the relatively stable, reciprocal interaction pattern of at least two people (Hinde, 1979). Social relationships constitute an important part of an individual's environment and are therefore essential for personality stability and change (Finn et al., 2017; Reitz, Zimmermann, Hutteman, Specht, & Neyer, 2014). Interacting with social relationship partners can require modifications to one's existing behavioral patterns (e.g., Cohen, Gottlieb, & Underwood, 2000; Heaney & Israel, 2013; Mund & Neyer, 2014; Rollnick, Miller, Butler, & Aloia, 2009). When investigating the role of social relationships as important environmental context, two different approaches are usually taken (e.g., Finn et al., 2017; Wrzus, Zimmermann, Mund, & Neyer, 2017). The first approach focuses on the revelation of life transitions or life events in the context of social relationships that are systematically associated with personality development, for example, the first romantic relationship, marriage, or parenthood (e.g., Back et al., 2011; Bleidorn et al., 2016; Lüdtke et al., 2011; Specht et al., 2011; Wagner et al., 2015; Wagner et al., 2014; Wrzus et al., 2013). This approach can be matched with the context level of personality development research. The second approach aims to reveal the pattern of interplay between a certain environmental social relationship context and subsequent personality development (e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Sturaro et al., 2008). This type of studies typically investigates *how* the association between specific characteristics of social relationships and subsequent personality development unfolds to understand the interplay and its contingencies (interplay level). This approach has commonly studied effects of quantitative (e.g., number or duration of relationships), and qualitative aspects (e.g., feelings of closeness, insecurity, conflict, or satisfaction) of social relationships on personality development (e.g., Mund & Neyer, 2014; Schaffhuser, Wagner, Lüdtke, & Allemand, 2014; Van Scheppingen, Denissen, Chung, Tambs, & Bleidorn, 2018).

Context level. Regarding the context level approach, the most consistent finding was revealed for engaging in the first romantic relationship. Thereby, entering the first romantic relationship has been associated with changes in personality mostly conforming to the maturity principle (for reviews see; Bleidorn et al., 2016; Finn et al., 2017). Emerging adults were shown to become more emotionally stable (Lehnart et al., 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007), more extraverted (e.g., Leikas & Salmela-Aro, 2015; Lüdtke et al., 2011; Neyer & Lehnart, 2007; Wagner et al., 2015), more agreeable (Leikas & Salmela-Aro, 2015), and

more conscientious (Neyer & Lehnart, 2007; Wagner et al., 2015). More inconsistent are the results regarding the remaining prominent domains of social relationships during emerging adulthood. For marriage and first parenthood it is not yet possible to draw solid conclusions as the existing longitudinal studies display an inconsistent pattern of results (e.g., Bleidorn et al., 2016; Galdiolo & Roskam, 2014; Jokela, Kivimäki, Elovainio, & Keltikangas-Järvinen, 2009; Specht et al., 2011; Van Scheppingen, Jackson, Specht, Hutteman, Denissen, & Bleidorn, 2016; Van Scheppingen et al., 2018).

Interplay level. Regarding the interplay level, qualitative aspects of social relationships constitute an important part of the environment that has been considered to engage in reciprocal processes with personality across time (e.g., Back et al., 2011; Finn et al., 2017; Mund & Neyer, 2014).

General findings. Multiple studies investigated the theoretically claimed reciprocal relationship between various relationship characteristics and personality across different types of interaction partners (e.g., kin, peers, colleagues; Asendorpf & Wilpers, 1998; Mund & Neyer, 2014; Neyer & Asendorpf, 2001). Thereby, extensive evidence indicates that personality traits and relationship characteristics are related with personality predicting subsequent relationship qualities more strongly than vice versa (e.g., Asendorpf & Wilpers, 1998; Asendorpf & Van Aken, 2003; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Parker, Lüdtke, Trautwein, & Roberts, 2012; Scollon & Diener, 2006; for a review, see Wrzus & Neyer, 2016). Overall, more agreeable individuals were shown to receive more social support from their families (Branje, Van Lieshout, & Van Aken, 2004). Being more conscientious was related to feelings of less dependency (Lehnart & Neyer, 2006) and less insecurity (Mund & Neyer, 2014) as well as more contact frequency (Asendorpf & Wilpers, 1998).

During emerging adulthood, friendships are considered essentially important and have thus been studied more specifically (Tanner & Arnett, 2011). In this regard, being more emotionally stable, more extraverted, and more open was related to having more peers (Asendorpf & Wilpers, 1998), being more extraverted and more agreeable was associated with higher feelings of closeness and importance of friends (Mund & Neyer, 2014; Neyer & Asendorpf, 2001), and more agreeableness was also related to having fewer conflicts with friends (Asendorpf & Wilpers, 1998). Less evidence was found for the reciprocal direction of effects, that is, relationship characteristics predicting subsequent personality development. Feeling insecure and engaging in more conflict was related to decreases in emotional stability (Neyer & Asendorpf, 2001; Sturaro et al., 2008), experiencing higher dependency with the interaction partner was associated with increases in emotional stability, and feeling more secure

related to increases in conscientiousness (Lehnart & Neyer, 2006). However, the imbalance between personality- and relationship effects remained which is not in line with the assumption of dynamic transactionism theory (Magnusson, 1990).

Methodological aspects. Regarding the presented findings, Mund and Neyer (2014) argued the comparison between the two directions of effects to be unfair whilst not accounting for (a) differences in the stability of the broad Big Five traits and the more fluctuating relationship characteristics, (b) the limited capability of the applied cross-lagged panel models to fully capture the underlying theory of dynamic transactionism, and (c) studying personality-relationship transactions across different time intervals and in different phases of life. In their analyses across eight years, they were the first to reveal an equal number of personality-relationship transactions in addressing the above mentioned points by (a) including the more fluctuating facet level of personality, (b) extending traditional bivariate latent difference score models by so-called *coupling effects* that resemble effects of change in one domain on subsequent change in the other domain (Grimm et al., 2012), and (c) investigating personality-relationship transactions in early to middle adulthood (Mund & Neyer, 2014). The majority of effects of social relationships on subsequent personality were revealed in the domain of friendship and with the romantic partner, thus, providing additional empirical evidence for these two domains within the environmental contexts of social relationships (Mund & Neyer, 2014).

Aiming for additional explanining factors, age has been proposed as a central moderator in the occurrence of reciprocal personality relationship transactions (Finn et al., 2017). It has been argued that age should reflect the occurrence of typical life transitions of a certain period of life (Finn et al., 2017; Neyer, Mund, Zimmermann, & Wrzus, 2014). Neyer et al. (2014) proposed that the occurrence of reciprocal personality-relationship transactions possibly depends on the level of *normativeness* of the life transition (i.e., expected, age-graded life phases; Caspi & Moffitt, 1993; Neyer et al., 2014). Relationship effects on personality development should appear in more normative life transitions and personality effects on social relationship development should mainly occur in non-normative, less scripted life transitions (Neyer et al., 2014). The key argument is that more normative life transitions (e.g., starting the first partnership, leaving the parental home) are filled with stark social role expectations that emerging adults aspire to comply with, and as a consequence, develop their personalities accordingly (Bleidorn et al., 2013; Roberts & Nickel, 2017). In contrast, non-normative life transitions (e.g., death of a close family member) carry less guiding information for appropriate behavior to successfully handle the respective challenges (Caspi & Moffitt, 1993; Neyer et al., 2014). Thus, regarding personality-relationship transactions it is yet to be studied whether the

observed imbalance between personality and relationship effects can also be resolved in a normative life transition in the age group of emerging adults.

The Context of Work

Regarding the work and professional life, preparing for and settling into a proper job to achieve financial independence is crucially important in the professional career development (e.g., Erikson, 1968; Havighurst, 1972). Studies in the context of work can also be grouped to the two different levels of context and interplay as presented for the studies on social relationships.

Context level. Regarding the context level, multiple domains of the context of work can be identified during emerging adulthood, for example, graduating from high school, undergoing post-secondary education, or starting the first job.

High school graduation. Transitioning from high school to post-secondary education has been associated with increases in conscientiousness (Bleidorn, 2012; Lüdtke et al., 2011) as well as increases in emotional stability and agreeableness (e.g., Lüdtke et al., 2011). In terms of post-secondary education, the large majority of studies followed emerging adults in college education, and overall, found rich evidence for a development in the direction of the maturity principle (e.g., Asendorpf & Wilpers, 1998; Klimstra et al., 2009; Lehnart et al., 2010; Niehoff et al., 2017; Pullmann et al., 2006; Roberts & Chapman, 2000; Roberts et al., 2002). However, to my knowledge no studies specifically provided empirical data for personality development in non-college emerging adults. There are studies that looked at representative samples including college and non-college students (e.g., Lüdtke et al., 2011; Roberts et al., 2001), but studies investigating personality development in other post-secondary educational pathways or differentiating between different types of post-secondary education are lacking (for an overview of studies, see Table 1; e.g., Asendorpf & Wilpers, 1998; Denissen, Ulferts, Lüdtke, Muck, & Gerstorf, 2014; Lüdtke et al., 2011; Vaidya et al., 2002). Thus, the present state of research on personality development in emerging adulthood primarily relies on college bound students who have followed a similar educational pathway to post-secondary college education (Henrich, Heine, & Norenzayan, 2010).

Entering the job market. Even though numerous studies have emerged in recent years focusing on well-being, satisfaction, or job demands and personality development in the work context (e.g., Denissen et al., 2014; Hudson et al., 2012; Le, Donnellan, & Conger, 2014; Roberts, Caspi, & Moffitt, 2003; Sutin & Costa, 2010; Wu, 2016), few studies have specifically captured personality development at job entry. Across studies, the working context was shown to be most strongly related to increases in conscientiousness (e.g., Leikas & Salmela-Aro, 2015;

Lodi-Smith & Roberts, 2007; Specht et al., 2011). Specifcally, Lüdtke et al. (2011) showed that perceiving job entry as negative was subsequently associated with less emotional stability, extraversion, and conscientiousness. Perceiving the start of the job as positive was consequently associated with more extraversion and more conscientiousness (Lüdtke et al., 2011).To my knowledge, studies specifically looking at personality development during the first months and years of the job context have not yet been conducted. However, these types of studies could provide relevant information on personality development in transitions as the time right after job entry has been discussed as a stressful phase including, for example, the orientation and adjustment to the new environment (*reality shock*; Nelson, Quick, & Eakin, 1988; Reicherts & Pihet, 2000; Saks & Ashforth, 1996; Voss, Wagner, Klusmann, Trautwein, & Kunter, 2017). In this respect, daily-diary studies were shown to allow for the identification of daily experiences (e.g., uplifts and hassles) that are associated with important psychological outcomes, such as beginning teachers' well-being (e.g., Schmidt, Klusmann, Lüdtke, Möller, & Kunter, 2017). Thus, the time after job entry can deliver important information on personality development in phases of transition. It would also allow for further information on potential mechanisms and processes of personality development in the context of the first job experience (Wrzus & Roberts, 2017).

Interplay level. With respect to the interplay level, different particularities of the working context have been shown to be meaningful for subsequent personality development (e.g., Denissen et al., 2014; Hudson et al., 2012; Le et al., 2014; Roberts et al., 2003). Emotional stability was shown to be positively related to work satisfaction, occupational attainment, and financial security (Le et al., 2014; Roberts et al., 2003), and lower levels of job stress (Wu, 2016). Extraversion was positively related to higher levels of resource power (Le et al., 2014; Roberts et al., 2003), psychological demands (Sutin & Costa, 2010), person-environment fit (Le et al., 2014), and lower levels of work investment (Hudson et al., 2012). Openness to experience was not shown to be predicted by or associated with work related characteristics (e.g., Le et al., 2014; Lodi-Smith & Roberts, 2007; Roberts et al., 2003; Sutin & Costa, 2010; Wu, 2016). Agreeableness was positively predicted by work involvement and work autonomy (Hudson et al., 2012; Roberts et al., 2003) and negatively predicted by hazardous work conditions (Sutin & Costa, 2010). Conscientiousness was primarily predicted by more work involvement (Hudson et al., 2012; Roberts et al., 2003).

Even though it was shown that specific characteristics of the context of work are associated with personality development, more research questions call to be answered: First, it has remained unclear how the effects of features of the context of work evolve when

investigated in the context of the first job experience. Second, the underlying mechanisms and processes explaining the emergence of the respective environment effects on personality development have yet to be investigated.

Studying Processes of Personality Development

Regarding potential processes and mechanisms of personality development, researchers in the field have only recently begun to discuss and propose methodological as well as conceptual approaches to reveal the profound processes and their contingencies (e.g., Bleidorn, 2015; Geukes et al., 2018; Wrzus & Mehl, 2015; Wrzus & Roberts, 2017). It was specifically argued that the strong focus on the contextual and interplay levels of personality development reflects a rather objective perspective, thereby, excluding the individual as important factor (e.g., Bleidorn, 2015; Denissen et al., 2013; Hennecke et al., 2014; Lodi-Smith & Roberts, 2007). Even though the Neo-Socioanalytic Model embeds *person characteristics*[1] such as the individuals' needs or goals within the personality trait level, these person characteristics were empirically shown to be crucial for subsequent emotional and behavioral reaction patterns, that is, personality development (e.g., Aldrup, Klusmann, & Lüdtke, 2017; Deci, Olafsen, & Ryan, 2017; Deci & Ryan, 2000; Denissen et al., 2013; Fishbach et al., 2009; Gagné & Deci, 2005; Hennecke et al., 2014). Thus, person characteristics such as motives, values, needs, goals, etc. incorporate aspects that play a unique role in the development of personality traits and should also be theoretically acknowledged. Accordingly, the microanalytical TESSERA framework considers both the personal expectancies and the individuals' evaluation of the respective environment as two key aspects for the subsequent occurrence of emotional states and behavioral reactions (Wrzus & Roberts, 2017).

Borrowing from adjoining fields of personality research, two well-founded concepts are particularly striking to serve as psychologically meaningful tools to include the individuals' expectations and perceptions of environmental contexts: the basic psychological needs (e.g., Deci & Ryan, 2008) and person-environment fit (e.g., Caplan, 1987).

The basic psychological needs. A renowned framework to assess environmental contexts from a subjective, psychological perspective (i.e., the perceived psychological value of an environment) is the basic psychological needs theory (BPN; Deci & Ryan, 2000, 2008) which is embedded in the larger framework of Self-Determination Theory (SDT; Ryan & Deci, 2000). According to Deci and Ryan (2000), human beings strive to fulfill three fundamental psychological needs: the *need for autonomy*, the *need for competence*, and the *need for relatedness*. The *need for autonomy* refers to the need to self-organize and feel volitional towards one's behavior (Ryan & Deci, 2008), including the feeling of being the origin of one's

actions (De Charms, 1968). The *need for competence* concerns perceiving oneself as effective in exercising and expressing oneself through one's actions (Ryan & Deci, 2008). The *need for relatedness* refers to feelings of belongingness and connectedness with others (Baumeister & Leary, 1995; Deci & Ryan, 1991). Regarding the psychological assessment of environments, each situation can be described according to the perceived level of need supply in the domains of autonomy, competence, and relatedness support. This broad scope of applicability allows for a profound assessment tool that can be universally applied and compared across different environmental contexts.

As the experience of the BPN in one's environmental contexts has been shown to be strongly related to indicators of optimal functioning in the contexts of, for example, work (for empirical overviews, see Deci et al., 2017; Van den Broeck, Ferris, Chang, & Rosen, 2016), social relationships (e.g., Deci & Ryan, 2014), or education (e.g., Klassen, Perry, & Frenzel, 2012; Niemiec & Ryan, 2009), BPN support could also account for personality maturation in emerging adulthood (Sheldon & Prentice, 2017). However, the potential association between the BPN and personality development has not yet been empirically investigated.

Person-environment fit. Whereas in the BPN framework, only need support of the environment is considered to account for the elicitation of psychological states (Ryan & Deci, 2008), other theories consider the person and the environment to be equally important (e.g., Baltes et al., 1998; Caplan, 1987; Magnusson, 1990). In this respect, congruence between attributes of a person and features of the environment (i.e., person and environment match) is referred to as person-environment fit (*P–E fit*; e.g., Caplan, 1987; Holland, 1997). Thus, P–E fit captures a specific condition of the spectrum of potential states in the ongoing interplay of the person and its environmental contexts (Cable & Edwards, 2004). P–E fit can be measured in the different contexts and domains of life (Caplan, 1987). For example, P–E fit in the working context can differ from P–E fit in the different types of social relationships (Edwards & Rothbard, 1999). However, the large majority of studies investigated P–E fit in the working context (e.g., Hoffman & Woehr, 2006; Su, Murdock, & Rounds, 2015). In this regard, P–E fit was shown to be related to a variety of outcomes, such as, adjustment, well-being, optimal functioning, organizational citizenship behavior, or less job terminations (e.g., Cooman et al., 2009; Deniz, Noyan, & Ertosun, 2015; Greguras & Diefendorff, 2009; Kristof-Brown, Li, & Schneider, 2016; for reviews, see; Hoffman & Woehr, 2006; Van Vianen, 2018). As the vast literature on P–E fit demonstrated overly positive associations with important indicators of functioning, P–E fit might also account for an indicator of functioning in the domain of personality development, that is, personality maturation (Harms, Roberts, & Winter, 2006;

Roberts & Robins, 2004). Linking P–E fit between students and their college environment to subsequent personality change showed that higher initial P–E fit was subsequently associated with higher rank-order consistency and changes in the direction of further reinforcing P–E fit that is, decreases in agreeableness and increases in emotional stability (Roberts & Robins, 2004). Another study looked at P–E fit during the 4-year college experience and found no effects of initial PE fit on personality at the end of college, but significant correlations between change in personality (extraversion and openness) and change in P–E fit (Harms, et al., 2006). Thus, in these two studies across the college years, P–E fit was not shown to be related to personality development in the direction of the maturity principle. Rather, P–E fit was associated with increases in personality consistency.

However, attributes of the person and features of the environment could be related with personality development in different types of interplay, for example, personality development could be associated with incongruence, attributes of the person could be more important features of the environment or vice versa (Denissen et al., 2013; Fishbach et al., 2009; Hennecke et al., 2014). Thus, P–E fit regarding variables of interest is just one possible state in the interplay between the person, the environment, and personality development. Additional research investigating theoretically plausible types of interplays is strongly needed to understand the relationship between the person, the environment, and personality development.

Research Desiderata

The above presented overview of previous studies and their findings clearly shows that personality traits develop across the whole life span with a time period of condensed developmental patterns from the late teens through the late 20s (i.e., emerging adulthood). Thereby, the environmental contexts of social relationships and work have been consistently shown to be associated with personality development. However, the overview was also able to disclose the central gaps and open questions that have remained unresolved in the research field.

First, the vast majority of the findings in emerging adulthood have been based on college students (e.g., Denissen et al., 2014; Lüdtke et al., 2011; Vaidya et al., 2002). This is problematic for the generalizability of the findings because the college environment represents a particularly unique context regarding, for example, the type of social role expectations, environmental requirements, transition phases, and tasks that are explicitly distinct from other post-secondary and non-educational settings (e.g., Clausen, 1991). Due to the important role of environmental contexts in personality development (e.g., Briley & Tucker-Drob, 2014; Hopwood et al., 2011; Magnusson, 1990, Roberts & Wood, 2006), it is possible that non-college

emerging adults undergo a different pattern of personality development than commonly known of college students. In aiming for a first step to close this gap in personality development research, study 1 investigated personality development in a part of the "forgotten half" (Arnett, 2000), that is, emerging adults undergoing vocational education and training. Because the individual's evaluation of the environmental context has been considered to be important (Bleidorn, 2015; Wrzus & Roberts, 2017), job strain and life satisfaction were tested as two indicators of context evaluation to predict personality development. Therefore, the research goals of study 1 were concerned with both the context level and the interplay level of personality development research. Within the Neo-Socioanalytic Model, study 1 can be organized to have targeted personality trait development from the identity perspective in the specific social role context of apprenticeship training in the working environment.

Second, the pattern of personality-social relationship transactions, and therefore the role of social relationships for personality development, has remained unclear in the time of emerging adulthood (Finn et al., 2017). Whereas the majority of studies reported an imbalance of effects (personality effects outnumbered the social relationship effects; e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Parker et al., 2010; Sturaro et al., 2008), novel studies suggest the level for the modeling of cross-lagged effects (i.e., trait-to-change cross-lagged effect vs. change-to-change cross lagged effect; Grimm et al., 2012; McArdle, 2009; Mund & Neyer, 2014) as well as the investigated type of life transition to be meaningful (e.g., Neyer et al., 2014). In order to resolve this important research question, study 2 investigated an extensive number of personality-relationship transactions at both the trait and the facet level during the major normative transition from high school to post-secondary education or work by applying extended bivariate latent difference score models (Grimm et al., 2012). Therefore, study 2 can be primarily classified at the context and interplay level. Regarding the classification in the Neo-Socioanalytic Model, study 2 also focused on personality trait development from the identity perspective in an environmental context filled with social role expectations. However contrasting study 1, study 2 concerned aspects of belongingness instead of status related components. Therefore, study 1 and study 2 complement each other regarding the two large domains of belongingness roles and work roles within the Neo-Socioanalytic Model.

Third, previous research has successfully identified important environmental contexts of personality development (e.g., Bleidorn et al., 2016). Thereby, large individual differences in change have indicated that people develop significantly different from each other in similar environmental contexts (e.g., Mõttus et al., 2017; Lucas & Donnellan, 2011; Schwaba & Bleidorn, 2017; Wagner et al., 2015). In this endeavor, both the individual's expectancy towards

the environmental context and the individual, psychological experience of the context have been largely overlooked (e.g., Bleidorn, 2015; Wrzus & Roberts, 2017). However, individuals not only enter environmental contexts with person specific characteristics such as traits, needs, goals, values, expectations, etc. that drive successive behavior (e.g., Denissen et al., 2013; Fishbach et al., 2009; Hennecke et al., 2014), but also perceive the environmental contexts they engage in differently (e.g., Lüdtke et al., 2011). In this regard, study 3 aimed to investigate the interplay between psychological need importance, need support experienced in the environment, and personality development (interplay and process level). Embedding study 3 in a theoretical context, it examined specific parts of the TESSERA sequence (Wrzus & Roberts, 2017). In this regard, need support provided by the environment can be seen as triggering situation and the psychological need importance can be grouped to the expectancies of the TESSERA sequence. It is important to note that the TESSERA sequence is a microanalytical model designed for short-term processes (Wrzus & Roberts, 2017). Because study 3 was conducted over a period of three years, it must not be confused with a microanalytical study, but a panel study that uses the segments of TESSERA. As the individual needs were used as predictors of personality development, study 3 tested a theoretical modification of the Neo-Socioanalytic Model: It is suggested to specifically include the predictive value of motives and values for personality traits.

Study 1

The first study was conducted with 1,886 participants (M_{ageT1} = 18.41) of the study on mathematics and science competencies in vocational education and training (ManKobE; Retelsdorf, Lindner, Nickolaus, Winther, & Köller, 2013) that followed emerging adults three times for the duration of their 3-year VET (Chapter 2). VET is a special, 3-year educational system that combines higher education in a vocational school and the acquisition of job-specific skills via on-the-job experience. By looking at non-college emerging adults, this study was the first to specifically investigate Big Five personality development in an environmental context that is systematically different from college education. VET trainees find themselves in-between two contexts: On the one hand, they undergo vocational schooling which is similar to high school including the regular attendance of class, doing homework, and taking exams. On the other hand, these trainees also undergo their first job experience as they are treated as regular company employees, and as such, they are officially hired, paid, formally registered, and are required to take over responsibilities for customers and colleagues.

Because the confrontation with and the acceptance of adult social role demands have been considered to be driving factors of personality development in the direction of the maturity

principle around the globe (e.g., Bleidorn et al., 2013; Lodi-Smith & Roberts, 2007Roberts & Wood, 2006;), it was expected to observe personality maturation in the VET trainees across the 3-year span. Latent difference score modeling was applied to reveal personality changes in two time intervals: from the beginning of VET to half time of VET 1.5 years later, and again 1.5 years later to the end of VET. Additionally, two indicators of context evaluation were investigated in bivariate latent difference score models to account for individual differences in personality development: Job strain as a specific factor of functioning and life satisfaction as an overall evaluation of one's life. Regarding the classification in the Neo-Socioanalytic Model, job strain referred to a specific state in the social role of work whereas life satisfaction represented the affective evaluation of all encountered life contexts, and as such, is not specifically mentioned in the model.

Study 2

Aiming for a better understanding of the role of social relationships for personality development in emerging adulthood, study 2 investigated personality-relationship transactions in the major normative life transition from high school to post-secondary education or work (Chapter 3). Utilizing the waves 1 to 3 of the Transformation of the Secondary School System and Academic Careers study (TOSCA; Trautwein, Neumann, Nagy, Lüdtke, & Maaz, 2010), the reciprocity of personality-social relationship transactions was investigated with a set of 4,534 emerging adults (M_{ageT1}: 19.60 years) three times biannually with the first interval capturing the normative life transition out of high school. Study 2 did not only investigate Big Five personality traits and the relationship characteristics of contact frequency, conflict frequency, closeness, importance, and insecurity, but also looked at their reciprocal relationship with the Big Five facets. The personality facets have been argued to be more comparable to the social relationship characteristics as they similarly fluctuate across time whereas the Big Five traits are more stable (e.g., Mund & Neyer, 2014). The study was the first to investigate the facets of openness to experience which allowed for more information on a trait that has not been well understood (Schwaba et al., 2018). Regarding the analytic model, the traditional bivariate latent difference score models were extended by a recent suggestion to consider coupling effects (i.e., change-to-change effects; Grimm et al., 2012). Coupling effects are thought to account for the theoretically postulated reciprocal dynamic interplay of personality-relationship effects more accurately (Mund & Neyer, 2014). Results of the findings in this special age group of emerging adulthood were integrated with the findings of Mund and Neyer (2014) during adulthood to an overall picture regarding the role of social relationships for personality development.

Study 3

The third study investigated the interplay of individual need importance and need support provided by the environment on subsequent Big Five trait personality development (Chapter 4). Investigating the interplay between expectancy to and perception of an environmental context on personality change allowed for an understanding of why and how individuals differ in their personality development in comparable environmental contexts. Drawing on the first assessment interval of the ManKobE study (N = 1,886; M_{ageT1} = 18.41), both characteristics of the individual and the perception of the environmental context of VET were described from a psychological perspective via the BPN (Ryan & Deci, 2008). That is, the importance individuals ascribe to BPN support in the context of VET and the individual's perception of BPN support at their training company were longitudinally related to personality development. Thereby, multiple hypotheses (e.g., main effects, effects of discrepancy, and optimal discrepancy effects) on the interplay between the importance of BPN support, perceived BPN support, and personality development were derived from theory and previous research to simultaneously test them against each other with an information-theoretic approach (e.g., Burnham & Anderson, 2002), combined with methods of response surface analysis (RSA; Edwards, 2002). RSA are useful in the study of person-environment transactions as they allow for the testing of different types of person-environment constellations and their relation to personality development (Edwards, 2002).

Footnotes

[1] The term person characteristics comprises all psychological attributes of a person that are not personality traits, for example, intelligence, creativity (Magnusson & Backteman, 2016), needs (Deci & Ryan, 2000), goals (Koo & Fishbach, 2008), etc.

Table 1

Longitudinal Studies on Big Five Personality Development in Emerging Adulthood (ages 16-30).

Authors	Sample	*N*	Measurement	Trait(s)	Design	Ages
*Adams & Fitch (1981)	College	148	Ego-Identity Incomplete Sentence Blank Sentence Completion Test	N,O	2x, 1 yr	18-22
Akse et al. (2007)	High school, College (CONAMORE)	325	Goldberg's Big Five questionnaire	N,E,O,A,C	2x, 2 yrs	16-18
*Asendorpf & Wilpers (1998)	College	132	NEO-FFI	N,E,O,A,C	4x, 6 mths	20-22
*Bates & Pandina (1989)	Community Sample (higher education & income)	400	Personality Research Form	E,A,C,O	2x, 3 yrs	18-21
Bleidorn (2012)	High school (Abitur)	910	NEO-FFI	N,E,O,A,C	3x, 1.5 yrs	19-20, 20-21
Borghuis et al. (2017)	RADAR	239	Goldberg's Big Five Questionnaire	N,E,O,A,C	7x, 1 yr	16-17, 17-18, 18-19, 19-20, 20-21, 21-22
Bratko & Butkovic (2007)	Citizen registrar	320	Eysenck Personality Questionnaire	N,E	2x, 4 yrs	17-21
*Cantoni (1955)	High school	211	Bell Adjustment Inventory	N	2x, 9 yrs	18-27
*Caputo et al. (1966)	College	52	Edwards Personal Preference Schedule	N,E,O,A,C	2x, 15 mths	18-20
*Cramer (1998)	College	88	Narcissistic Personality Inventory	A	2x, 4 yrs	18-22
*Crook (1943)	College	52	Thurstone Personality Schedule	N	2x, 6.5 yrs	18-25
*Davis & Franzoi (1991)	High school	205	Interpersonal Reactivity Index	N, O, A	3x, 3 yrs	16-18
*Davis & Satterly (1969)	College	149	16 Personality Factor Questionnaire	N,E,O,A,C	2x, 2 yrs	18-20

Dobewall & Aavik (2016)	College	53, 41	Short 5 (Facet level)	N,E,O,A,C	2x, 3 yrs	26-29
Fornés-Vives et al. (2012)	College	200	NEO-FFI	N	2x, 3 yrs	23-26
*Helson & Moane (1987)	College (MILLS)	81	California Psychological Inventory	E,O,A,C	2x, 6 yrs	21-27
Hopwood et al. (2011)	Minnesota Twin Family Study (MTFS)	1,252	Multidimensional Personality Questionnaire	N	3x, 12 yrs	17-24, 24-29
*Karney & Bradbury (1997)	College	106	Eysenck Personality Questionnaire	N	2x, 6 mths	24-28, 25-29
*Keltikangas-Järvinen (1989)	Representative	1737	AFMS questionnaire	A	2x, 6 yrs	18-21, 21-24
Klimstra et al. (2009)	High school, College (CONAMORE)	390	Goldberg's Big Five Questionnaire	N,E,O,A,C	5x, 5 yrs	16-21
Kupper et al. (2011)	Dutch Twin register	224	20 Item Type D Scale	N	3x, 9 yrs	17-23, 23-26
Lehnart et al. (2010)	High School with mostly College (MSALT)	703	Scales representing facets of Neuroticism	N	3x, 8 yrs	20-28
Leikas & Salmela-Aro (2015)	FinEdu	597	Big Five Inventory	N,E,O,A,C	2x, 3 yrs	20-23
*Loevinger et al. (1985)	College	648	Washington University Sentence Completion	O	3x, 4 yrs	18-22
Luan et al. (2017)	LOGIC	174	Adjective Pairs	N,E,O,A,C	2x, 12 yrs	17-29
Lucas & Donnellan (2011)	GSOEP	1,152	Big Five Inventory	N,E,O,A,C	2x, 4 yrs	21-24
Lüdtke et al. (2011)	High school (Abitur)	4,544	NEO-FFI	N,E,O,A,C	3x, 4 yrs	19-21,21-23
Magnus et al. (1993)	College	97	NEO-PI	N,E	2x, 4 yrs	
*McGue et al. (1993)	High School College	254	Multidimensional Personality Questionnaire	N,E,O,A,C	2x, 10 yrs	20-30

Milojev & Sibley (2017)	Representative	1,261	Mini-IPIP6	N,E,O,A,C	5x , 4 yrs	18-23, 19-24, 24-29
*Morizot & LeBlanc (2003)	Men	767	Eysenck Personality Inventory	N,E,A,C	2x, 13 yrs	17-30
*Muntaner et al. (1988)	College	29	Eysenck Personality Questionnaire	N,E,C	2x, 2 yrs	18-20
*Neyer & Asendorpf (2001)	Representative	489	NEO-FFI	N,E,A,C	2x, 4yrs	24-28
*Nichols (1967)	Gifted College Students	636	16 PF	N,E,O,A,C	2x, 4 yrs	18-22
Niehoff et al. (2017)	College	221	Big Five Inventory	N,E,O,A,C	2x, 6 months	ø22
*Ogawa et al. (1997)	At risk children	48	Youth Self-Report of Behavior Checklist	N	2x, 2 yrs	17-19
*Pedersen (1991)	High School	553	General Health Questionnaire	N	2x, 20 months	17-19
*Peterson & Lane (2001)	College	69	Altemeyer's Right-Wing Authoritarianism	O	2x, 4 yrs	18-22
*Piccione et al. (1989)	College	50	Stanford Hypnosis Susceptibility Scale	O	2x, 10 yrs	20-30
*Pogue-Geile & Rose (1985)	College	266	MMPI	N,A,C	2x, 5 yrs	20-25
*Popham & Holden (1991)	College	55	MMPI	N,E,O,A	2x, 1 yr	20-21
Pullmann et al. (2006)	High School	290	NEO-FFI	N,E,O,A	2x, 2 yrs	16-18
*Redmore (1983)	College	97	Washington University Sentence Completion	O	2x, 4 yrs	18-20
*Roberts (1997)	College	81	California Psychological Inventory	E	2x, 6 yrs	21-27
*Roberts et al. (2001)	Birth cohort	921	Multidimensional Personality Questionnaire	N,E,O,A	2x, 8 years	18-26
*Roberts & Chapman (2000)	College	77	California Psychological Inventory	N	2x, 6yrs	21-27
*Roberts et al. (2002)	College	78	California Psychological Inventory	E,O,A,C	2x, 6yrs	21-27
*Robins et al. (2001)	College	270	NEO-FFI	N,E,O,A,C	2x. 4 yrs	18-22
*Schofield (1953)	College	83	MMPI	N,C	2x,	22-24
Schwaba & Bleidorn (2017)	LISS	509	IPIP	N,E,O,A,C	5x, 7 years	20-24

Selfhout et al. (2010)	College	205	Ten Item Personality Inventory (TIPI-r)	N,E,O,A,C	5x, 1yr	19-20
Shiner et al. (2017)	Lower-middle class	205	Multidimensional Personality Questionnaire NEO-FFI	N,E,O,A,C	3x, 14 yrs	16-20, 20-30
*Stacy et al. (1991)	White, middle class	584	Zuckerman Sensation Seeking	E	2x, 9 yrs	18-27
*Stein et al. (1986)		654	Bentler Psychological Inventory	N,E,O,A,C	3x, 8 yrs	21-29
*Stevens & Truss (1985)	College	92,85	Edwards Personal Preference Schedule	N,E,O,A,C	2x, 12 yrs	18-30
*Stewart (1964)	College	89	Omnibus Personality Inventory	N,E,O,C	2x, 4 yrs	18-22
Sturaro et al. (2008)	Representative (LOGIC)	154	Adjective pairs NEO-FFI	N,E,O,A,C	2x, 6 yrs	17-23
Syed & Seiffge-Krenke (2013)	Representative			N,C	2x, 7 yrs	17-24
*Vaidya et al. (2002)	College	392	Big Five Inventory	N,E,O,A,C	2x, 2.5 yrs	18-21
Van den Akker et al. (2014)	FSPPD		HiPIC		2x, 3yrs	17-30
*Van der Velde et al. (1995)	Representative	314	3 DPT	N,E,C	2x, 4 yrs	18-22; 20-24
Vecchione et al. (2012)		403	Big Five Questionnaire	N,E,O,A,C	3x, 4 yrs	16-18, 18-20
*Viken et al. (1994)	Finnish twin register	4746	Eysenck Personality Inventory	N,E	2x, 6 yrs	20-26
*Watson & Walker (1996)	College	237	PANAS	N,E	2x, 6 yrs	18-25
*Wheeler & Schwartz (1989)	College	225	Millon Clinical Multiaxial Inventory	N,E,A,C	2x, 3 yrs	18-21
Wortman et al. (2012)	representative (HILDA)	1280	Adjective based by Saucier (1994)	N,E,O,A,C	2x, 4 years	20-24
*Yonge & Regan (1975)	College	833	Omnibus Personality Inventory	N,E,O,A,C	2x, 4 yrs	18-22
Zimmermann & Neyer (2013)	College (PEDES)	1,134	Big Five Inventory	N,E,O,A,C	3x, 13 mths	23-24

Note. N = Neuroticism, E = Extraversion, O = Openness to experience, A = Agreeableness, C = Conscientiousness. The studies marked * were taken from the meta-analyses of Roberts and DelVecchio (2000), and Roberts et al. (2006). When multiple studies on personality development were conducted with the same data set, I referred to the most encompassing study (e.g., LOGIC, TOSCA, Dunedin study).

Chapter 2

Study 1

Against All Odds – Is a More Differentiated View of Personality Development in Emerging Adulthood Needed? The Case of Young Apprentices

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Abstract

Personality development in emerging adults who do not attend college after high school has been largely overlooked so far. In this study, we investigated personality development in emerging German adults (N_{T1} = 1,886, M_{ageT1} = 18.01 years, 29% female) undergoing vocational education and training (VET). The trainees were assessed at the start of VET, 1.5 years later, and another 1.5 years after that, just before graduation. Longitudinal latent change score analyses were applied. Bivariate analyses investigated life satisfaction and job strain as social and work-related aspects that are potentially reciprocally related to personality development. Mean-level personality changes included increases in neuroticism and decreases in agreeableness and conscientiousness in the first interval. In the second interval, neuroticism decreased, and conscientiousness increased. Simultaneously, trainees reported a gradual decrease in extraversion and openness across the 3-year time span. Personality, especially agreeableness and conscientiousness, emerged as a stronger predictor of changes in job strain and life satisfaction than vice versa. For example, more agreeable and more conscientious trainees subsequently showed increases in life satisfaction. Trainees reporting higher job strain subsequently showed decreases in agreeableness. Trajectories of personality development partly support the maturity principle that has been established in many college student samples.

Against All Odds – Is a More Differentiated View of Personality Development in Emerging Adulthood Needed? The Case of Young Apprentices

Personality traits are relatively enduring, automatically occurring individual differences in a person's manner of feeling, thinking, and behaving across situations and time (e.g., Roberts, 2009). Personality has been shown to change substantially from adolescence to adulthood: On average, people become increasingly mature (i.e., less neurotic, more agreeable, and more conscientious; *maturity principle;* Roberts, Walton, & Viechtbauer, 2006; Roberts & Wood, 2006). *Emerging adulthood* (ages 18 to 25; Arnett, 2000), in particular, has been associated with major developmental challenges and corresponding personality changes (e.g., Bleidorn, 2015; Hill & Edmonds, 2017; Hutteman, Hennecke, Ort, Reitz, & Specht, 2014; Roberts, Caspi, & Moffitt, 2001; Scollon & Diener, 2006; Srivastava, John, Gosling, & Potter, 2003; Wrzus & Roberts, 2017). For example, transitioning from high school to university has been associated with changes in the maturity-related variables neuroticism, agreeableness, and conscientiousness (e.g., Lüdtke, Roberts, Trautwein, & Nagy, 2011), and entering the job market has been found to be related to increases in conscientiousness (Leikas & Salmela-Aro, 2015; Specht, Egloff, & Schmukle, 2011) as well as social dominance, which is a facet of extraversion (Roberts, Caspi, & Moffitt, 2003; but see for considerable exceptions, e.g., van Scheppingen, Jackson, Specht, Hutteman, Denissen, & Bleidorn, 2016; Wagner, Becker, Lüdtke, & Trautwein, 2015).

Thereby, the majority of studies investigating personality development in emerging adults have focused on college students or mixed samples (e.g., Asendorpf & Wilpers, 1998; Denissen, Ulferts, Lüdtke, Muck, & Gerstorf, 2014; Lüdtke et al., 2011; Vaidya, Gray, Haig, & Watson, 2002). Few studies have included participants from varying educational or work-related contexts by examining one birth cohort (Leikas & Salmela-Aro, 2015; Roberts et al. 2001, 2003). Thus, current research findings on personality development in emerging adulthood have primarily relied on participants who have followed a similar educational pathway to post-secondary college education (Henrich, Heine, & Norenzayan, 2010).

As college education is only one of many possible life paths that are each unique in terms of, for example, the occurrence and timing of developmental challenges, life events, career tracks, and societal demands, it is likely that emerging adults entering the job market right after high school face a different environment compared with their college-bound peers. Among others, personality development has been considered to be possibly driven by

investments in societal demands and responsibilities that are linked to age-graded and environmentally dependent social roles (*social investment principle*; Roberts, Wood, & Caspi, 2008; Roberts & Davis, 2016). Thus, one's personality might develop differently depending on the chosen context. It is therefore important to gain knowledge about the personality development of emerging adults who choose educational contexts that differ from a college education and how this relates to important indicators of functioning (i.e., life satisfaction and job strain). To close this gap, we investigated the personality development of emerging adults entering a common educational context that can be distinguished from college: vocational education and training (VET), which combines general schooling and the acquisition of job-specific skills via on-the-job experience.

Personality Development in Emerging Adulthood

Emerging adulthood is characterized by specific themes and developmental tasks (Schwaba & Bleidorn, 2017) and is thereby clearly distinguishable from other developmental periods such as adolescence or young adulthood (Roberts & DelVecchio, 2000). As opposed to adolescents, emerging adults no longer completely depend on their parents and families but start making life decisions on their own. In comparison with young adulthood, emerging adulthood is a developmental period in which age-based societal responsibilities, expectations, and social role demands are not yet too strong and depend more on one's own choices (Arnett, 2000). As many life-determining decisions such as marriage, career paths, and values have yet to be made, emerging adulthood allows people to experience a more self-determined exploration and organization of their lives. As a consequence, it is reasonable that emerging adults will choose different life paths and contexts concerning, for example, education or career tracks. Especially decisions for or against certain educational or work contexts subsequently determine societal role demands and life outcomes (Clausen, 1991) which in turn may impact personality development.

To examine personality development, there are three common statistical indicators that capture personality continuity or change: rank-order consistency, mean-level change, and individual differences in change. Rank-order consistency refers to the relative ranking of individuals within the group of interest; mean-level change provides absolute information on increases or decreases in the whole population, and individual differences in change capture an individual's pattern of increases, decreases, or no change in the respective personality traits (Roberts et al., 2008).

There is strong agreement across researchers with respect to patterns of personality development for (college-bound) emerging adults. As a brief summary, first, the rank-order consistency of trait personality has been shown to steadily increase in emerging adulthood and to subsequently continue to increase in young adulthood (Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000). Therefore, personality traits have been shown to be more stable in emerging adulthood than in childhood and adolescence. Second, in terms of mean-level changes, previous research has demonstrated that tremendous developmental changes, mostly conforming to the maturity principle (i.e., decreases in neuroticism, increases in agreeableness, and conscientiousness), take place during emerging adulthood (e.g., Lucas & Donnellan, 2011; Roberts et al., 2006; Specht et al., 2011). Third, individual differences in both levels and change have been revealed for all Big Five personality traits (e.g., Mõttus, Soto, & Slobodskaya, 2017; Roberts et al., 2001; Schwaba & Bleidorn, 2017; Watson & Humrichouse, 2006).

Perspectives on Personality Development

Undoubtedly, personality is primarily based on genetics and the corresponding processes. Especially in the early stages of life (i.e., childhood and adolescence), genetics are particularly prominent, whereas environmental aspects have been shown to become more important thereafter (e.g., Bleidorn, Kandler, & Caspi, 2014; Briley & Tucker-Drob, 2014). Focusing on the role of the environment, the recently discussed social investment theory postulates that personality development should mainly be driven by the investment in and commitment to social institutions and social roles that are located in a particular context of, for example, work and family life (Lodi-Smith & Roberts, 2007; Roberts et al. 2008). The theory suggests that inheriting social roles allows specific expectations to emerge, and these are more easily met by more mature personalities. The context that emerging adults select themselves into determines the role expectations and developmental challenges they will encounter. Despite the existing empirical support with respect to effects of love, family life (e.g., Neyer, Mund, Zimmermann, & Wrzus, 2014), and work life (e.g., Denissen et al. 2014; Lodi-Smith & Roberts, 2007; Roberts et al., 2003), there is also evidence that goes counter to this assumption with respect to the transition to parenthood with no effects (van Scheppingen et al., 2016) or with rather specific findings regarding the effect of one's first romantic relationship (Wagner et al., 2015). These recent findings emphasize that additional conditions such as the timing, the individual experience with, and the personal evaluation of life events should be considered with respect to their impact on personality development (e.g., Luhmann, Orth, Specht, Kandler, & Lucas, 2014; Zhang & Howell, 2011).

When looking at the broader context of work life, it is striking that the large majority of studies investigating personality development have focused on one specific group of people, namely, college students. To our knowledge, most studies in the research field have either looked at samples of college students only (e.g., Asendorpf & Wilpers, 1998; Selfhout, Burk, Branje, Denissen, van Aken, & Meeus, 2010), with the large majority of participants attending college (Parker et al., 2012; Wagner, Lüdtke, Roberts, & Trautwein, 2014), or more diverse samples that were not further differentiated in the analyses (e.g., Lucas & Donnellan, 2011; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Roberts et al., 2001, 2003; Roberts & DelVecchio, 2000; Sturaro, Denissen, van Aken, & Asendorpf., 2008).

One of the few studies that distinguished college students from non-college students in terms of personality development found significant differences regarding both selection and socialization effects (Lüdtke et al., 2011). Regarding selection effects, the study found that (a) more neurotic senior high school students were less likely to go to college and (b) higher openness in high school was positively associated with college entry. In terms of socialization effects, not going to college was associated with slower increases in agreeableness, but steeper increases in conscientiousness in comparison with college students. These first results highlight that different life contexts regarding post high school education or work are significantly associated with personality development in emerging adulthood. In the non-college group, Lüdtke et al. (2011) did not further differentiate between participants undergoing VET and participants directly starting a job. It is therefore of great interest to study personality development in larger samples of emerging adults following post-high-school educational or work contexts that do not imply the attendance of a college or university. One common system is VET, which has its origins in Germany and is nowadays highly respected in various countries around the globe (e.g., Austria, Denmark, Greece, Latvia, Slovakia, Spain, Switzerland, etc.; BMBF, 2017; National Academies of Sciences, Engineering, and Medicine, 2017). In the following section, we will introduce VET as a normative higher educational pathway, and provide information about its unique characteristics.

VET – The successful combination of schooling and on-the-job training. In Europe and the US, two different pathways for obtaining handicraft or trade skills (e.g., motor mechanical engineering, painting contractor, nursing, physiotherapy) have emerged: a college education and specific apprenticeship programs (National Academies of Sciences, Engineering, and Medicine, 2017). In the US, whereas the large majority of emerging adults will attend college or enter the work force, interest in apprenticeship programs has grown steadily (Messing-Mathie, 2015). In Europe, a specific type of apprenticeship has already come

into prominence: VET is a special, 3-year educational system that combines higher education in a vocational school and the acquisition of job-specific skills via on-the-job experience (about 64% of young German adults finished VET, whereas only 24% obtained some kind of college degree; Statistisches Bundesamt, 2015). American emerging adults who are not going to college have also been considered "the forgotten half," which has been largely overlooked in previous research (Arnett, 2000). Focusing on emerging adults enrolled in the VET program is a first step toward including some of these emerging adults who are not attending a traditional college educational pathway.

One of the most pronounced characteristics of VET trainees is that they often find themselves in between two social roles. On the one hand, trainees regularly attend vocational schooling, do homework, and take exams. Thus, this context is very similar to their previous high school experiences with respect to content, structure, and expectations. On the other hand, trainees are company employees, and as such, they are officially hired, paid, and formally registered. The latter comes with multiple aspects that are clearly different from, for example, a classic college environment: trainees sign an official, legally binding work contract, deal with a hierarchical leadership structure within the company and a given social environment, and experience a dependency on colleagues. Furthermore, during the time spent working at the respective company, VET trainees are faced with an age-diverse and mostly older social environment than during the time spent in school. In contrast to college students who are surrounded by like-minded peers, VET trainees might be confronted with a set of adult role themes, behaviors, and expectations (e.g., child care, family responsibilities, health-related problems) that are often rather different from their own daily challenges. Thus, they face new social environments, including challenges and opportunities. As personality development is considered to be potentially driven by the confrontation with new social roles or environments, we believe that differences in trainees' personality development should be reasonable to occur. Therefore, it was our goal to focus on VET trainees and get an understanding of their personality development.

Conditions of personality maturation. Recently, researchers have reasoned that it might not only be the new environmental context or the investment in a new social role (e.g., becoming a parent, divorce, graduating from high school, job promotion) but rather the individual's experience and evaluation of the context that determines whether and to what extent personality changes (e.g., Bleidorn, Hopwood, & Lucas., 2016). For example, Sutin, Costa, Wethington, and Eaton (2010) showed that judging a stressful life event (e.g., divorce, car accident, unemployment) as a "turning point" was associated with increases in neuroticism,

whereas perceiving the event as "a lesson learned" was related to increases in extraversion and conscientiousness. An individual's perception and evaluation of and reaction to his or her changing life circumstances could be more important in terms of subsequent personality development than the context itself (e.g., Zhang & Howell, 2011). With respect to VET, the young trainees' evaluation of their new contexts and their life in general could be potential factors that determine the direction in which their personalities will develop during VET.

Accordingly in the following, we would like to highlight two indicators of evaluation that differ by specificity: general life satisfaction and job strain. The new challenges and opportunities offered by the VET context most likely impact trainees' well-being (e.g., Luhmann, Hofmann, Eid, & Lucas, 2012). Well-being has been shown to be strongly related to personality (e.g., DeNeve & Cooper, 1998; Diener, Oishi, & Lucas, 2003; Hill, Turiano, Mroczek, & Roberts, 2012; Soto, 2015; Steel, Schmidt, & Shultz, 2008). Thus, we suggest that psychosocial aspects of well-being (e.g., life satisfaction or job strain) operate as essential psychosocial conditions for personality development in this developmental context (e.g., Hill et al., 2012; Roberts et al., 2003; Specht, Egloff, & Schmukle, 2013; van Aken, Denissen, Branje, Dubas, & Goossens, 2006).

Some studies have provided empirical evidence that high *life satisfaction*, the overall cognitive evaluation of one's personal life (Diener & Lucas, 1999), is a condition in which personality maturation can occur: High life satisfaction was shown to predict higher levels of extraversion, agreeableness, and conscientiousness as well as lower levels of neuroticism (Specht et al., 2013; van Aken et al., 2006). Also, with work being one of the most important life domains, *job strain*, which can be understood as perceived stress in the context of work, is likely to serve as a meaningful determinant for personality development. In this regard, previous research has been able to show that individuals who endured more stress at work are more likely to subsequently display lower levels of extraversion and higher levels of neuroticism (e.g., van Aken et al., 2006; Wu, 2016). Other scholars showed that the individual's broader evaluation of a context as stressful or negative was associated with subsequent increases in neuroticism (Sutin et al., 2010). Thus, investigating the individual's perception of a context can be meaningful for understanding personality development.

Placing this idea into the specific context of our study, we propose that perceptions of and reactions to new environmental contexts reflect a condition that is associated with personality development (Roberts & Jackson, 2008). As VET trainees find themselves in a special context during emerging adulthood, it is important to investigate whether and how

psychosocial factors that are more closely (e.g., work stress) or more broadly (e.g., life satisfaction) linked to the VET experience develop reciprocally during VET.

The Present Study

Our goal in conducting this study was twofold. First, we aimed to shed light on the longitudinal development of personality in emerging adults undergoing VET with three statistical indicators traditionally used in personality development: rank-order consistency, mean-level change, and individual differences in change (Roberts et al., 2008). On the basis of previous findings, we hypothesized and tested whether (a) trainees' personalities would also increase in rank-order stability during VET, (b) trainees would also display personality maturation, and (c) substantial individual differences in personality change would be displayed.

Second, we were interested in the ways in which interindividual differences in personality change would be related to the subjective psychosocial perception/evaluation of this specific educational pathway. As the VET context differs from the most commonly researched college environment, the respective findings on determining factors of interindividual differences in change in personality development cannot be directly transferred from previous studies. Thus, we examined the interplay of personality with each of two psychosocial factors over the course of VET. Specifically, we included life satisfaction as a general cognitive evaluation of one's life (Diener & Lucas, 1999) and job strain, which can be seen as a personally perceived evaluation of one's work environment considered detrimentally important for VET students. We expected life satisfaction to predict subsequent changes in personality such that increases in life satisfaction would be associated with increases in personality maturation, for example, increases in agreeableness and conscientiousness (Specht et al., 2013; van Aken et al., 2006). Similar to previous studies, we expected job strain to be associated with neuroticism (Scollon & Diener, 2006; Wu, 2016). Thus, our study is one of the first to investigate personality development in emerging adults in a VET trainee context in which post-secondary higher education is combined with on-the-job training.

Method

We hereby confirm that the information provided in the following sections on measures, study conditions, data exclusion, and sample determination is complete and accurate.

Participants

The study "Mathematics and Science Competencies in Vocational Education and Training" (ManKobE; e.g., Retelsdorf et al., 2013) followed emerging adults for the duration of their 3-year vocational education and training in Germany. The study's overall goal was to understand the role that academic competencies in mathematics and science, characteristics of training, and personal dispositions have for successful VET. Young trainees located in three German states agreed to take part in the study (N = 1,886; M_{age} = 18.41, SD_{age} = 1.82, 29% female). Participants were trained in science-based jobs. Specifically, we were able to include participants who were trained as industrial clerks (N_{T1} = 551), laboratory assistants (N_{T1} = 283), or technicians (N_{T1} = 1052). VET is mostly designed for a 3-year period combining higher education at school and the acquisition of job-specific skills via on-the-job experience. The double-tracked system allows for a specific job training while trainees simultaneously acquire profound academic knowledge in broader (e.g., German, English, Mathematics) as well as job-specific subjects (e.g., electrical engineering, accountancy and finance, biochemistry).

Assessments took place at the beginning of VET (August to November 2012, N_{T1} = 1886), 16.50 (SD = 1.01) months later around the time of intermediate examinations (N_{T2} = 1565), and at the end of vocational training in the summer of 2015—another 18.01 (SD = 1.01) months later (N_{T3} = 896). We conducted attrition analyses between trainees who participated in all three measurement occasions (continuers) and participants who did not complete the study (dropouts). Analyses revealed no substantial differences between study continuers and dropouts for all Big Five personality variables and additional background variables such as age, sex, type of secondary schooling, graduation degree, or immigration background (all ds< |.05|).

Measures

Personality. We assessed personality with 42 items of the German version of the Big Five Inventory (BFI; Lang, Lüdtke, & Asendorpf, 2001) to capture the personality dimensions neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Items were answered on a 5-point scale ranging from 1 (*applies not at all*) to 5 (*applies totally*). Cronbach's alpha reliabilities for the Big Five traits at the three measurement points were .71, .67, and .69 for neuroticism; .82, .82, and .83 for extraversion; .73, .71, and .69 for openness; .68, .69, and .69 for agreeableness; and .75, .76, and .79 for conscientiousness, respectively.

We were able to establish the Big Five personality structure for the three measurement occasions after accounting for acquiescent response tendencies, which are common in this age

group (Soto, John, Gosling, & Potter, 2008) and groups with low education levels (e.g., Rammstedt, Goldberg, & Borg, 2009). Following the procedure suggested by Soto et al. (2008), we first computed within-person response means and standard deviations based on a set of item pairs with opposite statements about personality (e.g., "I am considerate and kind to almost everyone" vs. "I am sometimes rude to others"), resulting in one mean and one standard deviation for each participant. Second, we used the resulting mean and standard deviation of each participant to ipsatize (within-person standardization) all of the data for that participant. The BFI item loadings with $|\lambda| > .20$ are exemplarily presented for the ipsatized items of the first measurement occasion (Supplement A1). Based on the eigenvalues from the exploratory factor analyses with raw and ipsatized items, a six-factor structure was preferred for the raw data, whereas for the ipsatized data, the theoretically postulated five-factor personality structure was supported (Supplement A2).

Life satisfaction. An adapted scale for life satisfaction (Pavot, Diener, & Suh, 1998; Trautwein, 2004) with four items (*I am satisfied with my current life*; *The life I am currently living is right for me*; *My current life circumstances are excellent*; *I have everything that is important to me*) was applied. Participants rated their current life satisfaction on a four-item scale ranging from 1 (*applies not at all*) to 4 (*applies totally*). Cronbach's alpha reliabilities for the three measurement points were satisfactory: .85, .86, and .90, respectively.

Job strain. To assess job strain, we used a three-item German scale (Westermann, Heise, Spies, & Trautwein, 1996) ranging from 1 (*applies not at all*) to 4 (*applies totally*). The items were: *Vocational training is wearing me out; It is barely possible to bring my training in line with other obligations; Because of the training, I often feel tired and stressed*. Cronbach's alpha reliabilities for the three measurement points were satisfactory: .74, .77, and .83, respectively.

Statistical Analysis

As our goal was twofold, we first used latent change score models for both the personality and the psychosocial variables individually to get an understanding of their longitudinal development. Second, in order to explore the reciprocal dynamics between the two psychosocial factors and personality in VET trainees, we applied bivariate latent change score models composed of two parts: (a) two separate latent change score models, one for the personality measures and one for the psychosocial factors, and (b) the resulting cross-lagged latent change score model (McArdle, 2009). The model is presented in Figure 1.

Latent change models. The latent change score models (McArdle, 2009) for the latent personality and latent psychosocial variables were slightly different for the personality traits and psychosocial factors. For personality, the model was based on a set of three indicator parcels, each composed of two to four items that were distributed according to their position in the questionnaire. Parcels, as opposed to items, are advantageous in terms of, for example, greater reliability as long as the items are true indicators of the construct (Little, 2013). We decided to use parceling because SEM models with parcels rely on fewer parameter estimates, resulting in a better ratio of variables to sample size and more stable parameter estimates (Little, 2013, p. 22). We allowed for correlations between residuals across time. The latent change score model for life satisfaction was set up with four items, and the latent change score model for job strain comprised three items per measurement point. We established strong measurement invariance across time for all personality models and for the models of life satisfaction and job strain (Table1). Latent change scores in personality, life satisfaction, and job strain were modeled from T1 to T2 and from T2 to T3. We were interested in the means and variances of the initial personality and psychosocial factor levels as well as of the two latent change scores.

Bivariate latent change score models. By combining the single latent change score models, we formed one bivariate latent change score model in which (a) the personality variables and the psychosocial factors (life satisfaction or job strain) were initially correlated, (b) their respective change variables were correlated (correlated change), (c) previous levels of the psychosocial factors served as predictors of subsequent changes in personality, and (d) the levels of personality characteristics at the previous measurement point predicted future changes in the psychosocial factors (cross-lagged paths).

Overall, we created 10 bivariate latent change score models for each of the Big Five personality traits with the two psychosocial factors of life satisfaction and job strain. In each model, we looked at two types of effects. First, we were interested in the means and variances of cross-lagged effects from one domain on subsequent change in the other domain for both measurement intervals, for example, neuroticism (T1) on change in life satisfaction (T1→T2), and vice versa, for example, life satisfaction (T1) on subsequent change in neuroticism (T1→T2). Second, we looked at initial and correlated changes. Specifically, we looked at the correlations between (a) the initial levels of personality and the respective psychosocial factor at T1, (b) the change scores of the first interval (T1→T2), and (c) the change scores of the second interval (T2→T3).

The analyses were conducted in R (R Core Team, 2015) and M*plus* 7.31(Muthén & Muthén, 1998-2015) using full information maximum likelihood estimation (FIML) to account for missing data (Enders, 2010). FIML takes all available information (i.e., even cases with missing values) into account when estimating model parameters. Considering the missing values to be missing at random (MAR; Rubin, 1976), that is, missing values on one variable (e.g., neuroticism) are systematically related to another variable in the model under investigation (e.g., life satisfaction) but not to neuroticism itself (Enders, 2010), FIML provides more precise and less distorted parameter estimation than, for example, listwise deletion, which requires the data to be missing completely at random (MCAR; Rubin, 1976). We controlled for sex, age, and high school degree in all analyses. We set the level of statistical significance at $p < .01$.

Results

In the following, we first present findings on the univariate latent change score models of the Big Five personality variables and the psychosocial factors: life satisfaction and job strain. Second, we present results from the more complex model that was used to capture cross-lagged personality and cross-lagged psychosocial effects.

Indicators of Development: Personality and Psychosocial Factors

Table 2 presents information on rank-order stabilities and Cohen's *d*. Descriptive statistics on the means, standard errors, variances, and fit statistics of the latent change score models are presented in Table 3 for both the personality and psychosocial variables.

Personality. With respect to personality, emerging adults undergoing VET reported significant changes across the 3 years of training on all personality dimensions. Regarding rank-order stability, the young trainees reported higher rank-order stability for all Big Five traits in the second half of VET. Thus, the first phase of VET was characterized by less rank-order stability in all personality traits. In the second phase, neuroticism, agreeableness, and conscientiousness displayed the largest increases in rank-order stability. The rank-order stabilities of extraversion and openness did not increase as much as neuroticism, agreeableness, and conscientiousness but were already higher in the first half of VET.

Looking at mean-level changes in the first half of VET (T1 → T2), the trainees displayed increases in neuroticism ($d = 0.37$) as well as decreases in the remaining four factors of extraversion ($d = -0.25$), openness ($d = -0.09$), agreeableness ($d = -0.43$), and conscientiousness ($d = -0.50$), reflecting an initial, short-term contradiction of the maturity

principle (Roberts et al., 2006), according to which long-term decreases in neuroticism and increases in agreeableness and conscientiousness should be expected. In the second half (T2 → T3), VET participants reported the opposite development compared with the first measurement interval at least for two of the maturity-related variables: The trainees became slightly less neurotic (d = -0.10) and more conscientious (d = 0.11). However, openness to experience continued to decrease (d = -0.13). However, changes in the second interval are smaller than those in the first phase indicating a reversion to the initial state.

With respect to interindividual differences in change, we found substantial variability in all personality variables across the duration of the 3-year VET program. Thus, the young trainees differed in terms of personality development. The 95% plausible values range (PVR) is a good indicator of variability in the sample as it indicates the range in which the values for 95% of the sample fell, assuming that the change was normally distributed (Raudenbush & Bryk, 2002). In the VET sample, we found a broad range of plausible values for the change scores: neuroticism (T1→T2: -0.53, 0.83; T2→T3: -0.48, 0.40), extraversion (T1→T2: -1.16, 0.80; T2→T3: -0.84, 0.82), openness (T1→T2: -0.75, 0.67; T2→T3: -0.65, 0.53), agreeableness (T1→T2: -0.71, 0.39; T2→T3: -0.45, 0.51), and conscientiousness (T1→T2: -1.12, 0.58; T2→T3: -0.67, 0.79). For all personality traits, the plausible values indicate that some trainees increased and some decreased in the respective trait across the three year VET span.

Psychosocial factors. Regarding the psychosocial factors, the rank-order stability for both life satisfaction and job strain did not change substantially in the first or second half of VET. However, when looking at the time span from the beginning to the end of VET, the rank-order stability decreased for both of the psychosocial variables. In terms of mean-level change, the trainees' life satisfaction decreased over the course of the entire duration of VET (d = -0.17). However, job strain was not perceived to change in the first half (d = 0.02), nor were increases in job strain in the second part of the training course statistically significant (d = 0.06). There was substantial variance, indicating interindividual differences in change in life satisfaction and job strain. Thus, the 95% PVR showed that some trainees increased whereas others decreased in life satisfaction (T1→T2: -1.26, 1.12; T2→T3: -1.31, 1.21) and job strain (T1→T2: -1.21, 1.21; T2→T3: -1.24, 1.36). Therefore, the bivariate latent change score models were examined to shed light on the reciprocal dynamics between change in personality and change in psychosocial factors.

Bivariate Latent Change Score Models

In the next step, we calculated bivariate latent change score models. All models indicated a very good fit to the data. The fit indices, the RMSEA (*M* = .036, *SD* = .00, Min. = .031, Max. = .042), SRMR (*M* = .041, *SD* = .01, Min. = .034, Max. = .051), and CFI (*M* = .958, *SD* = .01, Min. = .933, Max. = .972), indicated largely satisfactory model fits.

Initial correlations. Correlational patterns are displayed in Table 4. Both life satisfaction and job strain were substantially correlated with the personality variables at the start of VET. Specifically, life satisfaction was initially negatively correlated with neuroticism (ρ_{IC} = -.38) and significantly positive correlated with extraversion, agreeableness, openness, and conscientiousness (all $.09 < \rho_{IC} < .31$). Trainees who were more satisfied with their lives also reported being less neurotic and more extraverted, more agreeable, and more conscientious. Job strain displayed the opposite pattern with a significant positive initial correlation with neuroticism (ρ_{IC} = .46) and significant negative initial correlations with the remaining Big Five personality factors ($-.37 < \rho_{IC} < -.09$). The experience of higher job strain was initially more strongly associated with higher neuroticism as well as lower extraversion, openness, agreeableness, and conscientiousness.

Correlated changes. Regarding correlated changes, experiencing larger decreases in life satisfaction was simultaneously associated with larger increases in neuroticism as well as larger decreases in extraversion, openness, agreeableness, and conscientiousness for both measurement intervals. Also, reporting increases in job strain was associated with larger increases in neuroticism as well as larger decreases in extraversion, agreeableness, and conscientiousness.

Cross-lagged effects. In total, analyses on 40 cross-lagged effects revealed 10 significant effects ($p < .01$), eight of which were derived from effects of personality characteristics on subsequent change in the psychosocial variables and two effects from the psychosocial variables to subsequent personality change (Table 5).

Cross-lagged personality effects. Effects of personality on subsequent change in life satisfaction delivered the majority of effects (i.e., six): Emerging adults in VET indicating more neuroticism at T2 subsequently reported larger decreases in life satisfaction. The opposite effect was revealed for trainees describing themselves as more agreeable or more conscientious at the beginning or at the halfway point of VET as this group of trainees subsequently experienced increases in life satisfaction. Also, trainees who were more extraverted at T2 reported increases in life satisfaction from T2 to T3.

Cross-lagged effects of personality characteristics on subsequent change in job strain were rarely revealed. Trainees who were less conscientious at the beginning or at the halfway point of VET (T1 or T2) subsequently reported decreases in job strain.

Cross-lagged psychosocial effects. Overall, two effects of life satisfaction and job strain on personality change were shown. Trainees starting VET with higher life satisfaction subsequently reported increases in conscientiousness. Trainees reporting more job strain at the halfway point of VET subsequently decreased in agreeableness for the remainder of VET.

Discussion

Our goal was twofold: Not only did we aim to shed light on the personality development of one specific group of individuals who are part of the "forgotten half" (Arnett, 2000), but we also aimed to capture a better understanding of the significance of an individual's psychosocial evaluation of the VET context for personality development. Thus, we first investigated personality development in emerging adults undergoing VET. Second, we looked at the reciprocal, longitudinal relationship between personality and the psychosocial factors of life satisfaction and job strain. In the following, we will briefly summarize our major findings, highlight the importance of the results for this field of research, including implications for future research, and discuss the limitations of the present work.

Against all Odds: Personality Development in VET Trainees

As opposed to expectations based on previous research findings on personality development in emerging adults (e.g., Asendorpf & Wilpers, 1998; Bleidorn, 2015; Roberts et al., 2001, 2003), the young VET trainees displayed initial increases in neuroticism and decreases in extraversion, openness, agreeableness, and conscientiousness in the first 1.5 years of the 3-year VET apprenticeship. This is especially surprising because the young trainees were required to face intermediate examinations after the first 1.5 years of VET, and in this regard, the study by Bleidorn (2012) demonstrated that approaching an important period of exams was associated with increases in conscientiousness. In the second half of VET, the young trainees reported further decreases in openness while simultaneously reporting increases in conscientiousness and decreases in neuroticism, yet the changes in this second phase were considerably smaller than in the first phase. Thus, initial personality development in VET trainees went counter to the expectations that were based on the maturity principle and that had been revealed in many previous studies on emerging adulthood (e.g., Roberts et al., 2006). Even though the time period after high school (e.g., Lüdtke et al., 2011) or a young person's

entrance into the job market (e.g., Lodi-Smith & Roberts, 2007) have been shown to provide important contexts for personality development, this study provides tentative evidence that investing in age-graded social roles and being confronted with challenging, more adult expectations does not immediately, ultimately, and unconditionally lead to personality maturation (e.g., van Scheppingen et al., 2016). Thus, our findings may suggest that the scope of the social investment principle is limited.

Even though our findings seem to draw a picture that goes against expectations, the findings might simply point to a potential delay in personality maturation in leading up to the second phase of VET or even longer. In this regard, many previous studies revealed the maturity principle of personality development over longer periods of time, for example, across 4 years (e.g., Lucas & Donnellan, 2011; Neyer & Asendorpf, 2001) or even 8 years of time (Roberts et al., 2001). The VET students in the present study might display personality maturation in the time beyond their apprenticeship training. Future research will need to assess VET trainees in the transition from apprenticeship training to full-time employment to get a better understanding of personality development in young trainees. Nevertheless, in order to better understand the mechanisms of personality development, it is necessary to gather information on how personality develops in shorter periods of time. It is possible that processes of personality development that go beyond those proposed by social investment theory are at play. The observed patterns of "dips" in personality maturation have previously been shown to be especially prominent during the biological, social, and psychological transitions from adolescence to emerging adulthood (*disruption hypothesis*; Soto & Tackett, 2015; Soto, 2016). Given that we observed the VET students for a relatively short time period during an age span that is considered to fall between adolescence and adulthood (Arnett, 2000), it is also possible that the results of the first phase simply reflect a normative disruption in the overall development of personality maturation that has been overlooked by previous studies that have employed longer measurement intervals. Longitudinal research using short-term measurement occasions is needed to draw final conclusions on whether the observed "dip" should be considered normative in only this specific group of emerging adults or whether it applies to this age span more generally.

Regarding potential mechanisms that might account for our findings, we would like to offer three explanations: First, in the group of VET trainees, the age range was larger than in traditional college-track cohorts (e.g., M = 18.41, SD = 1.82 in our study), and therefore, the younger trainees in particular might still have been more strongly confronted with a diverse set of biological, social, and psychological transitions than college students. Because personality

can be seen as a function of genetics and individuals' dynamic, reciprocal transactions with the environment, the basic genetic developmental processes of adolescence are likely to still be at play because genetics have been shown to be more strongly associated with personality in the earlier stages of life (e.g., Bleidorn et al., 2014; Briley & Tucker-Drob, 2014; Kandler, 2012). The time of adolescence in particular is filled with important biological changes that are likely to affect personality (Briley & Tucker-Drob, 2014). Thus, findings supporting the disruption hypothesis in adolescence might also apply to the observed group of VET students (e.g., Allik, Laidra, Realo, & Pullmann, 2004; Soto, 2016; Van den Akker, Deković, Asscher, & Prinzie, 2014). In order to address the age issue, we analyzed the group of older trainees (21 to 25 years of age) separately and found the same developmental pattern that went counter to the maturity principle in the first half of VET. Thus, age might not be the only variable that can account for the pattern in our findings.

Second, emerging adults selecting themselves into an apprenticeship context might differ significantly from their college-bound peers in terms of their psychosocial development such that the VET context is more attractive to a specific personality type of individuals (Lüdtke et al., 2011). This might be true because the VET context includes, for example, the opportunity to stay in their hometown, keep their current living arrangements (e.g., with their families), and continue their established friendships. Although we were unable to compare the present sample with a control group of university students, we ran a control analyses to compare VET trainees who graduated high school with the Abitur (German certificate to attend university) and trainees with other lower high school degrees. This analysis revealed that trainees with the Abitur reported being significantly more open, agreeable, and conscientious (e.g., Lüdtke et al., 2011). Regarding personality development, however, trainees with the Abitur showed a developmental pattern that was almost identical to trainees without it. Again, the educational level might not be able to explain the results patterns.

Another possible explanation is that the VET apprenticeship environment is especially challenging for the large majority of trainees with respect to social, psychological, and skill-related social role expectations. In this regard, the first phase could be seen as an orientation phase requiring some time for the trainees to get to know the respective role and social norm expectations that subsequently lead them to better adjustment in the second interval (*reality shock*; Nelson, Quick, & Eakin, 1988; Saks & Ashforth, 1996). This phenomenon has also been discussed for other transitions into the work context, for example, for teachers (e.g., Voss, Wagner, Klusmann, Trautwein, & Kunter, 2017) or trainees (Reicherts & Pihet, 2000). In line with the latter argument, VET trainees reported being significantly less satisfied with their lives

after the first phase of VET. In order to further investigate the extent to which conditions of the developmental context of VET are reciprocally related to personality development, we conducted bivariate latent change score analyses that revealed that personality was a stronger determining factor than life satisfaction or job strain.

Personality as a Major Player in the Experience of Vocational Education and Training

In line with previous findings, the trainee personality was shown to be a stronger predictor of changes in life satisfaction and job strain than vice versa (Sutin & Costa, 2010). Thereby, our findings reinforced previous research that emphasized the association between personality characteristics and life satisfaction (e.g., DeNeve & Cooper, 1998). Even though neuroticism and extraversion have been shown to most strongly predict life satisfaction (Schimmack, Oishi, Furr, & Funder, 2004), we found this pattern in the sample of young trainees only in the second half of VET. Nevertheless, agreeableness and conscientiousness were revealed to be the strongest indicators of life satisfaction in both measurement intervals. Taking into account the fact that most of the participants experienced their first major transition into adulthood by entering the work force, it is reasonable that the personality characteristics that are most favored in the work context (i.e., agreeableness and conscientiousness) have the strongest impact on changes in life satisfaction in that phase of life. This might be especially important in this group of emerging adults as successfully entering the context of work can be seen as the most major developmental transition these emerging adults are facing. Thus, the context of work might be the strongest and potentially the most influential life domain.

It is therefore not surprising that conscientiousness emerged as a predictor of changes in job strain such that more conscientious trainees reported subsequent decreases in job strain in the first and second halves of VET. More conscientious trainees are more likely to accomplish given tasks thoroughly, to follow instructions systematically, and to overcome obstacles successfully. These characteristics might help trainees obtain more positive feedback from their colleagues and supervisors, thereby reducing some sources of job strain. In line with the findings on conscientiousness, we expected more agreeable trainees to subsequently experience less job strain as we expected more agreeable individuals to fit into and adjust to a new social environment more easily, thereby decreasing their likelihood to experience job strain. However, this expectation was not supported by the data. Also unexpectedly, more neurotic individuals did not subsequently experience significantly more job strain. More neurotic trainees are more likely to be emotionally affected by external circumstances and tend to be more stressed and insecure. Consequently, we expected less emotionally stable trainees

to be more affected and to subsequently experience more job-related stress as the apprenticeship context is filled with new experiences and challenges, including the likelihood to make mistakes or to be involved in social conflicts. It seems that when it comes to work-related stress, however, the personality characteristic most strongly related to successful task fulfillment, (i.e., conscientiousness) is pivotal. Combining these findings, we can state that in the context of VET, changes in job strain were most strongly predicted by conscientiousness, whereas changes in life satisfaction were most strongly predicted by agreeableness. In the second half of the apprenticeship, changes in life satisfaction were also strongly predicted by conscientiousness, neuroticism, and extraversion.

Does One's Situational Perception Change One's Personality?

Contrary to previous research and to our expectations, the trainees' personal overall evaluation of their lives as well as their specific stress-related evaluation of the work context did not systematically predict substantial changes in the Big Five personality characteristics. At least one effect that was in line with previous research emerged: Trainees who reported being more satisfied with their lives at the beginning of VET increased in conscientiousness in the first 1.5 years of VET (e.g., van Aken et al., 2006). However, the effect diminished during the second half of the apprenticeship, and life satisfaction did not predict changes in any of the other personality traits. Thus, effects of life satisfaction on subsequent personality change might be difficult to reveal in short time intervals such as 1.5 years.

Regarding job strain, only one effect was shown to be significant at the $p < .01$ level: Experiencing higher job-related stress at the halfway point of VET was associated with decreases in agreeableness for the remainder of the apprenticeship program. This effect reinforces previous findings that have already demonstrated the importance of work-related stress or hazardous working conditions on agreeableness (e.g., Sutin & Costa, 2010; van Aken et al., 2006). Undergoing work-related stress may consume most of the trainees' psychological and physical energy, potentially making it difficult to come up with resources for considerate, cooperative behavior. Other research was able to show that higher job strain can be associated with decreases in conscientiousness (Wu, 2016). Our study was unable to support this effect, which might indicate that job strain only serves as a predictor of conscientiousness in certain phases of life or possibly timing plays an important role in this association. Not only are VET trainees faced with potentially stressful work conditions, but they are also confronted with other challenges that are typical milestones in emerging adulthood (e.g., finding a romantic partner, deciding whether to leave or to stay at one's parents' home, rearranging leisure activities, or

maintaining friendships). Thus, job strain is only one of many factors of personality development, and this might possibly reduce the effect of job strain in this phase of life.

Summarizing the present study's findings, the trainees' personalities shaped their subsequent experience and evaluation of the apprenticeship context more strongly than vice versa. Our findings also indicated that the personal evaluation and experience of aspects of the VET context impacted changes in specific personality traits, specifically agreeableness and conscientiousness. Future research should take participants' evaluations of and experiences in certain situations into account to a larger extent to gain more specific knowledge about how our perceptions of the experiences we have change our personalities.

Limitations and Outlook

We conducted this study on the personality development of VET trainees with emerging adults in a 3-year apprenticeship program that was primarily focused on the field of science. The context of VET is most prominent in Germany and other European countries. Even though other countries have begun to implement similar programs, the large majority of emerging adults entering the workforce via apprenticeships are still based in Europe. However, our findings suggest that differentiating between different kinds of post-secondary education in the US (e.g., community colleges, 2-year colleges, 4-year colleges) might be meaningful when investigating personality development. Therefore, our study should be viewed as providing a first step toward including the "forgotten half" in personality-developmental research. It should be noted, however, that VET trainees represent a very specific part of the large group of the "forgotten half." Indeed, although VET trainees do not attend college, they follow a program of post high-school education with many stringent requirements. Thus, VET trainees are educationally embedded, whereas most members of the "forgotten half" do not enroll in any kind of educational program (Arnett, 2000). However, the meaning of the "forgotten half" should be viewed as heavily dependent on the societal and cultural context. Regarding European education, VET trainees represent a large part of the "forgotten half" as they have not been specifically investigated in personality development research. However, future research should study emerging adults who do not pursue further education and are thus confronted with very different challenges than emerging adults who are embedded in an educational context.

Regarding the representativeness of our sample, only one third of the participants were female. Thus, as a first step, future research should test the extent to which the present study's findings can be applied to groups with other gender distributions. Gender has been shown be

differentially associated with mean-level personality development and should be further investigated as a determining factor in future research (e.g., Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009; Lüdtke et al., 2011; Srivastava et al., 2003; Vecchione, Alessandri, Barbaranelli, & Caprara, 2012). Second, the trainees in the present study were drawn from science-based fields, which systematically differ from the social and service fields. Social and medical service fields (e.g., nurses, physiotherapists, social workers) might be confronted with different challenges in terms of, for example, serious illnesses, death, strict time schedules, and consequences of failure than in science-based fields. Based on trait activation theory (Tett & Burnett, 2003), different job contexts might trigger and involve different personality traits (e.g., Ziegler, Bensch, Maaß, Schult, Vogel, & Bühner, 2014). Thus, people working in the social sector might undergo different personality development than those in a more technical, mechanical sector. Third, future research might also account for diversity across emerging adults in terms of, for example, their cultural or immigration backgrounds. Bleidorn, Klimstra, Denissen, Rentfrow, Potter, and Gosling (2013) found that specific cultural differences (e.g., timing of marriage, percentage of people completing tertiary education) accounted for differences in personality development. Fourth, in order to allow for comparisons with college students, a control group would be desirable.

With respect to the evaluation of environmental contexts, life satisfaction and job strain should be seen as part of a first, rather broad approach. In order to use the evaluation of environmental contexts to obtain a more fine-grained understanding of the environment and potential mechanisms therein, future research might use the DIAMONDS framework (Rauthmann et al., 2014), which allows for a systematic assessment of situations.

Further, the time between measurement occasions is essential for understanding developmental processes (e.g., Luhmann et al., 2014). Unfortunately, the present study was limited to the 3 years of VET, thus restricting the information on personality development in VET trainees to this relatively short period of emerging adulthood. In order to draw comprehensive conclusions about the personality development of VET trainees, future research should take measurements before the start of VET and should follow the trainees across the transition from VET to full-employment or other pathways. Finally, future research should test specific hypotheses on the interplay of biological and environmental aspects that mediate or moderate personality development.

Conclusion

In the present study, we investigated the personality development of emerging adults undergoing VET across a 3-year period. In the first 1.5 years, VET trainees reported mean-level changes that went counter to the maturity principle with only conscientiousness displaying significant increases in the second 1.5 years of training. Openness and extraversion decreased steadily across the 3 years. Regarding psychosocial factors, personality predicted life satisfaction and job strain more strongly than vice versa. Future studies should extend research on the personality development of young trainees by specifically including the role of genetics to test specific hypotheses on the interplay of genetics, environmental context, and personality development. Also, including measurement occasions that occur before the start of and after the completion of VET is necessary for obtaining a better long-term understanding of personality development.

References

Allik, J., Laidra, K., Realo, A., & Pullmann, H. (2004). Personality development from 12 to 18 years of age: Changes in mean levels and structure of traits. *European Journal of Personality*, *18*, 445-462. doi: 10.1002/per.524

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*, 469-480. doi: 10.1037/0003-066X.55.5.469

Asendorpf, J. B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology*, *74*, 1531-1544. doi:10.1037/0022-3514.74.6.1531

Bleidorn, W. (2012). Hitting the road to adulthood: Short-term personality development during a major life transition. Personality and Social Psychology Bulletin, *38*, 1594-1808. doi: 10.1177/0146167212456707

Bleidorn, W. (2015). What accounts for personality maturation in early adulthood? *Current Directions in Psychological Science*, *24*, 245-252. doi:10.1177/0963721414568662

Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2016). Life events and personality trait change. *Journal of Personality*. doi: 10.1111/jopy.12286

Bleidorn, W., Kandler, C., & Caspi, A. (2014). The behavioural genetics of personality development in adulthood-classic, contemporary, and future trends. *European Journal of Personality*, *28*, 244-255. doi: 10.1002/per.1957

Bleidorn, W., Klimstra, T. A., Denissen, J. J. A., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2013). Personality maturation around the world: A cross-cultural examination of social-

investment theory. *Psychological Science*, *24*, 2530–2540. doi: 10.1177/0956797613498396

BMBF (2017). Retrieved from: https://www.bmbf.de/en/the-german-vocational-training-system-2129.html (18.09.2017, 13:43h)

Briley, D. A., & Tucker-Drob, E. M. (2014). Genetic and environmental continuity in personality development: A meta-analysis. *Psychological Bulletin*, *140*, 1303-1331. doi: 10.1037/a0037091

Clausen, J. S. (1991). Adolescent competence and the shaping of the life course. *American Journal of Sociology*, *96*, 805-842. doi: 10.1086/229609

DeNeve, K. M., & Cooper, H. (1998). The happy personality: A Meta-Analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, *124*, 197-229.

Denissen, J. J., Ulferts, H., Lüdtke, O., Muck, P. M., & Gerstorf, D. (2014). Longitudinal transactions between personality and occupational roles: A large and heterogeneous study of job beginners, stayers, and changers. *Developmental Psychology*, *50*, 1931-1942. doi:10.1037/a0036994

Diener, E., & Lucas, R. E. (1999). Personality and subjective well-being. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 213-229). New York: Russell Sage.

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, *54*, 403-425. doi: 10.1146/annurev.psych.54.101601.145056

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Bran Sciences*, *33*, 61-135. doi: 10.1017/S0140525X0999152X

Hill, P. L., & Edmonds, G. W. (2017). Personality development in adolescence. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 25-38). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Hill, P. L., Turiano, N. A., Mroczek, D. K., & Roberts, B. W. (2012). Examining concurrent and longitudinal relations between personality traits and social well-being in adulthood. *Social Psychology and Personality Science*, *3*, 698-705. doi: 10.1177/1948550611433888

Hutteman, R., Hennecke, M., Orth, U., Reitz, A. K., & Specht, J. (2014). Developmental tasks as a framework to study personality development in adulthood and old age. *European Journal of Personality*, *28*, 267-278. doi: 10.1002/per.1959

Kandler, C. (2012). Nature and nurture in personality development: The case of neuroticism and extraversion. *Current Directions in Psychological Science*, *21* (5), 290-296. doi: 10.1177/0963721412452557

Klimstra, T. A., Hale III, W. W., Raaijmakers, Q. A., Branje, S. J., & Meeus, W. H. (2009). Maturation of personality in adolescence. *Journal of Personality and Social Psychology*, *96* (4), 898-912. doi: 10.1037/a0014746

Lang, F. R., Lüdtke, O., & Asendorpf, J. B. (2001). Testgüte und psychometrische Äquivalenz der deutschen Version des Big Five Inventory (BFI) bei jungen, mittelalten und alten Erwachsenen [Psychometric properties and psychometric equivalence of the German version of the Big Five Inventory (BFI) in young, middle-aged, and old adults]. *Diagnostica*, *47*, 111-121. doi: 10.1026//0012-1924.47.3.111

Leikas, S., & Salmela-Aro (2015). Personality trait changes among young Finns: The role of life events and transitions. *Journal of Personality*, *83*, 117-236. doi: 10.1111/jopy.12088

Little, T. D. (2013). *Longitudinal structural equation modeling*. New York, NY: The Guilford Press.

Lodi-Smith, J., & Roberts, B. W. (2007). Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review*, *11*, 68-86. doi:10.1177/1088868306294590

Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, *103*, 847-861. doi: 10.1037/a0024298

Lüdtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology*, *101*, 620-637. doi: 10.1037/a0023743

Luhmann, M., Hofmann, W., Eid, M., & Lucas R. E. (2012). Subjective well-being and adaptation to life events: A Meta-Analysis. *Journal of Personality and Social Psychology*, *102*, 592-615. doi: 10.1037/a0025948

Luhmann, M., Orth, U., Specht, J., Kandler, C., & Lucas, R. E. (2014). Studying changes in life circumstances and personality: It's about time. *European Journal of Personality*, *28*, 256-266. doi: 10.1002/per.1951

McArdle, J. J. (2009). Latent variable modeling of differences and changes with longitudinal data. *Annual Review of Psychology*, *60*, 577-605. doi:10.1146/annurev.psych.60.110707.163612

Messing-Mathie, A. (2015). Building apprenticeship systems for middle-skill employment: Comparative lessons in innovation and sector-based strategies for apprenticeships. Retrieved from: http://sites.nationalacademies.org/pga/step/middleskilljobs/index.htm (18.09.2017, 13:54h).

Mõttus, R., Soto, C. J., Slobodskaya, H. R. (2017). Are all kids alike? The magnitude of individual differences in personality characteristics tends to increase from early childhood to early adolescence. *European Journal of Personality*, *31*, 313-328. doi: 10.1002/per.2107

Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

National Academies of Sciences, Engineering, and Medicine (2017). *Building America's Skilled Technical Workforce.* Washington, DC: The National Academies Press. doi:10.17226/23472

Nelson, D. L., Quick, J. C., & Eakin, M. E. (1988). A longitudinal study of newcomer role adjustment in US organizations. *Work & Stress*, 2, 239-253. doi: 10.1080/02678378808259172

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood. *Journal of personality and social psychology*, 84, 310–321. doi: 10.1037/0022-3514.81.6.1190

Neyer, F. J., Mund, M., Zimmermann, J., & Wrzus, C. (2014). Personality-relationship transactions revisited. *Journal of Personality*, 82, 539-550. doi: 10.1111/jopy.12063

Neyer, F. J., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across young adulthood. *Journal of Personality*, *75*, 535–568. doi:10.1111/j.1467-6494.2007.00448.x

Parker, P. D., Lüdtke, O., Trautwein, U., & Roberts, B. W. (2012). Personality and relationship quality during the transition from high school to early adulthood. *Journal of Personality*, *80*, 1061-1089. doi: 10.1111/j.1467-6494.2012.00766.x

Pavot, W., Diener, E., & Suh, E. (1998). The temporal satisfaction with life scale. *Journal of Personality Assessment*, *70*, 340-354. doi:10.1207/s15327752jpa7002_11

R Core Team (2015). R: A language and environment for statistical computing. R Foundation for Statistical Computing. Vienna, Austria. URL https://www.R-project.com/

Rammstedt, B., Goldberg, L. R., & Borg, I. (2010). The measurement equivalence of big-five factor markers for persons with different levels of education. *Journal of Research in Personality*, *44*, 53-61. doi:10.1016/j.jrp.2009.10.005

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical Linear Models. Applications and Data Analysis Methods* (2nd ed.). Thousand Oaks, CA: Sage Publication, Inc.

Rauthmann, J. F., Gallardo-Pujol, D., Guillaume, E. M., Todd, E., Nave, C. S., Sherman, R. A., Ziegler, M., Jones, A. B., & Funder, D. C. (2014). The situational eight DIAMONDS: A taxonomy of major dimensions of situation characteristics. *Journal of Personality and Social Psychology*, *107*, 677-718. doi: 10.1037/a0037250.supp

Reicherts, M., & Pihet, S. (2000). Job newcomers coping with stressful situations: A micro-analysis of adequate coping and well-being. *Swiss Journal of Psychology*, *59*, 303-316. Doi: 10.1024//1421-0185.59.4.303

Retelsdorf, J., Lindner, C., Nickolaus, R., Winther, E., & Köller, O. (2013). Forschungsdesiderate und Perspektiven – Ausblick auf ein Projekt zur Untersuchung mathematisch-naturwissenschaftlicher Kompetenzen in der beruflichen Erstausbildung (ManKobE). *Zeitschrift für Berufs- und Wirtschaftspädagogik*, Beiheft 26, 227-234.

Roberts, B. W. (2009). Back to the future: Personality and Assessment and personality development. *Journal of Research in Personality*, *43*, 137-145. doi:10.1016/j.jrp.2008.12.015

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2001). The kids are alright: Growth and stability in personality development from adolescence to adulthood. *Journal of Personality and Social Psychology*, *81*, 670-683. doi: 10.1037//0022-3514.81.4.670.

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, *84*, 582–593. doi:10.1037/0022-3514.84.3.582

Roberts, B. W., & Davis, J. P. (2016). Young adulthood is the crucible of personality development. *Emerging Adulthood*, 4, 1-9. doi:10.1177/2167696816653052

Roberts, B. W., & DelVecchio (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126, 3-25. doi: 10.1037//0033-2909.126.1.3

Roberts, B. W., & Jackson, J. J. (2008). Sociogenomic personality psychology. *Journal of Personality*, *76*, 1523-1544. doi:10.1111/j.1467-6494.2008.00530.x.x

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*, 1-25. doi: 10.1037/0033-2909.132.1.1

Roberts, B.W., & Wood, D. (2006). Personality development in the context of the neo-socioanalytic model of personality. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of personality development*. Mahwah: Erlbaum.

Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research* (pp. 375-398). New York, NY: The Guilford Press.

Rubin, D. B. (1976). Inference and missing data. *Biometrika*, 63, 581-592.

Saks, A. M., & Ashforth, B. E. (1996). Proactive socialization and behavioral self-management. *Journal of Vocational Behavior*, *48*, 301-323. doi: 10.1006/jvbe.1996.0026

Schimmack, U., Oishi, S., Furr, R. M., & Funder, D. C. (2004). Personality and life satisfaction: A facet-level analysis. *Personality and Social Psychology Bulletin*, *30*, 1062-1075.doi: 10.1177/0146167204264292

Schwaba, T., & Bleidorn, W. (2017). Personality development in emerging adulthood In J. Specht (Ed.), *Personality development across the lifespan* (pp. 25-38). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Selfhout, M., Burk, W., Branje S., Denissen, J., van Aken, M., & Meeus, W. (2010). Emerging late adolescent friendship networks and big five personality traits: A social network approach. *Journal of Personality*, *78*, 509-538. doi: 10.1111/j.1467-6494.2010.00625.x

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology*, *91*, 1152-1165. doi:10.1037/0022-3514.91.6.1152

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2008). Developmental psychometrics of big five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology*, *94*, 718-737. Doi: 10.1037/0022-3514.94.4.718

Soto, C. J. (2015). Is happiness good for your personality? Concurrent and prospective relations of the Big Five with subjective well-being. *Journal of Personality*, *83*, 45-55. Doi: 10.1111/jopy.12081

Soto, C. J., & Tackett, J. L. (2015). Personality traits in childhood and adolescence: Structure, development, and outcomes. *Current Directions in Psychological Science*, 24, 358-362. Doi: 10.1177/0963721415589345

Soto, C. J. (2016). The little six personality dimensions from early childhood to early adulthood: Mean-level age and gender differences in parents' reports. *Journal of Personality*, 84, 409-422. doi: 10.1111/jopy.12168

Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the big five. *Journal of Personality and Social Psychology*, *101*, 862-882. doi: 10.1037/a0024950

Specht, J., Egloff, B., & Schmukle, S. C. (2013). Examining mechanisms of personality maturation: The impact of life satisfaction on the development of the big five personality traits. *Social Psychological and Personality Science*, *4*, 181-189. doi: 10.1177/1948550612448197

Srivastava, S., John, O. P., Gosling, S. D., & Potter, J. (2003). Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology*, 84, 1041-1053. doi: 10.1037/0022-3514.84.5.1041

Statistisches Bundesamt (2016). Mikrozensus – Beruflicher Bildungsabschluss [Microcensus – educational degrees]. Retrieved from: https://www-genesis.destatis.de/genesis/online;jsessionid=10DFC10D49CAE199AE6BDF3C9369690C.tomcat_GO_1_3?operation=previous&levelindex=2&levelid=1531294110067&step=2 (11.07.2018, 09:32h)

Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological Bulletin*, *134*, 138-161. Doi: 10.1037/0033-2909.134.1.138

Sturaro, C., Denissen, J. J. A., van Aken, M. A. G., & Asendorpf, J. B. (2008). Person-environment transactions during emerging adulthood. *European Psychologist*, *13*, 1-11. doi:10.1027/1016-9040.13.1.1

Sutin, A. R., & Costa, P. T. (2010). Reciprocal influences of personality and job characteristics across middle adulthood. *Journal of Personality*, 78, 257-288. doi: 10.1111/j.1467-6494.2009.00615.x.

Sutin, A. R., Costa, P. T., Wethington, E., & Eaton, W. (2010). Turning points and lessons learned: Stressful life events and personality trait development across middle adulthood. *Psychology and Aging*, *25*, 524-533. doi:10.1037/a0018751

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology*, *88*, 500-517. doi: 10.1037/0021-9010.88.3.500

Trautwein, U. (2004). Die temporalen Facetten der Lebenszufriedenheit [The temporal facets of life satisfaction]. *Diagnostica*, *50*, 182-192. doi:10.1026/0012-1924.50.4.182

Vaidya, J. G., Gray, E. K., Haig, J., & Watson, D. (2002). On the temporal stability of personality: Evidence for differential stability and the role of life experiences. *Journal of Personality and Social Psychology*, *83*, 1469-1484. doi:10.1037//0022-3514.83.6.1469

Van Aken, M. A. G., Denissen, J. J. A., Branje, S. J. T., Dubas, J. D., & Goossens, L. (2006). Midlife concerns and short-term personality change in middle adulthood. *European Journal of Personality*, *20*, 497-513. doi:10.1002/per.603

Van den Akker, A. L., Deković, M., Asscher, J., & Prinzie, P. (2014). Mean-level personality development across childhood and adolescence: A temporary defiance of the maturity principle and bidirectional associations with parenting. *Journal of Personality and Social Psychology*, *107*, 736–750. doi: 10.1037/a0037248

Van Scheppingen, M. A., Jackson, J. J., Specht, J., Hutteman, R., Denissen, J. J. A., & Bleidorn, W. (2016). Personality trait development during the transition to parenthood: A test of social investment theory. *Social Psychological and Personality Science*, 7, 452-462. doi:10.1177/1948550616630032

Vecchione, M., Alessandri, G., Barbaranelli, C., & Caprara, G. (2012). Gender differences in the Big Five personality development: A longitudinal investigation from late adolescence to emerging adulthood. *Personality and Individual Differences*, *53*, 740–746. doi: 10.1016/j.paid.2012.05.033

Voss, T., Wagner, W., Klusmann, U., Trautwein, U., & Kunter, M. (2017). Changes in beginning teachers‘ classroom management knowledge and emotional exhaustion during the induction phase. *Contemporary Educational Psychology*, *51*, 170-184. doi: 10.1016/j.cedpsych.2017.08.002

Wagner, J., Becker, M., Lüdtke, O., & Trautwein, U. (2015). The first partnership experience and personality development: A propensity score matching study in young adulthood. *Social Psychological and Personality Science*, *6*, 455-463. doi:10.1177/1948550614566092

Wagner, J., Lüdtke, O., Roberts, B. W., & Trautwein, U. (2014). Who belongs to me? Social relationship and personality characteristics in the transition to young adulthood. *European Journal of Personality*, *28*, 586-603. doi: 10.1002/per.1974

Watson, D., & Humrichouse, J. (2006). Personality development in emerging adulthood: Integrating evidence from self-ratings and spouse ratings. *Journal of Personality and Social Psychology*, *91*, 959-974. doi:10.1037/0022-3514.91.5.959

Westermann, R., Heise, E., Spies, K., & Trautwein, U. (1996). Identifikation und Erfassung von Komponenten der Studienzufriedenheit [Identifying and assessing components of student satisfaction]. *Psychologie in Erziehung und Unterricht*, 43, 1-22.

Wrzus, C., & Roberts, B. W. (2017). Processes of personality development in adulthood: The TESSERA framework. *Personality and Social Psychology Review*, *21*, 253-277. doi:10.1177/1088868316652279

Wu, C. (2016). Personality change via work: A job demand-control model of big five personality changes. *Journal of Vocational Behavior*, *92*, 157-166. doi: 10.1016/j.jvb.2015.12.001

Zhang, J. W., & Howell, R. T. (2011). Do time perspectives predict unique variance in life satisfaction beyond personality traits? *Personality and Individual Differences*, *50*, 1261-1266. doi: 10.1016/j.paid.2011.02.021

Ziegler, M., Bensch, D., Maaß, U., Schult, V., Vogel, M., & Bühner, M. (2014). Big five facets as predictor of job training performance: The role of specific job demands. *Learning and Individual Differences*, *29*, 1–7. doi: 10.1016/j.lindif.2013.10.008

Table 1

Fit Indices for Measurement Invariances Tests for the Big Five Personality Factors (parcels) and the Psychosocial Factors (items) across all Subgroups with Maximum Likelihood

Model	χ^2	*df*	CFI	RMSEA	SRMR
Big Five personality factors (N = 1,886)					
Neuroticism					
Model 1: Unconstrained model	66.134	15	.983	.043	.026
Model 2: Weak invariance	66.561	19	.984	.036	.026
Model 3: Strong invariance	123.714	25	.967	.046	.042
Model 4: Strict invariance	126.610	29	.967	.042	.035
Extraversion					
Model 1: Unconstrained model	30.953	15	.997	.024	.017
Model 2: Weak invariance	45.099	19	.996	.027	.031
Model 3: Strong invariance	97.346	25	.989	.039	.040
Model 4: Strict invariance	109.945	29	.987	.038	.060
Openness					
Model 1: Unconstrained model	18.308	15	.999	.011	.012
Model 2: Weak invariance	24.252	19	.999	.012	.019
Model 3: Strong invariance	133.467	25	.973	.048	.051
Model 4: Strict invariance	165.989	29	.966	.050	.077
Agreeableness					
Model 1: Unconstrained model	34.979	15	.995	.027	.019
Model 2: Weak invariance	43.861	19	.994	.026	.026
Model 3: Strong invariance	71.038	25	.988	.031	.040
Model 4: Strict invariance	78.364	29	.987	.030	.048
Conscientiousness					
Model 1: Unconstrained model	24.844	15	.998	.019	.017
Model 2: Weak invariance	37.778	19	.996	.023	.029
Model 3: Strong invariance	76.602	25	.990	.033	.067
Model 4: Strict invariance	72.112	29	.992	.028	.047
Psychosocial factors (N=1872)					
Life Satisfaction					
Model 1: Unconstrained model	210.296	39	.982	.048	.021
Model 2: Weak invariance	214.405	45	.982	.045	.024
Model 3: Strong invariance	292.962	53	.974	.049	.058
Model 4: Strict invariance	339.442	59	.970	.050	.049
Job Strain					
Model 1: Unconstrained model	27.090	16	.997	.019	.017
Model 2: Weak invariance	43.527	20	.994	.025	.025
Model 3: Strong invariance	127.050	25	.975	.047	.048
Model 4: Strict invariance	153.993	30	.970	.047	.036

Table 2

Cohen's d and Rank-Order Stability Estimates from the Strong Measurement Invariance Models

	Cohen's *d*			Stability		
	d_{12}	d_{23}	d_{13}	r_{12}	r_{23}	r_{13}
Neuroticism	**0.37**	**-0.10**	**0.27**	**.61**[a]	**.83**	**.65**
Extraversion	**-0.25**	-0.01	**-0.26**	**.74**[a]	**.82**	**.69**
Openness	**-0.09**	**-0.13**	**-0.23**	**.70**[a]	**.77**	**.68**
Agreeableness	**-0.43**	0.08	**-0.35**	**.71**[a]	**.78**	**.66**
Conscientiousness	**-0.50**	**0.11**	**-0.39**	**.65**[a]	**.79**	**.68**
Life satisfaction	**-0.10**	-0.07	**-0.17**	**.54**	**.53**	**.41**
Job strain	0.02	0.06	0.08	**.51**	**.49**	**.34**

Note. r = correlation; bold effects are significant at $p < .01$. [a] indicates that r_{12} is significantly different from r_{23}.

Table 3

Model Results for the Latent Change Score Personality Models and the Psychosocial Factor Models (ML & Bootstrap = 5,000)

	T1				C2_1				C3_2				Model Fit				
	M	*SE*	*Var*	*CI*	*M*	*SE*	*Var*	*CI*	*M*	*SE*	*Var*	*CI*	χ^2	*df*	CFI	RMSEA	SRMR
N	**2.51**	.02	**.18**	[.15, .21]	**-0.15**	.02	**.12**	[.10, .15]	**-0.04**	.01	**.05**	[.03, .08]	116.715	23	.969	.046	.033
E	**3.52**	.02	**.50**	[.46, .54]	**-0.18**	.02	**.25**	[.22, .29]	-0.01	.02	**.18**	[.13, .23]	95.879	23	.988	.041	.039
O	**3.14**	.01	**.23**	[.20, .26]	**-0.04**	.01	**.13**	[.11, .16]	**-0.06**	.02	**.09**	[.06, .13]	122.458	23	.975	.048	.035
A	**3.46**	.01	**.14**	[.12, .16]	**-0.16**	.01	**.08**	[.07, .10]	-0.03	.01	**.06**	[.05, .09]	69.749	23	.988	.033	.036
C	**3.77**	.02	**.27**	[.24, .30]	**-0.27**	.02	**.19**	[.16, .22]	**-0.06**	.02	**.14**	[.11, .17]	65.050	23	.992	.031	.038
LS	**3.22**	.02	**.38**	[.35, .41]	**-0.07**	.02	**.37**	[.33, .40]	-0.05	.02	**.41**	[.35, .46]	294.602	51	.976	.048	.027
JS	**1.71**	.02	**.36**	[.32, .39]	0.00	.02	**.38**	[.33 ,.42]	-0.06	.02	**.44**	[.38, .50]	116.049	23	.979	.044	.025

Note. N = neuroticism; E = extraversion; O = openness; A = agreeableness; C = conscientiousness; LS = life satisfaction; JS = job strain; T1 = first measurement occasion; C_{2_1} = Change from T_2 to T_3; C_{3_2} = Change from T2 to T3; *M* = mean; *SE* = standard error; *Var* = variance; *CI* = confidence interval; bold coefficients are significant at $p < .01$.

Table 4

Initial Correlations and Correlated Changes for the Latent Broad Dimensions

	N			E			O			A			C		
	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}
Life satisfaction	**-.38**	**-.25**	**-.24**	**.27**	**.25**	**.29**	**.09**	**.12**	**.20**	**.25**	**.19**	.13	**.31**	**.30**	**.26**
Job strain	**.46**	**.38**	**.59**	**-.23**	**-.22**	**-.15**	**-.09**	-.05	.04	**-.25**	**-.16**	**-.23**	**-.36**	**-.28**	**-.18**

Note. N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness; ρ_{IC} = initial correlation between personality and the psychosocial variables; ρ_{CC2} = correlation between change in personality and change in the psychosocial variables between T1 and T2; ρ_{CC3} = correlation between change in personality and change in the psychosocial variables between T2 and T3. Bold correlations are significant at $p < .01$.

Table 5

Standardized Cross-Lagged Effects in Bivariate Latent Difference Score Models

	Time 2_1			Time 3_2			Model fit				
	γ	*SE*	*p*	γ	*SE*	*p*	χ^2	*df*	CFI	RMSEA	SRMR
Personality effects											
Neuroticism											
Life satisfaction	-0.09	.03	.013	**-0.18**	.05	.000	807.196	222	.954	.038	.043
Job strain	0.07	.04	.094	0.12	.06	.032	680.308	159	.933	.042	.045
Extraversion											
Life satisfaction	0.04	.03	.204	**0.17**	.04	.000	749.365	222	.967	.036	.043
Job strain	-0.06	.03	.047	0.02	.04	.591	493.830	159	.969	.034	.037
Openness											
Life satisfaction	-0.04	.03	.170	0.04	.04	.370	956.684	222	.946	.042	.051
Job strain	0.08	.03	.016	-0.02	.04	.705	662.926	159	.940	.042	.045
Agreeableness											
Life satisfaction	**0.10**	.03	.004	**0.13**	.05	.003	617.509	222	.971	.031	.035
Job strain	-0.07	.04	.073	-0.07	.05	.162	464.911	159	.964	.032	.036
Conscientiousness											
Life satisfaction	**0.13**	.03	.000	**0.16**	.04	.001	641.969	222	.972	.032	.034
Job strain	**-0.13**	.04	.000	**-0.13**	.05	.009	493.807	159	.966	.034	.036
Effects of the psychosocial factors											
Life satisfaction											
Neuroticism	-0.03	.04	.428	-0.01	.09	.970					
Extraversion	0.01	.04	.941	0.09	.05	.081					
Openness	0.05	.04	.177	-0.02	.06	.770					
Agreeableness	0.00	.04	.991	0.09	.06	.103					
Conscientiousness	**0.12**	.04	.001	0.02	.06	.691					
Job strain											
Neuroticism	0.08	.05	.068	-0.16	.12	.191					

Extraversion	-0.05	.04	.138	-0.08	.06	.162
Openness	-0.04	.04	.359	-0.12	.06	.041
Agreeableness	-0.04	.04	.326	**-0.16**	.06	.008
Conscientiousness	-0.09	.04	.018	-0.14	.06	.018

Note. Time2_1 = time interval from T1 to T2; Time3_2 = time interval from T2 to T3; γ = cross-lagged effects; *SE* = standard errors; *p* = *p*-value; bold effects are significant at $p < .01$.

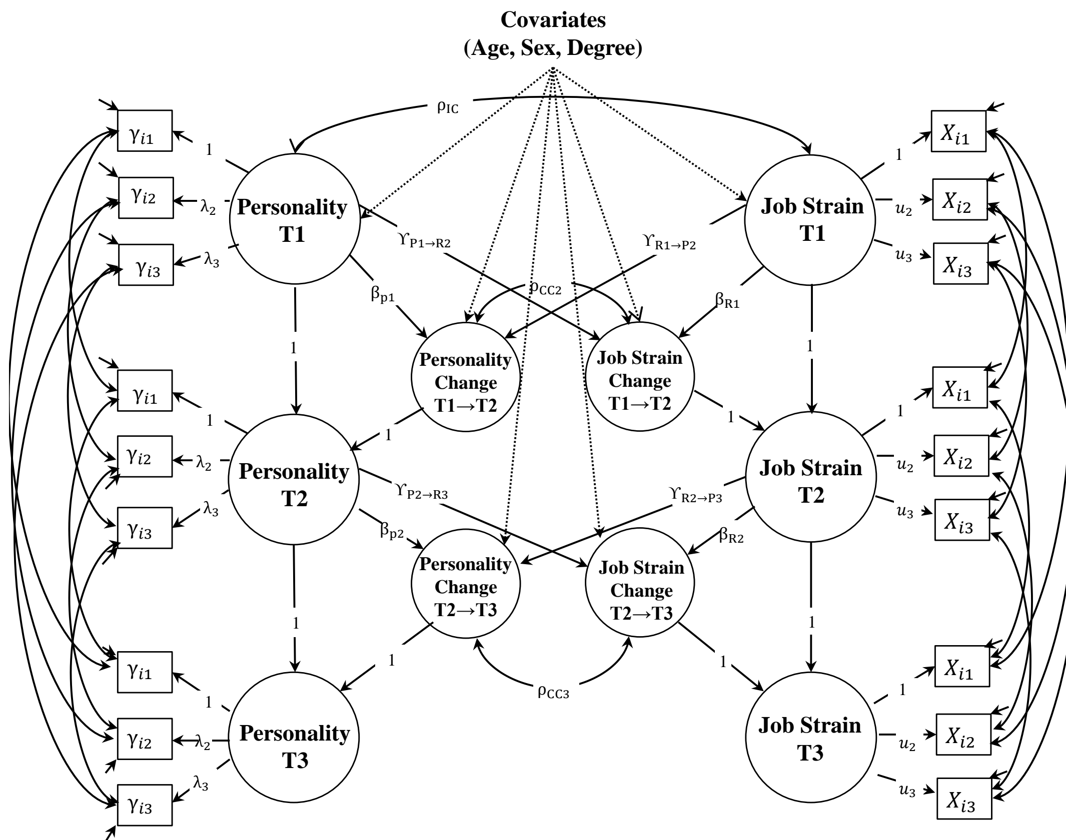

Figure 1. Bivariate latent change score model. Latent difference score model for the personality variables including three parcels of items as indicators and indicator-specific factors as well as the respective latent difference score model for the psychosocial variables with three parcels of items as indicators. The cross-lagged panel model in which levels of one domain predict subsequent change in the other domain can be seen in the middle of the model.

APPENDIX Study 1

Table A1

Promax Rotated Loadings |λ| > 0.200 of the Ipsatized EFA Big Five Factor Model at T1

	1	2	3	4	5
Neuroticism					
Bfi04				0.26	
Bfi09R				-0.68	
Bfi14		0.40		0.40	
Bfi19				0.48	
Bfi24R				-0.49	
Bfi33R				-0.66	
Bfi38	-0.20			0.52	
Extraversion					
Bfi01	0.75				
Bfi06R	-0.75				
Bfi11			0.43		
Bfi16	0.42				
Bfi21R	-0.73				
Bfi26	0.35	0.28	0.28		
Bfi30R	-0.58			21	
Bfi35	0.68				
Openness					
Bfi05			0.21		0.32
Bfi10			0.34		
Bfi15					0.31
Bfi20					0.50
Bfi25					0.38
Bfi29					0.64
Bfi34R					
Bfi39					0.41
Bfi40R					-0.72
Bfi42					0.33
Agreeableness					
Bfi02R		0.41			
Bfi07		-0.31			
Bfi12R		0.49			
Bfi17		-0.34			
Bfi22		-0.38			
Bfi27R		0.49			
Bfi31		-0.49			
Bfi36R		0.57			
Conscientiousness					
Bfi03			0.56		
Bfi08R		0.42	-0.28		
Bfi13			0.49		
Bfi18R			-0.49		
Bfi23R			-0.55		
Bfi28			0.47		
Bfi32			0.49		

Bfi37	0.43
Bfi41R	-0.38

Note. We based the ipsatization procedure on 15 opposite item pairs following the procedure suggested by Soto et al. (2008).

Table A2

Explorative Factor Analysis (EFA) with items - Eigenvalues of the first 10 components of the raw and ipsatized items

	N	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
T_1	2080	6.753	4.374	3.235	2.060	1.924	1.791	1.080	0.958	0.935	0.913
T_{1ips}	2046	5.058	3.527	2.572	2.231	2.023	1.341	1.152	1.107	1.044	1.033
T_2	1565	7.672	4.746	2.937	2.047	1.836	1.749	1.206	1.044	0.970	0.958
T_{2ips}	1439	5.335	3.177	2.333	2.013	1.957	1.545	1.390	1.206	1.140	1.106
T_3	896	8.550	5.531	2.773	2.037	1.752	1.482	1.136	1.043	0.939	0.904
T_{3ips}	809	5.902	2.959	2.329	2.035	1.723	1.549	1.466	1.233	1.164	1.086

Note. T_1 = first measurement occasion; T_2 = second measurement occasion; T_3 = third measurement occasion; ips = EFA conducted with ipsatized data.

Chapter 3

Study 2

Are Personality Traits and Relationship Characteristics Reciprocally Related? Longitudinal Analyses of Codevelopment in the Transition out of High School and Beyond

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Abstract

Personality development has been associated with changes in various aspects of social relationships (e.g., contact frequency, emotional closeness, etc.). However, specific patterns of personality-relationship transactions are still not well understood as not many empirical studies have explored major life transitions. Emerging adulthood with its numerous life transitions is crucial for personality and social relationship development. In this study, we looked at personality-relationship transactions in the transition from high school to college, apprenticeship training, and so forth. We used Waves 1 to 3 of the Transformation of the Secondary School System and Academic Careers (TOSCA) study, which measured the Big Five (McCrae & Costa, 2008) and their facets as well as five relationship characteristics in social networks with one's romantic partner, friends, kin, and others. Our analyses of extended bivariate latent difference score models revealed four main findings: First, there was an imbalance in personality-relationship transaction effects with the majority of effects occurring from personality to change in social relationships rather than in the opposite direction. Furthermore, only a few change-to-change associations occurred. Second, two thirds of the cross-lagged effects derived from personality facets. Third, the majority of effects were found in the second measurement interval (i.e., not during the transition out of high school, but in the time period after this transition). Finally, neuroticism and its facets, as well as conflict frequency and perceived feelings of insecurity in the relationship emerged as the most consistent associations in this age group. Theoretical and empirical implications for personality-relationship transaction patterns are discussed.

Are Personality Traits and Relationship Characteristics Reciprocally Related? Longitudinal Analyses of Codevelopment in the Transition out of High School and Beyond

The transition from high school to, for example, college, university, apprenticeship training, study abroad, and so forth (Arnett, 2000) has been found to be overtly important when it comes to personality development toward maturation in emerging adulthood, that is, toward a personality that is more emotionally stable, agreeable, and conscientious (e.g., Bleidorn & Schwaba, 2017; Lucas & Donnellan, 2011; Roberts, Caspi, & Moffitt, 2001; Roberts, Walton, & Viechtbauer, 2006; Roberts, Wood, & Caspi, 2008). Several scholars consider social relationships and their dynamic transactions with personality across time to be essential for understanding personality development (e.g., Asendorpf & van Aken, 2003; Back et al., 2011; Mund & Neyer, 2014; Neyer, Mund, Zimmermann, & Wrzus, 2014; Reitz, Zimmermann, Hutteman, Specht, & Neyer, 2014; Robins, Caspi, & Moffitt, 2002; Van de Schoot, Kaplan, Denissen, Asendorpf, Neyer, & Van Aken, 2014). Asendorpf and Wilpers (1998) were among the first to apply the paradigm of dynamic transactionism, which refers to the dynamic, continuous, and reciprocal processes that are considered to be the underlying factors of development (Magnusson, 1990), to the longitudinal co-development of relationships and personality. They postulated that there are reciprocal effects between personality and relationship characteristics. Like many authors who followed in their footsteps, Asendorpf and Wilpers (1998) revealed substantial cross-lagged effects of personality traits on relationship characteristics but had trouble providing equally strong evidence for the opposite direction. This generally one-sided or imbalanced pattern has also been supported by other research (e.g., Asendorpf & Van Aken, 2003; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Parker, Lüdtke, Trautwein, & Roberts, 2012; Robins et al., 2002; Scollon & Diener, 2006).

There is a recent theoretical argument that such an imbalance in the directions of these reciprocal effects might be related to the differential (in)stability of the social environment. In general, personality characteristics tend to demonstrate more stability than the social environment. Thus, in such cases, it should be a person's personality that has the strongest impact on that person's social environment (Neyer, Mund, Zimmermann, & Wrzus, 2014; Wrzus & Neyer, 2016). This has already been postulated by Caspi and Moffitt (1991) arguing that in disruptive transitions personality is rather stable than changing. Specifically, more fluctuating social networks have been considered to reinforce personality effects (Lehnart & Neyer, 2006; Selfhout, Burk, Branje, Denissen, van Aken, & Meeus, 2010). By contrast, in

examining personality-relationship transactions in relatively unstable social networks, Mund and Neyer (2014) found strong empirical evidence for the reciprocity of personality-relationship effects. As personality-relationship transactions depend not only on the stability of a person's social network but also on the life transition phase, it is important to look at specific age groups or major developmental transitions (e.g., high school graduation, retirement) to understand the determining factors.

Most previous studies have either targeted age-heterogeneous groups of emerging adults who have already transitioned from high school to college or university and beyond (e.g., Asendorpf & Wilpers, 1998; Mund & Neyer, 2014; Neyer & Asendorpf, 2001; Robins et al., 2002) or investigated such a transition in a more age-heterogeneous sample while not actually focusing on the effects of the transition (Branje, van Lieshout, & van Aken, 2004; Denissen, van Aken, & Dubas, 2009; Scollon & Diener, 2006; Sturaro, Denissen, Van Aken, & Asendorpf, 2008; Van den Akker, Deković, Asscher, & Prinzie, 2014). Therefore, in the present work, we investigated the dynamic transactions that occur between social relationships and personality in the normative life transition out of high school and beyond (e.g., university, apprenticeship training, studying abroad). Analyses were conducted on the 4-year longitudinal TOSCA data set (Trautwein, Neumann, Nagy, Lüdtke, & Maaz, 2010) with an initial sample of $N = 4{,}534$ emerging adults in the transition out of high school and beyond. Participants provided information on their personality and social network characteristics across three measurement occasions.

Personality-Relationship Transactions: Theoretical Perspectives and Empirical Challenges

Personality traits can be defined as relatively enduring, automatic individual differences in an individual's manner of feeling, thinking, and behaving across situations and time (e.g., Roberts, 2009). Regarding the mean-level development of personality traits, recent research findings have provided solid evidence that personality traits undergo changes throughout the entire lifespan (Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000; Roberts et al., 2006). Perspectives on the potential origins and mechanisms of personality development have been widely discussed (for an overview, see Specht et al., 2014). In addition to biological influences (Roberts & Jackson, 2008), as well as personality-environment interactions (e.g., Hutteman, Hennecke, Orth, Reitz, & Specht, 2014; Wrzus, Wagner, & Riediger, 2016) such as life events (e.g., Jeronimus, Riese, Sanderman, & Ormel, 2014; Lüdtke, Roberts, Trautwein, & Nagy., 2011; Specht, 2017; Wrzus, Hänel, Wagner, & Neyer, 2013), social roles, and the demands of

society (Roberts & Wood, 2006), both theoretical perspectives and empirical research emphasize the unique role of interpersonal relationships in this endeavor (Back et al., 2011).

Interpersonal relationships are understood as the relatively stable, reciprocal interaction patterns of at least two people (Hinde, 1979). They are seen as part of an individual's environment and are therefore considered important for personality stability and change (Reitz et al., 2014). The sum of an individual's social relationships makes up that individual's ego-centered *social network*[1], which comprises all people with whom an individual has repeated interactions and with whom mental representations of relationships exist (Baumeister & Leary, 1995; Fischer, 1982). As described by Wrzus et al. (2013), a person's social network can comprise various subnetworks such as a network of friends, a network of kin (e.g., parents, siblings, children, spouse etc.), or a work-related network (e.g., supervisors, subordinates, colleagues).

The study of personality-relationship transactions has been important in personality development research (e.g., Asendorpf & Van Aken, 2003; Asendorpf & Wilpers, 1998; Mund & Neyer, 2014; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Robins et al., 2002; Scollon & Diener, 2006; Sturaro et al., 2008). The origin lies in dynamic transactionism theory, which understands developmental change as an effect of dynamic, continuous, and reciprocal interactions between an individual and his/her environment (Magnusson, 1990). Asendorpf and Wilpers (1998) viewed interaction partners and their personalities as part of an individual's environment, thereby enabling reciprocal effects to occur (Neyer et al., 2014).

Empirical evidence of personality-relationship transactions. Previous research has focused on three types of effects in the investigation of personality-relationship transactions: cross-lagged effects of personality on subsequent relationship characteristics, cross-lagged effects of relationship characteristics on subsequent personality change, and the correlation between personality change and relationship change (e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Parker, Lüdtke, Trautwein, & Roberts, 2012).

Previous empirical evidence has revealed substantive effects of all Big Five personality traits on subsequent relationship characteristics: Among others, being more neurotic was shown to be subsequently related to more insecurity with colleagues (Mund & Neyer, 2014; Neyer & Asendorpf, 2001), less dependency with one's interaction partner (Lehnart & Neyer, 2006), and having fewer peers (Asendorpf & Wilpers, 1998). Being more extraverted was found to be related to increases in a person's number of friends (Asendorpf & Wilpers, 1998) as well as to increases in closeness to and importance of these friends (Mund & Neyer, 2014; Neyer & Asendorpf, 2001). Being more open and sociable was identified as being related to having more

peers (Asendoprf & Wilpers, 1998). More agreeable people were not only closer to their friends, less insecure with colleagues, and perceived their colleagues as more important (Neyer & Asendorpf, 2001); they also experienced more social support (Branje et al., 2004) and had fewer conflicts with peers (Asendorpf & Wilpers, 1998). Being more conscientious was found to be related to less dependency (Lehnart & Neyer, 2006), more contact (Asendorpf & Wilpers, 1998), and decreases in insecurity (Mund & Neyer, 2014) with interaction partners.

Effects of aspects of relationships on subsequent personality development were rarely revealed; the few exceptions show that more insecurity and conflict with one's interaction partner were related to more Neuroticism (Neyer & Asendorpf, 2001; Sturaro et al., 2008), more support from a person's best friend predicted more Extraversion (Sturaro et al., 2008), and higher levels of dependency predicted decreases in Neuroticism and higher levels of security predicted increases in Conscientiousness (Lehnart & Neyer, 2006). However, previous findings (Mund & Neyer, 2014) have only recently been empirically reinforced, thereby revealing more patterns of relationship effects on personality change: Neuroticism and its facets were predicted by the frequency of conflict with the romantic partner and additionally by conflict, insecurity, and closeness in the network of friends; facets of Extraversion (Activity, Sociability) were predicted by contact and conflict frequency with the romantic partner as well as by closeness and importance in the network of others; insecurity with kin and closeness with the romantic partner predicted changes in Agreeableness; and, a facet of Conscientiousness (Dependability) was predicted by insecurity with the romantic partner and the importance of the network of others (Mund & Neyer, 2014).

An additional possibility for investigating the relation between personality and relationship characteristics is to consider the correlation between personality change and relationship change. Depending on the applied model, correlated change scores are implemented differently but generally allow for conclusions about how personality change and relationship change are interrelated over a certain time period and thus focus on (co)developmental aspects of personality and relationship change (Allemand & Martin, 2016). Multiple studies have looked at the association between change in personality and change in relationship characteristics (Asendorpf & Wilpers, 1998; Lehnart & Neyer, 2006; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007). These studies have identified associations with most personality traits. First, increases in Neuroticism were correlated with more insecurity with one's romantic partner and friends (Parker et al., 2012) and with an overall decrease in relationship satisfaction (Scollon & Diener, 2006). Second, becoming more extraverted and outgoing was associated with experiencing increasingly more support from one's best friend

(Sturaro et al., 2008) and with more satisfaction with one's relationships in general (Scollon & Diener, 2006). Third, increases in Agreeableness and Conscientiousness were related to general decreases in conflict (Parker, et al., 2012; Sturaro et al., 2008), and increases in Conscientiousness were positively correlated with more social support (Hill, Payne, Jackson, Stine-Morrow, & Roberts, 2013).

Methodological challenges in personality-relationship transaction research. Although theoretical indications for reciprocal effects between personality and relationships are strong, previous research has had difficulty providing empirical evidence that the effect occurs in both directions (e.g., Asendorpf & Van Aken, 2003; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Parker, Lüdtke, Trautwein, & Roberts, 2012; Robins et al., 2002; Scollon & Diener, 2006). Recently, three major methodological challenges of the research field were discussed (Mund & Neyer, 2014): (a) inequality in comparisons between the rather fluctuating relationship characteristics and the broader, more stable Big Five personality traits; (b) the limited capability of traditional cross-lagged panel models to fully account for the theory of dynamic transactionism; and (c) the need to study personality-relationship transactions in different developmental stages.

With respect to the first point, the comparison between personality and relationship characteristics can be seen as unbalanced as it is more likely that more broad and thus more stable aspects (e.g., the Big Five personality dimensions, which target general tendencies of behavior) predict the rather specific aspects of relationships than vice versa (Asendorpf & van Aken, 2003; Mund & Neyer, 2014; Neyer & Asendorpf, 2001). Accordingly, Asendorpf and van Aken (2003) demonstrated that aspects of relationships such as perceived support were more likely to predict the more specific and (in part) less stable surface characteristics (e.g., global self-esteem and loneliness) than the broad Big Five dimensions were. In order to approximate symmetry between aspects of relationships and personality traits, it is reasonable to include personality at the more specific facet level (Mund & Neyer, 2014).

Second, it has been pointed out that cross-lagged panel models do not fully account for the theory of reciprocal and dynamic personality-relationship transactions as they do not allow for the measurement of the influences of changes in one domain on subsequent changes in the other domain (Mund & Neyer, 2014). However, extended bivariate latent difference score models include the effects of changes in one domain on subsequent changes in the other domain (*coupling effects*; Grimm, An, McArdle, Zonderman, & Resnick, 2012), in addition to the cross-lagged path of one domain predicting changes in the other domain and vice versa. Therefore, extended bivariate latent difference score models are considered to account more for of the

assumptions of the theory of dynamic transactionism and are thus possibly more appropriate for personality-relationship transaction research. This approach revealed that increases in the frequency of conflict with the romantic partner predicted subsequent increases in Conscientiousness and that increases in Agreeableness and its facets, Nonantagonism and Prosocial orientation, predicted subsequent decreases in contact and the frequency of conflict with friends (Mund & Neyer, 2014). Thus, including this new methodological approach suggested that there are additional transactions that occur between personality and relationship change. In order to underpin these new findings and to provide additional evidence for reciprocal personality-relationship transactions, further research is needed.

Regarding the third point (i.e., the need to study personality-relationship transactions in various periods of development, transitions, and age groups), we would like to emphasize one aspect. It is crucial that the timing of the measurement points be chosen carefully: first, by actually including the transition with pre-post measurement points surrounding the transition point, and second, by following up some time after the transition. Various studies either did not include assessments before the respective transition (e.g., Asendorpf & Wilpers, 1998) or included the transition but lumped together individuals from different life phases across emerging adulthood, a practice that does not allow for conclusions regarding possible patterns during and after a specific transition (e.g., Denissen et al., 2009; Scollon & Diener, 2006; Sturaro et al., 2008; Van den Akker et al., 2014).

One exception is the study by Parker et al. (2012), which was also based on the TOSCA study. However, Parker et al. (2012) focused only on one measurement point in high school and on one follow-up assessment after the transition from high school. This approach comes with some challenges. For example, it appears to be important to capture the stability of the personality and relationship variables in a longer time interval after the transition, as the first phase might be especially prone to fluctuations. Evidence suggests that the effects of relationship characteristics on personality change are more likely to occur in more stable and potentially longer lasting social networks (Lehnart & Neyer, 2006; Mund & Neyer, 2014; Sturaro et al., 2008). This point is crucial as emerging adulthood offers many potential life transitions. Social networks tend to stabilize after transition phases. Thus, it is therefore essential to include multiple measurement points to accurately capture (co)development in personality-relationship transactions and thereby ensure that findings regarding specific transitions are well understood (Dormann & Griffin, 2015).

The Present Study

With the present study, we aimed to push personality development research forward by examining personality-relationship transactions before and after the transition out of high school to, for example, university or apprenticeship training and beyond. Accordingly, we had four research aims. First, we examined the dynamic interplay between personality and social relationships over 4 years and across three measurement points. Second, we looked at differences in this dynamic interplay during and after the transition. Third, we investigated potential differences in personality-relationship transactions regarding personality traits and facets. Fourth, we were interested in recurring patterns of personality-relationship transactions across relationship types.

Regarding the first research goal, we expected our findings to be in line with previous results (i.e., we expected to find more cross-lagged personality effects on subsequent relationship change than vice versa; e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001). Second, we expected this finding to be especially true for the first measurement interval as we believe this time period is characterized by stronger inconsistencies in social networks due to leaving high school, relocating, meeting new people, and so forth than the following interval. However, we expected to find that the cross-lagged effects of relationship characteristics on subsequent personality change in the second measurement interval would be about equal to the personality effects, as it is reasonable to assume that social networks become more stable after the transition and both old and new social relationships have solidified. For example, entering college or relocating requires individuals to make decisions about how to distribute their time and effort across old and new relationships. It is plausible that emerging adults are more strongly confronted with this challenge in the first phase as they enter a new environment. Third, in line with Mund and Neyer's findings (2014) and considering that personality facets and relationship characteristics are more comparable in their levels of fluctuation than personality traits, we expected to find more effects on the facet level than on the trait level.

Finally, considering patterns of personality-relationship transactions, we expected that our findings would be in line with previous research: (a) The relationship between Neuroticism, including its facets, and conflict as well as insecurity was expected to be reciprocal (Neyer & Asendorpf, 2001; Sturaro et al., 2008); (b) Extraversion and its facets were expected to predict contact frequency and the importance of interaction partners (e.g., Asendorpf & Wilpers, 1998; Mund & Neyer, 2014); (c) Openness and its facets were expected to predict contact frequency (Mund & Neyer, 2014); (d) Agreeableness and Conscientiousness, including their facets, were

expected to predict conflict frequency, insecurity, and importance in the social network (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001). Regarding effects of relationship characteristics on personality change, (e) we expected conflict frequency and insecurity with the interaction partner to be most predictive of personality variables, especially for Neuroticism, Agreeableness, and Conscientiousness (e.g., Mund & Neyer, 2014; Neyer & Asendorpf, 2001); and (f) Contact frequency and closeness with the interaction partner were expected to predict changes in Extraversion and Openness (Mund & Neyer, 2014).

To test these hypotheses, we applied extended bivariate latent difference score models that are particularly suited to investigate dynamic personality-relationship transactions (Grimm et al., 2012; see also Mund & Neyer, 2014). As this is only the second study to use extended bivariate latent difference score models to investigate personality-relationship transactions, our study provides the unique opportunity to collect further empirical evidence on the suitability of the theory of dynamic transactionism for personality-relationship transactions. This is especially true for the theoretically important phase of emerging adulthood to which this modeling strategy has not yet been applied. In line with the previously described methodological challenges, three advantages of our study over previous studies can be identified. First, as our sample size was larger, a more precise estimation of the true population effects was ensured, and the detection of personality-relationship transactions was facilitated. Second, participants were observed during a major life transition in which students leave high school to enter university or the workforce; this increased our chances of empirically capturing personality-relationship transactions (Wagner, Lüdtke, Roberts, & Trautwein, 2014). Third, Openness and its facets have not been studied in personality-relationship transaction research. This study was able to provide supplemental data on the facets of Openness to yield information on the pieces that are currently missing from the jigsaw puzzle of personality-relationship transactions, thereby enabling a more comprehensive understanding of the current state of research.

Method

The Transformation of the Secondary School System and Academic Careers study (TOSCA; Köller, Watermann, Trautwein, & Lüdtke, 2004) was approved by the "Ministerium für Kultus, Jugend und Sport Baden-Württemberg" (ministry of culture, youths, and sports in the state of Baden-Württemberg).

Participants

We made use of the first three waves of the Transformation of the Secondary School System and Academic Careers study (TOSCA; Trautwein et al., 2010), which followed young adults in Germany from their last year of "Gymnasium" (the university track in high school) for up to 10 years in 2-year intervals. Even though personality data were assessed across all measurement occasions, relationship data were available only for the first three measurement points, thus restricting our analyses to Waves 1 to 3. The first measurement (T1) took place in the participants' last year of high school (February to May 2002) followed by Time 2 (T2; February to May 2004) and Time 3 (T3; February to May 2006). At Time 1, personality data from 4,534 participants with a mean age of 19.60 years (SD = 0.84, 55.3% female) were accessible (N_{T2} = 2,318, N_{T3} = 1,609). For the relationship data, 4,373 participants provided information at T1 (N_{T2} = 2,219, N_{T3} = 1,848). In line with previous publications that used this sample (for attrition analyses from T1 to T2, see Parker et al., 2012), our attrition analyses revealed that dropouts were more likely to be male ($d = -0.22$, $p < .000$), had lower scores on Conscientiousness ($d = -0.10$, $p < .003$) and Agreeableness ($d = -0.14$, $p < .000$), but had similar levels of Neuroticism, Extraversion, and Openness compared with continuers. With respect to network characteristics, dropouts reported less contact with their romantic partners ($d = -0.14$, $p < .01$) and were less insecure with friends ($d = -0.09$, $p < .02$) at Time 1.

Two previous studies on personality had already used the TOSCA personality and social network data (Parker et al., 2012; Wagner et al., 2014). Parker et al. (2012) used a longitudinal panel design to investigate the interplay between personality traits and participants' relationships with parents, siblings, and friends from the first to the second measurement occasion. Wagner et al. (2014) focused on within-person and between-person personality trait effects on changes in participants' social networks involving kin versus nonkin. However, in comparison with these other two studies, in the present study, we used social network and personality data from all three measurement points and focused on three additional aspects: (a) We included a more diverse set of social relationships (romantic partner, friends, kin, and others), (b) we included all five personality traits and their facets, and (c) we investigated the reciprocal relationships between personality and relationship characteristics with extended bivariate latent difference score models.

Measures

Personality. We used the German version of the NEO Five-Factor Inventory (NEO-FFI; Borkenau & Ostendorf, 1993) to assess the personality dimensions Neuroticism,

Extraversion, Openness to Experience, Agreeableness, and Conscientiousness, as well as their subfacets (Chapman, 2007; Saucier, 1998): Negative affect and Self-reproach (Neuroticism), Positive affect, Sociability, and Activity (Extraversion), Aesthetic interest, Intellectual interest, and Unconventionality (Openness), Nonantagonism and Prosocial orientation (Agreeableness), and Orderliness, Goal striving, and Dependability (Conscientiousness). Personality was assessed with a 4-point scale ranging from 1 (*applies not at all*) to 4 (*applies totally*) as young students showed a tendency to omit the middle points of the scale. Item response theory methods demonstrated that the 4-point scale had good psychometric properties (Lüdtke, Trautwein, Nagy, & Köller, 2004). Cronbach's alpha reliabilities for the Big Five traits at the three measurement points were .80, .87, and .88 for Neuroticism; .77, .80, and .79 for Extraversion; .73, .74, and .74 for Openness; .73, .73, and .75 for Agreeableness; and .83, .84, and .84 for Conscientiousness. Reliability coefficients for the facets ranged from α = .57 to .79 at T1, α = .58 to .80 at T2, and α = .58 to .81 at T3. Only the coefficients for the Unconventionality facet (α_{T1} = .34, α_{T2} = .35, α_{T3} = .35) were very low, which is in line with previous findings (Chapman, 2007).

Social relationships. Social relationship networks were assessed by asking participants to identify up to 25 people who play important (positive or negative) roles in their lives and with whom they have had contact at least once in the last 3 months (Neyer & Asendorpf, 2001). This type of network is called *ego-centered* as it is the person of interest providing information about his or her own network.[1] Subsequently, participants were asked to provide information for every listed person on the following relationship aspects: frequency of conflict (1 = *never* to 5 = *almost always*), frequency of contact (0 = *less than once a month* to 5 = *every day*), perceived closeness with one's relationship partner (1 = *very distant* to 5 = *very close*), perceived insecurity with one's interaction partner (1 = *never* to 5 = *always*), and overall importance (1 = *better to end the relationship* to 5 = *ending would put great strain on me*). To allow for conclusions about differences in personality-relationship transactions across various types of interaction partners, we grouped the listed interaction partners into the following four social subnetworks: romantic partner, friends, kin (parents, grandparents, siblings, children, etc.), and others (colleagues, sports teammates, etc.).

To assess the homogeneity and reliability of the five different aspects of relationships, we used intraclass correlation coefficients (ICCs; Hox, 2002). The ICC(1) indicates the proportion of the total variance in individual ratings (i.e., participants' ratings of network partners in our case) that is located between raters. The ICC(2) provides a measure of the reliability of the aggregated individual ratings regarding the different aspects of the participants'

social relationships (Lüdtke & Trautwein, 2007). The most variance was found within raters (Table 1). The ICC(2) displayed satisfactory reliabilities ranging from .41 to .74 with insecurity as the most reliable aspect of relationships. The mean reliabilities across all networks were: .52 for conflict, .56 for contact, .59 for closeness, .65 for insecurity, and .60 for importance. As the ICCs were calculated from multiple ratings, it was not possible to provide these statistics for the romantic partner.

Statistical Analysis

We applied extended bivariate latent difference score models (Grimm et al., 2012). The model (Figure 1) was composed of three parts: (a) two separate latent difference score models, one for the personality measures and one for the aspects of relationships, (b) the resulting cross-lagged latent difference score model, and (c) the coupling model, which further extended the cross-lagged latent difference score model.

Latent change models. The latent difference score models (McArdle, 2009) for the latent personality and relationship variables were slightly different for the personality traits and relationship characteristics. For personality, the model was based on a set of three indicator parcels, each composed of four items. The items were distributed according to their position in the questionnaire, and indicator-specific factors were included for all models in order to control for parcel-specific effects. The latent change relationship part of the model was set up with only one indicator (i.e., single-indicator measurement model) and was therefore saturated. We established strong measurement invariance for all personality models (see the online supplement, Tables A1 and A2). Personality and relationship changes were modeled from T1 to T2 and from T2 to T3.

Cross-lagged effects. The two single latent change models formed one latent difference-score model in which (a) the personality variables and the aspects of relationships were initially correlated, (b) their respective change variables were correlated, and (c) former levels of relationship characteristics served as predictors of subsequent changes in personality, and the levels of personality characteristics at the previous measurement point predicted future changes in relationships (cross-lagged paths). Positive γ-coefficients indicate that high levels in one domain at a given time point (e.g., high Neuroticism at T1) predicted future increases in the other domain (e.g., more insecurity with the interaction partner at T2). Negative γ-coefficients show that high levels in one domain at a given time point predicted successive decreases in the other domain later on.

Coupling model. The cross-lagged latent difference score model was extended by adding cross-lagged paths between the latent-change variables so that changes in one domain

(e.g., increase in Neuroticism from T1 to T2) predicted subsequent changes in the other domain (e.g., increase in insecurity with friends from T2 to T3).

Additional analyses. As the cross-lagged effects from T2 to T3 of the extended bivariate latent difference score model are different from the cross-lagged effects traditionally obtained from ordinary cross-lagged panel models, we conducted additional analyses of the latter and report the effects in the supplemental material. In order to quantify the relationship between the ordinary cross-lagged panel effects and the cross-lagged effects from the extended bivariate difference score models, we calculated the mean absolute difference between the two respective cross-lagged effects. For personality T1 on relationship T2 (P1-R2) the mean absolute difference was $\gamma = |.01|$ ($SD = .05$). For P2-R3, the mean absolute difference was $\gamma = |.04|$ ($SD = .05$); R1-P2: $\gamma = |.01|$ ($SD = .01$); R2-P3: $\gamma = |.04|$ ($SD = .05$).

The analyses were conducted in R (R Core Team, 2015) and M*plus* (Muthén & Muthén, 1998-2015) using the MLR estimator as well as full information maximum likelihood estimation to account for missing data (Enders, 2010). We controlled for sex and age in all analyses. We ran 360 models of which 100 models addressed the broad Big Five personality characteristics and 260 models the 13 Big Five facets. To reduce the Type I error rate, we considered cross-lagged and change-to-change effects to be significant when they were statistically significant at $p < .01$ and had a standardized regression coefficient $\geq |.10|$ (e.g., Asendorpf & Wilpers, 1998; Mund & Neyer, 2014; Neyer & Asendorpf, 2001; Parker et al. 2012; Roberts, Caspi, & Moffitt, 2003).

Results

In the following, we first report some preliminary analyses of the univariate personality and relationship models. Second, we present the findings on the complex model with respect to cross-lagged personality and relationship effects and the respective coupling effects.

Preliminary Analyses

Univariate models. Descriptive statistics on the means, their standard deviations, and stabilities across measurement intervals as well as the standardized mean differences for the personality variables are displayed in Table 2 and for the relationship characteristics in Table 3. Agreeableness and Conscientiousness, including their facets, displayed significant changes in both of the two assessment intervals. Further, emerging adults showed large decreases in Neuroticism and in the facets of Negative affect and Self-reproach in the first assessment interval. Simultaneously, they became more open and extraverted during the first interval. Whereas changes in Neuroticism, Extraversion, and Openness to Experience occurred primarily

from T1 to T2, these emerging adults became significantly more agreeable and more conscientious across the 4 years. This pattern is in line with previous findings presented at the personality trait level for this sample by Lüdtke and colleagues (2011). The rank-order stability of personality characteristics showed a tendency to be higher from T2 to T3 than from T1 to T2 (except for trait Conscientiousness). As expected, the personality facets displayed slightly less stable coefficients than the Big Five traits across time; for example, Neuroticism (r_{12}= .71, r_{23} = .78, r_{13} = .65) displayed higher stability coefficients than Negative affect (r_{12} = .64, r_{23} = .73, r_{13} = .55).

Regarding relationship characteristics, all social networks increased in size from T1 to T2 with the most pronounced change occurring in the network of friends and the network of others. From T2 to T3, the emerging adults' network of friends decreased, whereas the network of kin remained stable, and the remaining networks continued to increase in size. When relationship types were ordered by their mean levels, conflict and contact frequency were highest for the romantic partner and the network of kin followed by the network of others and friends. Closeness with the interaction partner was highest for the romantic partner, followed by kin, friends, and others. Insecurity with others was highest compared with friends, the romantic partner, and kin. The network of kin was considered the most important, followed by the romantic partner, friends, and others. However, regarding mean-level changes, the romantic partner and friends became significantly less important. As expected, the effect size range was broader and less consistent across networks and time compared with the personality variables. In particular, the frequency of conflict with friends, kin, and others decreased from T1 to T2 and decreased even further from T2 to T3. The pattern did not apply to the frequency of conflict with the romantic partner: In the first 2 years, the frequency of conflict with the partner increased substantially. Contact frequency with the romantic partner and kin decreased notably in both measurement intervals but for friends, the strongest decreases occurred from T1 to T2. Perceived closeness with the romantic partner decreased substantially across the 4 years, whereas closeness with friends increased from T2 to T3 and for kin from T1 to T2. Insecurity and importance decreased from T1 to T2 for all interaction partners except for importance of kin that increased in this time interval. As expected, the rank-order stabilities of the relationship variables, for example, frequency of contact with kin (r_{12} = .30, r_{23} = .53, r_{13} = .22) or insecurity with the romantic partner (r_{12} = .23, r_{23} = .31, r_{13} = .19), were generally lower than the stabilities of the personality traits and facets.

Bivariate Latent Difference Score Models

In the next step, we calculated bivariate latent difference score models. All models indicated a very good fit to the data (see the online supplement, Tables A3-A5). For the 100 Big Five trait models, the fit indices RMSEA (M = .030, SD = .00, Min. = .023, Max. = .038), SRMR (M = .031, SD = .01, Min. = .019, Max. = .045), and CFI (M = .980, SD = .01, Min. = .968, Max. = .990) reported satisfactory model fits. The 260 facet models showed a good fit as well (RMSEA: M = .028, SD = .01, Min. = .019, Max. = .039; SRMR: M = .037, SD = .01, Min. = .026, Max. = .065; CFI: M = .949, SD = .03, Min. = .885, Max. = .982).

Initial correlations and correlated changes. Table 4 provides an overview of these correlations. With respect to the initial correlations (ρ_{IC}) between the personality and relationship variables as well as their correlated changes (ρ_{CC2} and ρ_{CC3}), we found 74 correlations with $p < .01$ and a size of at least |.10|. Regarding the distributions of the correlations, the large majority were initial correlations, 15 were correlations between change scores from T1→T2 (ρ_{CC2}), and another 15 were correlations between change scores from the time interval T2→T3 (ρ_{CC3}). Initially, people high on Neuroticism felt very insecure with friends, others, kin, and the romantic partner, whereas more extraverted individuals felt less insecure with all of their interaction partners. Also, highly agreeable people reported less conflict in the networks of kin and friends and with the romantic partner.

The majority of the significant correlations between personality change and relationship change appeared for Neuroticism and Extraversion such that more Neuroticism and less Extraversion were positively correlated with insecurity with others, friends, kin, and the romantic partner.

Cross-lagged effects. The analyses revealed 69 significant cross-lagged effects ($p < .01$ and effect size ≥ |.10|) supporting the idea that personality traits predict relationship development (56 significant out of 720 tested personality) and relationship characteristics predict successive personality change (13 significant out of 720 tested relationship effects). We first present the significant results of the personality effects followed by the relationship effects.

Cross-lagged personality effects. Effects of personality characteristics on subsequent changes in aspects of relationships occurred with all interaction partners (see the online supplement, Table A3). As shown in Table 5, most personality effects occurred for relationship characteristics with kin (22), the romantic partner (14), others (11), and friends (9). We found 18 effects of personality traits on relationship characteristics, whereas the personality facets yielded 38 cross-lagged personality effects. For example, more neurotic individuals (Neuroticism and its facets Negative affect and Self-reproach) reported increases in insecurity

with all interaction partners across both time intervals. We found one personality effect of Extraversion, which was derived from one of its facets: People who were more social showed increases in their closeness with friends across time. The other broad dimensions, Openness, Agreeableness, and Conscientiousness, displayed only a few effects. People with higher Openness scores subsequently had less contact with kin. Highly agreeable as well as highly conscientious emerging adults reported less conflict with their friends 2 years later. More agreeable people also had less conflict with their romantic partner 2 years later. The strongest effects occurred in the network of kin and in the network of friends with more nonantagonistic (Agreeableness) people decreasing in conflict with kin and more neurotic individuals increasing in insecurity with friends. We also found effects of Extraversion and its facet Sociability, Neuroticism and its facet Self-reproach, and Goal striving (Conscientiousness). Not only did more extraverted and more sociable people feel closer to their friends 2 years later, but they also reported a higher frequency of contact with their friends. Emerging adults high on Goal striving reported less successive insecurity with their friends. People with stronger tendencies toward Neuroticism and Self-reproach felt more insecure with others and kin 2 years later (Table 5).

Cross-lagged relationship effects. The analyses revealed 13 cross-lagged relationship effects, two of which occurred from T1 to T2 and 11 of which occurred from T2 to T3. A minority of the effects appeared on the Big Five trait level (four), whereas nine effects occurred on the personality facet level (Table 6). The effects were fairly evenly distributed across the four relationship types, and a consistent pattern was found with respect to perceived insecurity. Specifically, people who felt more insecure with friends, kin, or others subsequently increased in Neuroticism and its facets Negative affect and Self-reproach. Also, participants who reported more insecurity with kin and others reported decreases in Extraversion and its facet Activity 2 years later. Furthermore, higher contact frequency with friends predicted increases in Goal striving (Conscientiousness). The largest effect was revealed for people who considered their romantic partner highly important and subsequently became more extraverted and decreased in Negative affect. Being close with the romantic partner was subsequently associated with more Extraversion.

Coupling effects. Table 7 presents two significant coupling personality effects and nine significant coupling relationship effects (720 coupling effects were tested). Similar to the cross-lagged analyses, changes in insecurity played an important role in subsequent personality development. Stronger decreases in insecurity with friends and others predicted increases in Agreeableness and its facets. In the network of kin, decreases in conflict frequency predicted

subsequent increases in Activity and Dependability. In the network of others decreases in contact frequency predicted subsequent increases in Neuroticism. The largest effect occurred for decreases in the importance of the romantic partner as a predictor of increases in Dependability. Two personality effects were discovered: Individuals with increases in Orderliness reported decreases in the importance of friends and increases in Positive affect predicted decreases in conflict frequency with kin.

Discussion

The aims of the current study were fourfold. First, we examined the dynamic interplay between personality and social relationships over 4 years. Second, we looked at differences before and after the transition out of high school to university, apprenticeship training, and beyond. Third, we examined potential differences between personality traits and facets. Fourth, we looked for patterns of personality-relationship transactions that were revealed in previous studies and could potentially reoccur in our study. In line with the results of previous studies, we revealed more effects of personality on subsequent relationship change than vice versa. During the transition phase, we observed almost no effects of relationship characteristics on subsequent personality change. However, in the phase after the transition, relationship effects started to set in on subsequent personality change. Also congruent with former research, personality facets were involved in personality-relationship transactions more often than personality traits. Regarding the patterns of personality-relationship transactions, we particularly reinforced the predominance of reciprocal effects between insecurity and Neuroticism as well as its facets.

In the following, we discuss our general findings on personality-relationship transactions, elaborate on recurring patterns, and then provide an outlook for future research.

Personality-Relationship Transactions

In this section we discuss three points regarding our findings. First, the majority of significant effects occurred for personality characteristics on subsequent relationship development (≈ 81%, 56 of 69 significant cross-lagged effects in total). This finding is in line with the majority of previous empirical studies, which also revealed more and stronger effects of personality characteristics on subsequent social relationship change than vice versa (e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Parker et al. 2012). Accordingly, our results emphasize stronger transactional effects of personality on social relationship development than of social relationships on personality change. However, the effects on the facet level made up about two thirds of the cross-lagged personality effects and

almost three quarters of the cross-lagged relationship effects, thereby outnumbering the effects that were related to the Big Five traits. At the same time we have to mention that we tested 13 personality facets whereas only five personality traits were tested. Thus, it is reasonable that two-thirds of the revealed effects were derived from the personality facets. Nevertheless, the personality effects exceeded the relationship effects at both the Big Five trait level and at the facet level. Therefore, in our study, it was not possible to resolve the imbalance in the personality-relationship transactions by including personality at the facet level. It is interesting that the picture was partly reversed when we looked at the coupling effects (see Table 7). Nine of the eleven coupling effects occurred in the direction of change in relationship characteristics to subsequent change in personality. Thereby, only two effects were displayed at the Big Five trait level, and all of the remaining effects emerged at the facet level. Thus, we conclude that a large number of effects are actually situated at the facet level of personality traits.

Second, as expected, the effects of social relationships on personality change showed a noticeable increase in the second measurement interval. Whereas only two social relationship effects occurred during the transition, namely, from the last year of high school to 2 years later, 11 social relationship effects were revealed in the second half of the study. In line with this finding, social networks became more stable as the time since the transition increased. This finding strengthens the assumption that more stable social networks allow for more social relationship effects to occur. In particular, when comparing social network stabilities across studies, one can see that more stable social networks enable social relationship effects to take place (Lehnart & Neyer, 2006; Sturaro et al., 2008).

Third, looking at the patterns tested, our effects were equally distributed across the four social networks of romantic partner, friends, kin, and others, underscoring the fact that the described finding is not distinct for any one of the social network types but rather applies to all four of the social interaction partners. Thus, it seems reasonable to state that personality predicts aspects of social relationship development more strongly than social relationship characteristics predict subsequent personality change. Specifically, it appears that Neuroticism and its facets, Negative affect and Self-reproach, are most strongly related to relationship change. Almost half of the cross-lagged personality effects were derived from Neuroticism and its facets. In addition, half of the cross-lagged relationship effects predicted changes in Neuroticism, Negative affect, and Self-reproach. Only the coupling effects were an exception: Only one of these effects concerned Neuroticism. Finally, also with respect to relationship characteristics, a clear pattern emerged: About 55% of the cross-lagged personality effects were related to changes in insecurity, and 25% of the cross-lagged personality effects predicted subsequent

frequency of conflict with the interaction partner. Similarly, almost three quarters of the relationship effects were derived from the effect of insecurity with the interaction partner on subsequent personality change. Thus, insecurity in relationships seems to be the strongest force reciprocally associated with personality change.

Neuroticism and insecurity, a (vicious) circle in relationships? Why do Neuroticism and its facets, as well as insecurity and frequency of conflict, display the strongest findings regarding quantity and strength of effect size in personality-relationship transactions? Whereas the personality effects of Neuroticism, Negative affect, and Self-reproach exclusively predicted increases in insecurity and frequency of conflict with the social interaction partner, only half of the relationship effects concerning insecurity predicted an increase in Neuroticism and its facets. Thus, insecurity and Neuroticism, including its facets, seem to reinforce each other across time: More neurotic individuals reported more insecurity 2 years later, whereas in turn, people who reported higher feelings of insecurity reported more Neuroticism later on. This finding seems to be in line with the assumption that more neurotic individuals perceive their relationships more negatively (Finn, Mitte, & Neyer, 2013), engage in communication accordingly (Frederickx & Hofmans, 2014), and experience more negative life events (Magnus, Diener, Jujita, & Pavot, 1993). They also experience long-term difficulties, which, in turn, strengthens their Neuroticism (Jeronimus et al., 2014; Shiner, Allen, & Masten, 2017; Shiner, Masten, & Tellegen, 2002). This reciprocal (vicious) circle might explain not only the strength of the displayed effects but also why the occurrence of relationship effects is almost exclusively restricted to the second time interval, that is, about 2 years after the transition out of high school. One could speculate that, especially during this transition in which emerging adults enter new environments and social roles and thus need to establish new social relationships with friends and colleagues (Wagner et al., 2014), it is predominantly the personality that affects social relationships. By contrast, social relationship effects on personality need more time to settle in (along with the relationship itself) and therefore occur somewhat later on.

Different developmental stages in personality-relationship transactions? Two major differences between previous studies and our study need to be considered. First, the TOSCA sample we used was comprised of one narrow age cohort that was assessed in 2-year intervals from approximately age 19 at the first assessment to age 23 at the third measurement point. Even though the TOSCA study was conducted over a longer period of time, our analyses were restricted to the first three waves, as ego-centered networks were not assessed beyond the first three waves. This leads to the second important difference: Our measurement intervals included the transition out of high school to university, apprenticeship training, study abroad,

and beyond, whereas previous research targeted university students at the beginning of their first semester (i.e., after the transition out of high school) and thus focused on only university students (Asendorpf & Wilpers, 1998). Measurement intervals play an important role when personality development and social relationship networks are under investigation as they determine the developmental span under investigation (Luhmann, Orth, Specht, Kandler, & Lucas, 2014). Social networks and personality change depend on different phases of adulthood, transitions, and life events (e.g., Hays & Oxley, 1986; Wrzus et al., 2013; Wrzus & Neyer, 2016). Thus, depending on, for example, the life transition or developmental stage that study participants are in, their social networks can be more or less stable and can therefore allow more or fewer personality-relationship transactions to take place.

Dynamic transactionism theory posits the reciprocal, dynamic, and continuous codevelopment of a person and his or her environment. Thus, early research in the field of personality-relationship transactions expected to reveal reciprocal effects between personality and social relationship characteristics (e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Mund & Neyer, 2014). However, bringing together our and previous findings, one might suggest that the dynamic interplay between personality and social relationship characteristics should not be understood as a fundamental, omnipresent reciprocal process: On the one hand, social network changes (or stabilities) show different patterns depending on, for example, a person's age or the life events they have experienced (Wrzus et al., 2013). On the other hand, personality development also depends on various environmental contingencies such as developmental periods or social role expectations (e.g., Bleidorn, Buyukcan-Tetik, Schwaba, van Scheppingen, Denissen, & Finkenauer, 2016; Denissen et al., 2014; Hutteman et al., 2014; Leikas & Salmera-Aro, 2014; Lüdtke et al., 2011). Thus, Finn, Zimmermann, and Neyer (2017) assumed that if both social relationship networks and personality characteristics develop as a function of an individual's lifetime, this is also true for the reciprocal effects between the two person-environment variables.

One major aspect of personality-relationship transactions is that they depend on the stability of one's social network. Studies of emerging adulthood (i.e., Asendorpf &Wilpers, 1998) with its different life transitions mostly capture a time in which the social network is relatively unstable, as emerging adults start or continue to build individual networks. In addition, measurement intervals determine whether one can accurately capture the development of social networks. Thereby, researchers have to find a balance between measurement intervals that are small enough to allow for a more specific understanding of the underlying processes of social network changes and, simultaneously measurement intervals that are big enough to

provide sufficient time for both variables, personality and social relationship characteristics, to establish effects on the respective other variable. Achieving this balance would thus make it possible to determine phases of (in)stability in social networks more precisely. More instability in social networks, as shown in our study, might be one reason for the (non)occurrence of reciprocal personality-relationship transactions. However, due to our finding that most relationship effects occurred in the later time interval when social networks became more stable, we argue that it is not the length of the measurement interval in and of itself that may be responsible for the reciprocity in personality-relationship effects but rather the life phase or the age at which social networks become more stable. It is plausible that, at younger ages, especially during major life transitions and corresponding social network changes, long-lasting relationships with friends, colleagues, sports teammates, and potential romantic partners are just beginning and are not yet settled. Important aspects regarding the perceived quality of any relationship (e.g., closeness, importance, insecurity, reliability, trustworthiness, etc.) might need multiple experiences with the respective partner across time before a consistent, reliable perception of the relationship can be formed. This might be a precondition for reciprocal personality-relationship effects to occur as personality effects are considered to be most prominent in more fluctuating environments (e.g., in unstable relationships). Thus, one possibility might be that relationship effects become stronger when relationships have endured the test of time and important aspects of relationship quality have solidified. To put this another way: It is possible that the distribution of potentially accountable environmental factors changes the longer a relationships lasts, such that even though personality becomes increasingly stable, it is relationships that are responsible for the changes that occur.

In order to further explore the role of the length of the measurement interval as an explanatory variable, we conducted two additional analyses to predict change in personality (which was also available in the later measurement points of the TOSCA study) with relationship characteristics 4 and 8 years later. We ran our models for measurement points 1, 3, and 5 to investigate whether relationship characteristics at T1 and T3 predicted changes in personality from T1 to T3 and from T3 to T5 (4-year measurement intervals). We further looked at relationship at T1 as a predictor of personality change at T5 to obtain results for an interval of 8 years, which is comparable to Mund and Neyer's (2014) intervals; their study is the only one to have found reciprocal effects between personality and social relationships. As expected, our additional analyses did not reveal any profound differences in the results; this, as we argue above, points to the importance of age rather than measurement intervals for patterns in personality-relationship transactions. Nevertheless, the time lag between measurement

occasions is of great importance, and the need for appropriate measurement intervals in longitudinal research has been pointed out by many methodologists (e.g., Gollob & Reichardt, 1987). Recently, Dormann and Griffin (2015) argued that shorter time lags are often more suitable in longitudinal studies than currently applied and subsequently called for studies with shorter measurement intervals.

Limitations and Outlook

Our study reinforces the existence of personality-relationship transactions, revealing stronger effects of personality traits on subsequent relationship change than vice versa. However, we need to point out that our study relied on observational longitudinal data and thus did not allow for a controlled manipulation of the personality or the relationship variables. Therefore, the results do not allow us to draw causal inferences (see Morgan & Winship, 2015). Further, the sample was only comprised of students who had followed the secondary school/ university track within the German school system. Thus, the sample was not representative of the German population in that age group, especially when considering the fact that students in other school tracks do not undergo the same transition or that they go through a comparable transition at an earlier age. Another aspect that should be referred to, is that personality was measured via self-reports which means that it is possible that participants' responses included social desirability tendencies.

Furthermore, when interpreting our findings it should be kept in mind that we conducted an extensive number of analyses (in total 2,160 effects were tested). However, as this study was able to confirm patterns previously revealed in personality-relationship transaction research, for example, the reciprocal relationship between Neuroticism and insecurity, it is reasonable to conclude that the tested effects reflect the theoretically postulated dynamic interplay between personality and social relationship characteristics. Both personality and social relationships are multidimensional constructs, including various traits and aspects that need to be considered. Thus, in order to fully capture the reciprocal dynamic between personality and social relationships, it is necessary to conduct this large number of analyses to ensure that all characteristics are considered. Replication studies are required to reinforce the patterns found in our and previous studies (Anderson & Maxwell, 2016; Asendorpf et al., 2013).

In order to develop a more precise understanding of personality-relationship transactions in different life phases, we suggest that the observation of personality and social relationship characteristics be broken down to the everyday behavioral level. This could be implemented by, for example, tracking social interactions with specifically developed applications for smartphones, requiring participants to constantly provide information on the

interactions they are engaging in, in order to develop a more profound understanding of how short-term state changes can alter traits in the long run (Hutteman, Nestler, Wagner, Egloff, & Back, 2015; Roberts & Jackson, 2008). This approach is especially important for developing an understanding of the basis of personality-relationship interactions and being able to fit analytical models accordingly. Furthermore, future research needs to address the question of how specific relationship aspects are more explicitly related to certain traits and whether the detection of certain statistical effects is linked to how trait-specific relationship features are measured. For example, insecurity is closely linked to the trait of Neuroticism, whereas the remaining four relationship characteristics assessed in this study are not explicitly associated with other personality traits. This methodological challenge could alter our understanding of personality-relationship transactions and thus needs further consideration in future studies. In conclusion, to shed more light on the understanding of mechanisms in personality development in relation to relationship experiences, personality-relationship transactions need to be investigated at the behavioral level more often.

Footnotes

[1]Different types of social networks can be distinguished (Wrzus, Hänel, Wagner, & Neyer, 2013). In this paper, we focused on data from ego-centered or personal social networks (e.g., Neyer & Asendorpf, 2001) as opposed to data from complete networks (for an overview, see Van Duijn, 2013).

References

Allemand, M., & Martin, M. (2016). On correlated change in personality. *European Psychologist*, *21*, 237-253. doi:10.1027/1016-9040/a000256

Anderson, S. F., & Maxwell, S. E. (2016). There's more than one way to conduct a replication study: Beyond statistical significance. *Psychological Methods*, *21*, 1-12. doi: 10.1037/met0000051

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*, 469-480. doi: 10.1037//0003-066X.55.5.469

Asendorpf, J. B., Conner, M., De Fruyt, F., De Houwer, J., Denissen, J. J. A., Fiedler, K., Fiedler, S., Funder, D. C., Kliegl, R., Nosek, B. A., Perugini, M., Robert, B. W., Schmitt, M., Van Aken, M. A. G., Weber, H., & Wicherts, J. M. (2013). Recommendations for increasing replicability in psychology. *European Journal of Personality*, *27*, 108-119. doi: 10.1002/per.1919

Asendorpf, J. B., & Van Aken, M. A. G. (2003). Personality-relationship transaction in adolescence: Core versus surface personality characteristics. *Journal of Personality*, *71*, 629-666. doi: 10.1111/1467-6494.7104005

Asendorpf, J. B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology*, *74*, 1531-1544. doi:10.1037/0022-3514.74.6.1531

Back, M. D., Baumert, A., Denissen, J. J. A., Hartung, F.-M., Penke, L., Schmukle, S. C., Schönbrodt, F. D., Schröder-Abé, M., Vollmann, M., Wagner, J., & Wrzus, C. (2011). PERSOC: A unified framework for understanding the dynamic interplay of personality and social relationships. *European Journal of Personality*, 25, 90-107. doi:10.1002/per.811

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497-529. doi: 10.1037//0033-2909.117.3.497

Bleidorn, W., Buyukcan-Tetik, A., Schwaba, T., van Scheppingen, M. A., Denissen, J. J., & Finkenauer, C. (2016). Stability and change in self-esteem during the transition to parenthood. *Social Psychological and Personality Science*, *7*, 560-569. doi: 10.1177/1948550616646428

Bleidorn, W., & Schwaba, T. (2017). Personality development in emerging adulthood. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 39-51). Amsterdam: Elsevier.

Borkenau, P., & Ostendorf, F. (1993). *NEO-Fünf-Faktoren Inventar (NEO-FFI)* [NEO Five Factor Inventory]. Göttingen, Germany: Hogrefe. doi: 10.1026//0012-1924.48.1.19

Branje, S. J. T., van Lieshout, C. F. M., & van Aken, M. A. G. (2004). Relations between Big Five personality characteristics and perceived support in adolescents' families. *Journal of Personality and Social Psychology*, 86, 615-628. doi:10.1037/0022-3514.86.4.615

Chapman, B. P. (2007). Bandwidth and fidelity on the NEO-Five Factor Inventory: Replicability and reliability of Saucier's (1998) item cluster subcomponents. *Journal of Personality Assessment*, *88*(2), 220–234. doi:10.1080/00223890701268082

Denissen, J. J., Van Aken, M. A. G., & Dubas, J. S. (2009). It takes two to tango: How parents' and adolescents' personalities link to the quality of their mutual relationship. *Developmental Psychology*, *45*, 928-941. doi: 10.1037/a0016230

Dormann, C. & Griffin, M. A. (2015). Optimal time lags in panel studies. *Psychological Methods*, *20*, 489-505. doi: 10.1037/met0000041

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.

Finn, C., Mitte, K., & Neyer, F. J. (2013). The relationship-specific interpretation bias mediates the link between neuroticism and satisfaction in couples. *European Journal of Personality*, 27, 200-212. doi: 10.1002/per.1862

Finn, C., Zimmermann, J., & Neyer, F. J. (2017). Personality development in close relationships. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 357-370). Amsterdam: Elsevier.

Fischer, C. S. (1982). *To dwell among friends: Personal networks in town and city*. Chicago, IL: University of Chicago Press.

Frederickx, S., & Hofmans, J. (2014). The role of personality in the initiation of communication situations. *Journal of Individual Differences*, 34, 30-37. doi: 10.1027/1614-0001/a000124

Gollob, H. F., & Reichardt, C. S. (1987). Taking account of time lags in causal models. *Child Development*, *58*, 80-92. doi: 10.2307/1130293

Grimm, K. J., An, Y., McArdle, J. J., Zonderman, A. B., & Resnick, S. M. (2012). Recent changes leading to subsequent changes: Extensions of multivariate latent difference score models. *Structural equation modeling : a multidisciplinary journal*, *19*, 268–292. doi: 10.1080/10705511.2012.659627

Hays, R. B., & Oxley, D. (1986). Social network development and functioning during a life transition. *Journal of Personality and Social Psychology*, *50*, 305-313. doi: 10.1037//0022-3514.50.2.305.

Hill, P. L., Brennan, R. P., Jackson, J. J., Stine-Morrow, E. A. L., & Roberts, B. W. (2013). Perceived social support predicts increased conscientiousness during older adulthood. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 69, 543-547. doi: 10.1093/geronb/gbt024

Hinde, R. A. (1979). *Towards understanding relationships*. London, England: Academic Press.

Hox, J. (2002). *Multilevel analysis: Techniques and applications*. Mahwah, NJ: Erlbaum.

Hutteman, R., Hennecke, M., Orth, U., Reitz, A. K., & Specht, J. (2014). Developmental tasks as a framework to study personality development in adulthood and old age. *European Journal of Personality*, *26*, 267-278. doi: 10.1002/per.1959

Hutteman, R., Nestler, S., Wagner, J., Egloff, B., & Back, M. D. (2015). Wherever I may roam: Processes of self-esteem development from adolescence to emerging adulthood in the context of international student exchange. *Journal of Personality and Social Psychology*, 108, 767-783. doi: 10.1037/pspp0000015

Jeronimus, B. F., Riese, H., Sanderman, R., & Ormel, J. (2014). Mutual reinforcement between neuroticism and life experiences: A five-wave, 16-year study to test reciprocal causation. *Journal of Personality and Social Psychology*, 107, 751-764. doi: 10.1037/a0037009

Köller, O., Watermann, R., Trautwein, U. & Lüdtke, O. (Eds.) (2004). *Wege zur Hochschulreife in Baden-Württemberg. TOSCA – Eine Untersuchung an allgemein bildenden und beruflichen Gymnasien [Pathways to graduation in Baden-Württemberg. TOSCA - An investigation at secondary high schools and vocational secondary schools]*. Opladen: Leske, Budrich.

Lehnart, J., & Neyer, F. J. (2006): Should I stay or should I go? Attachment and personality in stable and instable romantic relationships. *European Journal of Personality*, *20*, 475-495. doi: 10.1002/per.606

Leikas, S., & Salmela-Aro, K. (2014). Personality Trait Changes Among Young Finns: The Role of Life Events and Transitions. *Journal of Personality*, *83*, 117-126. doi: 10.1111/jopy.12088

Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, *101*, 847-861. doi: 10.1037/a0024298

Lüdtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology*, *101*, 620-637. doi: 10.1037/a0023743

Lüdtke, O., & Trautwein, U. (2007). Aggregating to the between-person level in idiographic research designs: Personal goal research as an example of the need to distinguish between reliability and homogeneity. *Journal of Research in Personality*, *41,* 230-238. doi: 10.1016/j.jrp.2006.03.005

Lüdtke, O., Trautwein, U., Nagy, G., & Köller, O. (2004). Eine Validierungsstudie zum NEO-FFI in einer Stichprobe junger Erwachsener: Effekte des Itemformats, faktorielle Validität und Zusammenhänge mit Schulleistungsindikatoren [A validation of the NEO-FFI in a sample of young adults: Effects of the response format, factorial validity, and relations with indicators of academic achievement]. *Diagnostica*, *50*, 134-144. doi: 10.1026/0012-1924.50.3.134

Luhmann, M., Orth, U., Specht, J., Kandler, C., & Lucas, R. E. (2014). Studying changes in life circumstances and personality: It's about time. *European Journal of Personality*, *28*, 256-266. doi: 10.1002/per.1951

Magnus, K., Diener, E., Fujita, F., & Pavot, W. (1993). Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of Personality and Social Psychology*, 65, 1046-1053. doi: 10.1037/0022-3514.65.5.1046

Magnusson, D. (1990). Personality development from an interactional perspective. In L. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 193-222). New York, NY: Guilford Press.

McArdle, J. J. (2009). Latent variable modeling of differences and changes with longitudinal data. *Annual Review of Psychology*, *60*, 577-605. doi: 10.1146/annurev.psych.60.110707.163612

McCrae, R. R., & Costa, P. T. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 159-181). New York, NY: Guilford Press.

Morgan, S. L., & Winship, C. (2015). Counterfactuals and causal inference: Methods and principles for social research (2nd ed.). Cambridge, UK: Cambridge University Press.

Mund, M., & Neyer, F. J. (2014). Treating personality-relationship transactions with respect: Narrow facets, advanced models, and extended time frames. *Journal of personality and social psychology*, *107*, 352–368. doi: 10.1037/a0036719

Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood. *Journal of personality and social psychology*, 84, 310–321. doi: 10.1037/0022-3514.81.6.1190

Neyer, F. J., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across young adulthood. *Journal of Personality*, *75*, 535-568. doi: 10.1111/j.1467-6494.2007.00448.x

Neyer, F. J., Mund, M., Zimmermann, J., & Wrzus, C. (2014). Personality-relationship transactions revisited. *Journal of Personality*, *82*, 539-550. doi: 10.1111/jopy.12063

Parker, P. D., Lüdtke, O., Trautwein, U., & Roberts, B. W. (2012). Personality and relationship quality during the transition from high school to early adulthood. *Journal of Personality*, *80*, 1061-1089. doi: 10.1111/j.1467-6494.2012.00766.x

Reitz, A. K., Zimmermann, J., Hutteman, R., Specht, J., & Neyer, F. J. (2014). How peers make a difference: The role of peer groups and peer relationships in personality development. *European Journal of Personality*, *28*, 279–288. doi: 10.1002/per.1965

Roberts, B. W. (2009). Back to the future: Personality and Assessment and personality development. *Journal of Research in Personality*, *43*, 137-145. doi: 10.1016/j.jrp.2008.12.015

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2001). The kids are alright: Growth and stability in personality development from adolescence to adulthood. *Journal of Personality and Social Psychology*, *81*, 670-683. doi: 10.1037//0022-3514.81.4.670.

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, *84*, 582-593. doi: 10.1037/0022-3514.84.3.582

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, *126*, 3-25. doi: 10.1037/0033-2909.126.1.3

Roberts, B. W., & Jackson, J. J. (2008). Sociogenomic personality psychology. *Journal of Personality*, *76*, 1523-1544. doi: 10.1111/j.1467-6494.2008.00530.x

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*, 1-25. doi: 10.1037/0033-2909.132.1.1

Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-socioanalytic model of personality. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of Personality Development* (pp. 11-39). Mahwah, NJ: Erlbaum.

Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research* (pp. 375-398). New York, NY: The Guilford Press.

Robins, R. W., Caspi, A., & Moffitt, T. E. (2002). It's not just who you're with, it's who you are: Personality and relationship experiences across multiple relationships. *Journal of Personality*, *70*, 925-964. doi: 10.1037/0022-3514.88.3.562

R Core Team (2015). R: A language and environment for statistical computing. R Foundation for Statistical Computing. Vienna, Austria. URL https://www.R-project.com/

Saucier, G. (1998). Replicable item-cluster subcomponents in the neo five-factor inventory. *Journal of Personality Assessment*, 70, 263–276. doi: 10.1207/s15327752jpa7002_6

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology*, 91, 1152-1165. doi: 10.1037/0022-3514.91.6.1152

Selfhout, M., Burk, W., Branje, S., Denissen, J. J., van Aken, M., & Meeus, W. (2010). Emerging late adolescent friendship networks and big five personality traits: A social network approach. *Journal of Personality*, *78*, 509-538. doi: 10.1111/j.1467-6494.2010.00625.x

Shiner, R. L., Allen, T. A., & Masten, A. S. (2017). Adversity in adolescence predicts personality trait change from childhood to adulthood. *Journal of Research in Personality*, *67*, 171-182. doi: 10.1016/j.jrp.2016.10.002

Shiner, R. L., Masten, A. S., & Tellegen, A. (2002). A developmental perspective on personality in emerging adulthood: Childhood antecedents and concurrent adaptation. *Journal of Personality and Social Psychology*, *83*, 1165-1177. doi: 10.1037//0022-3514.83.5.1165

Specht, J. (2017). Personality development in reaction to major life events. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 341-356). Amsterdam: Elsevier.

Specht, J., Bleidorn, W., Denissen, J. J. A., Hennecke, M., Hutteman, R., Kandler, C., Luhmann, M., Orth, U., Reitz, A. K., & Zimmermann, J. (2014). What drives adult personality development? A comparison of theoretical perspectives and empirical evidence. *European Journal of Personality*, *28*, 216–230. doi: 10.1002/per.1966

Sturaro, C., Denissen, J. J. A., Van Aken, M. A. G., & Asendorpf, J. B. (2008). Person-environment transactions during emerging adulthood: The interplay between personality characteristics and social relationships. *European Psychologist*, *13*, 1-11. doi: 10.1027/1016-9040.13.1.1

Trautwein, U., Neumann, M., Nagy, G., Lüdtke,. O., & Maaz, K. (Hrsg.). (2010). *Schulleistungen von Abiturienten: Die neu geordnete gymnasiale Oberstufe auf dem Prüfstand* [*School performance of high school graduates: The newly structured secondary school level (Gymnaisum) on trial*]. Wiesbaden: VS-Verlag für Sozialwissenschaften.

Van den Akker, A. L., Deković, M., Asscher, J., & Prinzie, P. (2014). Mean-level personality development across childhood and adolescence: A temporary defiance of the maturity principle and bidirectional associations with parenting. *Journal of Personality and Social Psychology*, *107*, 736-750. doi: 10.1037/a0037248

Van De Schoot, R., Kaplan, D., Denissen, J., Asendorpf, J. B., Neyer, F., J., & Van Aken, M. A. (2014). A gentle introduction to Bayesian analysis: Applications to developmental research. *Child Development*, *85*, 842-860. doi: 10.1111/cdev.12169

Van Duijn, M. (2013). Multilevel modeling of social network and relational data. In M. A. Scott, J. S. Simonoff, & B. D. Marx (Eds.), *The SAGE Handbook of Multilevel Modeling*. (pp. 599-618). London: Sage publishers.

Wagner, J., Lüdtke, O., Roberts, B. W., & Trautwein, U. (2014). Who belongs to me? Social relationship and personality characteristics in the transition to young adulthood. *European Journal of Personality*, *28*, 586-603. doi: 10.1002/per

Wrzus, C., Hänel, M., Wagner, J., & Neyer, F. J. (2013). Social network changes and life events across the life span: A meta-analysis. *Psychological Bulletin*, *139*, 53-80. doi: 10.1037/a0028601

Wrzus, C., & Neyer, F. J. (2016). Co-development of personality and friendships across the lifespan. *European Psychologist*, *21*, 254-273. doi: 10.1027/1016-9040/a000277

Wrzus, C., Wagner, G. G., & Riediger, M. (2016). Personality-situation transactions from adolescence to old age. *Journal of Personality and Social Psychology*, *110*, 782-799. doi: 10.1037/pspp0000054

Table 1

Homogeneity and Reliability of Relationship Variables in the Three Subnetworks

	Homogeneity			Reliability		
Aspect	T1	T2	T3	T1	T2	T3
			Friend			
Conflict	.24	.23	.24	.51	.57	.58
Contact	.19	.23	.23	.45	.59	.57
Closeness	.26	.24	.26	.54	.59	.61
Insecurity	.34	.33	.32	.63	.69	.67
Importance	.31	.29	.29	.60	.65	.65
			All kin			
Conflict	.18	.22	.25	.43	.53	.58
Contact	.17	.38	.41	.41	.72	.74
Closeness	.37	.36	.37	.67	.69	.70
Insecurity	.36	.31	.36	.67	.64	.69
Importance	.31	.24	.24	.61	.57	.57
			Others			
Conflict	.24	.25	.27	.42	.50	.53
Contact	.29	.28	.25	.50	.54	.51
Closeness	.28	.24	.28	.48	.49	.54
Insecurity	.37	.36	.36	.58	.63	.63
Importance	.36	.31	.32	.56	.57	.60

Note. Homogeneity was calculated via the intraclass correlation coefficient ICC(1); reliability with the ICC(2). See Hox (2002) for details on formulae. Homogeneity and reliability were not calculated for the romantic partner.

Table 2

Descriptive Statistics for the Latent Personality Variables

Dimension	M			SD	Standardized mean difference			Stability		
	T1	T2	T3		T1→T2	T2→T3	T1→T3	r_{12}	r_{23}	r_{13}
Neuroticism	2.28	2.16	2.15	.43	**−0.29**	−0.03	**−0.32**	**.71**	**.78**	**.65**
Negative affect	2.36	2.24	2.24	.43	**−0.28**	−0.02	**−0.30**	**.64**	**.73**	**.55**
Self-reproach	2.21	2.11	2.10	.43	**−0.24**	−0.04	**−0.28**	**.69**	**.75**	**.63**
Extraversion	2.85	2.88	2.89	.35	**0.08**	0.03	**0.11**	**.78**	**.84**	**.72**
Positive affect	3.09	3.13	3.15	.41	**0.10**	0.04	**0.14**	**.75**	**.80**	**.65**
Sociability	2.89	2.90	2.91	.39	**0.05**	0.00	**0.05**	**.81**	**.84**	**.73**
Activity	2.58	2.59	2.59	.35	0.03	0.01	0.04	**.82**	**.85**	**.75**
Openness	2.76	2.83	2.84	.38	**0.19**	0.03	**0.22**	**.86**	**.89**	**.82**
Unconventionality	2.75	2.74	2.71	.22	−0.06	**−0.12**	**−0.19**	**.75**	**.94**	**.74**
Aesthetic interest	2.54	2.67	2.67	.63	**0.20**	0.00	**0.20**	**.85**	**.86**	**.82**
Intellectual interest	2.92	2.97	2.98	.45	**0.12**	0.03	**0.14**	**.78**	**.86**	**.70**
Agreeableness	2.91	3.01	3.07	.30	**0.35**	**0.18**	**0.53**	**.76**	**.81**	**.70**
Nonantagonism	2.81	2.88	2.93	.22	**0.35**	**0.23**	**0.58**	**.69**	**.77**	**.64**
Prosocial orientation	3.01	3.13	3.18	.28	**0.40**	**0.19**	**0.59**	**.76**	**.78**	**.62**
Conscientiousness	2.89	3.03	3.11	.40	**0.36**	**0.19**	**0.54**	**.76**	**.69**	**.80**
Orderliness	2.81	2.93	2.99	.41	**0.29**	**0.15**	**0.45**	**.80**	**.82**	**.75**
Goal striving	2.84	2.90	2.96	.46	**0.12**	**0.14**	**0.25**	**.75**	**.80**	**.66**
Dependability	3.05	3.25	3.33	.38	**0.53**	**0.21**	**0.74**	**.68**	**.72**	**.58**

Note. Bold correlations and standardized mean differences are significant at $p < .05$. *SD* = standard deviation from strict invariance testing.

Table 3

Descriptive Statistics of the Relationship Variables

	M			*SD*			Standardized mean difference			Stability		
Aspect	T1	T2	T3	T1	T2	T3	T1→T2	T2→T3	T1→T3	r_{12}	r_{23}	r_{13}
						Romantic partner						
Size	0.47	0.63	0.66	0.52	0.56	0.55	**0.29**	**0.06**	**0.36**	.52	.56	.40
Conflict	2.45	2.50	2.47	0.81	0.81	0.81	**0.06**	−0.04	**0.03**	**.30**	**.37**	**.24**
Contact	4.42	4.22	4.21	0.79	1.10	1.21	**−0.22**	**−0.01**	**−0.22**	**.09**	**.21**	.04
Closeness	4.74	4.70	4.68	0.64	0.63	0.70	**−0.07**	**−0.03**	**−0.09**	.08	.07	.02
Insecurity	1.55	1.52	1.48	0.75	0.73	0.73	**−0.04**	−0.05	−0.09	**.23**	**.31**	**.19**
Importance	4.68	4.65	4.65	0.71	0.78	0.82	**−0.04**	0.00	−0.05	**.09**	**.17**	.10
						Friends						
Size	2.94	4.33	3.98	2.56	3.20	3.13	**0.50**	**−0.11**	**0.38**	.40	.54	.34
Conflict	1.97	1.84	1.80	0.63	0.56	0.55	**−0.23**	0.07	**−0.29**	**.34**	**.34**	**.28**
Contact	3.53	2.65	2.60	0.97	1.03	1.06	**−0.89**	−0.05	**−0.93**	**.14**	**.32**	**.13**
Closeness	3.79	3.78	3.80	0.64	0.57	0.56	−0.01	**0.05**	**0.03**	**.29**	**.39**	**.30**
Insecurity	1.63	1.57	1.56	0.65	0.57	0.55	**−0.10**	−0.03	**−0.12**	**.38**	**.44**	**.31**
Importance	4.14	4.04	4.04	0.68	0.64	0.65	**−0.15**	0.01	**−0.08**	**.31**	**.43**	**.31**
						All kin						
Size	3.18	3.82	3.87	2.02	2.25	2.36	**0.30**	0.02	**0.32**	.44	.53	.40
Conflict	2.63	2.44	2.30	0.68	0.65	0.67	**−0.28**	**−0.21**	**−0.48**	**.42**	**.47**	**.33**
Contact	4.20	3.34	3.07	0.95	1.24	1.23	**−0.81**	**−0.22**	**−1.09**	**.30**	**.53**	**.22**
Closeness	4.17	4.22	4.22	0.73	0.68	0.67	**0.07**	0.00	**0.07**	**.48**	**.46**	**.40**
Insecurity	1.50	1.45	1.43	0.63	0.57	0.57	**−0.08**	−0.03	**−0.11**	**.41**	**.43**	**.37**
Importance	4.70	4.75	4.76	0.56	0.46	0.43	**0.09**	0.03	0.12	**.34**	**.36**	**.32**
						Others						
Size	1.20	1.95	2.09	1.77	2.43	2.41	**0.37**	**0.06**	**0.45**	.22	.44	.13
Conflict	2.36	2.01	1.99	1.04	0.88	0.88	**−0.36**	−0.02	**−0.37**	**.23**	**.26**	**.21**
Contact	3.35	3.27	3.24	1.34	1.25	1.17	−0.06	−0.03	**−0.09**	.09	**.23**	**.10**
Closeness	3.16	3.11	3.10	0.98	0.80	0.80	−0.06	0.91	−0.07	**.21**	**.25**	**.14**
Insecurity	2.06	1.97	1.98	1.02	0.90	0.90	**−0.10**	0.01	**−0.09**	**.36**	**.41**	**.31**
Importance	3.27	3.13	3.12	1.12	0.89	0.88	−0.14	−0.01	−0.15	**.21**	**.29**	**.18**
						All						
Size	7.80	10.72	10.60	4.33	5.51	5.48	**0.61**	−0.02	**0.60**	.57	.72	.62
Conflict	2.32	2.13	2.07	0.53	0.48	0.47	**−0.38**	−0.13	**−0.49**	.40	.47	.35
Contact	3.88	3.14	3.05	0.71	0.81	0.80	**−0.99**	**−0.12**	**−1.14**	.26	.44	.25
Closeness	3.95	3.91	3.91	0.56	0.50	0.50	−0.08	0.01	−0.07	.36	.44	.32
Insecurity	1.62	1.59	1.57	0.55	0.50	0.48	**−0.05**	**−0.04**	**−0.09**	.46	.54	.43
Importance	4.31	4.20	4.20	0.56	0.51	0.51	**−0.20**	0.01	**−0.20**	.32	.43	.29

Note. Bold correlations and standardized mean differences are significant are significant at $p < .05$.

Table 4

Initial Correlations and Correlated Changes for the Broad Dimensions

	N			E			O			A			C		
Aspect	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}	ρ_{IC}	ρ_{CC2}	ρ_{CC3}
Romantic partner															
Conflict	**.18**	**.10**	.10	−.08	−.03	.06	−.01	.03	.09	**−.18**	−.10	**−.12**	−.09	.03	−.08
Contact	−.05	−.01	−.02	.05	−.06	−.05	.00	−.05	−.08	.04	.01	−.03	.00	.06	.02
Closeness	**−.12**	−.01	−.07	.07	−.05	−.05	−.06	−.07	−.12	**.10**	.03	.02	.05	.04	.00
Insecurity	**.24**	**.10**	**.14**	**−.12**	.02	.01	.08	.11	.03	**−.14**	−.06	−.08	**−.10**	.00	−.05
Importance	−.04	.02	−.01	.00	−.07	−.10	−.05	−.07	−.11	.07	−.01	.04	.05	.05	.05
Friends															
Conflict	**.13**	.08	.08	−.04	−.02	−.09	.04	.04	−.04	**−.20**	−.07	**−.13**	**−.12**	−.08	.05
Contact	−.06	−.05	.02	**.13**	**.12**	.03	−.08	−.01	−.05	.05	.01	−.01	.00	−.02	−.04
Closeness	−.07	−.02	−.03	**.15**	**.11**	**.14**	.05	.07	.06	**.10**	.06	.06	−.01	−.02	.01
Insecurity	**.33**	**.21**	**.19**	**−.19**	**−.15**	**−.14**	**.10**	−.03	.01	**−.12**	−.09	−.06	**−.11**	**−.13**	**−.11**
Importance	−.02	.01	.03	**.15**	.06	.04	.00	.00	.04	**.12**	.05	.03	−.02	.03	.00
All kin															
Conflict	**.18**	**.18**	**.12**	−.03	−.06	−.03	.06	−.02	−.05	**−.28**	−.17	**−.17**	**−.16**	**−.12**	**−.11**
Contact	−.06	.01	−.01	.04	.01	.04	**−.11**	−.06	−.08	.05	.00	−.06	.05	−.01	.04
Closeness	**−.12**	−.08	−.09	**.17**	.09	.06	−.07	−.01	−.02	**.21**	**.10**	.06	**.11**	.02	.05
Insecurity	**.25**	**.20**	**.22**	**−.12**	−.08	**−.15**	**.12**	.02	−.04	**−.15**	**−.10**	**−.10**	**−.10**	−.06	−.05
Importance	−.02	−.03	−.02	**.07**	.05	−.03	−.06	−.03	−.01	**.13**	.08	.02	.06	.04	−.03
Others															
Conflict	**.10**	.05	.06	−.02	−.02	−.03	.05	.02	.07	**−.16**	−.09	−.11	**−.12**	−.03	−.05
Contact	−.03	−.03	−.03	.00	.01	−.04	−.05	−.06	−.01	.05	−.02	.00	.02	.02	−.03
Closeness	−.06	−.06	**−.10**	**.11**	**.14**	.04	.02	.03	.02	.08	.08	.01	.02	.03	.00
Insecurity	**.30**	**.25**	**.19**	**−.11**	**−.13**	−.09	**.10**	.05	.02	**−.11**	−.04	−.07	−.08	−.08	−.05
Importance	−.08	−.05	−.01	.08	.09	.03	−.01	−.07	−.01	**.10**	.07	−.03	.07	.02	−.03

Note. N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness; ρ_{IC} = initial correlation between personality and relationship variables; ρ_{CC2} = correlation between change in personality and change in relationship aspects between T1 and T2; ρ_{CC3} = correlation between change in personality and change in relationship aspects between T2 and T3. Bold correlations are significant at $p < .01$ and have a size of at least |.10|.

Table 5

Cross-Lagged Personality Effects on Change in Relationship Characteristics

Personality	Relationship aspect	$\gamma_{P1 \rightarrow R2}$	95% CI	p	$\gamma_{P2 \rightarrow R3}$	95% CI	p
			Romantic partner				
Neuroticism	Conflict				.12	[.05 , .19]	.001
	Insecurity	.13	[.07 , .18]	.000	.12	[.06 , .18]	.000
Negative affect	Conflict				.14	[.06 , .21]	.000
	Insecurity	.11	[.05 , .17]	.000	.13	[.06 , .20]	.000
Self-reproach	Conflict				.10	[.03 , .17]	.005
	Insecurity	.12	[.06 , .18]	.000	.12	[.06 , .19]	.000
Unconventionality	Insecurity	.12	[.06 , .18]	.000			
Agreeableness	Conflict	−.10	[−.15 , −.04]	.001			
Nonantagonsim	Conflict	−.14	[−.21 , −.08]	.000	−.11	[−.18 , −.03]	.005
Conscientiousness	Conflict				−.10	[−.16 , −.04]	.001
			Friends				
Neuroticism	Insecurity	.14	[.10 , .18]	.000	.17	[.11 , .23]	.000
Negative affect	Insecurity	.12	[.08 , .17]	.000	.13	[.07 , .19]	.000
Self-reproach	Insecurity	.13	[.09 , .18]	.000	.16	[.10 , .21]	.000
Sociability	Closeness				.10	[.05 , .15]	.000
Aesthetic interest	Insecurity				.10	[.05 , .14]	.000
Prosocial orientation	Conflict				−.10	[−.15 , −.04]	.001
			Kin				
Neuroticism	Insecurity	.13	[.09 , .17]	.000	.14	[.09 , .20]	.000
Negative affect	Insecurity	.12	[.08 , .17]	.000	.10	[.04 , .16]	.001
Self-reproach	Insecurity	.12	[.08 , .16]	.000	.14	[.09 , .20]	.000
Openness	Contact	−.16	[−.20 , −.11]	.000	−.15	[−.20 , −.10]	.000
Aesthetic interest	Contact	−.10	[−.15 , −.05]	.000			
	Insecurity				.10	[.05 , .14]	.000
Intellectual interest	Contact	−.17	[−.22 , −.12]	.000	−.10	[−.15 , −.04]	.000
Agreeableness	Conflict	−.10	[−.15 , −.06]	.000	−.11	[−.16 , −.06]	.000
	Closeness				.12	[.07 , .17]	.000
	Insecurity	−.12	[−.17 , −.08]	.000			
Nonantagonsim	Conflict	−.18	[−.23 , −.12]	.000	−.22	[−.29 , −.15]	.000
	Closeness				.10	[.04 , .16]	.001
	Insecurity	−.15	[−.20 , −.10]	.000	−.10	[−.17 , −.03]	.003
Conscientiousness	Conflict	−.10	[−.14 , −.06]	.000			
			Others				
Neuroticism	Insecurity	.12	[.06 , .17]	.000	.17	[.10 , .23]	.000
Negative affect	Insecurity				.13	[.06 , .20]	.000
Self-reproach	Insecurity	.13	[.08 , .18]	.000	.17	[.10 , .24]	.000
Unconventionality	Insecurity				.16	[.10 , .22]	.000
	Importance				−.10	[−.16 , −.04]	.001
Agreeableness	Insecurity	−.10	[−.15 , −.05]	.000			
Nonantagonsim	Conflict				−.10	[−.16 , −.03]	.002

Insecurity	−.10	[−.16 , −.04]	.000

Note. $\gamma_{P1 \rightarrow R2}$ = cross-lagged personality effect from T1 to T2; $\gamma_{P2 \rightarrow R3}$ = cross-lagged personality effect from T2 to T3; CI = confidence interval of parameter estimate; *p* = p-value.

Table 6

Cross-Lagged Relationship Effects on Personality Change

Personality	Relationship aspect	$\gamma_{R1\rightarrow P2}$	95% CI	*p*	$\gamma_{R2\rightarrow P3}$	95% CI	*p*
			Romantic partner				
Negative affect	Contact	−.12	[−.20 , −.04]	.005			
	Importance				−.18	[−.29 , −.06]	.004
Extraversion	Closeness				.19	[.06 , .32]	.005
	Importance				.20	[.06 , .34]	.004
			Friends				
Negative affect	Insecurity				.14	[.07 , .21]	.000
Goal striving	Contact				.13	[.03 , .23]	.009
	Closeness	.10	[.04 , .17]	.001			
			Kin				
Negative affect	Insecurity				.13	[.06 , .21]	.000
Self-reproach	Insecurity				.10	[.03 , .17]	.007
Extraversion	Insecurity				−.11	[−.20 , −.03]	.010
			Others				
Negative affect	Insecurity				.12	[.03 , .21]	.008
Extraversion	Insecurity				−.14	[−.23 , −.04]	.004
Activity	Insecurity				−.14	[−.25 , −.04]	.009

Note. $\gamma_{R1\rightarrow P2}$= cross-lagged relationship effect from T1 to T2, $\gamma_{R2\rightarrow P3}$= cross-lagged relationship effect from T2 to T3; CI = confidence interval of parameter estimate; *p* = p-value.

Table 7

Coupling Effects in Relationships with a Romantic Partner, Network of Friends, all Kin, and Others

Personality	Relationship aspect	ξ	95% CI	*p*-value
		Romantic partner		
Relationship effects				
Dependability (C)	Importance	−.20	[−.33, −.08]	.002
		Friends		
Personality effects				
Orderliness (C)	Importance	−.10	[−.17, −.02]	.009
Relationship effects				
Agreeableness	Insecurity	.12	[.04, .20]	.003
Nonantagonism (A)	Insecurity	.12	[.03, .21]	.008
Prosocial orientation (A)	Insecurity	.13	[.04, .22]	.007
		Kin		
Personality effects				
Positive affect (E)	Conflict	−.10	[−.17, −.04]	.003
Relationship effects				
Activity (E)	Conflict	.12	[.03, .21]	.009
Dependability (C)	Conflict	.13	[.06, .21]	.001
		Others		
Relationship effects				
Neuroticism	Contact	−.17	[−.30, −.04]	.010
Agreeableness	Insecurity	.13	[.03, .22]	.010
Nonantagonism (A)	Insecurity	.16	[.04, .27]	.009

Note. ξ = cross-lagged coupling effect; CI = confidence interval of parameter estimate. For the facets, their superordinate Big Five dimension is given in parentheses; N = Neuroticism; E = Extraversion; C = Conscientiousness.

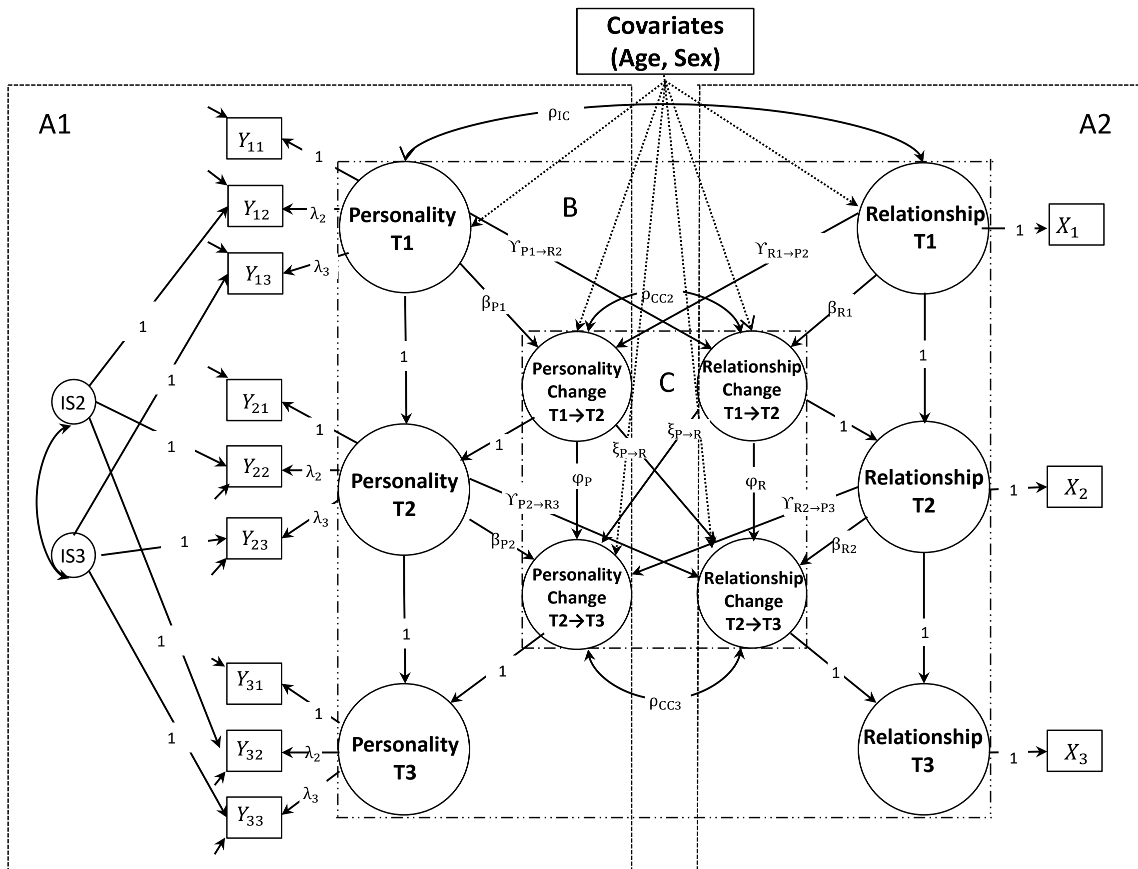

Figure 1. Extended bivariate latent change model. A1 displays the latent difference score model for the personality variables including three item parcels as indicators and indicator-specific factors. A2 represents the respective latent difference score model for the relationship variables with one indicator per measurement occasion. B is the cross-lagged panel model in which levels of one domain predict subsequent change in the other domain, and C shows the extension applied by Grimm, An, McArdle, Zonderman, and Resnick (2012) with changes in one domain predicting successive change in the other domain. Adapted from "Treating Personality-Relationship Transactions With Respect: Narrow, Facets, Advanced Models, and Extended Time Frames," by M. Mund and F. J. Neyer, 2014, *Journal of Personality and Social Psychology*, *107*, p. 357. Copyright 2014 by the American Psychological Association.

APPENDIX Study 2

Table A1

Fit Indices for Measurement Invariances Tests for the Big Five Personality Factors (MLR)

Model	χ^2	*df*	CFI	RMSEA
Neuroticism				
Model 1: Unconstrained model	19.38	17	1	.006
Model 2: Weak invariance	163.41	25	.989	.035
Model 3: Strong invariance	193.78	29	.987	.035
Extraversion				
Model 1: Unconstrained model	67.94	17	.995	.026
Model 2: Weak invariance	73.75	25	.996	.021
Model 3: Strong invariance	105.95	28	.993	.025
Openness				
Model 1: Unconstrained model	20.11	17	1	.006
Model 2: Weak invariance	58.17	25	.997	.017
Model 3: Strong invariance	64.67	29	.996	.017
Agreeableness				
Model 1: Unconstrained model	20.50	17	1	.007
Model 2: Weak invariance	35.01	25	.999	.009
Model 3: Strong invariance	65.80	28	.995	.017
Conscientiousness				
Model 1: Unconstrained model	55.95	17	.997	.023
Model 2: Weak invariance	68.62	25	.997	.020
Model 3: Strong invariance	107.21	28	.994	.025

Note. MLR = maximum likelihood parameter estimates with robust standard errors, χ^2 = Chi - square test statistic, *df* = degrees of freedom, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation.

Table A2

Fit Indices for Measurement Invariances Tests for the Big Five Personality Facets (MLR)

Model	χ^2	*df*	CFI	RMSEA
Neuroticism				
Negative affect (5 indicators)				
Model 1: Unconstrained model	269.50	69	.976	.025
Model 2: Weak invariance	449.06	83	.957	.031
Model 3: Strong invariance	698.22	91	.928	.038
Self-reproach (7 indicators)				
Model 1: Unconstrained model	262.31	153	.993	.013
Model 2: Weak invariance	361.97	177	.989	.015
Model 3: Strong invariance	552.85	189	.978	.021
Extraversion				
Positive affect (4 indicators)				
Model 1: Unconstrained model	202.35	39	.980	.030
Model 2: Weak invariance	253.70	51	.975	.030
Model 3: Strong invariance	272.13	57	.973	.029
Sociability (4 indicators)				
Model 1: Unconstrained model	104.80	39	.991	.019
Model 2: Weak invariance	119.43	51	.991	.017
Model 3: Strong invariance	215.05	57	.979	.025
Activity (4 indicators)				
Model 1: Unconstrained model	294.18	39	.965	.038
Model 2: Weak invariance	331.05	51	.961	.035
Model 3: Strong invariance	412.35	57	.951	.037
Openness				
Unconventionality (4 indicators)				
Model 1: Unconstrained model	49.80	39	.998	.008
Model 2: Weak invariance	115.13	51	.987	.017
Model 3: Strong invariance	543.79	57	.899	.044
Aesthetic interest (3 indicators)				
Model 1: Unconstrained model	68.77	17	.994	.026
Model 2: Weak invariance	96.36	25	.991	.025
Model 3: Strong invariance	148.23	29	.985	.030
Intellectual interest (3 indicators)				
Model 1: Unconstrained model	47.11	17	.993	.020
Model 2: Weak invariance	94.20	25	.985	.025
Model 3: Strong invariance	268.79	29	.947	.043
Agreeableness				
Nonantagonism (8 indicators)				
Model 1: Unconstrained model	398.86	207	.983	.014
Model 2: Weak invariance	470.37	235	.979	.015
Model 3: Strong invariance	626.97	249	.966	.018
Prosocial orientation (4 indicators)				
Model 1: Unconstrained model	134.85	69	.990	.015
Model 2: Weak invariance	187.07	85	.985	.016
Model 3: Strong invariance	221.57	93	.981	.018
Conscientiousness				
Orderliness (4 indicators)				

Model 1: Unconstrained model	365.28	69	.972	.031
Model 2: Weak invariance	457.96	85	.964	.031
Model 3: Strong invariance	559.14	93	.955	.033
Goal striving (3 indicators)				
Model 1: Unconstrained model	26.90	17	.998	.011
Model 2: Weak invariance	57.39	25	.995	.017
Model 3: Strong invariance	113.83	29	.986	.025
Dependability (4 indicators)				
Model 1: Unconstrained model	176.43	39	.982	.028
Model 2: Weak invariance	201.01	51	.980	.026
Model 3: Strong invariance	225.85	57	.974	.026

Note. MLR = maximum likelihood parameter estimates with robust standard errors, χ^2 = Chi -square test statistic, *df* = degrees of freedom, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation.

Table A3

Cross-Lagged Personality Effects on Relationship Change from the Bivariate Latent Difference Score Models

Personality	Relationship Aspect	$\gamma_{P1 \to R2}$	95% CI	*p*-value	$\gamma_{P2 \to R3}$	95% CI	*p*-value	χ^2	*df*	CFI	RMSEA	SRMR
					Romantic Partner							
Neuroticism	Conflict	0.07	[0.02, 0.12]	.011	0.12	[0.05, 0.19]	.001	410.02	59	.974	.037	.036
	Contact	−0.05	[−0.10, 0.01]	.082	−0.02	[−0.08, 0.03]	.400	393.12	59	.976	.036	.035
	Closeness	−0.04	[−0.09, 0.00]	.070	−0.04	[−0.10, 0.02]	.158	409.34	59	.974	.037	.036
	Insecurity	0.13	[0.07, 0.18]	.000	0.12	[0.06, 0.18]	.000	411.21	59	.974	.037	.037
	Importance	−0.02	[−0.07, 0.03]	.498	−0.02	[−0.08, 0.04]	.429	404.13	59	.974	.037	.036
Negative affect	Conflict	0.06	[0.01, 0.12]	.026	0.14	[0.06, 0.21]	.000	1086.45	153	.900	.038	.062
	Contact	−0.03	[−0.08, 0.03]	.345	−0.04	[−0.11, 0.02]	.188	1095.78	153	.897	.038	.062
	Closeness	−0.06	[−0.11, −0.01]	.014	−0.07	[−0.13, −0.01]	.021	1114.76	153	.896	.038	.062
	Insecurity	0.11	[0.05, 0.17]	.000	0.13	[0.06, 0.20]	.000	1116.19	153	.897	.038	.063
	Importance	−0.02	[−0.06, 0.03]	.498	−0.06	[−0.12, 0.01]	.069	1114.67	153	.894	.038	.063
Self-reproach	Conflict	0.05	[0.00, 0.11]	.049	0.10	[0.03, 0.17]	.005	801.84	279	.970	.021	.030
	Contact	−0.05	[−0.11, 0.01]	.071	−0.03	[−0.09, 0.04]	.400	724.45	279	.974	.019	.026
	Closeness	−0.05	[−0.10, 0.00]	.043	−0.02	[−0.08, 0.05]	.634	744.20	279	.973	.020	.027
	Insecurity	0.12	[0.06, 0.18]	.000	0.12	[0.06, 0.19]	.000	752.69	279	.972	.020	.027
	Importance	−0.02	[−0.08, 0.03]	.396	0.00	[−0.07, 0.07]	.949	722.36	279	.974	.019	.026
Extraversion	Conflict	−0.01	[−0.06, 0.04]	.716	−0.03	[−0.10, 0.03]	.286	344.40	58	.975	.034	.031
	Contact	0.03	[−0.02, 0.08]	.300	−0.01	[−0.07, 0.04]	.663	334.61	58	.976	.033	.029
	Closeness	0.06	[0.02, 0.11]	.006	0.00	[−0.05, 0.05]	.946	330.90	58	.976	.033	.028
	Insecurity	−0.04	[−0.10, 0.01]	.119	−0.04	[−0.11, 0.02]	.153	335.73	58	.976	.033	.029
	Importance	0.03	[−0.02, 0.08]	.300	−0.02	[−0.07, 0.04]	.571	331.43	58	.976	.033	.029
Positive affect	Conflict	−0.02	[−0.08, 0.03]	.441	−0.07	[−0.13, −0.00]	.039	419.96	102	.965	.027	.040
	Contact	0.04	[−0.02, 0.10]	.157	−0.02	[−0.08, 0.05]	.603	383.90	102	.968	.025	.034
	Closeness	0.06	[0.01, 0.11]	.017	0.00	[−0.06, 0.05]	.929	386.35	102	.968	.025	.035
	Insecurity	−0.05	[−0.11, 0.01]	.073	−0.05	[−0.11, 0.02]	.145	399.94	102	.966	.026	.038

	Importance	0.01	[−0.04, 0.07]	.630	−0.03	[−0.08, 0.03]	.360	373.67	102	.969	.025	.034
Sociability	Conflict	0.01	[−0.04, 0.06]	.698	−0.02	[−0.08, 0.05]	.597	441.24	102	.958	.028	.031
	Contact	0.02	[−0.03, 0.08]	.437	−0.02	[−0.08, 0.04]	.513	442.48	102	.958	.028	.030
	Closeness	0.04	[−0.01, 0.10]	.114	0.02	[−0.04, 0.07]	.501	436.58	102	.958	.028	.030
	Insecurity	−0.02	[−0.08, 0.03]	.422	−0.03	[−0.10, 0.03]	.308	456.57	102	.956	.028	.031
	Importance	0.03	[−0.03, 0.08]	.318	−0.01	[−0.07, 0.04]	.690	448.22	102	.957	.028	.031
Activity	Conflict	0.02	[−0.04, 0.07]	.565	0.03	[−0.03, 0.08]	.361	515.96	102	.945	.031	.041
	Contact	0.00	[−0.05, 0.05]	.931	0.02	[−0.04, 0.07]	.596	467.76	102	.951	.029	.031
	Closeness	0.00	[−0.04, 0.05]	.848	−0.01	[−0.07, 0.04]	.631	473.60	102	.950	.029	.032
	Insecurity	0.02	[−0.03, 0.07]	.493	−0.06	[−0.11, 0.00]	.054	514.59	102	.945	.031	.036
	Importance	−0.03	[−0.08, 0.02]	.225	0.01	[−0.05, 0.06]	.819	464.29	102	.951	.029	.031
Openness	Conflict	0.02	[−0.03, 0.07]	.358	0.03	[−0.02, 0.09]	.256	257.13	59	.981	.028	.030
	Contact	0.00	[−0.05, 0.06]	.952	0.01	[−0.05, 0.06]	.799	244.76	58	.982	.027	.029
	Closeness	−0.01	[−0.06, 0.04]	.754	−0.02	[−0.07, 0.03]	.505	242.28	58	.982	.027	.028
	Insecurity	0.08	[0.02, 0.13]	.006	0.07	[0.02, 0.13]	.011	242.41	58	.982	.027	.028
	Importance	0.01	[−0.04, 0.06]	.658	−0.02	[−0.07, 0.04]	.516	238.89	58	.982	.027	.029
Unconventionality	Conflict	0.06	[0.002, 0.13]	.043	0.09	[0.02, 0.16]	.019	674.04	102	.892	.036	.042
	Contact	0.03	[−0.04, 0.10]	.342	0.05	[−0.01, 0.12]	.119	685.51	102	.888	.036	.043
	Closeness	0.01	[−0.05, 0.06]	.863	−0.02	[−0.09, 0.04]	.468	685.51	102	.887	.036	.042
	Insecurity	0.12	[0.06, 0.18]	.000	0.09	[0.02, 0.15]	.012	681.69	102	.890	.036	.043
	Importance	0.01	[−0.05, 0.08]	.721	−0.01	[−0.07, 0.05]	.753	684.28	102	.886	.036	.043
Aesthetic interest	Conflict	0.02	[−0.03, 0.07]	.438	0.04	[−0.02, 0.10]	.194	237.07	59	.981	.026	.028
	Contact	−0.01	[−0.07, 0.05]	.791	−0.02	[−0.07, 0.03]	.491	247.93	59	.979	.027	.028
	Closeness	0.01	[−0.04, 0.06]	.698	−0.03	[−0.08, 0.02]	.199	235.19	59	.980	.026	.028
	Insecurity	0.05	[−0.002, 0.11]	.059	0.09	[0.04, 0.14]	.001	246.21	59	.980	.027	.029
	Importance	0.01	[−0.04, 0.07]	.620	−0.04	[−0.09, 0.01]	.132	234.49	59	.980	.026	.027
Intellectual interest	Conflict	−0.04	[−0.10, 0.02]	.165	−0.06	[−0.13, −0.00]	.048	382.64	59	.938	.036	.048
	Contact	0.01	[−0.06, 0.07]	.859	−0.01	[−0.07, 0.05]	.721	385.86	59	.935	.036	.049
	Closeness	0.02	[−0.04, 0.07]	.614	0.00	[−0.05, 0.05]	.987	384.64	59	.935	.036	.049
	Insecurity	0.04	[−0.02, 0.10]	.152	0.01	[−0.06, 0.07]	.805	389.69	59	.936	.036	.048

	Importance	0.04	[−0.02, 0.10]	.182	0.00	[−0.06, 0.06]	.920	390.79	59	.934	.036	.049
Agreeableness	Conflict	−0.10	[−0.15, −0.04]	.001	−0.06	[−0.12, −0.01]	.031	208.64	59	.983	.024	.034
	Contact	0.04	[−0.02, 0.09]	.240	0.01	[−0.05, 0.06]	.871	215.32	58	.982	.025	.036
	Closeness	0.06	[0.01, 0.11]	.016	0.01	[−0.05, 0.06]	.792	222.24	58	.981	.026	.036
	Insecurity	−0.04	[−0.09, 0.01]	.146	−0.03	[−0.09, 0.03]	.314	233.65	58	.979	.027	.038
	Importance	0.05	[−0.00, 0.10]	.070	0.01	[−0.04, 0.07]	.642	228.70	58	.980	.026	.037
Nonantagonsim	Conflict	−0.14	[−.21, −0.08]	.000	−0.11	[−0.18, −0.03]	.005	1103.01	354	.937	.022	.038
	Contact	0.03	[−0.04, 0.10]	.437	0.02	[−0.06, 0.08]	.674	1097.84	354	.936	.022	.037
	Closeness	0.03	[−0.03, 0.09]	.310	0.01	[−0.05, 0.07]	.760	1103.60	354	.936	.022	.038
	Insecurity	0.00	[−0.06, 0.06]	.994	−0.08	[−0.14, −0.02]	.014	1118.78	354	.935	.022	.038
	Importance	0.02	[−0.04, 0.08]	.523	0.00	[−0.06, 0.07]	.924	1118.37	354	.934	.022	.039
Prosocial orientation	Conflict	−0.06	[−0.12, 0.00]	.051	−0.06	[−0.12, 0.00]	.064	420.97	153	.963	.020	.031
	Contact	0.05	[−0.02, 0.11]	.149	0.02	[−0.04, 0.08]	.454	439.72	153	.960	.021	.033
	Closeness	0.06	[0.00, 0.12]	.035	0.01	[−0.05, 0.07]	.734	458.30	153	.958	.022	.033
	Insecurity	−0.05	[−0.12, 0.01]	.086	−0.01	[−0.08, 0.05]	.662	458.29	153	.958	.022	.035
	Importance	0.02	[−0.04, 0.09]	.453	0.04	[−0.03, 0.10]	.266	450.08	153	.958	.021	.034
Conscientiousness	Conflict	−0.08	[−0.13, −0.03]	.001	−0.10	[−0.16, −0.04]	.001	229.08	59	.987	.026	.023
	Contact	−0.02	[−0.07, 0.03]	.425	0.02	[−0.03, 0.08]	.442	201.49	58	.989	.024	.020
	Closeness	0.01	[−0.03, 0.05]	.688	0.04	[−0.01, 0.10]	.122	213.90	58	.988	.025	.021
	Insecurity	−0.05	[−0.10, −0.00]	.042	−0.07	[−0.13, −0.02]	.012	200.84	58	.989	.024	.021
	Importance	0.00	[−0.05, 0.04]	.859	0.03	[−0.03, 0.09]	.277	201.21	58	.989	.024	.021
Orderliness	Conflict	−0.03	[−0.08, 0.02]	.179	−0.08	[−0.14, −0.02]	.006	811.44	153	.940	.032	.046
	Contact	−0.02	[−0.07, 0.02]	.334	0.01	[−0.05, 0.06]	.766	795.61	153	.941	.031	.042
	Closeness	0.02	[−0.03, 0.06]	.506	0.03	[−0.02, 0.08]	.283	784.99	153	.942	.031	.042
	Insecurity	−0.03	[−0.08, 0.02]	.178	−0.06	[−0.11, 0.00]	.058	794.99	153	.941	.031	.044
	Importance	−0.02	[−0.07, 0.03]	.393	0.02	[−0.04, 0.08]	.482	783.35	153	.942	.031	.042
Goal striving	Conflict	−0.07	[−0.12, −0.01]	.016	−0.08	[−0.15, −0.02]	.011	277.05	59	.967	.029	.028
	Contact	−0.01	[−0.07, 0.05]	.722	0.04	[−0.02, 0.10]	.237	280.46	59	.966	.030	.028
	Closeness	0.03	[−0.02, 0.08]	.197	0.04	[−0.02, 0.09]	.214	293.01	59	.964	.030	.029
	Insecurity	−0.05	[−0.10, 0.00]	.057	−0.04	[−0.10, 0.02]	.168	274.70	59	.966	.029	.028

	Importance	0.01	[−0.04, 0.07]	.646	−0.02	[−0.08, 0.04]	.576	292.56	58	.963	.031	.030
Dependability	Conflict	−0.09	[−0.14, −0.03]	.003	−0.06	[−0.13, −0.00]	.041	306.26	102	.975	.022	.028
	Contact	0.03	[−0.03, 0.08]	.335	0.04	[−0.02, 0.10]	.157	309.21	102	.975	.022	.028
	Closeness	0.03	[−0.02, 0.08]	.187	0.05	[−0.003, 0.11]	.065	302.93	102	.975	.021	.028
	Insecurity	−0.02	[−0.07, 0.03]	.436	−0.05	[−0.11, 0.01]	.097	321.44	102	.973	.022	.031
	Importance	0.04	[−0.01, 0.09]	.097	0.04	[−0.02, 0.10]	.174	318.75	102	.973	.022	.029
					Friends							
Neuroticism	Conflict	0.02	[−0.02, 0.05]	.419	0.05	[0.00, 0.11]	.044	398.17	59	.976	.036	.036
	Contact	−0.05	[−0.09, −0.01]	.011	−0.04	[−0.09, 0.02]	.192	383.79	59	.976	.036	.035
	Closeness	−0.04	[−0.08, −0.01]	.024	0.01	[−0.05, 0.06]	.770	393.12	59	.975	.036	.036
	Insecurity	0.14	[0.10, 0.18]	.000	0.17	[0.11, 0.23]	.000	399.69	59	.976	.036	.037
	Importance	−0.02	[−0.06, 0.02]	.268	0.05	[−0.01, 0.10]	.083	402.06	59	.975	.037	.035
Negative affect	Conflict	0.04	[−0.005, 0.08]	.087	0.08	[0.02, 0.13]	.011	1075.68	153	.902	.037	.062
	Contact	−0.03	[−0.08, 0.01]	.134	−0.01	[−0.07, 0.04]	.684	1076.01	153	.900	.037	.062
	Closeness	−0.04	[−0.08, 0.01]	.084	−0.01	[−0.07, 0.05]	.688	1083.15	153	.901	.037	.062
	Insecurity	0.12	[0.08, 0.17]	.000	0.13	[0.07, 0.19]	.000	1144.90	153	.901	.039	.064
	Importance	−0.02	[−0.06, 0.02]	.270	0.02	[−0.03, 0.08]	.392	1097.13	153	.900	.038	.062
Self-reproach	Conflict	−0.01	[−0.05, 0.03]	.541	0.04	[−0.01, 0.10]	.092	767.73	279	.972	.020	.027
	Contact	−0.06	[−0.10, −0.02]	.002	−0.03	[−0.08, 0.02]	.246	725.90	279	.974	.019	.026
	Closeness	−0.05	[−0.09, −0.01]	.011	0.03	[−0.03, 0.08]	.315	751.93	279	.973	.020	.027
	Insecurity	0.13	[0.09, 0.18]	.000	0.16	[0.10, 0.21]	.000	776.14	279	.972	.020	.027
	Importance	−0.02	[−0.06, 0.02]	.238	0.04	[−0.01, 0.10]	.106	766.54	279	.972	.020	.027
Extraversion	Conflict	−0.01	[−0.04, 0.03]	.772	−0.02	[−0.07, 0.03]	.494	341.56	58	.976	.034	.029
	Contact	0.07	[0.03, 0.10]	.001	0.04	[−0.01, 0.09]	.139	337.03	58	.976	.033	.029
	Closeness	0.08	[0.04, 0.12]	.000	0.08	[0.03, 0.13]	.003	329.45	58	.977	.033	.028
	Insecurity	−0.06	[−0.10, −0.02]	.004	−0.06	[−0.11, −0.01]	.030	343.12	58	.976	.034	.030
	Importance	0.06	[0.02, 0.10]	.002	0.06	[0.01, 0.11]	.014	337.59	58	.977	.033	.028
Positive affect	Conflict	−0.03	[−0.07, 0.01]	.148	−0.04	[−0.09, 0.02]	.176	408.84	102	.967	.026	.036
	Contact	0.04	[−0.004, 0.08]	.075	0.03	[−0.03, 0.08]	.305	382.43	102	.969	.025	.033

	Closeness	0.04	[0.00, 0.08]	.051	0.04	[−0.02, 0.09]	.214	377.07	102	.970	.025	.033
	Insecurity	−0.03	[−0.08, 0.01]	.111	−0.05	[−0.10, 0.01]	.098	471.28	102	.961	.029	.043
	Importance	0.02	[−0.03, 0.06]	.440	0.03	[−0.02, 0.09]	.252	373.40	102	.971	.025	.032
Sociability	Conflict	0.02	[−0.02, 0.06]	.385	−0.01	[−0.06, 0.04]	.732	464.94	102	.956	.029	.030
	Contact	0.09	[0.05, 0.13]	.000	0.03	[−0.02, 0.08]	.190	444.58	102	.959	.028	.030
	Closeness	0.08	[0.04, 0.12]	.000	0.10	[0.05, 0.15]	.000	457.53	102	.958	.028	.031
	Insecurity	−0.06	[−0.10, −0.02]	.004	−0.06	[−0.11, −0.01]	.026	463.79	102	.958	.029	.032
	Importance	0.09	[0.05, 0.14]	.000	0.09	[0.04, 0.14]	.000	454.93	102	.959	.028	.030
Activity	Conflict	0.01	[−0.03, 0.05]	.655	0.02	[−0.02, 0.07]	.298	507.24	102	.948	.030	.035
	Contact	0.04	[0.00, 0.08]	.043	0.04	[−0.01, 0.09]	.113	478.18	102	.951	.029	.031
	Closeness	0.06	[0.02, 0.10]	.003	0.05	[0.00, 0.10]	.044	487.91	102	.950	.030	.034
	Insecurity	0.00	[−0.04, 0.04]	.985	−0.03	[−0.07, 0.02]	.244	596.86	102	.938	.033	.044
	Importance	0.04	[0.00, 0.08]	.031	0.02	[−0.03, 0.06]	.470	495.35	102	.950	.030	.034
Openness	Conflict	0.03	[−0.01, 0.06]	.162	−0.02	[−0.06, 0.03]	.480	237.41	59	.983	.026	.028
	Contact	−0.08	[−0.11, −0.04]	.000	0.01	[−0.04, 0.05]	.747	241.36	58	.982	.027	.028
	Closeness	0.04	[0.00, 0.07]	.053	0.05	[0.00, 0.09]	.049	242.61	58	.982	.027	.029
	Insecurity	0.03	[−0.01, 0.07]	.130	0.08	[0.03, 0.12]	.002	258.31	58	.981	.028	.030
	Importance	0.03	[−0.01, 0.07]	.117	0.01	[−0.04, 0.06]	.669	237.45	58	.983	.027	.029
Unconventionality	Conflict	0.01	[−0.04, 0.06]	.616	−0.03	[−0.08, 0.02]	.287	675.38	102	.896	.036	.041
	Contact	−0.08	[−0.13, −0.03]	.001	0.00	[−0.06, 0.05]	.885	687.20	102	.891	.036	.042
	Closeness	0.01	[−0.04, 0.06]	.793	0.00	[−0.06, 0.06]	.990	676.34	102	.896	.036	.043
	Insecurity	0.04	[−0.01, 0.09]	.102	0.06	[0.00, 0.11]	.035	668.91	102	.901	.036	.041
	Importance	0.02	[−0.03, 0.06]	.511	0.01	[−0.05, 0.06]	.871	670.06	102	.898	.036	.042
Aesthetic interest	Conflict	0.02	[−0.02, 0.06]	.412	0.01	[−0.04, 0.05]	.799	234.65	59	.981	.026	.026
	Contact	−0.06	[−0.10, −0.02]	.006	−0.01	[−0.06, 0.04]	.729	237.90	59	.981	.026	.027
	Closeness	0.01	[−0.03, 0.06]	.530	0.07	[0.02, 0.12]	.006	244.80	59	.980	.027	.029
	Insecurity	0.03	[−0.01, 0.08]	.120	0.10	[0.05, 0.14]	.000	248.66	59	.980	.027	.027
	Importance	0.02	[−0.02, 0.06]	.348	0.01	[−0.04, 0.06]	.688	235.29	59	.981	.026	.027
Intellectual interest	Conflict	0.00	[−0.04, 0.04]	.926	−0.02	[−0.07, 0.03]	.395	401.83	59	.937	.037	.049
	Contact	−0.08	[−0.12, −0.03]	.001	0.02	[−0.03, 0.07]	.437	387.05	59	.938	.036	.048

	Closeness	0.04	[−0.00, 0.08]	.064	0.01	[−0.04, 0.06]	.831	372.20	59	.942	.035	.048
	Insecurity	0.00	[−0.04, 0.05]	.861	0.04	[−0.01, 0.09]	.096	430.67	59	.933	.038	.050
	Importance	0.00	[−0.04, 0.04]	.973	0.00	[−0.05, 0.06]	.912	381.94	59	.941	.036	.049
Agreeableness	Conflict	−0.08	[−0.12, −0.03]	.001	−0.08	[−0.13, −0.03]	.003	216.99	59	.982	.025	.035
	Contact	−0.01	[−0.05, 0.04]	.785	−0.04	[−0.08, 0.01]	.138	241.39	58	.979	.027	.037
	Closeness	0.03	[−0.01, 0.07]	.135	0.00	[−0.05, 0.05]	.988	236.46	58	.980	.027	.038
	Insecurity	−0.07	[−0.11, −0.03]	.001	−0.02	[−0.06, 0.03]	.532	351.47	58	.968	.034	.045
	Importance	0.02	[−0.03, 0.06]	.448	−0.01	[−0.06, 0.05]	.829	246.46	58	.979	.027	.039
Nonantagonsim	Conflict	−0.07	[−0.12, −0.02]	.003	−0.09	[−0.14, −0.03]	.003	1107.54	354	.938	.022	.038
	Contact	0.01	[−0.04, 0.06]	.663	−0.03	[−0.09, 0.03]	.351	1131.64	354	.934	.022	.038
	Closeness	0.03	[−0.02, 0.07]	.249	−0.04	[−0.10, 0.02]	.181	1131.08	354	.935	.022	.041
	Insecurity	−0.07	[−0.12, −0.03]	.002	−0.08	[−0.14, −0.02]	.006	1218.91	354	.930	.024	.041
	Importance	0.01	[−0.04, 0.05]	.804	−0.05	[−0.11, 0.01]	.090	1141.54	354	.935	.023	.042
Prosocial orientation	Conflict	−0.06	[−0.11, −0.02]	.008	−0.10	[−0.15, −0.04]	.001	442.86	153	.962	.021	.033
	Contact	−0.02	[−0.06, 0.03]	.423	−0.04	[−0.09, 0.01]	.123	447.65	153	.960	.021	.032
	Closeness	0.03	[−0.01, 0.08]	.154	0.01	[−0.04, 0.07]	.651	460.13	153	.959	.021	.034
	Insecurity	−0.04	[−0.09, 0.00]	.056	0.02	[−0.03, 0.06]	.546	554.83	153	.948	.025	.039
	Importance	0.02	[−0.03, 0.06]	.491	0.02	[−0.04, 0.08]	.457	463.72	153	.959	.022	.035
Conscientiousness	Conflict	−0.06	[−0.09, −0.02]	.003	−0.05	[−0.09, 0.00]	.039	228.07	59	.987	.026	.022
	Contact	0.03	[−0.01, 0.06]	.176	−0.07	[−0.11, −0.02]	.002	199.77	58	.989	.024	.021
	Closeness	0.02	[−0.01, 0.06]	.180	0.00	[−0.04, 0.05]	.893	222.83	58	.987	.026	.023
	Insecurity	−0.04	[−0.08, −0.01]	.020	−0.09	[−0.13, −0.04]	.000	236.58	58	.987	.027	.024
	Importance	0.04	[−0.002, 0.07]	.063	0.00	[−0.04, 0.05]	.986	204.03	58	.989	.024	.022
Orderliness	Conflict	−0.03	[−0.07, 0.01]	.132	−0.04	[−0.10, 0.01]	.076	795.95	153	.942	.031	.042
	Contact	0.00	[−0.04, 0.04]	.838	−0.06	[−0.11, −0.02]	.008	773.53	153	.944	.031	.042
	Closeness	0.01	[−0.04, 0.04]	.809	0.00	[−0.05, 0.05]	.890	772.36	153	.944	.031	.042
	Insecurity	−0.04	[−0.08, 0.00]	.068	−0.07	[−0.12, −0.02]	.003	877.83	153	.937	.033	.048
	Importance	0.02	[−0.02, 0.06]	.336	−0.01	[−0.05, 0.04]	.851	772.21	153	.945	.031	.041
Goal striving	Conflict	−0.03	[−0.07, 0.01]	.130	0.00	[−0.05, 0.04]	.933	284.43	59	.967	.030	.028
	Contact	0.04	[0.003, 0.08]	.035	−0.03	[−0.08, 0.02]	.274	281.37	59	.966	.029	.028

	Closeness	0.06	[0.02, 0.10]	.007	0.03	[−0.02, 0.08]	.231	285.43	59	.967	.030	.030
	Insecurity	−0.06	[−0.10, −0.02]	.003	−0.06	[−0.10, −0.01]	.023	287.34	59	.967	.030	.029
	Importance	0.04	[0.00, 0.08]	.039	0.03	[−0.02, 0.08]	.303	271.37	58	.969	.029	.029
Dependability	Conflict	−0.07	[−0.11, −0.02]	.002	−0.06	[−0.11, −0.01]	.015	311.69	102	.975	.022	.028
	Contact	0.03	[−0.01, 0.07]	.141	−0.09	[−0.14, −0.04]	.000	296.91	102	.977	.021	.027
	Closeness	0.05	[0.01, 0.09]	.019	−0.01	[−0.06, 0.04]	.687	286.64	102	.978	.020	.026
	Insecurity	−0.02	[−0.06, 0.02]	.296	−0.06	[−0.11, −0.01]	.013	362.33	102	.970	.024	.034
	Importance	0.07	[0.02, 0.11]	.002	0.01	[−0.04, 0.06]	.837	310.10	102	.976	.022	.027
					All kin							
Neuroticism	Conflict	0.05	[0.01, 0.09]	.012	0.09	[0.04, 0.15]	.001	419.32	59	.975	.037	.037
	Contact	0.00	[−0.04, 0.04]	.964	0.02	[−0.03, 0.08]	.426	387.89	59	.977	.036	.035
	Closeness	−0.04	[−0.09, −0.003]	.036	−0.04	[−0.09, 0.01]	.163	409.65	59	.975	.037	.036
	Insecurity	0.13	[0.09, 0.17]	.000	0.14	[0.09, 0.20]	.000	421.70	59	.974	.038	.037
	Importance	−0.02	[−0.05, 0.02]	.392	0.01	[−0.04, 0.05]	.836	407.07	59	.974	.037	.036
Negative affect	Conflict	0.07	[0.02, 0.12]	.004	0.09	[0.03, 0.16]	.003	1094.57	153	.904	.038	.063
	Contact	−0.04	[−0.08, 0.01]	.152	0.00	[−0.06, 0.07]	.887	1110.06	153	.901	.038	.063
	Closeness	−0.06	[−0.10, −0.01]	.014	−0.03	[−0.09, 0.02]	.238	1092.83	153	.903	.038	.063
	Insecurity	0.12	[0.08, 0.17]	.000	0.10	[0.04, 0.16]	.001	1116.59	153	.902	.038	.063
	Importance	−0.04	[−0.08, 0.01]	.084	0.02	[−0.03, 0.07]	.365	1090.86	153	.898	.037	.063
Self-reproach	Conflict	0.02	[−0.02, 0.07]	.289	0.09	[0.03, 0.14]	.002	804.28	279	.970	.021	.029
	Contact	0.00	[−0.05, 0.04]	.904	0.00	[−0.06, 0.05]	.940	748.77	279	.973	.020	.026
	Closeness	−0.04	[−0.08, 0.00]	.068	−0.04	[−0.08, 0.01]	.142	780.62	279	.972	.020	.027
	Insecurity	0.12	[0.08, 0.16]	.000	0.14	[0.09, 0.20]	.000	808.62	279	.970	.021	.028
	Importance	−0.01	[−0.05, 0.03]	.668	−0.01	[−0.06, 0.03]	.614	731.40	279	.973	.019	.027
Extraversion	Conflict	0.00	[−0.04, 0.04]	.927	−0.03	[−0.08, 0.02]	.228	338.41	58	.977	.033	.029
	Contact	0.02	[−0.02, 0.06]	.354	0.03	[−0.02, 0.08]	.279	356.08	58	.976	.034	.030
	Closeness	0.06	[0.01, 0.10]	.009	0.08	[0.04, 0.13]	.001	332.70	58	.977	.033	.028
	Insecurity	−0.04	[−0.08, −0.01]	.025	−0.05	[−0.10, 0.00]	.067	333.11	58	.977	.033	.029
	Importance	0.05	[0.01, 0.09]	.025	0.08	[0.03, 0.12]	.001	328.35	58	.976	.033	.028
Positive affect	Conflict	0.03	[−0.02, 0.07]	.211	−0.02	[−0.08, 0.03]	.353	454.26	102	.963	.028	.044

	Contact	0.05	[0.00, 0.10]	.043	0.03	[−0.03, 0.08]	.293	372.25	102	.971	.025	.032
	Closeness	0.03	[−0.01, 0.08]	.172	0.05	[−0.01, 0.10]	.080	420.34	102	.966	.027	.037
	Insecurity	−0.01	[−0.05, 0.04]	.786	−0.02	[−0.07, 0.04]	.535	439.26	102	.963	.028	.044
	Importance	0.02	[−0.02, 0.07]	.267	0.06	[0.02, 0.11]	.010	373.58	102	.969	.025	.033
Sociability	Conflict	−0.01	[−0.05, 0.03]	.561	−0.03	[−0.08, 0.02]	.249	440.87	102	.961	.028	.030
	Contact	0.02	[−0.02, 0.07]	.358	0.03	[−0.03, 0.08]	.350	467.38	102	.958	.029	.032
	Closeness	0.07	[0.02, 0.11]	.003	0.08	[0.03, 0.12]	.001	445.20	102	.961	.028	.030
	Insecurity	−0.06	[−0.10, −0.02]	.007	−0.04	[−0.09, 0.01]	.088	462.19	102	.958	.028	.032
	Importance	0.04	[0.001, 0.08]	.047	0.07	[0.02, 0.11]	.004	446.19	102	.957	.028	.031
Activity	Conflict	0.05	[0.004, 0.09]	.030	0.04	[−0.01, 0.09]	.092	519.15	102	.948	.031	.036
	Contact	−0.01	[−0.06, 0.04]	.655	0.03	[−0.02, 0.08]	.254	479.00	102	.953	.029	.031
	Closeness	−0.01	[−0.05, 0.04]	.777	0.01	[−0.04, 0.06]	.750	515.21	102	.949	.030	.036
	Insecurity	0.04	[−0.003, 0.08]	.069	−0.01	[−0.06, 0.04]	.662	552.10	102	.943	.032	.039
	Importance	0.02	[−0.02, 0.06]	.438	0.03	[−0.01, 0.07]	.169	459.97	102	.952	.028	.031
Openness	Conflict	0.02	[−0.02, 0.06]	.243	0.01	[−0.03, 0.06]	.574	242.06	59	.983	.027	.029
	Contact	−0.16	[−.20, −0.11]	.000	−0.15	[−0.20, −0.10]	.000	260.56	58	.981	.028	.029
	Closeness	−0.07	[−0.11, −0.03]	.001	−0.02	[−0.06, 0.02]	.396	232.45	58	.984	.026	.028
	Insecurity	0.05	[0.01, 0.09]	.012	0.09	[0.05, 0.14]	.000	248.35	58	.982	.027	.028
	Importance	−0.02	[−0.06, 0.02]	.328	0.01	[−0.03, 0.05]	.680	236.69	58	.982	.027	.028
Unconventionality	Conflict	0.07	[0.02, 0.12]	.009	−0.01	[−0.06, 0.05]	.777	673.67	102	.901	.036	.041
	Contact	−0.06	[−0.12, 0.00]	.041	−0.09	[−0.15, −0.03]	.004	777.93	102	.885	.039	.053
	Closeness	−0.02	[−0.08, 0.03]	.366	−0.05	[−0.10, 0.00]	.055	688.80	102	.900	.036	.043
	Insecurity	0.06	[0.01, 0.12]	.021	0.07	[0.01, 0.12]	.016	706.94	102	.896	.037	.043
	Importance	−0.03	[−0.08, 0.01]	.170	−0.01	[−0.06, 0.04]	.681	675.04	102	.891	.036	.042
Aesthetic interest	Conflict	0.02	[−0.03, 0.06]	.438	0.05	[0.001, 0.11]	.047	238.99	59	.981	.026	.028
	Contact	−0.10	[−0.15, −0.05]	.000	−0.09	[−0.15, −0.04]	.000	262.05	59	.979	.028	.029
	Closeness	−0.07	[−0.12, −0.03]	.002	−0.01	[−0.06, 0.04]	.603	228.82	59	.982	.026	.026
	Insecurity	0.05	[0.01, 0.10]	.019	0.10	[0.05, 0.14]	.000	242.57	59	.981	.027	.028
	Importance	−0.02	[−0.06, 0.03]	.477	0.02	[−0.02, 0.07]	.368	231.21	59	.981	.026	.027

Intellectual interest	Conflict	0.02	[−0.03, 0.06]	.448	0.00	[−0.05, 0.05]	.961	402.95	59	.940	.037	.048
	Contact	−0.17	[−.22, −0.12]	.000	−0.10	[−0.15, −0.04]	.000	400.29	59	.941	.036	.049
	Closeness	−0.08	[−0.12, −0.03]	.001	0.02	[−0.03, 0.06]	.547	393.72	59	.942	.036	.048
	Insecurity	0.03	[−0.01, 0.08]	.162	0.04	[−0.01, 0.09]	.134	408.88	59	.938	.037	.049
	Importance	−0.04	[−0.08, 0.00]	.047	0.01	[−0.03, 0.06]	.562	383.33	59	.937	.036	.048
Agreeableness	Conflict	−0.10	[−0.15, −0.06]	.000	−0.11	[−0.16, −0.06]	.000	242.84	59	.980	.027	.039
	Contact	0.02	[−0.03, 0.06]	.435	0.01	[−0.05, 0.06]	.815	220.90	58	.982	.025	.035
	Closeness	0.01	[−0.04, 0.06]	.636	0.12	[0.07, 0.17]	.000	230.70	58	.981	.026	.037
	Insecurity	−0.12	[−0.17, −0.08]	.000	−0.06	[−0.11, −0.01]	.033	293.69	58	.974	.031	.042
	Importance	0.02	[−0.03, 0.06]	.471	0.05	[0.00, 0.10]	.041	220.10	58	.980	.025	.036
Nonantagonsim	Conflict	−0.18	[−.23, −0.12]	.000	−0.22	[−0.29, −0.15]	.000	1149.55	354	.939	.023	.039
	Contact	0.03	[−0.02, 0.09]	.228	0.00	[−0.06, 0.06]	.952	1124.68	354	.937	.022	.037
	Closeness	0.03	[−0.02, 0.09]	.240	0.10	[0.04, 0.16]	.001	1114.24	354	.939	.022	.038
	Insecurity	−0.15	[−.20, −0.10]	.000	−0.10	[−0.17, −0.03]	.003	1155.59	354	.935	.023	.039
	Importance	0.03	[−0.02, 0.08]	.282	0.04	[−0.02, 0.10]	.209	1117.25	354	.935	.022	.038
Prosocial orientation	Conflict	−0.06	[−0.11, −0.02]	.009	−0.04	[−0.10, 0.01]	.121	439.37	153	.964	.021	.032
	Contact	0.04	[−0.01, 0.09]	.155	−0.01	[−0.07, 0.05]	.728	427.50	153	.964	.020	.032
	Closeness	−0.01	[−0.06, 0.04]	.644	0.08	[0.03, 0.13]	.002	462.07	153	.961	.022	.034
	Insecurity	−0.05	[−0.10, 0.00]	.039	−0.01	[−0.06, 0.05]	.813	497.02	153	.955	.023	.036
	Importance	0.03	[−0.02, 0.08]	.321	0.02	[−0.03, 0.07]	.419	445.90	153	.959	.021	.034
Conscientiousness	Conflict	−0.10	[−0.14, −0.06]	.000	−0.01	[−0.06, 0.04]	.731	232.16	59	.987	.026	.022
	Contact	0.06	[0.02, 0.10]	.005	0.02	[−0.03, 0.07]	.396	188.74	58	.990	.023	.019
	Closeness	0.02	[−0.02, 0.06]	.319	0.05	[0.01, 0.10]	.025	206.17	58	.989	.024	.021
	Insecurity	−0.08	[−0.11, −0.04]	.000	−0.01	[−0.06, 0.04]	.587	207.22	58	.988	.024	.020
	Importance	0.04	[0.00, 0.07]	.080	0.00	[−0.04, 0.05]	.934	197.42	58	.989	.023	.020
Orderliness	Conflict	−0.09	[−0.14, −0.05]	.000	−0.01	[−0.06, 0.04]	.658	796.02	153	.944	.031	.043
	Contact	0.07	[0.03, 0.12]	.002	0.05	[−0.01, 0.10]	.079	804.72	153	.943	.031	.042
	Closeness	0.04	[−0.01, 0.09]	.082	0.06	[0.01, 0.11]	.019	774.78	153	.945	.031	.041
	Insecurity	−0.07	[−0.12, −0.03]	.000	−0.01	[−0.06, 0.04]	.712	815.99	153	.941	.032	.044
	Importance	0.03	[−0.01, 0.08]	.121	0.00	[−0.05, 0.04]	.931	752.88	153	.944	.030	.041

Goal striving	Conflict	−0.05	[−0.09, 0.00]	.035	0.01	[−0.04, 0.07]	.610	289.33	59	.967	.030	.028
	Contact	0.02	[−0.03, 0.07]	.371	0.04	[−0.02, 0.09]	.162	277.32	59	.969	.029	.027
	Closeness	0.03	[−0.02, 0.07]	.278	0.06	[0.01, 0.11]	.019	285.88	59	.968	.030	.029
	Insecurity	−0.06	[−0.10, −0.01]	.010	−0.03	[−0.08, 0.02]	.213	302.88	59	.964	.031	.031
	Importance	0.02	[−0.02, 0.06]	.317	0.03	[−0.02, 0.08]	.185	259.57	58	.968	.028	.027
Dependability	Conflict	−0.06	[−0.10, −0.01]	.019	0.00	[−0.05, 0.05]	.964	317.17	102	.975	.022	.029
	Contact	0.08	[0.03, 0.13]	.001	−0.01	[−0.07, 0.04]	.663	299.40	102	.977	.021	.027
	Closeness	−0.01	[−0.06, 0.04]	.615	0.07	[0.02, 0.12]	.012	306.82	102	.976	.021	.027
	Insecurity	−0.04	[−0.09, 0.00]	.048	0.02	[−0.04, 0.07]	.494	336.40	102	.972	.023	.032
	Importance	0.02	[−0.02, 0.06]	.310	−0.01	[−0.05, 0.04]	.744	295.99	102	.976	.021	.027
					Others							
Neuroticism	Conflict	−0.01	[−0.05, 0.04]	.753	0.06	[0.00, 0.12]	.063	432.76	59	.973	.038	.038
	Contact	−0.05	[−0.09, −0.01]	.019	−0.02	[−0.08, 0.04]	.565	393.87	59	.975	.036	.035
	Closeness	−0.01	[−0.05, 0.03]	.634	−0.04	[−0.10, 0.02]	.219	397.96	59	.975	.036	.036
	Insecurity	0.12	[0.06, 0.17]	.000	0.17	[0.10, 0.23]	.000	425.69	59	.974	.038	.038
	Importance	0.01	[−0.03, 0.06]	.541	−0.02	[−0.08, 0.04]	.567	413.44	59	.974	.037	.037
Negative affect	Conflict	0.02	[−0.03, 0.07]	.458	0.06	[0.00, 0.13]	.053	1077.19	153	.899	.037	.062
	Contact	−0.05	[−0.09, −0.005]	.030	0.01	[−0.05, 0.07]	.781	1083.99	153	.898	.038	.062
	Closeness	0.02	[−0.02, 0.07]	.364	−0.04	[−0.10, 0.03]	.275	1080.49	153	.898	.037	.062
	Insecurity	0.06	[0.01, 0.11]	.031	0.13	[0.06, 0.20]	.000	1120.98	153	.898	.038	.065
	Importance	0.03	[−0.01, 0.08]	.170	−0.06	[−0.12, 0.01]	.089	1082.96	153	.898	.038	.062
Self-reproach	Conflict	−0.02	[−0.07, 0.02]	.329	0.05	[−0.01, 0.11]	.119	785.69	279	.970	.021	.029
	Contact	−0.04	[−0.08, 0.01]	.098	−0.01	[−0.06, 0.05]	.782	747.44	279	.973	.020	.027
	Closeness	−0.02	[−0.06, 0.03]	.449	−0.04	[−0.10, 0.02]	.184	735.90	279	.973	.019	.027
	Insecurity	0.13	[0.08, 0.18]	.000	0.17	[0.10, 0.24]	.000	799.95	279	.970	.021	.028
	Importance	0.00	[−0.04, 0.04]	.989	−0.02	[−0.08, 0.04]	.570	773.81	279	.971	.020	.028
Extraversion	Conflict	−0.01	[−0.06, 0.03]	.648	−0.01	[−0.06, 0.05]	.738	343.95	58	.975	.034	.030
	Contact	−0.02	[−0.06, 0.02]	.409	−0.01	[−0.06, 0.04]	.571	346.36	58	.975	.034	.030
	Closeness	0.02	[−0.02, 0.07]	.240	0.05	[−0.01, 0.10]	.092	334.33	58	.976	.033	.029
	Insecurity	−0.07	[−0.12, −0.02]	.004	−0.02	[−0.08, 0.03]	.439	346.23	58	.975	.034	.033

	Importance	0.02	[−0.02, 0.06]	.312	0.04	[−0.02, 0.09]	.171	339.99	58	.976	.034	.029
Positive affect	Conflict	−0.02	[−0.07, 0.03]	.386	−0.01	[−0.07, 0.05]	.763	387.97	102	.968	.025	.035
	Contact	−0.01	[−0.06, 0.03]	.560	0.00	[−0.05, 0.05]	.923	371.84	102	.970	.025	.033
	Closeness	0.03	[−0.02, 0.08]	.201	0.05	[−0.01, 0.10]	.125	388.77	102	.967	.026	.035
	Insecurity	−0.05	[−0.10, 0.01]	.087	0.01	[−0.05, 0.07]	.748	456.13	102	.961	.028	.047
	Importance	0.01	[−0.03, 0.06]	.563	0.05	[−0.01, 0.11]	.081	390.87	102	.967	.026	.034
Sociability	Conflict	−0.01	[−0.05, 0.04]	.797	−0.02	[−0.08, 0.03]	.408	444.30	102	.958	.028	.031
	Contact	−0.03	[−0.08, 0.01]	.163	0.00	[−0.05, 0.05]	.949	460.70	102	.956	.029	.033
	Closeness	0.03	[−0.02, 0.07]	.252	0.04	[−0.01, 0.10]	.138	431.51	102	.959	.027	.029
	Insecurity	−0.06	[−0.11, −0.01]	.019	−0.04	[−0.10, 0.02]	.169	472.88	102	.955	.029	.035
	Importance	0.01	[−0.03, 0.05]	.655	0.05	[−0.01, 0.10]	.112	437.64	102	.959	.028	.030
Activity	Conflict	0.02	[−0.02, 0.07]	.322	0.03	[−0.03, 0.08]	.310	500.32	102	.947	.030	.034
	Contact	−0.03	[−0.07, 0.02]	.202	−0.01	[−0.06, 0.04]	.584	459.55	102	.952	.029	.030
	Closeness	−0.01	[−0.06, 0.03]	.556	0.03	[−0.03, 0.08]	.330	468.60	102	.951	.029	.033
	Insecurity	0.03	[−0.02, 0.09]	.193	0.02	[−0.04, 0.07]	.552	554.18	102	.941	.032	.043
	Importance	−0.02	[−0.06, 0.03]	.510	0.03	[−0.02, 0.08]	.304	498.46	102	.947	.030	.035
Openness	Conflict	0.02	[−0.02, 0.06]	.309	0.03	[−0.01, 0.08]	.165	233.26	59	.983	.026	.028
	Contact	−0.04	[−0.08, 0.00]	.048	0.00	[−0.05, 0.05]	.930	245.49	58	.982	.027	.031
	Closeness	0.02	[−0.02, 0.07]	.316	−0.02	[−0.07, 0.03]	.376	236.80	58	.982	.027	.028
	Insecurity	0.06	[0.01, 0.11]	.023	0.08	[0.03, 0.14]	.002	251.99	58	.981	.028	.031
	Importance	0.02	[−0.03, 0.06]	.470	−0.05	[−0.10, 0.00]	.038	235.52	58	.983	.027	.028
Unconventionality	Conflict	−0.01	[−0.07, 0.04]	.653	0.03	[−0.02, 0.09]	.265	662.99	102	.891	.036	.042
	Contact	−0.07	[−0.12, −0.01]	.014	−0.05	[−0.11, 0.01]	.106	662.98	102	.892	.036	.042
	Closeness	0.01	[−0.04, 0.07]	.651	−0.06	[−0.12, 0.00]	.050	670.84	102	.889	.036	.043
	Insecurity	0.07	[0.00, 0.13]	.042	0.16	[0.10, 0.22]	.000	663.19	102	.895	.036	.042
	Importance	0.01	[−0.05, 0.06]	.802	−0.10	[−0.16, −0.04]	.001	667.17	102	.891	.036	.042
Aesthetic interest	Conflict	0.03	[−0.02, 0.08]	.229	0.05	[0.00, 0.10]	.037	241.50	59	.980	.027	.028
	Contact	−0.05	[−0.09, 0.00]	.050	0.00	[−0.05, 0.06]	.936	246.90	59	.980	.027	.028
	Closeness	0.03	[−0.02, 0.07]	.253	0.01	[−0.05, 0.06]	.782	235.98	59	.981	.026	.027
	Insecurity	0.06	[0.01, 0.12]	.021	0.09	[0.03, 0.15]	.002	238.06	59	.981	.027	.029

	Importance	0.03	[−0.02, 0.07]	.273	−0.03	[−0.08, 0.03]	.311	235.38	59	.981	.026	.027
Intellectual interest	Conflict	0.00	[−0.05, 0.05]	.948	0.02	[−0.04, 0.08]	.432	396.68	59	.934	.036	.049
	Contact	0.00	[−0.05, 0.04]	.882	0.00	[−0.05, 0.06]	.943	380.30	59	.937	.036	.048
	Closeness	0.01	[−0.04, 0.05]	.820	−0.03	[−0.08, 0.03]	.311	398.86	59	.934	.037	.049
	Insecurity	−0.01	[−0.06, 0.05]	.737	0.01	[−0.05, 0.07]	.771	383.24	59	.937	.036	.048
	Importance	0.02	[−0.03, 0.06]	.518	−0.05	[−0.11, 0.01]	.078	395.23	59	.935	.036	.049
Agreeableness	Conflict	−0.05	[−0.10, 0.00]	.046	−0.07	[−0.13, −0.02]	.012	217.14	59	.981	.025	.036
	Contact	0.04	[0.00, 0.08]	.077	0.01	[−0.05, 0.06]	.841	207.88	58	.983	.024	.035
	Closeness	0.01	[−0.03, 0.06]	.607	0.04	[−0.02, 0.10]	.149	218.12	58	.981	.025	.037
	Insecurity	−0.10	[−0.15, −0.05]	.000	−0.07	[−0.14, −0.01]	.032	260.00	58	.976	.028	.041
	Importance	0.01	[−0.03, 0.06]	.551	0.03	[−0.03, 0.09]	.298	228.94	58	.980	.026	.038
Nonantagonsim	Conflict	−0.04	[−0.09, 0.02]	.187	−0.10	[−0.16, −0.03]	.002	1102.28	354	.936	.022	.039
	Contact	0.08	[0.03, 0.13]	.002	0.01	[−0.05, 0.07]	.740	1090.08	354	.937	.022	.037
	Closeness	0.03	[−0.02, 0.08]	.207	0.05	[−0.02, 0.12]	.143	1097.97	354	.936	.022	.039
	Insecurity	−0.10	[−0.16, −0.04]	.000	−0.09	[−0.16, −0.02]	.013	1143.44	354	.933	.023	.040
	Importance	0.02	[−0.03, 0.07]	.442	0.04	[−0.03, 0.10]	.263	1114.68	354	.935	.022	.040
Prosocial orientation	Conflict	−0.02	[−0.07, 0.04]	.537	−0.05	[−0.11, 0.02]	.143	441.85	153	.960	.021	.033
	Contact	0.02	[−0.03, 0.07]	.377	0.00	[−0.06, 0.05]	.874	419.22	153	.963	.020	.032
	Closeness	−0.04	[−0.09, 0.01]	.128	0.04	[−0.02, 0.10]	.164	421.38	153	.962	.020	.033
	Insecurity	−0.02	[−0.08, 0.04]	.478	−0.01	[−0.08, 0.05]	.739	455.78	153	.959	.021	.035
	Importance	−0.02	[−0.07, 0.03]	.415	0.03	[−0.03, 0.09]	.318	429.39	153	.962	.020	.033
Conscientiousness	Conflict	−0.01	[−0.05, 0.03]	.649	−0.04	[−0.09, 0.01]	.137	236.02	59	.986	.026	.023
	Contact	0.07	[0.03, 0.11]	.001	0.04	[−0.01, 0.09]	.112	203.30	58	.989	.024	.020
	Closeness	−0.02	[−0.07, 0.02]	.259	0.05	[0.00, 0.10]	.033	194.62	58	.989	.023	.020
	Insecurity	−0.06	[−0.10, −0.02]	.009	−0.06	[−0.12, −0.01]	.017	211.01	58	.988	.025	.021
	Importance	0.01	[−0.03, 0.05]	.697	0.03	[−0.02, 0.08]	.308	205.86	58	.989	.024	.021
Orderliness	Conflict	−0.03	[−0.08, 0.01]	.174	−0.02	[−0.08, 0.03]	.457	774.77	153	.943	.031	.042
	Contact	0.05	[0.01, 0.09]	.017	0.03	[−0.02, 0.08]	.250	795.79	153	.941	.031	.042
	Closeness	−0.01	[−0.06, 0.03]	.654	0.04	[−0.01, 0.10]	.112	785.81	153	.942	.031	.042
	Insecurity	−0.07	[−0.12, −0.02]	.003	−0.04	[−0.09, 0.02]	.189	812.75	153	.940	.032	.045

	Importance	0.02	[−0.02, 0.07]	.280	0.02	[−0.04, 0.07]	.524	769.85	153	.943	.031	.041
Goal striving	Conflict	0.03	[−0.02, 0.08]	.203	0.01	[−0.05, 0.06]	.824	272.37	59	.967	.029	.028
	Contact	0.05	[0.01, 0.10]	.020	0.02	[−0.03, 0.07]	.413	294.48	59	.964	.030	.029
	Closeness	−0.03	[−0.08, 0.01]	.146	0.07	[0.01, 0.12]	.015	289.07	59	.964	.030	.029
	Insecurity	−0.08	[−0.13, −0.03]	.003	−0.05	[−0.11, 0.00]	.061	297.12	59	.963	.031	.030
	Importance	0.00	[−0.05, 0.04]	.887	0.07	[0.02, 0.13]	.006	273.03	58	.967	.029	.028
Dependability	Conflict	−0.02	[−0.07, 0.02]	.290	−0.04	[−0.10, 0.02]	.177	302.04	102	.976	.021	.027
	Contact	0.03	[−0.01, 0.08]	.175	0.07	[0.01, 0.12]	.014	302.71	102	.975	.021	.028
	Closeness	−0.03	[−0.08, 0.02]	.191	0.04	[−0.02, 0.10]	.193	288.91	102	.977	.021	.027
	Insecurity	−0.02	[−0.07, 0.04]	.555	−0.03	[−0.10, 0.03]	.280	353.86	102	.969	.024	.032
	Importance	0.00	[−0.04, 0.04]	.991	0.02	[−0.04, 0.07]	.583	294.05	102	.976	.021	.027

Note. $\gamma_{P1 \rightarrow R2}$ = effect of personality at first measurement occasion on relationship change at second measurement occasion, $\gamma_{P2 \rightarrow R3}$ = effect of personality at second measurement occasion on relationship change at third measurement occasion, CI = confidence interval of the parameter estimate.

Table A4

Cross-Lagged Relationship Effects on Personality Change from the Bivariate Latent Difference Score Models

Personality	Relationship Aspect	$\gamma_{R1 \rightarrow P2}$	95% CI	*p*-value	$\gamma_{R2 \rightarrow P3}$	95% CI	*p*-value
			Romantic Partner				
Neuroticism	Conflict	.05	[−.03, .12]	.230	.09	[−.02, .20]	.104
	Contact	−.07	[−.14, −.002]	.043	−.11	[−.26, .03]	.119
	Closeness	.02	[−.04, .08]	.599	−.08	[−.21, .04]	.178
	Insecurity	.06	[−.02, .13]	.128	.00	[−.12, .11]	.951
	Importance	−.02	[−.09, .04]	.474	−.15	[−.28, −.01]	.035
Negative affect	Conflict	.06	[−.02, .14]	.148	.10	[−.01, .20]	.087
	Contact	−.12	[−.20, −.04]	.005	.02	[−.12, .17]	.733
	Closeness	−.02	[−.09, .06]	.665	−.11	[−.22, .01]	.066
	Insecurity	.11	[.03, .19]	.008	.04	[−.06, .15]	.430
	Importance	−.02	[−.11, .07]	.656	−.18	[−.29, −.06]	.004
Self-reproach	Conflict	.05	[−.03, .12]	.200	.11	[.02, .21]	.019
	Contact	−.06	[−.14, .01]	.080	−.02	[−.14, .11]	.823
	Closeness	.03	[−.03, .09]	.344	−.08	[−.19, .03]	.169
	Insecurity	.02	[−.05, .10]	.502	.02	[−.08, .12]	.705
	Importance	−.04	[−.10, .02]	.237	−.10	[−.22, .02]	.095
Extraversion	Conflict	−.01	[−.09, .07]	.805	−.06	[−.18, .06]	.302
	Contact	.02	[−.06, .09]	.682	.00	[−.15, .16]	.963
	Closeness	−.02	[−.09, .05]	.646	.19	[.06, .32]	.005
	Insecurity	−.04	[−.12, .04]	.299	−.10	[−.21, .02]	.094
	Importance	.00	[−.08, .08]	.989	.20	[.06, .34]	.004
Positive affect	Conflict	.01	[−.07, .10]	.746	−.07	[−.19, .05]	.252
	Contact	.00	[−.08, .09]	.970	.02	[−.14, .18]	.814
	Closeness	.01	[−.07, .08]	.872	.12	[.00, .24]	.042
	Insecurity	−.04	[−.12, .05]	.400	−.01	[−.11, .10]	.879
	Importance	.02	[−.07, .11]	.617	.14	[.01, .27]	.032
Sociability	Conflict	.05	[−.05, .14]	.346	−.03	[−.14, .09]	.642
	Contact	.02	[−.08, .12]	.682	.10	[−.05, .25]	.176
	Closeness	−.03	[−.14, .07]	.518	.11	[−.03, .25]	.131
	Insecurity	.00	[−.09, .10]	.944	−.06	[−.18, .06]	.331
	Importance	−.03	[−.13, .07]	.568	.10	[−.04, .23]	.175
Activity	Conflict	.02	[−.08, .12]	.637	−.04	[−.16, .08]	.481
	Contact	.08	[−.04, .19]	.176	−.06	[−.24, .11]	.481
	Closeness	−.03	[−.14, .08]	.585	.17	[.03, .32]	.020
	Insecurity	−.04	[−.13, .06]	.420	−.13	[−.25, −.01]	.040
	Importance	−.04	[−.14, .05]	.387	.14	[−.01, .28]	.066
Openness	Conflict	.06	[−.03, .15]	.176	−.07	[−.18, .04]	.236
	Contact	.01	[−.08, .09]	.864	−.10	[−.27, .06]	.229
	Closeness	.05	[−.03, .12]	.203	.15	[−.002, .31]	.053
	Insecurity	.03	[−.06, .12]	.471	−.02	[−.16, .10]	.705
	Importance	−.08	[−.16, .01]	.076	.11	[−.05, .26]	.176

Unconventionality	Conflict	.14	[.01, .27]	.034	−.28	[−.77, .20]	.254
	Contact	−.01	[−.12, .09]	.799	−.59	[−1.32, .14]	.114
	Closeness	.01	[−.09, .12]	.791	.08	[−.27, .44]	.645
	Insecurity	.08	[−.04, .20]	.170	−.15	[−.60, .29]	.504
	Importance	−.02	[−.13, .09]	.709	−.21	[−.59, .16]	.268
Aesthetic interest	Conflict	.02	[−.07, .11]	.720	−.05	[−.16, .06]	.412
	Contact	.02	[−.08, .11]	.761	.01	[−.14, .16]	.913
	Closeness	.01	[−.07, .10]	.753	.14	[−.02, .30]	.081
	Insecurity	.00	[−.08, .08]	.988	−.04	[−.15, .07]	.439
	Importance	−.06	[−.15, .03]	.175	.12	[−.04, .28]	.135
Intellectual interest	Conflict	−.02	[−.12, .08]	.772	−.03	[−.18, .12]	.720
	Contact	.03	[−.07, .13]	.551	−.13	[−.32, .06]	.183
	Closeness	.10	[.01, .20]	.032	−.04	[−.21, .13]	.621
	Insecurity	−.05	[−.15, .06]	.365	.09	[−.06, .24]	.236
	Importance	−.06	[−.15, .04]	.246	.07	[−.10, .24]	.439
Agreeableness	Conflict	.02	[−.06, .10]	.624	−.05	[−.16, .06]	.374
	Contact	−.02	[−.10, .07]	.725	.05	[−.08, .18]	.477
	Closeness	−.02	[−.09, .05]	.653	−.01	[−.12, .10]	.855
	Insecurity	.06	[−.02, .14]	.127	−.02	[−.12, .07]	.625
	Importance	−.04	[−.12, .04]	.312	.01	[−.13, .14]	.932
Nonantagonsim	Conflict	.01	[−.09, .11]	.796	−.15	[−.28, −.02]	.028
	Contact	−.01	[−.10, .09]	.879	.05	[−.12, .21]	.553
	Closeness	.01	[−.08, .10]	.863	.03	[−.11, .16]	.709
	Insecurity	.06	[−.03, .15]	.199	−.06	[−.18, .06]	.321
	Importance	−.02	[−.11, .08]	.753	.07	[−.09, .22]	.398
Prosocial orientation	Conflict	−.02	[−.12, .08]	.680	.01	[−.11, .14]	.854
	Contact	−.03	[−.12, .07]	.606	.04	[−.13, .22]	.625
	Closeness	.00	[−.09, .08]	.984	.04	[−.10, .17]	.605
	Insecurity	.03	[−.06, .12]	.505	−.02	[−.13, .10]	.803
	Importance	.00	[−.09, .09]	.969	.04	[−.12, .19]	.637
Conscientiousness	Conflict	−.03	[−.10, .04]	.338	−.01	[−.10, .08]	.851
	Contact	.02	[−.06, .09]	.682	−.05	[−.17, .06]	.375
	Closeness	.02	[−.04, .09]	.476	.06	[−.05, .16]	.313
	Insecurity	−.02	[−.09, .05]	.571	−.05	[−.14, .04]	.283
	Importance	.01	[−.06, .07]	.786	.10	[−.01, .21]	.083
Orderliness	Conflict	.02	[−.06, .11]	.607	.03	[−.08, .13]	.608
	Contact	.02	[−.07, .10]	.724	−.03	[−.18, .11]	.659
	Closeness	.00	[−.08, .08]	.991	.04	[−.08, .17]	.493
	Insecurity	.02	[−.06, .11]	.579	.00	[−.10, .10]	.948
	Importance	−.01	[−.09, .08]	.865	.10	[−.02, .23]	.102
Goal striving	Conflict	−.07	[−.15, .01]	.081	.04	[−.07, .16]	.463
	Contact	−.02	[−.11, .06]	.563	.03	[−.12, .18]	.691
	Closeness	.02	[−.06, .10]	.666	.10	[−.03, .22]	.124
	Insecurity	−.01	[−.09, .08]	.853	−.14	[−.26, −.02]	.017
	Importance	.05	[−.04, .13]	.268	.02	[−.12, .16]	.731
Dependability	Conflict	.01	[−.07, .08]	.842	−.04	[−.15, .07]	.456
	Contact	.05	[−.03, .12]	.231	−.13	[−.27, .01]	.075

	Closeness	.07	[−.002, .14]	.057	.02	[−.12, .15]	.816
	Insecurity	−.07	[−.14, −.002]	.042	.01	[−.09, .10]	.904
	Importance	.02	[−.05, .10]	.492	.10	[−.02, .23]	.089
			Friends				
Neuroticism	Conflict	.02	[−.04, .07]	.586	.06	[−.01, .14]	.108
	Contact	−.03	[−.08, .03]	.333	−.05	[−.15, .04]	.264
	Closeness	−.04	[−.09, .01]	.126	−.06	[−.14, .02]	.167
	Insecurity	.04	[−.02, .09]	.211	.07	[−.01, .15]	.077
	Importance	−.04	[−.10, .01]	.123	−.03	[−.11, .04]	.417
Negative affect	Conflict	.01	[−.05, .07]	.763	.09	[.02, .16]	.018
	Contact	−.02	[−.07, .04]	.609	−.10	[−.18, −.01]	.026
	Closeness	−.03	[−.09, .03]	.328	−.05	[−.12, .02]	.180
	Insecurity	.07	[.01, .13]	.024	.14	[.07, .21]	.000
	Importance	−.01	[−.07, .04]	.666	−.07	[−.14, .01]	.076
Self-reproach	Conflict	.03	[−.02, .08]	.292	.05	[−.02, .12]	.159
	Contact	−.02	[−.07, .04]	.545	−.02	[−.11, .06]	.609
	Closeness	−.03	[−.08, .03]	.306	−.03	[−.10, .05]	.479
	Insecurity	.02	[−.03, .08]	.399	.07	[−.01, .14]	.082
	Importance	−.05	[−.10, .01]	.108	−.01	[−.08, .06]	.780
Extraversion	Conflict	−.04	[−.10, .01]	.116	.03	[−.06, .11]	.562
	Contact	.02	[−.04, .08]	.493	.02	[−.09, .12]	.778
	Closeness	.05	[−.01, .10]	.104	.04	[−.05, .14]	.342
	Insecurity	−.02	[−.08, .03]	.425	−.07	[−.16, .02]	.104
	Importance	.03	[−.03, .08]	.336	.08	[−.01, .16]	.069
Positive affect	Conflict	−.04	[−.10, .03]	.256	−.01	[−.09, .07]	.744
	Contact	.01	[−.05, .08]	.727	.00	[−.09, .10]	.977
	Closeness	.05	[−.01, .11]	.127	.09	[.01, .17]	.035
	Insecurity	−.04	[−.11, .02]	.159	−.05	[−.13, .03]	.232
	Importance	.04	[−.03, .10]	.285	.06	[−.02, .14]	.160
Sociability	Conflict	−.05	[−.12, .01]	.117	.01	[−.08, .10]	.856
	Contact	.00	[−.07, .07]	.932	−.05	[−.15, .06]	.367
	Closeness	.01	[−.06, .08]	.783	.00	[−.09, .10]	.994
	Insecurity	.00	[−.07, .07]	.989	−.04	[−.13, .05]	.420
	Importance	−.02	[−.09, .05]	.615	.03	[−.06, .12]	.464
Activity	Conflict	.01	[−.06, .08]	.689	.01	[−.09, .10]	.911
	Contact	.02	[−.06, .09]	.624	.08	[−.04, .19]	.201
	Closeness	.01	[−.06, .09]	.735	.08	[−.02, .18]	.101
	Insecurity	.03	[−.04, .10]	.469	−.05	[−.14, .04]	.306
	Importance	−.02	[−.09, .05]	.625	.10	[−.001, .19]	.053
Openness	Conflict	.01	[−.06, .07]	.815	.05	[−.04, .13]	.293
	Contact	−.02	[−.09, .04]	.485	.02	[−.08, .13]	.667
	Closeness	.03	[−.04, .10]	.451	.09	[.00, .18]	.051
	Insecurity	.01	[−.06, .07]	.806	−.04	[−.12, .05]	.387
	Importance	.00	[−.06, .07]	.920	.05	[−.04, .14]	.308
Unconventionality	Conflict	.05	[−.04, .13]	.269	.01	[−.21, .23]	.948
	Contact	−.03	[−.11, .06]	.509	.05	[−.20, .31]	.681
	Closeness	−.01	[−.10, .09]	.902	.27	[−.14, .69]	.201

	Insecurity	.03	[−.05, .12]	.432	−.06	[−.27, .15]	.575
	Importance	−.03	[−.12, .06]	.501	.24	[−.10, .58]	.174
Aesthetic interest	Conflict	.04	[−.03, .10]	.315	.06	[−.02, .14]	.149
	Contact	−.02	[−.08, .05]	.663	.03	[−.07, .13]	.550
	Closeness	.03	[−.04, .11]	.390	.05	[−.04, .14]	.278
	Insecurity	.00	[−.06, .07]	.966	−.05	[−.14, .03]	.195
	Importance	.04	[−.04, .11]	.336	.04	[−.04, .13]	.332
Intellectual interest	Conflict	−.02	[−.09, .05]	.593	.05	[−.06, .16]	.371
	Contact	.00	[−.07, .08]	.921	.02	[−.12, .16]	.798
	Closeness	.06	[−.02, .13]	.140	.00	[−.11, .12]	.948
	Insecurity	−.03	[−.10, .04]	.355	.02	[−.08, .12]	.708
	Importance	.02	[−.05, .09]	.599	.03	[−.08, .14]	.579
Agreeableness	Conflict	.07	[.004, .13]	.038	−.04	[−.12, .04]	.327
	Contact	.00	[−.06, .06]	.976	−.09	[−.19, .00]	.060
	Closeness	.02	[−.04, .09]	.452	.02	[−.06, .11]	.578
	Insecurity	.01	[−.05, .07]	.729	−.03	[−.11, .04]	.396
	Importance	.00	[−.06, .06]	.983	.00	[−.08, .08]	.998
Nonantagonsim	Conflict	.09	[.01, .17]	.023	−.03	[−.13, .06]	.507
	Contact	.03	[−.04, .10]	.377	−.10	[−.21, .01]	.080
	Closeness	.01	[−.06, .08]	.749	.04	[−.06, .13]	.481
	Insecurity	−.02	[−.08, .05]	.617	−.05	[−.14, .04]	.271
	Importance	−.04	[−.11, .03]	.239	−.04	[−.13, .06]	.453
Prosocial orientation	Conflict	.04	[−.04, .10]	.337	−.08	[−.17, .02]	.110
	Contact	−.05	[−.12, .02]	.170	−.01	[−.13, .10]	.807
	Closeness	.04	[−.03, .12]	.233	.02	[−.08, .11]	.742
	Insecurity	−.01	[−.07, .06]	.870	−.01	[−.10, .07]	.767
	Importance	−.01	[−.08, .07]	.898	.03	[−.07, .13]	.506
Conscientiousness	Conflict	−.08	[−.13, −.02]	.005	−.03	[−.10, .05]	.483
	Contact	−.04	[−.10, .01]	.109	.06	[−.02, .14]	.116
	Closeness	.05	[−.005, .10]	.077	.02	[−.05, .09]	.538
	Insecurity	−.02	[−.07, .03]	.472	−.07	[−.13, .00]	.044
	Importance	.04	[−.02, .09]	.206	.04	[−.03, .11]	.276
Orderliness	Conflict	−.05	[−.11, .02]	.141	−.05	[−.12, .03]	.241
	Contact	−.04	[−.10, .02]	.210	.04	[−.05, .14]	.354
	Closeness	−.01	[−.07, .05]	.838	.04	[−.04, .11]	.368
	Insecurity	.01	[−.06, .07]	.837	−.03	[−.10, .04]	.454
	Importance	−.03	[−.10, .03]	.273	.04	[−.03, .12]	.275
Goal striving	Conflict	−.07	[−.14, −.01]	.025	.00	[−.09, .08]	.972
	Contact	−.04	[−.11, .02]	.167	.13	[.03, .23]	.009
	Closeness	.10	[.04, .17]	.001	−.02	[−.10, .07]	.697
	Insecurity	.00	[−.06, .06]	.934	−.11	[−.19, −.02]	.012
	Importance	.08	[.02, .15]	.008	.02	[−.07, .10]	.727
Dependability	Conflict	−.06	[−.12, .00]	.044	−.01	[−.09, .07]	.826
	Contact	−.02	[−.08, .03]	.367	.02	[−.07, .10]	.706
	Closeness	.05	[−.01, .10]	.103	.04	[−.04, .11]	.334
	Insecurity	−.02	[−.07, .03]	.437	−.06	[−.13, .02]	.132
	Importance	.06	[.002, .12]	.044	.03	[−.05, .11]	.420

		All kin					
Neuroticism	Conflict	.02	[−.03, .07]	.368	.04	[−.04, .12]	.315
	Contact	−.02	[−.08, .03]	.434	−.03	[−.12, .07]	.568
	Closeness	−.04	[−.09, .01]	.089	−.03	[−.10, .05]	.454
	Insecurity	.04	[−.01, .10]	.115	.10	[.02, .18]	.017
	Importance	−.04	[−.09, .01]	.113	−.02	[−.09, .06]	.670
Negative affect	Conflict	.04	[−.02, .10]	.187	.06	[−.01, .13]	.102
	Contact	−.06	[−.12, .00]	.060	−.02	[−.11, .07]	.666
	Closeness	−.05	[−.11, .00]	.060	−.04	[−.12, .03]	.265
	Insecurity	.07	[.02, .13]	.012	.13	[.06, .21]	.000
	Importance	−.03	[−.09, .03]	.354	−.07	[−.14, .00]	.044
Self-reproach	Conflict	.02	[−.04, .07]	.580	.02	[−.05, .09]	.580
	Contact	−.02	[−.07, .04]	.595	.02	[−.06, .11]	.596
	Closeness	−.04	[−.10, .01]	.107	−.03	[−.10, .04]	.388
	Insecurity	.03	[−.02, .09]	.248	.10	[.03, .17]	.007
	Importance	−.04	[−.10, .01]	.098	−.02	[−.08, .05]	.622
Extraversion	Conflict	−.02	[−.07, .04]	.565	.00	[−.08, .08]	.969
	Contact	.03	[−.03, .09]	.298	.02	[−.08, .12]	.716
	Closeness	.06	[0.00, .11]	.057	.06	[−.02, .15]	.159
	Insecurity	−.01	[−.06, .05]	.836	−.11	[−.20, −.03]	.010
	Importance	.05	[−.01, .11]	.110	.08	[.04, .16]	.039
Positive affect	Conflict	.00	[−.06, .06]	.950	−.05	[−.13, .03]	.208
	Contact	.05	[−.01, .11]	.102	−.04	[−.14, .05]	.382
	Closeness	.04	[−.02, .11]	.201	.02	[−.06, .10]	.585
	Insecurity	−.01	[−.08, .05]	.655	−.08	[−.16, .00]	.044
	Importance	.02	[−.05, .08]	.646	.07	[−.01, .14]	.073
Sociability	Conflict	−.02	[−.08, .05]	.632	.03	[−.06, .11]	.516
	Contact	.02	[−.05, .09]	.617	−.01	[−.11, .09]	.851
	Closeness	.07	[.005, .14]	.035	−.02	[−.11, .06]	.584
	Insecurity	−.02	[−.08, .04]	.562	−.06	[−.15, .03]	.223
	Importance	.08	[.01, .16]	.024	.01	[−.07, .09]	.862
Activity	Conflict	−.01	[−.08, .06]	.824	−.02	[−.12, .07]	.610
	Contact	.00	[−.08, .07]	.934	.01	[−.11, .12]	.921
	Closeness	.01	[−.06, .08]	.832	.08	[−.01, .17]	.084
	Insecurity	.00	[−.07, .07]	.955	−.04	[−.13, .06]	.452
	Importance	.02	[−.04, .09]	.497	.08	[−.01, .16]	.071
Openness	Conflict	−.02	[−.08, .04]	.545	.01	[−.07, .10]	.794
	Contact	−.04	[−.11, .02]	.212	.03	[−.08, .15]	.581
	Closeness	.02	[−.05, .09]	.509	.07	[−.02, .16]	.106
	Insecurity	.01	[−.05, .08]	.722	−.02	[−.11, .06]	.585
	Importance	.05	[−.03, .12]	.210	.05	[−.04, .13]	.254
Unconventionality	Conflict	.01	[−.08, .10]	.792	.04	[−.18, .26]	.749
	Contact	−.08	[−.18, .02]	.106	.47	[−.83, 1.78]	.476
	Closeness	.00	[−.09, .10]	.938	.15	[−.17, .47]	.354
	Insecurity	.04	[−.05, .13]	.403	−.14	[−.46, .19]	.406
	Importance	.00	[−.09, .10]	.946	.18	[−.14, .51]	.274
Aesthetic interest	Conflict	−.03	[−.10, .03]	.326	.00	[−.08, .08]	.969

	Contact	−.04	[−.11, .03]	.287	−.04	[−.15, .07]	.441
	Closeness	.03	[−.04, .10]	.418	.05	[−.03, .14]	.191
	Insecurity	.01	[−.06, .08]	.803	−.06	[−.13, .02]	.124
	Importance	.04	[−.03, .12]	.230	−.01	[−.09, .06]	.705
Intellectual interest	Conflict	−.01	[−.08, .06]	.783	.11	[.00, .22]	.055
	Contact	−.04	[−.11, .03]	.242	.03	[−.10, .17]	.630
	Closeness	.01	[−.06, .08]	.785	.04	[−.08, .14]	.535
	Insecurity	.03	[−.04, .11]	.374	.07	[−.03, .18]	.164
	Importance	.00	[−.07, .07]	.978	.03	[−.08, .14]	.575
Agreeableness	Conflict	.01	[−.05, .07]	.723	−.03	[−.11, .05]	.412
	Contact	.00	[−.06, .06]	.952	−.06	[−.14, .03]	.213
	Closeness	.02	[−.04, .08]	.526	−.02	[−.09, .06]	.669
	Insecurity	.03	[−.03, .10]	.262	−.04	[−.11, .04]	.382
	Importance	.06	[.00, .12]	.048	.00	[−.08, .08]	.982
Nonantagonsim	Conflict	−.02	[−.10, .06]	.619	−.04	[−.15, .07]	.489
	Contact	.00	[−.07, .07]	.990	−.05	[−.16, .06]	.368
	Closeness	.02	[−.05, .10]	.543	−.02	[−.12, .08]	.689
	Insecurity	.03	[−.05, .10]	.481	−.08	[−.18, .02]	.100
	Importance	.07	[−.01, .15]	.083	.01	[−.09, .11]	.783
Prosocial orientation	Conflict	.01	[−.06, .08]	.826	−.07	[−.17, .02]	.146
	Contact	.02	[−.05, .08]	.612	−.09	[−.20, .02]	.094
	Closeness	.03	[−.04, .10]	.407	−.03	[−.12, .06]	.531
	Insecurity	.03	[−.03, .10]	.342	.02	[−.08, .11]	.726
	Importance	.04	[−.03, .11]	.307	−.05	[−.15, .04]	.291
Conscientiousness	Conflict	.01	[−.04, .07]	.606	−.02	[−.10, .05]	.500
	Contact	.02	[−.03, .08]	.461	.02	[−.07, .11]	.628
	Closeness	.00	[−.06, .05]	.897	.04	[−.03, .11]	.257
	Insecurity	−.02	[−.08, .03]	.368	−.07	[−.14, −.01]	.036
	Importance	.00	[−.06, .05]	.940	−.01	[−.08, .05]	.745
Orderliness	Conflict	.04	[−.02, .10]	.234	−.01	[−.08, .07]	.883
	Contact	.01	[−.06, .08]	.757	.06	[−.03, .16]	.205
	Closeness	−.02	[−.09, .04]	.513	.02	[−.06, .10]	.606
	Insecurity	.00	[−.07, .07]	.998	−.04	[−.11, .04]	.372
	Importance	.00	[−.06, .07]	.931	−.03	[−.10, .04]	.428
Goal striving	Conflict	.02	[−.04, .08]	.409	−.03	[−.11, .06]	.553
	Contact	.03	[−.03, .10]	.327	.00	[−.12, .11]	.948
	Closeness	.01	[−.05, .07]	.745	.03	[−.06, .12]	.513
	Insecurity	−.02	[−.08, .04]	.459	−.03	[−.12, .06]	.517
	Importance	−.04	[−.10, .02]	.232	.00	[−.09, .09]	.974
Dependability	Conflict	.00	[−.05, .06]	.919	−.08	[−.16, .00]	.042
	Contact	−.02	[−.07, .04]	.513	−.03	[−.13, .06]	.478
	Closeness	−.02	[−.07, .04]	.584	.07	[−.01, .14]	.077
	Insecurity	−.01	[−.06, .04]	.596	−.06	[−.14, .01]	.104
	Importance	.01	[−.05, .07]	.723	.00	[−.07, .08]	.941
			Others				
Neuroticism	Conflict	.04	[−.02, .11]	.221	.03	[−.07, .13]	.504
	Contact	.00	[−.07, .07]	.996	.09	[−.03, .21]	.136

	Closeness	−.02	[−.09, .05]	.576	−.02	[−.12, .08]	.740
	Insecurity	.01	[−.06, .08]	.723	.07	[−.03, .16]	.185
	Importance	−.01	[−.08, .06]	.774	.00	[−.10, .10]	1.000
Negative affect	Conflict	.05	[−.02, .13]	.152	.07	[−.02, .16]	.117
	Contact	−.01	[−.08, .07]	.837	.04	[−.06, .14]	.456
	Closeness	.00	[−.08, .07]	.921	−.10	[−.19, −.01]	.031
	Insecurity	.07	[−.01, .15]	.055	.12	[.03, .21]	.008
	Importance	−.01	[−.09, .06]	.764	−.04	[−.12, .05]	.426
Self-reproach	Conflict	.02	[−.04, .09]	.486	.03	[−.06, .12]	.506
	Contact	.00	[−.07, .07]	.925	.02	[−.09, .13]	.686
	Closeness	.00	[−.07, .06]	.905	.05	[−.04, .14]	.279
	Insecurity	−.02	[−.09, .05]	.582	.10	[.01, .19]	.024
	Importance	−.01	[−.08, .06]	.720	.05	[−.04, .14]	.273
Extraversion	Conflict	.01	[−.06, .08]	.713	−.04	[−.14, .06]	.474
	Contact	.01	[−.07, .08]	.858	.04	[−.08, .16]	.512
	Closeness	−.04	[−.11, .03]	.257	.02	[−.09, .13]	.729
	Insecurity	.05	[−.02, .12]	.201	−.14	[−.23, −.04]	.004
	Importance	−.01	[−.08, .06]	.839	.00	[−.10, .10]	.974
Positive affect	Conflict	−.04	[−.12, .03]	.258	.04	[−.05, .13]	.392
	Contact	.06	[−.02, .14]	.146	−.02	[−.13, .09]	.765
	Closeness	−.02	[−.10, .06]	.671	.04	[−.05, .14]	.376
	Insecurity	−.02	[−.09, .06]	.703	−.03	[−.12, .06]	.551
	Importance	−.02	[−.10, .06]	.638	−.01	[−.10, .09]	.863
Sociability	Conflict	.03	[−.06, .11]	.534	−.09	[−.19, .02]	.103
	Contact	−.01	[−.10, .08]	.843	.11	[−.01, .23]	.077
	Closeness	−.08	[−.17, .01]	.070	.03	[−.08, .14]	.646
	Insecurity	.03	[−.05, .12]	.466	−.09	[−.19, .01]	.068
	Importance	.02	[−.07, .10]	.674	.00	[−.11, .11]	.993
Activity	Conflict	.07	[−.02, .17]	.124	.04	[−.08, .16]	.490
	Contact	−.02	[−.12, .07]	.619	.12	[−.02, .25]	.088
	Closeness	.00	[−.10, .09]	.987	−.06	[−.18, .06]	.292
	Insecurity	.11	[.01, .20]	.026	−.14	[−.25, −.04]	.009
	Importance	−.04	[−.13, .05]	.400	−.06	[−.18, .05]	.294
Openness	Conflict	−.03	[−.11, .06]	.519	−.02	[−.12, .09]	.781
	Contact	−.01	[−.10, .08]	.763	−.01	[−.14, .11]	.855
	Closeness	.03	[−.05, .12]	.445	.13	[.02, .24]	.016
	Insecurity	−.07	[−.15, .02]	.128	.02	[−.08, .12]	.672
	Importance	.02	[−.07, .10]	.675	.10	[−.01, .21]	.066
Unconventionality	Conflict	.03	[−.08, .15]	.562	−.06	[−.36, .24]	.684
	Contact	−.05	[−.16, .06]	.361	.30	[−.20, .79]	.239
	Closeness	−.04	[−.16, .08]	.487	.22	[−.23, .66]	.339
	Insecurity	.01	[−.11, .13]	.912	.02	[−.25, .29]	.881
	Importance	−.03	[−.14, .08]	.588	.01	[−.29, .31]	.954
Aesthetic interest	Conflict	−.02	[−.10, .07]	.697	.02	[−.08, .12]	.724
	Contact	.03	[−.06, .13]	.474	−.04	[−.16, .08]	.498
	Closeness	.02	[−.06, .11]	.615	.02	[−.08, .13]	.652
	Insecurity	−.05	[−.14, .04]	.314	−.01	[−.10, .09]	.874

	Importance	−.01	[−.10, .08]	.812	.03	[−.07, .14]	.506
Intellectual interest	Conflict	−.01	[−.10, .08]	.854	−.04	[−.19, .10]	.550
	Contact	−.04	[−.14, .06]	.412	−.04	[−.20, .13]	.653
	Closeness	.06	[−.04, .16]	.220	.16	[.03, .29]	.014
	Insecurity	−.10	[−.19, −.01]	.035	.01	[−.12, .13]	.897
	Importance	.01	[−.08, .11]	.793	.17	[.04, .31]	.014
Agreeableness	Conflict	.02	[−.06, .09]	.619	−.04	[−.14, .06]	.426
	Contact	.04	[−.04, .12]	.287	.01	[−.10, .12]	.906
	Closeness	−.01	[−.09, .06]	.762	.03	[−.07, .12]	.545
	Insecurity	.06	[−.02, .14]	.149	−.09	[−.18, .001]	.053
	Importance	−.04	[−.12, .04]	.287	.04	[−.05, .14]	.371
Nonantagonsim	Conflict	.02	[−.07, .11]	.620	−.04	[−.15, .08]	.535
	Contact	.01	[−.08, .10]	.779	.00	[−.14, .13]	.982
	Closeness	−.04	[−.12, .05]	.404	.04	[−.07, .15]	.463
	Insecurity	.05	[−.04, .14]	.260	−.11	[−.22, 0.00]	.044
	Importance	−.04	[−.13, .05]	.424	.06	[−.05, .17]	.298
Prosocial orientation	Conflict	.02	[−.06, .10]	.633	−.07	[−.19, .04]	.206
	Contact	.09	[.01, .18]	.037	.00	[−.13, .14]	.948
	Closeness	−.01	[−.10, .07]	.808	.02	[−.10, .13]	.805
	Insecurity	.03	[−.06, .12]	.518	−.05	[−.17, .07]	.430
	Importance	−.07	[−.16, .02]	.110	.02	[−.10, .13]	.780
Conscientiousness	Conflict	−.03	[−.09, .04]	.373	.03	[−.05, .11]	.495
	Contact	.04	[−.03, .10]	.276	.00	[−.09, .09]	.973
	Closeness	−.02	[−.09, .05]	.533	−.01	[−.09, .07]	.793
	Insecurity	−.06	[−.13, .01]	.102	−.02	[−.10, .06]	.587
	Importance	−.02	[−.10, .04]	.480	.02	[−.06, .10]	.629
Orderliness	Conflict	−.03	[−.12, .05]	.482	−.01	[−.10, .09]	.853
	Contact	.02	[−.06, .11]	.565	.04	[−.07, .14]	.497
	Closeness	−.02	[−.11, .06]	.573	.02	[−.08, .11]	.715
	Insecurity	−.03	[−.12, .05]	.464	−.01	[−.10, .08]	.797
	Importance	−.02	[−.11, .07]	.632	−.01	[−.11, .09]	.839
Goal striving	Conflict	−.06	[−.14, .02]	.116	.07	[−.03, .18]	.165
	Contact	.02	[−.07, .10]	.686	−.02	[−.13, .10]	.769
	Closeness	−.01	[−.10, .08]	.817	.00	[−.10, .10]	.976
	Insecurity	−.05	[−.13, .03]	.235	−.04	[−.14, .06]	.424
	Importance	.01	[−.07, .09]	.834	.05	[−.05, .15]	.361
Dependability	Conflict	.00	[−.07, .07]	.986	−.02	[−.10, .07]	.740
	Contact	.02	[−.04, .09]	.485	.00	[−.11, .10]	.968
	Closeness	.00	[−.07, .07]	.934	.04	[−.06, .14]	.456
	Insecurity	−.04	[−.11, .03]	.232	−.04	[−.14, .06]	.403
	Importance	−.03	[−.10, .04]	.431	.08	[−.02, .18]	.107

Note. $\gamma_{R1 \rightarrow P2}$ = effect of relationship characteristic at first measurement occasion on personality change at second measurement occasion, $\gamma_{R2 \rightarrow P3}$ = effect of relationship characteristic at second measurement occasion on personality change at third measurement occasion, CI = confidence interval of parameter estimate.

Table A5

Change-Change Effects

Personality	Relationship Aspect	PC → RC	95% CI	*p*-value	RC → PC	95% CI	*p*-value
			Romantic Partner				
Neuroticism	Conflict	−.04	[−.11, .04]	.317	−.06	[−.19, .07]	.364
	Contact	.05	[−.02, .12]	.182	.08	[−.07, .24]	.295
	Closeness	.05	[−.01, .12]	.119	.03	[−.11, .17]	.682
	Insecurity	−.05	[−.12, .03]	.209	.03	[−.08, .14]	.555
	Importance	.04	[−.02, .10]	.233	.13	[−.02, .28]	.080
Negative affect	Conflict	−.04	[−.12, .04]	.326	−.07	[−.18, .04]	.230
	Contact	.04	[−.04, .12]	.301	−.08	[−.23, .08]	.327
	Closeness	.06	[−.01, .14]	.111	.05	[−.08, .18]	.462
	Insecurity	−.04	[−.12, .03]	.271	.03	[−.08, .13]	.593
	Importance	.05	[−.02, .13]	.177	.13	[.00, .26]	.049
Self-reproach	Conflict	−.01	[−.09, .06]	.709	−.05	[−.17, .06]	.347
	Contact	.04	[−.04, .11]	.335	−.01	[−.15, .13]	.892
	Closeness	.01	[−.06, .07]	.799	.04	[−.10, .18]	.564
	Insecurity	−.04	[−.11, .04]	.335	.02	[−.08, .12]	.748
	Importance	.02	[−.04, .08]	.519	.13	[.00, .27]	.054
Extraversion	Conflict	−.08	[−.15, .00]	.049	.08	[−.05, .22]	.210
	Contact	.08	[.01, .14]	.032	.06	[−.11, .22]	.483
	Closeness	.04	[−.03, .10]	.249	−.10	[−.24, .05]	.185
	Insecurity	−.03	[−.10, .04]	.403	−.01	[−.12, .11]	.934
	Importance	.03	[−.03, .10]	.338	−.13	[−.28, .02]	.078
Positive affect	Conflict	−.08	[−.16, .01]	.082	.04	[−.09, .17]	.523
	Contact	.09	[.005, .17]	.038	.01	[−.14, .17]	.871
	Closeness	.06	[−.02, .14]	.125	−.10	[−.23, .02]	.115
	Insecurity	−.04	[−.12, .04]	.373	.04	[−.07, .15]	.508
	Importance	.09	[.01, .16]	.023	−.14	[−.28, .00]	.047
Sociability	Conflict	−.08	[−.18, .01]	.080	.10	[−.03, .23]	.142
	Contact	.04	[−.04, .12]	.334	−.10	[−.26, .05]	.200
	Closeness	.01	[−.07, .10]	.759	−.04	[−.19, .11]	.594
	Insecurity	−.03	[−.11, .05]	.473	−.07	[−.19, .05]	.255
	Importance	.01	[−.08, .10]	.791	−.07	[−.21, .08]	.364
Activity	Conflict	−.11	[−.20, −.01]	.026	.03	[−.10, .16]	.609
	Contact	.02	[−.07, .11]	.674	.07	[−.11, .25]	.427
	Closeness	.02	[−.06, .10]	.616	−.15	[−.30, .01]	.068
	Insecurity	.01	[−.08, .10]	.888	.02	[−.11, .15]	.732
	Importance	.00	[−.08, .09]	.929	−.09	[−.25, .07]	.288
Openness	Conflict	.02	[−.07, .11]	.660	−.01	[−.15, .12]	.844
	Contact	−.06	[−.14, .02]	.131	.11	[−.06, .28]	.216
	Closeness	−.03	[−.11, .05]	.512	−.14	[−.31, .04]	.125
	Insecurity	.02	[−.07, .10]	.722	.05	[−.08, .19]	.433
	Importance	−.03	[−.12, .06]	.491	−.15	[−.32, .02]	.084

Unconventionality	Conflict	.05	[−.07, .16]	.432	.09	[−.30, .48]	.645
	Contact	−.06	[−.16, .04]	.250	.51	[−.20, 1.23]	.158
	Closeness	.06	[−.03, .15]	.196	−.12	[−.49, .25]	.521
	Insecurity	.02	[−.09, .14]	.664	.22	[−.27, .70]	.381
	Importance	.02	[−.07, .11]	.681	.20	[−.19, .59]	.306
Aesthetic interest	Conflict	.03	[−.06, .12]	.510	.00	[−.12, .12]	.958
	Contact	.00	[−.08, .08]	.996	−.02	[−.18, .14]	.842
	Closeness	.02	[−.06, .09]	.711	−.16	[−.35, .03]	.099
	Insecurity	−.03	[−.11, .05]	.454	.05	[−.08, .18]	.424
	Importance	−.03	[−.11, .05]	.465	−.18	[−.36, .00]	.047
Intellectual interest	Conflict	−.07	[−.17, .03]	.189	.05	[−.12, .22]	.583
	Contact	−.05	[−.15, .05]	.310	.14	[−.07, .34]	.196
	Closeness	−.07	[−.17, .03]	.169	.07	[−.12, .26]	.488
	Insecurity	.02	[−.07, .12]	.637	−.02	[−.19, .15]	.800
	Importance	−.02	[−.13, .08]	.653	−.10	[−.28, .09]	.305
Agreeableness	Conflict	.01	[−.07, .09]	.794	.04	[−.09, .17]	.529
	Contact	.02	[−.05, .10]	.534	−.11	[−.24, .03]	.131
	Closeness	.01	[−.06, .08]	.775	−.06	[−.20, .08]	.387
	Insecurity	.03	[−.05, .10]	.446	.11	[−.001, .22]	.052
	Importance	.02	[−.05, .08]	.635	−.06	[−.22, .10]	.478
Nonantagonsim	Conflict	.00	[−.10, .10]	.965	.14	[−.01, .29]	.061
	Contact	.03	[−.06, .12]	.499	−.09	[−.27, .09]	.321
	Closeness	.04	[−.04, .13]	.333	−.10	[−.27, .06]	.228
	Insecurity	.04	[−.05, .13]	.384	.08	[−.06, .23]	.268
	Importance	.06	[−.04, .15]	.247	−.13	[−.30, .04]	.141
Prosocial orientation	Conflict	.03	[−.06, .12]	.528	−.02	[−.17, .12]	.751
	Contact	.01	[−.08, .09]	.914	−.08	[−.25, .09]	.351
	Closeness	−.07	[−.15, .01]	.099	−.07	[−.22, .07]	.339
	Insecurity	.07	[−.02, .16]	.131	.15	[.03, .28]	.013
	Importance	−.03	[−.11, .05]	.421	−.06	[−.24, .11]	.495
Conscientiousness	Conflict	−.01	[−.07, .06]	.835	.00	[−.10, .10]	.938
	Contact	.01	[−.05, .07]	.766	.03	[−.10, .16]	.662
	Closeness	.00	[−.06, .06]	.978	−.08	[−.20, .04]	.169
	Insecurity	−.06	[−.12, .01]	.070	.01	[−.09, .11]	.822
	Importance	−.04	[−.09, .02]	.204	−.15	[−.28, −.02]	.019
Orderliness	Conflict	.02	[−.06, .10]	.569	−.04	[−.16, .07]	.463
	Contact	.05	[−.03, .12]	.211	.02	[−.14, .17]	.824
	Closeness	.00	[−.07, .07]	.973	−.07	[−.22, .07]	.328
	Insecurity	−.05	[−.12, .03]	.210	−.01	[−.13, .10]	.826
	Importance	−.07	[−.14, −.01]	.035	−.13	[−.28, .01]	.066
Goal striving	Conflict	−.02	[−.11, .06]	.555	−.05	[−.18, .08]	.453
	Contact	.03	[−.04, .11]	.385	.01	[−.15, .16]	.943
	Closeness	.01	[−.07, .08]	.898	−.01	[−.14, .12]	.870
	Insecurity	−.08	[−.16, .00]	.043	.04	[−.08, .16]	.555
	Importance	.02	[−.05, .09]	.543	.03	[−.12, .17]	.715
Dependability	Conflict	−.04	[−.11, .04]	.347	.05	[−.06, .16]	.377
	Contact	−.03	[−.10, .03]	.331	.07	[−.08, .21]	.382

	Closeness	−.01	[−.07, .06]	.878	−.10	[−.23, .04]	.156
	Insecurity	−.02	[−.10, .05]	.504	.03	[−.07, .14]	.547
	Importance	−.01	[−.07, .06]	.842	−.20	[−.33, −.08]	.002
			Friends				
Neuroticism	Conflict	−.02	[−.08, .04]	.555	−.03	[−.12, .05]	.415
	Contact	.04	[−.02, .10]	.149	.06	[−.03, .15]	.179
	Closeness	−.02	[−.07, .04]	.606	.00	[−.09, .08]	.933
	Insecurity	−.03	[−.09, .03]	.288	.01	[−.08, .09]	.879
	Importance	−.03	[−.09, .03]	.347	.05	[−.02, .13]	.180
Negative affect	Conflict	−.02	[−.09, .04]	.512	−.03	[−.11, .04]	.385
	Contact	.04	[−.03, .11]	.241	.05	[−.03, .13]	.216
	Closeness	.00	[−.06, .07]	.908	.00	[−.08, .07]	.955
	Insecurity	−.04	[−.10, .03]	.305	−.04	[−.12, .03]	.228
	Importance	−.02	[−.09, .05]	.614	.05	[−.02, .13]	.191
Self-reproach	Conflict	−.01	[−.06, .06]	.875	.00	[−.07, .08]	.941
	Contact	.04	[−.02, .10]	.154	.02	[−.06, .11]	.570
	Closeness	−.03	[−.09, .03]	.302	−.03	[−.11, .04]	.398
	Insecurity	−.01	[−.07, .05]	.792	.01	[−.06, .09]	.717
	Importance	−.03	[−.09, .02]	.266	.00	[−.07, .07]	.981
Extraversion	Conflict	.00	[−.06, .06]	.995	−.01	[−.10, .07]	.763
	Contact	−.02	[−.08, .04]	.529	−.05	[−.15, .05]	.310
	Closeness	−.02	[−.08, .04]	.508	−.06	[−.15, .04]	.247
	Insecurity	−.04	[−.10, .02]	.181	.04	[−.04, .13]	.341
	Importance	−.01	[−.08, .05]	.662	−.08	[−.17, .01]	.083
Positive affect	Conflict	−.02	[−.08, .05]	.664	.04	[−.04, .12]	.352
	Contact	.00	[−.07, .07]	.957	−.03	[−.12, .06]	.469
	Closeness	−.04	[−.11, .04]	.342	−.03	[−.11, .06]	.528
	Insecurity	−.05	[−.12, .01]	.108	.01	[−.07, .09]	.771
	Importance	−.04	[−.11, .03]	.304	−.04	[−.12, .04]	.330
Sociability	Conflict	.04	[−.03, .11]	.238	−.06	[−.15, .03]	.198
	Contact	−.04	[−.12, .03]	.257	.00	[−.10, .10]	.966
	Closeness	−.03	[−.10, .05]	.468	−.03	[−.13, .06]	.492
	Insecurity	−.02	[−.09, .05]	.561	.00	[−.09, .09]	.993
	Importance	−.02	[−.10, .06]	.621	−.05	[−.14, .05]	.345
Activity	Conflict	−.02	[−.10, .05]	.540	.01	[−.08, .11]	.780
	Contact	.00	[−.07, .07]	.934	−.09	[−.20, .02]	.099
	Closeness	.04	[−.04, .11]	.369	−.08	[−.18, .02]	.118
	Insecurity	−.07	[−.14, .01]	.071	.09	[−.01, .19]	.071
	Importance	.02	[−.05, .10]	.571	−.07	[−.17, .03]	.184
Openness	Conflict	.01	[−.06, .08]	.793	−.02	[−.10, .07]	.729
	Contact	.01	[−.05, .08]	.708	−.03	[−.14, .07]	.557
	Closeness	−.01	[−.07, .06]	.803	−.05	[−.14, .04]	.322
	Insecurity	−.02	[−.09, .04]	.475	.01	[−.07, .10]	.753
	Importance	−.02	[−.09, .05]	.612	−.07	[−.16, .02]	.141
Unconventionality	Conflict	.04	[−.05, .14]	.390	−.02	[−.24, .19]	.820
	Contact	.02	[−.07, .12]	.627	−.05	[−.32, .22]	.724
	Closeness	−.08	[−.18, .03]	.151	−.32	[−.86, .23]	.255

	Insecurity	−.04	[−.14, .06]	.406	.10	[−.15, .36]	.416
	Importance	−.03	[−.13, .07]	.536	−.29	[−.72, .14]	.189
Aesthetic interest	Conflict	−.01	[−.08, .06]	.773	−.04	[−.12, .04]	.378
	Contact	.04	[−.04, .10]	.327	−.05	[−.14, .05]	.344
	Closeness	.00	[−.07, .07]	.959	−.01	[−.10, .09]	.904
	Insecurity	−.02	[−.10, .05]	.537	.05	[−.04, .14]	.280
	Importance	.01	[−.06, .09]	.707	−.02	[−.10, .07]	.738
Intellectual interest	Conflict	−.01	[−.09, .06]	.771	.03	[−.08, .14]	.575
	Contact	−.04	[−.12, .03]	.267	.02	[−.11, .15]	.784
	Closeness	.02	[−.06, .10]	.665	.01	[−.10, .13]	.841
	Insecurity	−.02	[−.10, .06]	.665	−.08	[−.18, .02]	.135
	Importance	−.01	[−.08, .07]	.842	−.04	[−.16, .07]	.454
Agreeableness	Conflict	−.01	[−.07, .06]	.884	.03	[−.05, .11]	.486
	Contact	.03	[−.03, .10]	.315	.01	[−.08, .10]	.798
	Closeness	.02	[−.04, .09]	.499	−.04	[−.12, .04]	.350
	Insecurity	.00	[−.07, .06]	.973	.12	[.04, .20]	.003
	Importance	.00	[−.07, .07]	.940	−.05	[−.13, .03]	.258
Nonantagonsim	Conflict	−.01	[−.09, .07]	.836	.06	[−.05, .16]	.281
	Contact	.01	[−.08, .09]	.897	−.01	[−.12, .09]	.813
	Closeness	.05	[−.03, .14]	.218	−.07	[−.17, .02]	.146
	Insecurity	.04	[−.05, .12]	.403	.12	[.03, .21]	.008
	Importance	.03	[−.05, .11]	.462	−.07	[−.16, .03]	.175
Prosocial orientation	Conflict	−.01	[−.08, .06]	.719	.02	[−.08, .12]	.669
	Contact	.02	[−.05, .10]	.569	.00	[−.11, .11]	.951
	Closeness	.01	[−.07, .08]	.867	−.02	[−.11, .08]	.749
	Insecurity	.00	[−.07, .07]	.998	.13	[.04, .22]	.007
	Importance	.00	[−.08, .08]	.997	−.03	[−.12, .06]	.547
Conscientiousness	Conflict	−.04	[−.10, .02]	.218	.01	[−.06, .08]	.761
	Contact	.01	[−.04, .06]	.778	−.02	[−.10, .05]	.529
	Closeness	−.03	[−.09, .02]	.227	−.04	[−.11, .03]	.269
	Insecurity	.04	[−.01, .10]	.131	.06	[.00, .13]	.058
	Importance	−.03	[−.08, .03]	.327	.00	[−.07, .07]	.946
Orderliness	Conflict	−.01	[−.08, .06]	.782	.01	[−.07, .09]	.809
	Contact	.00	[−.06, .07]	.903	−.01	[−.10, .08]	.823
	Closeness	−.07	[−.14, .00]	.041	−.04	[−.12, .04]	.284
	Insecurity	.04	[−.03, .10]	.284	.05	[−.03, .12]	.203
	Importance	−.10	[−.17, −.02]	.009	−.01	[−.09, .06]	.728
Goal striving	Conflict	−.06	[−.13, .01]	.082	−.02	[−.11, .07]	.681
	Contact	−.02	[−.09, .04]	.482	−.04	[−.14, .05]	.359
	Closeness	−.06	[−.13, .00]	.052	.04	[−.05, .13]	.430
	Insecurity	−.01	[−.07, .06]	.870	.08	[−.003, .16]	.059
	Importance	.00	[−.06, .07]	.946	.02	[−.08, .11]	.751
Dependability	Conflict	−.04	[−.10, .02]	.243	.01	[−.07, .09]	.834
	Contact	.02	[−.04, .07]	.592	−.02	[−.10, .07]	.670
	Closeness	.02	[−.04, .08]	.462	−.08	[−.16, .00]	.039
	Insecurity	.05	[−.01, .12]	.102	.03	[−.05, .12]	.439
	Importance	−.01	[−.06, .05]	.880	−.03	[−.11, .05]	.469

		All kin					
Neuroticism	Conflict	.04	[−.02, .10]	.221	−.04	[−.11, .04]	.366
	Contact	−.02	[−.08, .04]	.461	−.02	[−.12, .08]	.742
	Closeness	−.02	[−.08, .03]	.431	−.02	[−.09, .06]	.623
	Insecurity	−.04	[−.10, .02]	.228	.00	[−.08, .07]	.966
	Importance	−.02	[−.07, .04]	.601	.03	[−.04, .10]	.382
Negative affect	Conflict	.06	[−.01, .13]	.095	−.05	[−.12, .02]	.155
	Contact	.00	[−.07, .07]	.981	−.03	[−.12, .07]	.574
	Closeness	−.02	[−.09, .04]	.521	−.01	[−.08, .06]	.702
	Insecurity	−.04	[−.10, .03]	.251	−.03	[−.10, .04]	.373
	Importance	−.06	[−.12, .01]	.070	.08	[.01, .16]	.026
Self-reproach	Conflict	.03	[−.03, .09]	.345	−.02	[−.08, .05]	.617
	Contact	−.01	[−.07, .05]	.733	−.04	[−.13, .05]	.426
	Closeness	−.03	[−.08, .03]	.343	−.04	[−.11, .02]	.207
	Insecurity	−.02	[−.09, .04]	.515	−.03	[−.09, .04]	.431
	Importance	.01	[−.04, .07]	.686	.01	[−.06, .08]	.809
Extraversion	Conflict	−.04	[−.10, .02]	.193	.02	[−.06, .10]	.568
	Contact	−.03	[−.09, .04]	.405	.04	[−.07, .15]	.450
	Closeness	.01	[−.05, .07]	.718	−.01	[−.10, .07]	.750
	Insecurity	−.05	[−.10, .01]	.126	.04	[−.04, .12]	.310
	Importance	−.04	[−.09, .01]	.146	−.05	[−.13, .04]	.274
Positive affect	Conflict	−.10	[−.17, −.04]	.003	.06	[−.02, .14]	.121
	Contact	−.04	[−.11, .04]	.341	.04	[−.06, .14]	.448
	Closeness	.04	[−.02, .11]	.180	.01	[−.07, .09]	.875
	Insecurity	−.05	[−.12, .02]	.133	.02	[−.06, .09]	.655
	Importance	−.03	[−.09, .03]	.357	−.09	[−.17, −.01]	.028
Sociability	Conflict	.04	[−.03, .12]	.222	−.07	[−.15, .02]	.125
	Contact	.00	[−.08, .07]	.952	.05	[−.06, .16]	.345
	Closeness	.00	[−.07, .07]	.994	−.01	[−.10, .08]	.785
	Insecurity	.00	[−.07, .06]	.898	.02	[−.07, .10]	.728
	Importance	−.01	[−.08, .06]	.731	−.01	[−.10, .09]	.871
Activity	Conflict	−.07	[−.14, .01]	.084	.12	[.03, .21]	.009
	Contact	−.06	[−.13, .02]	.136	.07	[−.06, .19]	.287
	Closeness	.01	[−.06, .08]	.778	−.05	[−.14, .04]	.284
	Insecurity	−.05	[−.13, .02]	.157	.09	[−.004, .18]	.060
	Importance	−.05	[−.11, .01]	.102	−.03	[−.12, .06]	.563
Openness	Conflict	.05	[−.02, .12]	.179	−.09	[−.18, −.01]	.037
	Contact	.08	[.02, .16]	.017	−.04	[−.16, .08]	.504
	Closeness	.03	[−.04, .10]	.377	.03	[−.06, .12]	.500
	Insecurity	−.01	[−.07, .06]	.847	−.02	[−.10, .06]	.594
	Importance	.02	[−.04, .08]	.464	−.01	[−.10, .08]	.847
Unconventionality	Conflict	.02	[−.08, .12]	.726	−.14	[−.40, .13]	.309
	Contact	−.01	[−.13, .11]	.830	−.38	[−1.41, .64]	.463
	Closeness	−.04	[−.13, .06]	.456	.06	[−.20, .31]	.658
	Insecurity	−.08	[−.17, .02]	.102	.07	[−.14, .29]	.507
	Importance	−.01	[−.09, .08]	.890	−.02	[−.26, .22]	.869
Aesthetic interest	Conflict	.06	[−.02, .14]	.115	−.05	[−.13, .04]	.269

	Contact	.08	[.01, .16]	.033	.04	[−.07, .15]	.505
	Closeness	.06	[−.02, .13]	.123	.02	[−.07, .10]	.699
	Insecurity	−.02	[−.09, .05]	.581	−.03	[−.10, .05]	.484
	Importance	.00	[−.06, .06]	.929	−.02	[−.10, .06]	.574
Intellectual interest	Conflict	.04	[−.05, .12]	.425	−.10	[−.21, .01]	.079
	Contact	.06	[−.03, .14]	.200	−.03	[−.17, .11]	.700
	Closeness	.01	[−.06, .09]	.744	.04	[−.07, .15]	.435
	Insecurity	−.02	[−.09, .06]	.686	−.08	[−.18, .02]	.102
	Importance	.01	[−.07, .08]	.894	−.03	[−.14, .08]	.635
Agreeableness	Conflict	−.02	[−.08, .05]	.642	.01	[−.07, .09]	.798
	Contact	.03	[−.03, .10]	.351	.01	[−.09, .10]	.923
	Closeness	−.04	[−.11, .02]	.185	.04	[−.04, .12]	.327
	Insecurity	.05	[−.02, .12]	.137	−.01	[−.08, .06]	.798
	Importance	−.02	[−.08, .04]	.474	.00	[−.08, .08]	.941
Nonantagonsim	Conflict	.06	[−.03, .14]	.188	.03	[−.08, .13]	.622
	Contact	.04	[−.04, .13]	.305	−.06	[−.18, .06]	.304
	Closeness	−.04	[−.12, .04]	.371	.02	[−.08, .12]	.694
	Insecurity	.08	[−.001, .17]	.052	.01	[−.08, .10]	.801
	Importance	−.01	[−.08, .06]	.828	.00	[−.10, .10]	.979
Prosocial orientation	Conflict	−.02	[−.10, .05]	.547	.02	[−.07, .12]	.649
	Contact	.07	[−.01, .14]	.080	.08	[−.04, .19]	.178
	Closeness	−.03	[−.10, .03]	.324	.07	[−.03, .16]	.191
	Insecurity	.03	[−.04, .10]	.473	−.02	[−.10, .06]	.689
	Importance	.01	[−.06, .07]	.864	.02	[−.08, .12]	.655
Conscientiousness	Conflict	−.07	[−.13, −.01]	.021	.07	[−.002, .14]	.055
	Contact	−.01	[−.07, .04]	.604	.04	[−.05, .13]	.377
	Closeness	−.01	[−.07, .04]	.679	−.05	[−.12, .02]	.138
	Insecurity	.00	[−.05, .06]	.939	.03	[−.04, .09]	.434
	Importance	.02	[−.04, .07]	.546	−.03	[−.11, .04]	.387
Orderliness	Conflict	−.06	[−.13, .01]	.079	.02	[−.06, .10]	.664
	Contact	−.02	[−.09, .05]	.527	.00	[−.10, .10]	.972
	Closeness	−.04	[−.11, .02]	.216	−.03	[−.11, .05]	.495
	Insecurity	.00	[−.07, .08]	.980	.01	[−.07, .09]	.839
	Importance	.02	[−.05, .08]	.614	−.01	[−.09, .08]	.875
Goal striving	Conflict	−.06	[−.13, .01]	.095	.08	[−.01, .16]	.076
	Contact	.01	[−.06, .07]	.834	.12	[.01, .22]	.038
	Closeness	.00	[−.07, .07]	.993	−.03	[−.12, .05]	.472
	Insecurity	−.03	[−.10, .04]	.382	.03	[−.06, .11]	.524
	Importance	.03	[−.03, .10]	.316	−.07	[−.16, .02]	.139
Dependability	Conflict	−.05	[−.12, .01]	.116	.13	[.06, .21]	.001
	Contact	−.04	[−.10, .02]	.215	.06	[−.03, .16]	.197
	Closeness	.01	[−.05, .07]	.810	−.09	[−.16, −.01]	.021
	Insecurity	.02	[−.04, .08]	.434	.03	[−.04, .10]	.443
	Importance	.00	[−.06, .06]	.986	−.04	[−.12, .03]	.261
			Others				
Neuroticism	Conflict	−.01	[−.07, .06]	.881	.06	[−.04, .17]	.235
	Contact	−.01	[−.08, .06]	.757	−.17	[−.30, −.04]	.010

	Closeness	.01	[−.05, .08]	.692	.02	[−.09, .13]	.759
	Insecurity	−.06	[−.13, .01]	.070	−.06	[−.16, .04]	.244
	Importance	.02	[−.05, .08]	.665	−.03	[−.14, .08]	.572
Negative affect	Conflict	.02	[−.05, .10]	.545	.04	[−.06, .14]	.457
	Contact	−.01	[−.08, .07]	.892	−.11	[−.23, .00]	.044
	Closeness	−.01	[−.08, .07]	.838	.05	[−.06, .15]	.386
	Insecurity	−.01	[−.09, .06]	.741	−.02	[−.11, .08]	.762
	Importance	.05	[−.03, .12]	.238	−.02	[−.12, .09]	.767
Self-reproach	Conflict	−.02	[−.09, .04]	.522	.06	[−.03, .16]	.199
	Contact	−.02	[−.08, .05]	.659	−.03	[−.15, .08]	.555
	Closeness	.03	[−.03, .10]	.349	−.04	[−.14, .05]	.377
	Insecurity	−.09	[−.16, −.02]	.014	−.08	[−.17, .01]	.072
	Importance	.03	[−.04, .10]	.406	−.07	[−.16, .03]	.165
Extraversion	Conflict	.00	[−.07, .07]	.999	−.05	[−.16, .06]	.410
	Contact	.02	[−.05, .08]	.595	.06	[−.08, .19]	.414
	Closeness	.05	[−.02, .12]	.124	.04	[−.07, .16]	.444
	Insecurity	−.05	[−.13, .02]	.178	.03	[−.08, .14]	.540
	Importance	.07	[.004, .14]	.039	.03	[−.09, .14]	.659
Positive affect	Conflict	−.03	[−.11, .05]	.453	−.07	[−.18, .03]	.152
	Contact	.01	[−.06, .08]	.826	.06	[−.05, .18]	.292
	Closeness	.02	[−.06, .09]	.648	.00	[−.10, .10]	.990
	Insecurity	−.09	[−.16, −.01]	.028	.00	[−.09, .10]	.940
	Importance	.03	[−.05, .10]	.458	.01	[−.09, .12]	.787
Sociability	Conflict	.04	[−.05, .12]	.380	−.01	[−.12, .10]	.850
	Contact	−.03	[−.11, .06]	.507	−.02	[−.16, .11]	.723
	Closeness	.05	[−.04, .14]	.280	.03	[−.10, .15]	.666
	Insecurity	.02	[−.07, .11]	.682	.02	[−.10, .13]	.801
	Importance	.03	[−.06, .12]	.485	.06	[−.06, .18]	.336
Activity	Conflict	−.02	[−.11, .06]	.595	−.06	[−.18, .07]	.364
	Contact	.01	[−.07, .09]	.786	.03	[−.11, .18]	.659
	Closeness	.08	[−.01, .17]	.067	.12	[−.01, .25]	.069
	Insecurity	−.06	[−.15, .03]	.203	.07	[−.06, .19]	.301
	Importance	.09	[.001, .17]	.048	.12	[−.01, .25]	.065
Openness	Conflict	−.02	[−.10, .05]	.526	−.05	[−.17, .06]	.361
	Contact	−.09	[−.16, −.01]	.021	.00	[−.13, .13]	.999
	Closeness	−.02	[−.10, .06]	.680	.01	[−.11, .12]	.898
	Insecurity	−.04	[−.12, .04]	.357	−.05	[−.16, .06]	.394
	Importance	−.03	[−.12, .05]	.409	.01	[−.11, .13]	.898
Unconventionality	Conflict	.00	[−.11, .11]	.987	−.10	[−.44, .24]	.559
	Contact	−.06	[−.16, .04]	.215	−.20	[−.59, .20]	.324
	Closeness	−.02	[−.14, .09]	.669	.07	[−.26, .39]	.688
	Insecurity	−.03	[−.15, .09]	.618	−.21	[−.59, .18]	.288
	Importance	−.04	[−.15, .07]	.474	.13	[−.20, .47]	.437
Aesthetic interest	Conflict	−.03	[−.11, .04]	.412	−.02	[−.13, .08]	.686
	Contact	−.07	[−.15, .00]	.061	.05	[−.08, .18]	.426
	Closeness	.01	[−.07, .09]	.798	−.02	[−.14, .09]	.694
	Insecurity	−.09	[−.17, −.01]	.038	.01	[−.09, .10]	.920

	Importance	−.01	[−.08, .07]	.905	−.03	[−.14, .08]	.645
Intellectual interest	Conflict	−.04	[−.13, .05]	.356	.02	[−.13, .18]	.753
	Contact	−.06	[−.14, .03]	.178	−.08	[−.25, .10]	.376
	Closeness	−.01	[−.11, .08]	.828	−.02	[−.17, .12]	.749
	Insecurity	−.02	[−.11, .08]	.694	−.03	[−.17, .11]	.672
	Importance	−.01	[−.10, .08]	.880	−.03	[−.18, .13]	.748
Agreeableness	Conflict	.03	[−.04, .10]	.453	.01	[−.10, .12]	.918
	Contact	−.01	[−.08, .05]	.665	−.02	[−.14, .11]	.801
	Closeness	−.03	[−.10, .04]	.418	−.10	[−.21, .01]	.067
	Insecurity	.06	[−.02, .13]	.146	.13	[.03, .22]	.010
	Importance	−.02	[−.10, .06]	.648	−.08	[−.19, .02]	.128
Nonantagonsim	Conflict	.06	[−.03, .15]	.178	.05	[−.08, .18]	.452
	Contact	−.06	[−.14, .03]	.181	.02	[−.12, .17]	.739
	Closeness	−.05	[−.14, .04]	.316	−.14	[−.27, −.02]	.027
	Insecurity	.04	[−.06, .13]	.437	.16	[.04, .27]	.009
	Importance	−.04	[−.14, .05]	.376	−.10	[−.22, .03]	.128
Prosocial orientation	Conflict	−.01	[−.09, .08]	.854	.03	[−.11, .16]	.692
	Contact	.06	[−.02, .14]	.170	−.04	[−.18, .11]	.619
	Closeness	−.04	[−.12, .04]	.358	−.10	[−.23, .03]	.148
	Insecurity	.07	[−.01, .16]	.096	.08	[−.04, .19]	.182
	Importance	−.03	[−.11, .06]	.516	−.07	[−.20, .06]	.291
Conscientiousness	Conflict	.02	[−.04, .08]	.522	.00	[−.08, .09]	.957
	Contact	.02	[−.04, .08]	.616	−.03	[−.12, .07]	.584
	Closeness	−.06	[−.12, .00]	.046	−.04	[−.12, .05]	.408
	Insecurity	.01	[−.06, .07]	.858	.04	[−.04, .12]	.343
	Importance	−.03	[−.09, .03]	.325	−.04	[−.13, .05]	.434
Orderliness	Conflict	.03	[−.04, .10]	.459	.02	[−.08, .11]	.733
	Contact	.01	[−.06, .08]	.829	−.02	[−.13, .09]	.745
	Closeness	−.07	[−.14, .01]	.073	−.03	[−.13, .06]	.487
	Insecurity	−.01	[−.09, .07]	.799	.05	[−.04, .14]	.276
	Importance	−.02	[−.10, .05]	.532	−.03	[−.13, .07]	.567
Goal striving	Conflict	−.08	[−.15, −.01]	.026	−.08	[−.18, .03]	.179
	Contact	.01	[−.06, .08]	.763	−.03	[−.15, .09]	.605
	Closeness	−.01	[−.08, .07]	.857	.00	[−.12, .12]	.997
	Insecurity	−.06	[−.14, .02]	.147	.03	[−.08, .13]	.626
	Importance	.00	[−.08, .07]	.920	.01	[−.10, .12]	.829
Dependability	Conflict	.04	[−.02, .11]	.207	.05	[−.05, .15]	.297
	Contact	.02	[−.04, .08]	.559	.01	[−.10, .12]	.890
	Closeness	−.04	[−.11, .03]	.238	−.09	[−.19, .01]	.091
	Insecurity	−.01	[−.08, .06]	.694	.02	[−.08, .12]	.672
	Importance	−.05	[−.12, .02]	.139	−.06	[−.17, .05]	.260

Note. PC = personality change, RC = relationship change, CI = confidence interval of parameter estimate. PC → RC = effect of personality change from T1 to T2 on relationship change from T2 to T3. RC → PC = effect of relationship change from T1 to T2 on personality change from T2 to T3.

Table A6

Cross-Lagged Personality Effects on Relationship Characteristics from the Cross-Lagged Panel Model

Personality	Relationship Aspect	$\gamma_{P1 \rightarrow R2}$	95% CI	p−value	$\gamma_{P2 \rightarrow R3}$	95% CI	p−value	χ^2	df	CFI	RMSEA	SRMR
					Romantic Partner							
Neuroticism	Conflict	0.08	[0.02, 0.15]	.009	0.13	[0.02, 0.15]	.000	405.199	59	.975	.037	.039
	Contact	−0.06	[−0.13, 0.00]	.066	−0.01	[−0.13, 0.00]	.849	383.461	59	.976	.036	.037
	Closeness	−0.06	[−0.13, 0.03]	.062	−0.02	[−0.13, 0.00]	.498	40.192	59	.975	.037	.037
	Insecurity	0.16	[0.09, 0.23]	.000	0.14	[0.09, 0.23]	.000	406.85	59	.975	.037	.039
	Importance	−0.02	[−0.09, 0.04]	.448	−0.01	[−0.09, 0.04]	.693	396.095	59	.975	.036	.038
Negative affect	Conflict	0.08	[0.01, 0.15]	.022	0.15	[0.01, 0.15]	.000	854.813	149	.924	.033	.057
	Contact	−0.03	[−0.10, 0.03]	.295	−0.03	[−0.10, 0.03]	.351	853.777	149	.923	.033	.056
	Closeness	−0.08	[−0.15, −0.02]	.009	−0.06	[−0.15, −0.02]	.112	871.652	149	.922	.034	.056
	Insecurity	0.14	[0.07, 0.22]	.000	0.16	[0.07, 0.23]	.000	877.972	149	.922	.034	.058
	Importance	−0.03	[−0.09, 0.03]	.373	−0.05	[−0.09, 0.03]	.141	875.47	149	.920	.034	.057
Self-reproach	Conflict	0.07	[0.00, 0.13]	.042	0.12	[0.00, 0.13]	.001	662.17	271	.977	.018	.031
	Contact	−0.06	[−0.13, 0.00]	.063	−0.02	[−0.13, 0.00]	.572	573.18	271	.982	.016	.026
	Closeness	−0.07	[−0.14, −0.00]	.037	−0.02	[−0.14, −0.00]	.683	592.91	271	.981	.017	.027
	Insecurity	0.15	[0.08, 0.22]	.000	0.14	[0.08, 0.22]	.000	613.854	271	.980	.017	.028
	Importance	−0.03	[−0.11, 0.04]	.386	−0.00	[−0.11, 0.04]	.987	577.836	271	.982	.016	.027
Extraversion	Conflict	−0.01	[−0.07, 0.05]	.817	−0.07	[−0.07, 0.05]	.027	329.82	59	.977	.033	.030
	Contact	0.03	[−0.03, 0.10]	.317	0.01	[−0.03, 0.10]	.705	309.155	59	.978	.031	.026
	Closeness	0.09	[0.03, 0.15]	.005	0.01	[0.03, 0.15]	.660	303.984	59	.979	.031	.025
	Insecurity	−0.06	[−0.13, 0.01]	.121	−0.08	[−0.13, 0.01]	.021	315.385	59	.978	.032	.028
	Importance	0.03	[−0.03, 0.10]	.287	−0.00	[−0.03, 0.10]	.885	306.502	59	.978	.031	.027
Positive affect	Conflict	−0.02	[−0.09, 0.05]	.519	−0.11	[−0.09, 0.05]	.001	417.722	100	.965	.027	.041
	Contact	0.05	[−0.02, 0.12]	.174	0.01	[−0.02, 0.12]	.708	373.109	100	.969	.025	.034
	Closeness	0.08	[0.01, 0.15]	.019	0.02	[0.01, 0.15]	.527	376.94	100	.968	.025	.035
	Insecurity	−0.06	[−0.14, 0.01]	.086	−0.09	[−0.14, 0.01]	.016	394.508	100	.967	.026	.039

	Importance	0.02	[−0.05, 0.08]	.665	0.01	[−0.05, 0.08]	.805	368.581	100	.969	.025	.034
Sociability	Conflict	0.02	[−0.05, 0.08]	.589	−0.04	[−0.05, 0.08]	.212	37.315	100	.967	.025	.031
	Contact	0.03	[−0.04, 0.09]	.452	−0.01	[−0.04, 0.09]	.738	357.145	100	.968	.024	.029
	Closeness	0.06	[−0.01, 0.13]	.106	0.03	[−0.01, 0.13]	.390	349.292	100	.969	.024	.028
	Insecurity	−0.03	[−0.10, 0.04]	.413	−0.06	[−0.10, 0.04]	.095	379.317	100	.966	.025	.030
	Importance	0.03	[−0.03, 0.10]	.313	−0.02	[−0.03, 0.10]	.648	362.849	100	.967	.025	.030
Activity	Conflict	0.02	[−0.00, 0.08]	.503	0.02	[−0.04, 0.08]	.478	461.449	100	.952	.029	.042
	Contact	0.00	[−0.06, 0.06]	.938	0.02	[−0.06, 0.06]	.527	396.203	100	.960	.026	.030
	Closeness	0.01	[−0.05, 0.07]	.818	−0.01	[−0.05, 0.06]	.687	404.524	100	.959	.027	.031
	Insecurity	0.02	[−0.04, 0.07]	.520	−0.07	[−0.04, 0.07]	.050	451.253	100	.953	.029	.037
	Importance	−0.04	[−0.10, 0.02]	.240	0.00	[−0.10, 0.02]	.923	395.591	100	.960	.026	.031
Openness	Conflict	0.02	[−0.03, 0.08]	.415	0.05	[−0.03, 0.08]	.134	273.536	59	.979	.029	.033
	Contact	0.00	[−0.06, 0.07]	.912	−0.00	[−0.06, 0.07]	.891	256.976	59	.981	.028	.030
	Closeness	−0.01	[−0.07, 0.06]	.786	−0.03	[−0.07, 0.06]	.393	251.77	59	.981	.028	.030
	Insecurity	0.09	[0.03, 0.16]	.006	0.10	[0.03, 0.16]	.003	257.89	59	.980	.028	.031
	Importance	0.02	[−0.05, 0.08]	.641	−0.03	[−0.05, 0.08]	.307	251.141	59	.981	.028	.031
Unconventionality	Conflict	0.08	[0.00, 0.15]	.047	0.11	[0.00, 0.15]	.007	244.569	100	.973	.018	.028
	Contact	0.04	[−0.04, 0.13]	.318	0.06	[−0.04, 0.13]	.121	248.009	100	.972	.019	.029
	Closeness	0.00	[−0.08, 0.09]	.921	−0.03	[−0.08, 0.07]	.451	243.346	100	.972	.018	.028
	Insecurity	0.15	[0.07, 0.24]	.000	0.11	[0.07, 0.24]	.007	246.77	100	.972	.018	.030
	Importance	0.02	[−0.07, 0.10]	.699	−0.01	[−0.07, 0.10]	.753	247.66	100	.971	.019	.029
Aesthetic interest	Conflict	0.02	[−0.04, 0.08]	.515	0.05	[−0.04, 0.08]	.122	216.03	59	.983	.025	.026
	Contact	−0.01	[−0.08, 0.06]	.804	−0.02	[−0.08, 0.06]	.455	215.962	59	.983	.025	.023
	Closeness	0.01	[−0.06, 0.08]	.700	−0.04	[−0.06, 0.08]	.204	205.227	59	.984	.024	.023
	Insecurity	0.07	[−0.00, 0.14]	.063	0.11	[−0.00, 0.14]	.001	222.087	59	.982	.025	.027
	Importance	0.02	[−0.05, 0.09]	.620	−0.06	[−0.05, 0.09]	.072	21.257	59	.983	.024	.024
Intellectual interest	Conflict	−0.05	[−0.11, 0.02]	.200	−0.09	[−0.11, 0.02]	.019	226.274	59	.968	.026	.031
	Contact	0.01	[−0.07, 0.08]	.865	−0.02	[−0.07, 0.08]	.568	218.648	59	.968	.025	.030
	Closeness	0.02	[−0.06, 0.10]	.613	−0.01	[−0.06, 0.10]	.743	217.329	59	.969	.025	.031
	Insecurity	0.05	[−0.02, 0.12]	.156	0.02	[−0.02, 0.12]	.604	227.145	59	.967	.026	.032

	Importance	0.05	[−0.02, 0.12]	.178	−0.01	[−0.02, 0.12]	.875	222.064	59	.968	.025	.031
Agreeableness	Conflict	−0.11	[−0.18, −0.05]	.001	−0.08	[−0.18, −0.05]	.014	199.151	59	.984	.023	.030
	Contact	0.04	[−0.03, 0.11]	.272	0.01	[−0.03, 0.11]	.684	201.407	59	.983	.024	.030
	Closeness	0.08	[0.02, 0.15]	.016	0.01	[0.02, 0.15]	.661	206.694	59	.983	.024	.030
	Insecurity	−0.05	[−0.12, 0.02]	.129	−0.04	[−0.12, 0.02]	.254	231.118	59	.980	.026	.034
	Importance	0.06	[−0.01, 0.12]	.071	0.03	[−0.01, 0.12]	.447	213.196	59	.982	.025	.032
Nonantagonsim	Conflict	−0.18	[−0.25, −0.10]	.000	−0.14	[−0.25, −0.10]	.000	964.853	344	.948	.02	.039
	Contact	0.03	[−0.06, 0.12]	.479	0.03	[−0.06, 0.12]	.422	95.388	344	.948	.02	.038
	Closeness	0.04	[−0.04, 0.12]	.323	0.03	[−0.04, 0.12]	.356	956.566	344	.947	.02	.038
	Insecurity	−0.01	[−0.09, 0.07]	.783	−0.09	[−0.09, 0.07]	.009	98.3	344	.946	.021	.039
	Importance	0.02	[−0.06, 0.10]	.612	0.03	[−0.06, 0.10]	.430	974.367	344	.946	.021	.040
Prosocial orientation	Conflict	−0.07	[−0.15, 0.00]	.054	−0.07	[−0.15, 0.00]	.048	397.415	149	.966	.02	.032
	Contact	0.06	[−0.02, 0.13]	.153	0.03	[−0.02, 0.13]	.440	406.389	149	.964	.02	.033
	Closeness	0.08	[0.01, 0.15]	.035	0.00	[0.01, 0.15]	.917	428.213	149	.961	.021	.034
	Insecurity	−0.07	[−0.15, 0.01]	.074	−0.01	[−0.15, 0.01]	.767	44.785	149	.960	.021	.036
	Importance	0.03	[−0.05, 0.11]	.454	0.04	[−0.05, 0.11]	.266	418.57	149	.962	.021	.034
Conscientiousness	Conflict	−0.10	[−0.15, −0.04]	.002	−0.13	[−0.15, −0.04]	.000	198.883	59	.989	.023	.025
	Contact	−0.03	[−0.09, 0.03]	.381	0.03	[−0.09, 0.03]	.390	191.671	59	.990	.023	.023
	Closeness	0.01	[−0.05, 0.07]	.668	0.05	[−0.05, 0.07]	.119	206.155	59	.989	.024	.025
	Insecurity	−0.06	[−0.13, 0.00]	.047	−0.11	[−0.13, −0.00]	.001	201.46	59	.989	.024	.026
	Importance	−0.00	[−0.06, 0.06]	.888	0.04	[−0.06, 0.06]	.332	199.932	59	.989	.024	.026
Orderliness	Conflict	−0.04	[−0.10, 0.02]	.191	−0.09	[−0.10, 0.02]	.008	744.561	149	.946	.030	.044
	Contact	−0.03	[−0.09, 0.03]	.302	0.02	[−0.09, 0.03]	.536	717.092	149	.948	.030	.038
	Closeness	0.02	[−0.04, 0.08]	.53	0.04	[−0.04, 0.08]	.281	706.306	149	.949	.029	.039
	Insecurity	−0.04	[−0.10, 0.02]	.214	−0.08	[−0.10, 0.02]	.018	726.102	149	.947	.030	.041
	Importance	−0.02	[−0.08, 0.03]	.412	0.01	[−0.08, 0.03]	.698	711.565	149	.948	.030	.039
Goal striving	Conflict	−0.08	[−0.14, −0.01]	.022	−0.11	[−0.14, −0.01]	.003	235.693	59	.973	.026	.027
	Contact	−0.01	[−0.09, 0.06]	.698	0.05	[−0.09, 0.06]	.175	228.841	59	.974	.026	.025
	Closeness	0.04	[−0.02, 0.11]	.177	0.047	[−0.02, 0.11]	.204	24.051	59	.972	.027	.026
	Insecurity	−0.06	[−0.13, 0.00]	.061	−0.07	[−0.13, 0.00]	.036	234.511	59	.972	.026	.028

	Importance	0.02	[−0.05, 0.09]	.633	−0.02	[−0.05, 0.09]	.701	253.296	59	.970	.028	.028
Dependability	Conflict	−0.10	[−0.17, −0.03]	.003	−0.07	[−0.17, −0.03]	.016	308.827	100	.975	.022	.028
	Contact	0.03	[−0.04, 0.09]	.379	0.05	[−0.04, 0.09]	.188	301.605	100	.975	.022	.027
	Closeness	0.04	[−0.02, 0.10]	.205	0.07	[−0.02, 0.10]	.065	295.52	100	.976	.021	.027
	Insecurity	−0.02	[−0.09, 0.04]	.477	−0.08	[−0.09, 0.04]	.036	32.407	100	.973	.023	.031
	Importance	0.05	[−0.01, 0.12]	.108	0.06	[−0.01, 0.12]	.139	319.897	100	.973	.023	.029
					Friends							
Neuroticism	Conflict	0.02	[−0.03, 0.07]	.407	0.07	[0.01, 0.12]	.013	427,02	59	.973	.038	.040
	Contact	−0.06	[−0.11, −0.02]	.010	−0.02	[−0.08, 0.03]	.412	384,859	59	.976	.036	.037
	Closeness	−0.05	[−0.10, −0.01]	.032	−0.01	[−0.06, 0.05]	.759	425,773	59	.973	.038	.040
	Insecurity	0.17	[0.12, 0.22]	.000	0.19	[0.14, 0.24]	.000	41.344	59	.976	.037	.039
	Importance	−0.02	[−0.07, 0.02]	.301	0.03	[−0.02, 0.08]	.276	441,493	59	.972	.039	.040
Negative affect	Conflict	0.04	[−0.01, 0.09]	.094	0.08	[0.03, 0.14]	.005	875,651	149	.923	.033	.057
	Contact	−0.04	[−0.10, 0.01]	.111	0.00	[−0.06, 0.06]	.971	846,991	149	.925	.033	.056
	Closeness	−0.05	[−0.10, 0.01]	.097	−0.02	[−0.07, 0.04]	.596	886,52	149	.921	.034	.057
	Insecurity	0.15	[0.10, 0.20]	.000	0.15	[0.09, 0.20]	.000	928,434	149	.922	.035	.059
	Importance	−0.03	[−0.08, 0.02]	.302	0.01	[−0.04, 0.07]	.628	903,827	149	.92	.034	.057
Self-reproach	Conflict	−0.02	[−0.07, 0.03]	.486	0.07	[0.01, 0.12]	.019	66.992	271	.978	.018	.029
	Contact	−0.08	[−0.13, −0.03]	.001	−0.02	[−0.08, 0.03]	.405	586,636	271	.982	.016	.026
	Closeness	−0.06	[−0.11, −0.01]	.02	0.01	[−0.05, 0.06]	.794	648,684	271	.978	.018	.028
	Insecurity	0.16	[0.10, 0.21]	.000	0.19	[0.13, 0.25]	.000	657,78	271	.978	.018	.028
	Importance	−0.03	[−0.08, 0.02]	.284	0.03	[−0.03, 0.08]	.343	664,624	271	.977	.018	.028
Extraversion	Conflict	−0.01	[−0.06, 0.04]	.805	−0.03	[−0.08, 0.03]	.338	354,177	59	.975	.034	.029
	Contact	0.08	[0.03, 0.13]	.001	0.05	[−0.01, 0.10]	.086	316,459	59	.978	.032	.027
	Closeness	0.10	[0.05, 0.15]	.000	0.09	[0.04, 0.14]	.001	343,344	59	.976	.033	.029
	Insecurity	−0.07	[−0.12, −0.02]	.006	−0.09	[−0.14, −0.04]	.001	347,253	59	.976	.034	.030
	Importance	0.08	[0.03, 0.13]	.002	0.08	[0.03, 0.13]	.003	355,567	59	.975	.034	.029
Positive affect	Conflict	−0.04	[−0.09, 0.02]	.165	−0.06	[−0.12, 0.01]	.074	436,748	100	.963	.028	.037
	Contact	0.05	[−0.01, 0.10]	.078	0.04	[−0.02, 0.10]	.161	376,962	100	.969	.025	.034
	Closeness	0.05	[0.00, 0.10]	.051	0.05	[−0.01, 0.10]	.101	407,243	100	.966	.027	.035

	Insecurity	−0.04	[−0.09, 0.01]	.133	−0.08	[−0.14, −0.03]	.003	491,071	100	.958	.030	.044
	Importance	0.02	[−0.03, 0.07]	.429	0.04	[−0.01, 0.10]	.140	407,321	100	.967	.027	.035
Sociability	Conflict	0.02	[−0.03, 0.08]	.378	−0.01	[−0.06, 0.05]	.830	424,234	100	.961	.027	.031
	Contact	0.12	[0.07, 0.17]	.000	0.04	[−0.02, 0.10]	.163	366,048	100	.968	.025	.029
	Closeness	0.10	[0.05, 0.15]	.000	0.12	[0.07, 0.17]	.000	413,101	100	.963	.027	.032
	Insecurity	−0.07	[−0.12, −0.02]	.005	−0.08	[−0.14, −0.03]	.003	409,177	100	.964	.027	.032
	Importance	0.11	[0.06, 0.16]	.000	0.10	[0.05, 0.16]	.000	413,41	100	.963	.027	.031
Activity	Conflict	0.01	[−0.04, 0.06]	.643	0.03	[−0.02, 0.09]	.227	478,699	100	.951	.03	.036
	Contact	0.05	[0.00, 0.10]	.044	0.05	[−0.01, 0.11]	.073	416,514	100	.959	.027	.031
	Closeness	0.07	[0.02, 0.12]	.004	0.06	[0.01, 0.11]	.030	464,071	100	.953	.029	.036
	Insecurity	0.00	[−0.05, 0.05]	.972	−0.03	[−0.08, 0.02]	.183	565,248	100	.942	.033	.045
	Importance	0.05	[0.01, 0.10]	.031	0.02	[−0.04, 0.07]	.564	473,781	100	.952	.029	.036
Openness	Conflict	0.03	[−0.01, 0.08]	.168	−0.01	[−0.07, 0.04]	.614	287,66	59	.978	.030	.033
	Contact	−0.98	[−0.15, −0.05]	.000	0.00	[−0.05, 0.05]	.953	259,356	59	.981	.028	.030
	Closeness	0.05	[−0.00, 0.10]	.055	0.05	[−0.00, 0.10]	.062	296,311	59	.977	.030	.034
	Insecurity	0.03	[−0.01, 0.08]	.131	0.09	[0.04, 0.14]	.001	299,431	59	.977	.031	.034
	Importance	0.04	[−0.01, 0.09]	.111	0.00	[−0.05, 0.05]	.904	293,814	59	.978	.030	.034
Unconventionality	Conflict	0.01	[−0.05, 0.07]	.727	−0.01	[−0.07, 0.06]	.816	282,909	100	.967	.021	.029
	Contact	−0.11	[−0.17, −0.04]	.001	−0.01	[−0.08, 0.05]	.666	257,73	100	.971	.019	.029
	Closeness	0.01	[−0.05, 0.08]	.683	−0.01	[−0.07, 0.06]	.833	292,85	100	.965	.021	.033
	Insecurity	0.05	[−0.01, 0.11]	.093	0.09	[0.03, 0.15]	.002	261,321	100	.972	.019	.028
	Importance	0.03	[−0.03, 0.09]	.347	−0.01	[−0.07, 0.05]	.796	285,93	100	.967	.021	.031
Aesthetic interest	Conflict	0.02	[−0.03, 0.07]	.398	0.01	[−0.04, 0.07]	.698	247,495	59	.980	.027	.026
	Contact	−0.08	[−0.13, −0.02]	.006	−0.01	[−0.07, 0.04]	.641	216,519	59	.983	.025	.023
	Closeness	0.02	[−0.04, 0.07]	.503	0.09	[0.04, 0.15]	.002	255,587	59	.979	.028	.028
	Insecurity	0.04	[−0.01, 0.09]	.117	0.11	[0.06, 0.16]	.000	251,563	59	.980	.027	.026
	Importance	0.03	[−0.03, 0.08]	.321	0.02	[−0.03, 0.08]	.408	251,638	59	.980	.027	.027
Intellectual interest	Conflict	−0.00	[−0.06, 0.05]	.920	−0.02	[−0.08, 0.04]	.453	277,477	59	.960	.029	.034
	Contact	−0.10	[−0.15, −0.04]	.001	0.01	[−0.04, 0.07]	.682	228,829	59	.968	.026	.030
	Closeness	0.05	[−0.01, 0.10]	.086	0.01	[−0.05, 0.06]	.772	251,547	59	.964	.027	.033

	Insecurity	0.01	[−0.05, 0.06]	.863	0.04	[−0.01, 0.10]	.123	30.004	59	.957	.031	.035
	Importance	−0.00	[−0.06, 0.05]	.952	−0.00	[−0.06, 0.06]	.933	262,905	59	.963	.028	.034
Agreeableness	Conflict	−0.09	[−0.15, −0.04]	.001	−0.11	[−0.17, −0.06]	.000	236,516	59	.98	.026	.032
	Contact	−0.01	[−0.06, 0.04]	.697	−0.03	[−0.08, 0.02]	.247	234,261	59	.98	.026	.032
	Closeness	0.04	[−0.01, 0.09]	.142	0.02	[−0.04, 0.08]	.519	264,749	59	.977	.028	.035
	Insecurity	−0.08	[−0.13, −0.03]	.001	−0.02	[−0.07, 0.03]	.405	377,616	59	.965	.035	.042
	Importance	0.02	[−0.03, 0.07]	.438	0.01	[−0.04, 0.07]	.665	277,094	59	.975	.029	.036
Nonantagonsim	Conflict	−0.09	[−0.15, −0.03]	.002	−0.13	[−0.20, −0.07]	.000	992,867	344	.946	.021	.039
	Contact	0.01	[−0.05, 0.07]	.662	−0.03	[−0.09, 0.04]	.397	991,471	344	.945	.021	.039
	Closeness	0.03	[−0.03, 0.09]	.279	−0.01	[−0.08, 0.05]	.662	103.51	344	.943	.021	.042
	Insecurity	−0.10	[−0.15, −0.04]	.001	−0.10	[−0.16, −0.04]	.001	1,104,252	344	.939	.023	.042
	Importance	0.01	[−0.05, 0.06]	.781	−0.04	[−0.10, 0.03]	.267	1,043,793	344	.942	.022	.043
Prosocial orientation	Conflict	−0.08	[−0.14, −0.02]	.010	−0.13	[−0.19, −0.06]	.000	449,208	149	.960	.022	.034
	Contact	−0.02	[−0.08, 0.03]	.413	−0.05	[−0.10, 0.02]	.141	422,963	149	.963	.021	.033
	Closeness	0.04	[−0.02, 0.10]	.170	0.02	[−0.04, 0.09]	.463	47.431	149	.957	.022	.036
	Insecurity	−0.05	[−0.10, 0.00]	.067	0.02	[−0.03, 0.08]	.414	559,713	149	.947	.025	.040
	Importance	0.02	[−0.04, 0.07]	.509	0.03	[−0.03, 0.09]	.311	476,573	149	.957	.022	.037
Conscientiousness	Conflict	−0.07	[−0.11, −0.02]	.004	−0.09	[−0.14, −0.04]	.001	227,651	59	.987	.026	.027
	Contact	0.03	[−0.01, 0.08]	.162	−0.08	[−0.13, −0.03]	.002	20.064	59	.989	.023	.025
	Closeness	0.03	[−0.02, 0.08]	.182	0.00	[−0.05, 0.05]	.924	261,465	59	.985	.028	.031
	Insecurity	−0.06	[−0.10, −0.01]	.015	−0.09	[−0.14, −0.05]	.000	262,2	59	.985	.028	.030
	Importance	0.04	[−0.00, 0.09]	.055	−0.00	[−0.05, 0.05]	.941	243,568	59	.986	.027	.029
Orderliness	Conflict	−0.04	[−0.08, 0.01]	.146	−0.07	[−0.13, −0.01]	.020	758,164	149	.945	.031	.040
	Contact	0.00	[−0.05, 0.05]	.886	−0.07	[−0.13, −0.02]	.006	703,9	149	.950	.029	.038
	Closeness	0.01	[−0.05, 0.06]	.837	−0.01	[−0.06, 0.05]	.738	742,031	149	.947	.030	.040
	Insecurity	−0.04	[−0.09, 0.01]	.077	−0.07	[−0.13, −0.02]	.004	836,804	149	.940	.033	.046
	Importance	0.03	[−0.02, 0.07]	.322	−0.03	[−0.08, 0.02]	.292	747,017	149	.947	.030	.040
Goal striving	Conflict	−0.04	[−0.09, 0.01]	.156	−0.03	[−0.08, 0.02]	.269	276,816	59	.968	.029	.029
	Contact	0.06	[0.01, 0.11]	.031	−0.03	[−0.09, 0.02]	.217	24.017	59	.973	.027	.026
	Closeness	0.07	[0.02, 0.13]	.006	0.03	[−0.02, 0.09]	.215	281,961	59	.967	.029	.031

	Insecurity	−0.07	[−0.12, −0.02]	.003	−0.08	[−0.13, −0.03]	.003	269,964	59	.969	.029	.029
	Importance	0.05	[0.00, 0.10]	.038	0.04	[−0.02, 0.09]	.167	277,551	59	.968	.029	.031
Dependability	Conflict	−0.08	[−0.14, −0.03]	.003	−0.10	[−0.16, −0.05]	.000	341,284	100	.971	.024	.029
	Contact	0.04	[−0.01, 0.09]	.132	−0.10	[−0.16, −0.05]	.000	297,565	100	.976	.021	.027
	Closeness	0.06	[0.01, 0.11]	.019	−0.00	[−0.06, 0.06]	.942	327,925	100	.973	.023	.029
	Insecurity	−0.03	[−0.08, 0.02]	.249	−0.07	[−0.12, −0.01]	.015	385,295	100	.967	.026	.035
	Importance	0.08	[0.03, 0.13]	.002	0.01	[−0.04, 0.07]	.610	349,41	100	.971	.024	.029
					All kin							
Neuroticism	Conflict	0.06	[0.01, 0.10]	.014	0.12	[0.07, 0.17]	.000	44.135	59	.973	.038	.040
	Contact	0.00	[−0.04, 0.05]	.950	0.01	[−0.04, 0.05]	.775	384,31	59	.977	.036	.037
	Closeness	−0.05	[−0.09, −0.00]	.045	−0.06	[−0.10, −0.01]	.014	465,561	59	.971	.040	.040
	Insecurity	0.15	[0.10, 0.19]	.000	0.16	[0.11, 0.21]	.000	466,29	59	.971	.040	.042
	Importance	−0.02	[−0.06, 0.03]	.428	−0.01	[−0.05, 0.04]	.831	439,097	59	.971	.038	.042
Negative affect	Conflict	0.07	[0.02, 0.13]	.006	0.13	[0.08, 0.19]	.000	886,808	149	.925	.034	.057
	Contact	−0.04	[−0.09, 0.01]	.125	−0.01	[−0.06, 0.05]	.836	875,026	149	.925	.033	.057
	Closeness	−0.06	[−0.11, −0.01]	.017	−0.07	[−0.12, −0.02]	.007	913,111	149	.922	.034	.058
	Insecurity	0.14	[0.09, 0.19]	.000	0.12	[0.06, 0.17]	.000	932,85	149	.921	.035	.058
	Importance	−0.05	[−0.11, 0.01]	.095	−0.01	[−0.06, 0.04]	.676	898,071	149	.918	.034	.058
Self-reproach	Conflict	0.02	[−0.03, 0.07]	.363	0.10	[0.05, 0.16]	.000	692,099	271	.976	.019	.030
	Contact	−0.00	[−0.05, 0.05]	.886	−0.01	[−0.06, 0.04]	.716	606,154	271	.981	.017	.026
	Closeness	−0.04	[−0.09, 0.01]	.104	−0.05	[−0.10, −0.00]	.034	703,624	271	.975	.019	.029
	Insecurity	0.13	[0.08, 0.18]	.000	0.17	[0.11, 0.22]	.000	723,699	271	.974	.020	.031
	Importance	−0.01	[−0.06, 0.04]	.764	−0.01	[−0.06, 0.04]	.627	628,87	271	.979	.017	.029
Extraversion	Conflict	0.00	[−0.04, 0.04]	.978	−0.04	[−0.09, 0.01]	.082	343,123	59	.977	.033	.028
	Contact	0.02	[−0.02, 0.07]	.345	0.02	[−0.02, 0.07]	.340	335,143	59	.977	.033	.027
	Closeness	0.06	[0.01, 0.10]	.015	0.12	[0.07, 0.16]	.000	363,398	59	.975	.034	.030
	Insecurity	−0.05	[−0.10, −0.00]	.034	−0.08	[−0.13, −0.03]	.003	367,999	59	.974	.035	.030
	Importance	0.06	[0.01, 0.11]	.025	0.08	[0.03, 0.14]	.002	345,236	59	.974	.033	.031
Positive affect	Conflict	0.04	[−0.01, 0.08]	.162	−0.06	[−0.11, −0.01]	.033	482,19	100	.960	.030	.045
	Contact	0.05	[0.00, 0.10]	.042	0.02	[−0.03, 0.07]	.337	366,311	100	.972	.025	.032

	Closeness	0.03	[−0.02, 0.08]	.226	0.09	[0.04, 0.15]	.001	47.119	100	.961	.029	.039
	Insecurity	−0.00	[−0.05, 0.05]	.886	−0.05	[−0.11, 0.00]	.065	489,787	100	.958	.030	.045
	Importance	0.03	[−0.02, 0.08]	.276	0.08	[0.02, 0.13]	.010	409,493	100	.964	.027	.037
Sociability	Conflict	−0.01	[−0.06, 0.03]	.577	−0.02	[−0.07, 0.03]	.465	389,838	100	.966	.026	.029
	Contact	0.02	[−0.03, 0.07]	.362	0.03	[−0.03, 0.08]	.322	388,527	100	.967	.026	.030
	Closeness	0.07	[0.02, 0.12]	.004	0.11	[0.06, 0.15]	.000	418,519	100	.963	.027	.031
	Insecurity	−0.06	[−0.11, −0.02]	.008	−0.06	[−0.12, −0.01]	.020	437,299	100	.96	.028	.033
	Importance	0.05	[0.00, 0.10]	.052	0.09	[0.04, 0.14]	.001	401,891	100	.962	.026	.032
Activity	Conflict	0.05	[0.01, 0.10]	.023	0.04	[−0.01, 0.09]	.116	487,992	100	.952	.030	.037
	Contact	−0.0	[−0.06, 0.04]	.689	0.02	[−0.02, 0.07]	.334	418,234	100	.960	.027	.031
	Closeness	−0.01	[−0.06, 0.04]	.708	0.02	[−0.04, 0.07]	.535	512,419	100	.949	.031	.038
	Insecurity	0.05	[−0.00, 0.09]	.056	−0.02	[−0.08, 0.03]	.435	55.033	100	.943	.032	.041
	Importance	0.02	[−0.03, 0.07]	.432	0.02	[−0.03, 0.07]	.464	438,292	100	.954	.028	.035
Openness	Conflict	0.02	[−0.02, 0.07]	.276	0.03	[−0.02, 0.08]	.243	286,024	59	.979	.030	.032
	Contact	−0.17	[−0.21, −0.12]	.000	−0.14	[−0.18, −0.09]	.000	278,177	59	.980	.029	.030
	Closeness	−0.07	[−0.11, −0.03]	.001	−0.02	[−0.07, 0.03]	.354	308,422	59	.977	.031	.034
	Insecurity	0.06	[0.01, 0.10]	.014	0.12	[0.08, 0.17]	.000	317,164	59	.976	.032	.033
	Importance	−0.02	[−0.07, 0.02]	.331	0.01	[−0.05, 0.06]	.829	289,937	59	.977	.030	.035
Unconventionality	Conflict	0.08	[0.02, 0.14]	.010	0.00	[−0.06, 0.06]	.887	268,386	100	.971	.020	.028
	Contact	−0.08	[−0.14, −0.01]	.021	−0.10	[−0.15, −0.04]	.001	341,007	100	.959	.024	.042
	Closeness	−0.03	[−0.09, 0.03]	.380	−0.07	[−0.13, −0.01]	.017	314,766	100	.963	.022	.032
	Insecurity	0.08	[0.02, 0.14]	.015	0.10	[0.04, 0.16]	.001	33.182	100	.96	.023	.031
	Importance	−0.04	[−0.10, 0.02]	.187	−0.02	[−0.08, 0.05]	.619	286,376	100	.965	.021	.032
Aesthetic interest	Conflict	0.02	[−0.03, 0.07]	.473	0.06	[0.01, 0.12]	.019	243,391	59	.981	.027	.026
	Contact	−0.11	[−0.16, −0.06]	.000	−0.09	[−0.14, −0.04]	.001	238,631	59	.982	.026	.025
	Closeness	−0.08	[−0.12, −0.30]	.002	−0.01	[−0.06, 0.05]	.823	268,861	59	.978	.029	.027
	Insecurity	0.06	[0.01, 0.11]	.021	0.12	[0.07, 0.17]	.000	274,86	59	.977	.029	.028
	Importance	−0.02	[−0.07, 0.03]	.498	0.02	[−0.03, 0.08]	.418	246,315	59	.979	.027	.029
Intellectual interest	Conflict	0.02	[−0.03, 0.07]	.495	0.01	[−0.04, 0.06]	.669	269,232	59	.963	.029	.032
	Contact	−0.18	[−0.23, −0.13]	.000	−0.09	[−0.14, −0.04]	.000	239,233	59	.969	.026	.031

	Closeness	−0.08	[−0.13, −0.03]	.001	0.02	[−0.04, 0.07]	.574	292,215	59	.959	.030	.034
	Insecurity	0.04	[−0.02, 0.09]	.173	0.06	[0.01, 0.12]	.028	305,073	59	.956	.031	.034
	Importance	−0.05	[−0.10, −0.00]	.042	0	[−0.06, 0.06]	.989	26.859	59	.961	.028	.035
Agreeableness	Conflict	−0.11	[−0.16, −0.06]	.000	−0.13	[−0.19, −0.08]	.000	254,531	59	.979	.028	.036
	Contact	0.02	[−0.03, 0.07]	.465	0.01	[−0.04, 0.06]	.589	213,127	59	.983	.024	.029
	Closeness	0.01	[−0.04, 0.06]	.682	0.14	[0.09, 0.19]	.000	275,791	59	.976	.029	.034
	Insecurity	−0.14	[−0.19, −0.09]	.000	−0.05	[−0.11, 0.00]	.072	344,106	59	.968	.033	.040
	Importance	0.02	[−0.04, 0.08]	.461	0.08	[0.02, 0.14]	.007	244,126	59	.977	.027	.035
Nonantagonsim	Conflict	−0.20	[−0.26, −0.13]	.000	−0.24	[−0.31, −0.18]	.000	1,024,373	344	.948	.021	.040
	Contact	0.03	[−0.03, 0.09]	.314	0.02	[−0.04, 0.07]	.541	988,117	344	.947	.021	.038
	Closeness	0.03	[−0.02, 0.09]	.254	0.14	[0.08, 0.21]	.000	1,022,391	344	.945	.021	.039
	Insecurity	−0.18	[−0.24, −0.12]	.000	−0.10	[−0.17, −0.03]	.003	1,069,232	344	.942	.022	.040
	Importance	0.04	[−0.03, 0.10]	.270	0.09	[0.01, 0.16]	.025	1,01.405	344	.944	.021	.040
Prosocial orientation	Conflict	−0.07	[−0.12, −0.02]	.012	−0.06	[−0.12, −0.00]	.043	435,918	149	.964	.021	.033
	Contact	0.04	[−0.02, 0.09]	.169	−0.00	[−0.06, 0.05]	.976	405,39	149	.967	.020	.032
	Closeness	−0.01	[−0.07, 0.04]	.612	0.11	[0.05, 0.17]	.000	493,306	149	.956	.023	.036
	Insecurity	−0.06	[−0.11, −0.00]	.037	0.00	[−0.06, 0.06]	.987	53.638	149	.95	.024	.038
	Importance	0.03	[−0.03, 0.10]	.327	0.04	[−0.03, 0.10]	.242	457,407	149	.957	.022	.037
Conscientiousness	Conflict	−0.10	[−0.15, −0.06]	.000	−0.03	[−0.08, 0.02]	.195	232,808	59	.987	.026	.026
	Contact	0.07	[0.02, 0.11]	.005	0.02	[−0.03, 0.07]	.406	187,206	59	.99	.022	.023
	Closeness	0.02	[−0.02, 0.07]	.322	0.07	[0.02, 0.11]	.009	263,611	59	.985	.028	.030
	Insecurity	−0.09	[−0.13, −0.05]	.000	−0.03	[−0.08, 0.02]	.285	261,943	59	.984	.028	.028
	Importance	0.04	[−0.01, 0.09]	.084	0.01	[−0.04, 0.06]	.745	234,422	59	.986	.026	.030
Orderliness	Conflict	−0.10	[−0.15, −0.05]	.000	−0.04	[−0.09, 0.02]	.186	753,469	149	.947	.031	.040
	Contact	0.08	[0.03, 0.13]	.002	0.04	[−0.01, 0.09]	.092	732,354	149	.949	.030	.039
	Closeness	0.04	[−0.01, 0.09]	.083	0.07	[0.02, 0.12]	.007	761,493	149	.946	.031	.040
	Insecurity	−0.08	[−0.13, −0.04]	.000	−0.03	[−0.08, 0.03]	.350	80.26	149	.942	.032	.042
	Importance	0.04	[−0.01, 0.10]	.134	0.01	[−0.05, 0.06]	.753	719,017	149	.947	.030	.040
Goal striving	Conflict	−0.05	[−0.10, −0.00]	.043	−0.00	[−0.06, 0.05]	.949	274,706	59	.969	.029	.028
	Contact	0.02	[−0.03, 0.07]	.377	0.04	[−0.01, 0.09]	.109	236,554	59	.975	.026	.025

	Closeness	0.03	[−0.02, 0.08]	.305	0.08	[0.03, 0.13]	.002	297,743	59	.966	.030	.031
	Insecurity	−0.06	[−0.11, −0.02]	.011	−0.06	[−0.12, −0.01]	.024	314,509	59	.962	.032	.032
	Importance	0.03	[−0.03, 0.08]	.337	0.05	[−0.01, 0.10]	.131	267,504	59	.967	.028	.031
Dependability	Conflict	−0.06	[−0.11, −0.01]	.019	−0.02	[−0.07, 0.04]	.559	349,272	100	.971	.024	.030
	Contact	0.09	[0.04, 0.14]	.001	−0.02	[−0.07, 0.04]	.563	30.58	100	.977	.021	.027
	Closeness	−0.01	[−0.07, 0.04]	.630	0.08	[0.02, 0.14]	.005	367,878	100	.969	.025	.029
	Insecurity	−0.05	[−0.10, −0.00]	.038	0.02	[−0.04, 0.08]	.594	393,064	100	.965	.026	.034
	Importance	0.03	[−0.03, 0.08]	.311	−0.01	[−0.06, 0.05]	.824	333,969	100	.971	.023	.030
					Others							
Neuroticism	Conflict	−0.01	[−0.07, 0.05]	.796	0.08	[0.02, 0.15]	.007	432,432	59	.973	.038	.041
	Contact	−0.07	[−0.13, −0.01]	.019	−0.03	[−0.09, 0.03]	.308	389,049	59	.976	.036	.038
	Closeness	−0.02	[−0.07, 0.05]	.636	−0.05	[−0.11, 0.02]	.151	389,148	59	.975	.036	.038
	Insecurity	0.14	[0.08, 0.21]	.000	0.17	[0.10, 0.23]	.000	428,362	59	.973	.038	.042
	Importance	0.02	[−0.04, 0.08]	.556	−0.02	[−0.09, 0.04]	.479	409,871	59	.974	.037	.040
Negative affect	Conflict	0.03	[−0.04, 0.09]	.424	0.10	[0.04, 0.17]	.001	846,284	149	.924	.033	.057
	Contact	−0.07	[−0.13, −0.01]	.030	0.01	[−0.06, 0.07]	.877	846,792	149	.924	.033	.057
	Closeness	0.03	[−0.04, 0.09]	.379	−0.05	[−0.12, 0.01]	.120	844,595	149	.923	.033	.056
	Insecurity	0.07	[0.01, 0.14]	.033	0.15	[0.08, 0.21]	.000	893,468	149	.922	.034	.060
	Importance	0.04	[−0.02, 0.11]	.188	−0.05	[−0.12, 0.02]	.133	851,398	149	.923	.033	.057
Self-reproach	Conflict	−0.03	[−0.09, 0.04]	.383	0.06	[−0.01, 0.13]	.079	651,237	271	.978	.018	.030
	Contact	−0.05	[−0.11, 0.01]	.123	−0.02	[−0.08, 0.05]	.623	598,778	271	.981	.017	.027
	Closeness	−0.02	[−0.09, 0.04]	.478	−0.04	[−0.10, 0.03]	.263	591,34	271	.981	.017	.028
	Insecurity	0.16	[0.09, 0.22]	.000	0.17	[0.10, 0.23]	.000	676,053	271	.977	.019	.031
	Importance	0.00	[−0.06, 0.06]	.988	−0.01	[−0.08, 0.05]	.673	635,25	271	.979	.018	.029
Extraversion	Conflict	−0.02	[−0.07, 0.05]	.610	−0.01	[−0.07, 0.05]	.761	326,72	59	.977	.032	.029
	Contact	−0.03	[−0.09, 0.04]	.413	−0.01	[−0.07, 0.05]	.718	318,886	59	.978	.032	.027
	Closeness	0.03	[−0.03, 0.09]	.281	0.08	[0.02, 0.14]	.013	311,586	59	.978	.032	.027
	Insecurity	−0.08	[−0.14, −0.03]	.005	−0.03	[−0.09, 0.02]	.246	334,277	59	.976	.033	.033
	Importance	0.03	[−0.04, 0.08]	.409	0.08	[0.02, 0.13]	.014	323,638	59	.977	.032	.029
Positive affect	Conflict	−0.03	[−0.09, 0.04]	.412	−0.03	[−0.10, 0.04]	.400	388,464	100	.967	.026	.037

	Contact	−0.02	[−0.09, 0.05]	.558	0.01	[−0.05, 0.07]	.744	36.668	100	.971	.025	.033
	Closeness	0.04	[−0.02, 0.11]	.214	0.06	[−0.00, 0.13]	.065	378,908	100	.968	.025	.036
	Insecurity	−0.05	[−0.11, 0.02]	.140	−0.02	[−0.08, 0.05]	.642	462,761	100	.96	.029	.048
	Importance	0.02	[−0.05, 0.08]	.635	0.08	[0.01, 0.15]	.023	386,294	100	.968	.026	.035
Sociability	Conflict	−0.01	[−0.07, 0.05]	.702	−0.01	[−0.08, 0.06]	.764	369,894	100	.967	.025	.030
	Contact	−0.04	[−0.10, 0.02]	.190	−0.01	[−0.07, 0.06]	.820	375,826	100	.966	.025	.031
	Closeness	0.03	[−0.03, 0.10]	.277	0.07	[0.00, 0.13]	.042	348,75	100	.969	.024	.027
	Insecurity	−0.07	[−0.13, −0.01]	.018	−0.04	[−0.10, 0.03]	.258	401,926	100	.963	.026	.035
	Importance	0.01	[−0.05, 0.07]	.717	0.07	[0.00, 0.13]	.038	36.346	100	.968	.025	.029
Activity	Conflict	0.03	[−0.03, 0.09]	.309	0.04	[−0.02, 0.11]	.168	44.984	100	.954	.028	.035
	Contact	−0.04	[−0.10, 0.02]	.216	−0.02	[−0.08, 0.04]	.534	39.248	100	.961	.026	.029
	Closeness	−0.02	[−0.08, 0.04]	.480	0.05	[−0.02, 0.11]	.166	406,146	100	.959	.027	.033
	Insecurity	0.04	[−0.02, 0.10]	.192	0.03	[−0.04, 0.09]	.409	50.654	100	.947	.030	.044
	Importance	−0.03	[−0.08, 0.04]	.434	0.04	[−0.02, 0.11]	.196	442,5	100	.954	.028	.036
Openness	Conflict	0.03	[−0.03, 0.09]	.309	0.04	[−0.02, 0.10]	.147	253,309	59	.981	.028	.032
	Contact	−0.06	[−0.12, 0.00]	.062	−0.01	[−0.07, 0.05]	.687	26.633	59	.98	.028	.032
	Closeness	0.03	[−0.03, 0.10]	.297	−0.03	[−0.09, 0.03]	.322	249,588	59	.981	.027	.030
	Insecurity	0.07	[0.01, 0.14]	.022	0.09	[0.04, 0.15]	.001	277,718	59	.979	.029	.034
	Importance	0.02	[−0.03, 0.08]	.423	−0.07	[−0.13, −0.01]	.018	252,449	59	.981	.028	.031
Unconventionality	Conflict	−0.02	[−0.09, 0.06]	.699	0.05	[−0.02, 0.12]	.129	24.087	100	.973	.018	.029
	Contact	−0.10	[−0.17, −0.02]	.011	−0.06	[−0.14, 0.01]	.085	232,758	100	.974	.018	.028
	Closeness	0.02	[−0.06, 0.10]	.683	−0.07	[−0.15, 0.00]	.051	238,582	100	.973	.018	.029
	Insecurity	0.09	[0.01, 0.17]	.032	0.18	[0.11, 0.24]	.000	244,419	100	.973	.018	.029
	Importance	0.01	[−0.07, 0.09]	.859	−0.12	[−0.19, −0.05]	.001	243,736	100	.972	.018	.029
Aesthetic interest	Conflict	0.04	[−0.02, 0.10]	.210	0.06	[0.00, 0.12]	.05	222,542	59	.982	.025	.026
	Contact	−0.06	[−0.13, 0.00]	.058	−0.01	[−0.07, 0.06]	.857	221,385	59	.982	.025	.024
	Closeness	0.04	[−0.03, 0.10]	.263	0.01	[−0.06, 0.08]	.750	207,809	59	.984	.024	.024
	Insecurity	0.08	[0.02, 0.14]	.016	0.09	[0.04, 0.16]	.002	227,166	59	.982	.026	.027
	Importance	0.04	[−0.03, 0.10]	.272	−0.04	[−0.10, 0.03]	.291	212,806	59	.983	.025	.025
	Conflict	0.00	[−0.06, 0.07]	.947	0.03	[−0.05, 0.10]	.474	241,416	59	.964	.027	.033

	Contact	−0.00	[−0.07, 0.06]	.928	−0.00	[−0.07, 0.07]	.919	216,168	59	.969	.025	.029
Intellectual interest	Closeness	0.01	[−0.06, 0.07]	.819	−0.04	[−0.11, 0.03]	.253	234,13	59	.966	.026	.031
	Insecurity	−0.01	[−0.08, 0.06]	.768	0.01	[−0.06, 0.08]	.759	231,925	59	.967	.026	.032
	Importance	0.02	[−0.04, 0.09]	.500	−0.07	[−0.14, −0.00]	.041	234,209	59	.966	.026	.032
Agreeableness	Conflict	−0.07	[−0.14, −0.01]	.036	−0.09	[−0.16, −0.03]	.004	21.429	59	.982	.024	.032
	Contact	0.06	[−0.01, 0.12]	.074	0.01	[−0.06, 0.07]	.848	192,99	59	.984	.023	.029
	Closeness	0.02	[−0.05, 0.08]	.560	0.05	[−0.02, 0.12]	.132	208,992	59	.982	.024	.031
	Insecurity	−0.12	[−0.18, −0.06]	.000	−0.06	[−0.13, 0.01]	.094	268,034	59	.975	.029	.038
	Importance	0.02	[−0.04, 0.09]	.491	0.04	[−0.03, 0.10]	.262	223,964	59	.981	.025	.034
Nonantagonsim	Conflict	−0.06	[−0.13, 0.02]	.143	−0.12	[−0.19, −0.05]	.001	965,531	344	.947	.02	.039
	Contact	0.12	[0.05, 0.19]	.001	−0.00	[−0.07, 0.07]	.955	944,85	344	.949	.02	.038
	Closeness	0.05	[−0.03, 0.12]	.212	0.05	[−0.02, 0.13]	.171	959,146	344	.947	.02	.040
	Insecurity	−0.13	[−0.20, −0.06]	.000	−0.10	[−0.17, −0.02]	.013	1,014,975	344	.943	.021	.041
	Importance	0.03	[−0.04, 0.10]	.408	0.04	[−0.04, 0.11]	.328	978,92	344	.946	.021	.041
Prosocial orientation	Conflict	−0.02	[−0.09, 0.05]	.541	−0.07	[−0.14, 0.01]	.074	419,82	149	.962	.021	.034
	Contact	0.03	[−0.04, 0.10]	.401	0.01	[−0.06, 0.08]	.830	388,558	149	.967	.019	.033
	Closeness	−0.05	[−0.12, 0.02]	.131	0.05	[−0.03, 0.12]	.141	393,969	149	.966	.02	.033
	Insecurity	−0.03	[−0.10, 0.04]	.377	0.00	[−0.07, 0.07]	.944	442,914	149	.96	.021	.036
	Importance	−0.03	[−0.10, 0.04]	.413	0.03	[−0.04, 0.10]	.358	406,477	149	.964	.02	.034
Conscientiousness	Conflict	−0.01	[−0.07, 0.05]	.688	−0.06	[−0.12, −0.00]	.042	209,109	59	.988	.024	.027
	Contact	0.09	[0.04, 0.15]	.001	0.06	[−0.00, 0.12]	.056	196,598	59	.989	.023	.023
	Closeness	−0.03	[−0.09, 0.03]	.278	0.05	[−0.02, 0.11]	.084	194,286	59	.989	.023	.025
	Insecurity	−0.07	[−0.13, −0.02]	.009	−0.08	[−0.14, −0.03]	.003	217,899	59	.988	.025	.027
	Importance	0.01	[−0.04, 0.07]	.671	0.03	[−0.03, 0.09]	.367	209,002	59	.988	.024	.027
Orderliness	Conflict	−0.05	[−0.11, 0.02]	.154	−0.04	[−0.10, 0.03]	.278	709,606	149	.948	.03	.040
	Contact	0.07	[0.01, 0.13]	.018	0.04	[−0.02, 0.11]	.179	719,017	149	.948	.03	.039
	Closeness	−0.01	[−0.08, 0.05]	.702	0.04	[−0.03, 0.10]	.262	715,288	149	.948	.03	.039
	Insecurity	−0.09	[−0.15, −0.03]	.005	−0.05	[−0.11, 0.01]	.073	752,225	149	.945	.031	.043
	Importance	0.03	[−0.03, 0.09]	.316	0.02	[−0.05, 0.08]	.603	702,008	149	.949	.029	.039
Goal striving	Conflict	0.05	[−0.02, 0.11]	.160	−0.03	[−0.09, 0.04]	.433	239,792	59	.972	.027	.028

	Contact	0.07	[0.01, 0.13]	.023	0.03	[−0.03, 0.10]	.324	244,718	59	.971	.027	.027
	Closeness	−0.05	[−0.11, 0.02]	.147	0.08	[0.02, 0.15]	.012	24.115	59	.972	.027	.027
	Insecurity	−0.09	[−0.15, −0.03]	.005	−0.08	[−0.14, −0.03]	.005	261,302	59	.969	.028	.030
	Importance	−0.00	[−0.07, 0.06]	.894	0.09	[0.03, 0.16]	.003	241,97	59	.972	.027	.028
Dependability	Conflict	−0.04	[−0.10, 0.03]	.246	−0.06	[−0.13, 0.01]	.111	307,879	100	.975	.022	.028
	Contact	0.05	[−0.02, 0.11]	.174	0.09	[0.02, 0.16]	.009	296,226	100	.976	.021	.027
	Closeness	−0.04	[−0.11, 0.02]	.206	0.04	[−0.03, 0.11]	.215	287,973	100	.977	.021	.027
	Insecurity	−0.02	[−0.08, 0.04]	.530	−0.05	[−0.12, 0.02]	.140	361,456	100	.968	.025	.032
	Importance	0.00	[−0.06, 0.07]	.898	0.01	[−0.05, 0.08]	.682	299,812	100	.975	.022	.028

Note. $\gamma_{P1 \rightarrow R2}$ = effect of personality at first measurement occasion on relationship characteristics at second measurement occasion, $\gamma_{P2 \rightarrow R3}$ = effect of personality at second measurement occasion on relationship characteristics at third measurement occasion, CI = confidence interval of the parameter estimate.

Table A7

Cross-Lagged Relationship Effects on Personality Characteristics from the Cross-Lagged Panel Model

Personality	Relationship Aspect	$\gamma_{R1\rightarrow P2}$	95% CI	*p*−value	$\gamma_{R2\rightarrow P3}$	95% CI	*p*−value
			Romantic Partner				
Neuroticism	Conflict	0.04	[0.06, 0.20]	.190	0.03	[−0.02, 0.09]	.188
	Contact	−0.06	[−0.07, 0.06]	.027	−0.02	[−0.11, −0.01]	.243
	Closeness	0.01	[−0.09, 0.04]	.627	−0.03	[−0.03, 0.05]	.085
	Insecurity	0.04	[0.08, 0.20]	.166	0.02	[−0.02, 0.09]	.489
	Importance	−0.03	[−0.08, 0.06]	.283	−0.03	[−0.07, 0.02]	.229
Negative affect	Conflict	0.06	[0.08, 0.22]	.073	0.04	[−0.01, 0.12]	.211
	Contact	−0.09	[−0.10, 0.04]	.006	−0.02	[−0.15, −0.03]	.460
	Closeness	−0.02	[−0.13, 0.01]	.564	−0.06	[−0.07, 0.04]	.053
	Insecurity	0.08	[0.09, 0.23]	.011	0.05	[0.02, 0.14]	.132
	Importance	−0.03	[−0.12, 0.02]	.355	−0.06	[−0.10, 0.03]	.051
Self-reproach	Conflict	0.04	[0.05, 0.20]	.181	0.06	[−0.02, 0.09]	.032
	Contact	−0.05	[−0.09, 0.05]	.073	−0.02	[−0.10, 0.01]	.459
	Closeness	0.02	[−0.09, 0.06]	.416	−0.05	[−0.03, 0.07]	.086
	Insecurity	0.016	[0.08, 0.21]	.570	0.04	[−0.04, 0.07]	.254
	Importance	−0.04	[−0.08, 0.08]	.088	−0.01	[−0.09, 0.01]	.667
Extraversion	Conflict	−0.02	[−0.14, −0.01]	.519	−0.01	[−0.07, 0.03]	.794
	Contact	0.01	[−0.05, 0.08]	.771	0.03	[−0.04, 0.06]	.243
	Closeness	−0.01	[−0.05, 0.08]	.846	0.06	[−0.05, 0.04]	.002
	Insecurity	−0.03	[−0.15, −0.01]	.287	−0.05	[−0.08, 0.02]	.031
	Importance	0.01	[−0.06, 0.05]	.698	0.05	[−0.04, 0.06]	.010
Positive affect	Conflict	0.00	[−0.18, −0.04]	.945	−0.03	[−0.05, 0.06]	.414
	Contact	0.00	[−0.06, 0.08]	.998	0.03	[−0.06, 0.06]	.405
	Closeness	0.01	[−0.05, 0.09]	.598	0.04	[−0.04, 0.06]	.174
	Insecurity	−0.03	[−0.16, −0.02]	.285	0.00	[−0.09, 0.03]	.898
	Importance	0.03	[−0.06, 0.07]	.339	0.033	[−0.03, 0.09]	.274
Sociability	Conflict	0.01	[−0.11, 0.02]	.710	0.02	[−0.05, 0.07]	.493
	Contact	0.02	[−0.08, 0.05]	.436	0.02	[−0.04, 0.08]	.521
	Closeness	−0.02	[−0.04, 0.09]	.614	0.06	[−0.07, 0.04]	.040
	Insecurity	0.01	[−0.13, 0.01]	.685	−0.06	[−0.04, 0.07]	.061
	Importance	−0.01	[−0.08, 0.05]	.737	0.04	[−0.06, 0.05]	.168
Activity	Conflict	0.01	[−0.04, 0.09]	.772	−0.02	[−0.05, 0.07]	.483
	Contact	0.04	[−0.04, 0.09]	.254	0.01	[−0.03, 0.10]	.866
	Closeness	0.00	[−0.08, 0.06]	.989	0.05	[−0.06, 0.06]	.081
	Insecurity	−0.03	[−0.13, 0.00]	.351	−0.07	[−0.08, 0.03]	.009
	Importance	−0.01	[−0.06, 0.07]	.711	0.05	[−0.06, 0.04]	.070
Openness	Conflict	0.03	[−0.02, 0.11]	.148	−0.04	[−0.01, 0.07]	.089
	Contact	−0.00	[−0.07, 0.06]	.868	−0.00	[−0.05, 0.04]	.965
	Closeness	0.03	[−0.09, 0.04]	.076	0.03	[−0.00, 0.07]	.149
	Insecurity	0.01	[0.03, 0.16]	.555	−0.01	[−0.03, 0.06]	.756
	Importance	−0.03	[−0.10, 0.03]	.272	0.01	[−0.07, 0.02]	.740

Unconventionality	Conflict	0.10	[0.03, 0.19]	.011	−0.09	[0.02, 0.17]	.027
	Contact	−0.06	[−0.02, 0.14]	.139	−0.05	[−0.13, 0.02]	.225
	Closeness	0.03	[−0.12, 0.05]	.469	0.02	[−0.04, 0.09]	.673
	Insecurity	0.04	[0.03, 0.19]	.316	−0.01	[−0.04, 0.11]	.814
	Importance	−0.03	[−0.09, 0.06]	.406	−0.01	[−0.10, 0.04]	.767
Aesthetic interest	Conflict	0.01	[−0.01, 0.12]	.688	−0.04	[−0.04, 0.06]	.130
	Contact	0.01	[−0.08, 0.04]	.744	0.01	[−0.04, 0.06]	.767
	Closeness	0.02	[−0.10, 0.02]	.344	0.02	[−0.03, 0.07]	.466
	Insecurity	−0.00	[0.04, 0.17]	.863	−0.03	[−0.05, 0.04]	.220
	Importance	−0.01	[−0.12, 0.01]	.711	0.00	[−0.06, 0.04]	.995
Intellectual interest	Conflict	−0.02	[−0.16, −0.01]	.551	−0.01	[−0.08, 0.04]	.823
	Contact	0.01	[−0.09, 0.05]	.816	−0.01	[−0.06, 0.07]	.667
	Closeness	0.06	[−0.08, 0.06]	.034	0.00	[0.01, 0.12]	.908
	Insecurity	−0.03	[−0.05, 0.09]	.446	0.04	[−0.09, 0.04]	.203
	Importance	−0.03	[−0.08, 0.07]	.419	0.00	[−0.09, 0.04]	.952
Agreeableness	Conflict	0.01	[−0.14, −0.02]	.780	−0.02	[−0.05, 0.06]	.575
	Contact	−0.00	[−0.05, 0.08]	.958	−0.02	[−0.05, 0.05]	.429
	Closeness	−0.01	[−0.05, 0.08]	.787	−0.03	[−0.05, 0.04]	.217
	Insecurity	0.03	[−0.10, 0.03]	.308	0.02	[−0.02, 0.07]	.344
	Importance	−0.02	[−0.04, 0.09]	.366	−0.02	[−0.07, 0.03]	.497
Nonantagonsim	Conflict	−0.02	[−0.22, −0.06]	.630	−0.04	[−0.09, 0.06]	.288
	Contact	0.00	[−0.04, 0.10]	.927	−0.01	[−0.06, 0.07]	.704
	Closeness	0.02	[−0.04, 0.10]	.579	−0.03	[−0.04, 0.08]	.280
	Insecurity	0.03	[−0.16, −0.02]	.417	−0.00	[−0.04, 0.09]	.929
	Importance	−0.0	[−0.05, 0.11]	.981	−0.02	[−0.06, 0.06]	.661
Prosocial orientation	Conflict	−0.02	[−0.14, −0.00]	.625	−0.00	[−0.08, 0.05]	.946
	Contact	−0.01	[−0.04, 0.10]	.837	−0.01	[−0.07, 0.06]	.672
	Closeness	0.01	[−0.07, 0.08]	.739	−0.01	[−0.05, 0.07]	.871
	Insecurity	−0.00	[−0.09, 0.06]	.900	0.05	[−0.06, 0.06]	.139
	Importance	0.01	[−0.03, 0.12]	.756	−0.00	[−0.05, 0.07]	.973
Conscientiousness	Conflict	−0.02	[−0.19, −0.06]	.345	−0.02	[−0.07, 0.02]	.329
	Contact	0.01	[−0.04, 0.09]	.715	−0.03	[−0.04, 0.06]	.196
	Closeness	0.02	[−0.01, 0.12]	.287	−0.01	[−0.02, 0.07]	.809
	Insecurity	−0.01	[−0.17, −0.04]	.573	−0.03	[−0.06, 0.03]	.123
	Importance	0.02	[−0.04, 0.11]	.289	−0.01	[−0.02, 0.07]	.538
Orderliness	Conflict	0.02	[−0.15, −0.02]	.428	−0.01	[−0.03, 0.07]	.681
	Contact	0.01	[−0.04, 0.09]	.696	−0.02	[−0.04, 0.06]	.439
	Closeness	0.01	[−0.03, 0.11]	.730	−0.01	[−0.04, 0.06]	.655
	Insecurity	0.02	[−0.15, −0.01]	.552	−0.01	[−0.04, 0.07]	.748
	Importance	0.01	[−0.06, 0.08]	.612	−0.00	[−0.04, 0.06]	.900
Goal striving	Conflict	−0.04	[−0.18, −0.04]	.110	−0.00	[−0.10, 0.01]	.953
	Contact	−0.02	[−0.02, 0.12]	.575	0.02	[−0.07, 0.04]	.630
	Closeness	0.02	[−0.03, 0.12]	.598	0.06	[−0.04, 0.07]	.041
	Insecurity	−0.01	[−0.14, −0.01]	.697	−0.09	[−0.07, 0.05]	.004
	Importance	0.03	[−0.09, 0.06]	.250	0.02	[−0.02, 0.09]	.489
Dependability	Conflict	0.00	[−0.16, −0.20]	.995	−0.02	[−0.06, 0.06]	.512
	Contact	0.03	[−0.02, 0.11]	.288	−0.06	[−0.03, 0.10]	.070

	Closeness	0.07	[−0.00, 0.14]	.019	−0.04	[0.01, 0.12]	.247
	Insecurity	−0.06	[−0.15, −0.01]	.028	0.02	[−0.12, −0.01]	.509
	Importance	0.05	[−0.02, 0.13]	.104	−0.03	[−0.01, 0.11]	.372
			Friends				
Neuroticism	Conflict	0.01	[−0.03, 0.05]	.518	0.02	[−0.01, 0.05]	.253
	Contact	−0.02	[−0.06, 0.02]	.232	−0.01	[−0.04, 0.03]	.721
	Closeness	−0.03	[−0.07, 0.01]	.104	−0.03	[−0.06, 0.00]	.086
	Insecurity	0.03	[−0.02, 0.07]	.223	0.04	[0.01, 0.07]	.026
	Importance	−0.04	[−0.07, 0.00]	.054	−0.00	[−0.03, 0.03]	.909
Negative affect	Conflict	0.01	[−0.03, 0.06]	.538	0.05	[0.01, 0.09]	.028
	Contact	−0.02	[−0.06, 0.03]	.431	−0.04	[−0.09, 0.01]	.080
	Closeness	−0.02	[−0.07, 0.02]	.281	−0.04	[−0.09, 0.01]	.120
	Insecurity	0.06	[0.01, 0.10]	.011	0.09	[0.04, 0.13]	.000
	Importance	−0.02	[−0.06, 0.03]	.403	−0.04	[−0.08, 0.01]	.135
Self-reproach	Conflict	0.02	[−0.02, 0.06]	.288	0.02	[−0.02, 0.07]	.353
	Contact	−0.02	[−0.06, 0.02]	.444	−0.01	[−0.06, 0.03]	.612
	Closeness	−0.02	[−0.06, 0.02]	.347	−0.03	[−0.08, 0.01]	.150
	Insecurity	0.02	[−0.03, 0.06]	.398	0.05	[0.00, 0.10]	.041
	Importance	−0.04	[−0.08, 0.00]	.068	−0.01	[−0.05, 0.04]	.752
Extraversion	Conflict	−0.03	[−0.06, 0.01]	.126	0.01	[−0.02, 0.05]	.530
	Contact	0.02	[−0.02, 0.06]	.355	−0.01	[−0.05, 0.02]	.482
	Closeness	0.04	[−0.00, 0.07]	.062	0.01	[−0.03, 0.04]	.792
	Insecurity	−0.02	[−0.06, 0.02]	.278	−0.02	[−0.06, 0.01]	.251
	Importance	0.03	[−0.01, 0.06]	.153	0.02	[−0.02, 0.05]	.377
Positive affect	Conflict	−0.03	[−0.07, 0.01]	.166	0.01	[−0.04, 0.05]	.820
	Contact	0.01	[−0.03, 0.06]	.573	−0.02	[−0.07, 0.03]	.381
	Closeness	0.04	[−0.01, 0.08]	.100	0.04	[−0.01, 0.09]	.085
	Insecurity	−0.03	[−0.08, 0.01]	.133	−0.02	[−0.07, 0.03]	.379
	Importance	0.03	[−0.01, 0.08]	.143	0.02	[−0.03, 0.07]	.377
Sociability	Conflict	−0.02	[−0.06, 0.02]	.261	−0.00	[−0.05, 0.04]	.934
	Contact	−0.00	[−0.04, 0.04]	.936	−0.03	[−0.07, 0.02]	.198
	Closeness	0.01	[−0.03, 0.06]	.515	−0.02	[−0.06, 0.03]	.541
	Insecurity	−0.00	[−0.04, 0.04]	.831	−0.02	[−0.06, 0.03]	.515
	Importance	−0.00	[−0.04, 0.04]	.959	0.01	[−0.04, 0.05]	.841
Activity	Conflict	0.01	[−0.03, 0.05]	.653	0.00	[−0.05, 0.05]	.974
	Contact	0.02	[−0.02, 0.07]	.256	−0.00	[−0.05, 0.05]	.904
	Closeness	0.02	[−0.02, 0.06]	.372	0.02	[−0.03, 0.07]	.431
	Insecurity	0.00	[−0.04, 0.04]	.894	0.01	[−0.04, 0.05]	.816
	Importance	0.00	[−0.04, 0.04]	.964	0.03	[−0.02, 0.08]	.184
Openness	Conflict	0.00	[−0.03, 0.04]	.790	0.02	[−0.02, 0.05]	.415
	Contact	−0.01	[−0.04, 0.02]	.625	−0.00	[−0.04, 0.04]	.885
	Closeness	0.02	[−0.02, 0.05]	.300	0.02	[−0.01, 0.06]	.207
	Insecurity	0.00	[−0.03, 0.03]	.918	−0.01	[−0.05, 0.03]	.646
	Importance	0.01	[−0.03, 0.04]	.670	0.01	[−0.03, 0.04]	.785
Unconventionality	Conflict	0.02	[−0.04, 0.08]	.459	−0.01	[−0.08, 0.07]	.888
	Contact	−0.01	[−0.07, 0.04]	.665	0	[−0.07, 0.07]	.996
	Closeness	0.03	[−0.04, 0.09]	.425	0.03	[−0.04, 0.11]	.389

	Insecurity	0.00	[−0.06, 0.06]	.999	−0.00	[−0.07, 0.07]	.987
	Importance	0.01	[−0.05, 0.07]	.676	0.02	[−0.05, 0.09]	.531
Aesthetic interest	Conflict	0.02	[−0.01, 0.06]	.231	0.02	[−0.02, 0.06]	.368
	Contact	−0.00	[−0.04, 0.03]	.851	0.01	[−0.03, 0.05]	.663
	Closeness	0.02	[−0.02, 0.06]	.302	0.02	[−0.02, 0.06]	.418
	Insecurity	−0.00	[−0.04, 0.03]	.799	−0.01	[−0.05, 0.03]	.519
	Importance	0.02	[−0.02, 0.06]	.282	0.02	[−0.02, 0.06]	.313
Intellectual interest	Conflict	−0.02	[−0.07, 0.03]	.375	0.04	[−0.02, 0.09]	.167
	Contact	0.00	[−0.05, 0.05]	.994	0.01	[−0.04, 0.07]	.684
	Closeness	0.03	[−0.02, 0.08]	.182	0.00	[−0.05, 0.06]	.915
	Insecurity	−0.01	[−0.05, 0.04]	.684	−0.01	[−0.06, 0.04]	.795
	Importance	0.02	[−0.03, 0.06]	.496	0.00	[−0.05, 0.06]	.885
Agreeableness	Conflict	0.04	[0.00, 0.09]	.042	−0.02	[−0.07, 0.02]	.348
	Contact	0.00	[−0.04, 0.04]	.991	−0.06	[−0.10, −0.01]	.019
	Closeness	0.02	[−0.02, 0.06]	.320	−0.00	[−0.05, 0.05]	.963
	Insecurity	−0.01	[−0.05, 0.03]	.682	0.01	[−0.03, 0.06]	.523
	Importance	0.01	[−0.03, 0.05]	.738	−0.02	[−0.06, 0.03]	.442
Nonantagonsim	Conflict	0.06	[−0.00, 0.11]	.056	−0.02	[−0.08, 0.04]	.482
	Contact	0.02	[−0.03, 0.07]	.363	−0.08	[−0.14, −0.02]	.010
	Closeness	0.02	[−0.03, 0.08]	.374	−0.01	[−0.06, 0.05]	.859
	Insecurity	−0.04	[−0.09, 0.01]	.138	0.00	[−0.06, 0.06]	.958
	Importance	−0.01	[−0.06, 0.04]	.679	−0.06	[−0.12, 0.00]	.055
Prosocial orientation	Conflict	0.01	[−0.03, 0.06]	.553	−0.04	[−0.10, 0.01]	.133
	Contact	−0.03	[−0.08, 0.01]	.167	−0.01	[−0.07, 0.05]	.726
	Closeness	0.03	[−0.02, 0.09]	.187	0.00	[−0.05, 0.06]	.911
	Insecurity	−0.02	[−0.07, 0.03]	.378	0.03	[−0.02, 0.08]	.227
	Importance	0.00	[−0.05, 0.05]	.907	0.01	[−0.05, 0.07]	.690
Conscientiousness	Conflict	−0.06	[−0.10, −0.02]	.002	−0.01	[−0.05, 0.04]	.745
	Contact	−0.03	[−0.06, 0.01]	.121	0.04	[−0.00, 0.08]	.067
	Closeness	0.03	[−0.00, 0.07]	.058	0.00	[−0.04, 0.04]	.979
	Insecurity	−0.02	[−0.05, 0.02]	.288	−0.01	[−0.06, 0.03]	.488
	Importance	0.03	[−0.01, 0.06]	.164	0.02	[−0.02, 0.06]	.263
Orderliness	Conflict	−0.04	[−0.07, 0.00]	.074	−0.01	[−0.06, 0.03]	.577
	Contact	−0.02	[−0.06, 0.01]	.216	0.03	[−0.02, 0.07]	.256
	Closeness	−0.00	[−0.04, 0.04]	.918	0.01	[−0.03, 0.06]	.601
	Insecurity	−0.01	[−0.04, 0.03]	.795	0.01	[−0.04, 0.05]	.696
	Importance	−0.02	[−0.06, 0.02]	.283	0.02	[−0.02, 0.06]	.359
Goal striving	Conflict	−0.05	[−0.10, −0.01]	.020	−0.01	[−0.06, 0.05]	.866
	Contact	−0.03	[−0.07, 0.02]	.250	0.07	[0.02, 0.12]	.004
	Closeness	0.07	[0.03, 0.12]	.001	0.00	[−0.05, 0.05]	.991
	Insecurity	−0.01	[−0.05, 0.03]	.626	−0.05	[−0.10, 0.01]	.085
	Importance	0.06	[0.02, 0.11]	.004	0.06	[−0.03, 0.06]	.542
Dependability	Conflict	−0.06	[−0.10, −0.01]	.021	−0.01	[−0.07, 0.05]	.748
	Contact	−0.02	[−0.07, 0.03]	.385	0.01	[−0.04, 0.06]	.651
	Closeness	0.05	[−0.00, 0.09]	.053	−0.01	[−0.06, 0.05]	.861
	Insecurity	−0.02	[−0.07, 0.02]	.281	−0.02	[−0.07, 0.03]	.474
	Importance	0.05	[0.00, 0.10]	.033	0.01	[−0.04, 0.07]	.634

		All kin					
Neuroticism	Conflict	0.02	[−0.02, 0.06]	.289	0.01	[−0.03, 0.04]	.696
	Contact	−0.01	[−0.05, 0.03]	.479	−0.02	[−0.05, 0.01]	.171
	Closeness	−0.03	[−0.07, 0.01]	.108	−0.02	[−0.05, 0.01]	.249
	Insecurity	0.03	[−0.01, 0.07]	.115	0.05	[0.01, 0.08]	.008
	Importance	−0.03	[−0.07, 0.01]	.087	0.00	[−0.03, 0.03]	.995
Negative affect	Conflict	0.04	[−0.01, 0.09]	.082	0.02	[−0.02, 0.07]	.351
	Contact	−0.04	[−0.09, 0.01]	.082	−0.04	[−0.08, 0.01]	.122
	Closeness	−0.04	[−0.09, 0.00]	.069	−0.04	[−0.08, 0.01]	.095
	Insecurity	0.06	[0.02, 0.10]	.009	0.08	[0.04, 0.13]	.000
	Importance	−0.03	[−0.08, 0.01]	.144	−0.03	[−0.07, 0.02]	.267
Self-reproach	Conflict	0.01	[−0.03, 0.05]	.474	−0.01	[−0.05, 0.04]	.785
	Contact	−0.01	[−0.05, 0.04]	.723	−0.01	[−0.05, 0.04]	.737
	Closeness	−0.03	[−0.07, 0.01]	.163	−0.03	[−0.08, 0.01]	.147
	Insecurity	0.03	[−0.01, 0.07]	.164	0.06	[0.01, 0.10]	.016
	Importance	−0.03	[−0.08, 0.01]	.102	−0.01	[−0.05, 0.04]	.795
Extraversion	Conflict	−0.01	[−0.05, 0.02]	.429	0.01	[−0.02, 0.04]	.607
	Contact	0.02	[−0.02, 0.05]	.365	0.02	[−0.01, 0.06]	.165
	Closeness	0.04	[0.00, 0.08]	.048	0.03	[−0.01, 0.06]	.158
	Insecurity	−0.01	[−0.04, 0.03]	.664	−0.04	[−0.08, −0.01]	.016
	Importance	0.04	[−0.00, 0.07]	.064	0.03	[−0.01, 0.06]	.104
Positive affect	Conflict	−0.01	[−0.05, 0.03]	.694	−0.00	[−0.05, 0.04]	.893
	Contact	0.03	[−0.01, 0.07]	.138	−0.00	[−0.05, 0.04]	.837
	Closeness	0.03	[−0.01, 0.08]	.173	0.01	[−0.03, 0.06]	.570
	Insecurity	−0.01	[−0.06, 0.03]	.581	−0.05	[−0.09, 0.00]	.075
	Importance	0.03	[−0.02, 0.07]	.277	0.01	[−0.03, 0.06]	.580
Sociability	Conflict	−0.00	[−0.04, 0.04]	.929	−0.01	[−0.05, 0.04]	.820
	Contact	0.01	[−0.03, 0.05]	.777	0.01	[−0.03, 0.05]	.562
	Closeness	0.05	[0.01, 0.09]	.019	−0.02	[−0.06, 0.03]	.461
	Insecurity	−0.01	[−0.05, 0.02]	.471	−0.03	[−0.08, 0.02]	.226
	Importance	0.05	[0.01, 0.10]	.011	0.00	[−0.04, 0.04]	.993
Activity	Conflict	−0.02	[−0.06, 0.02]	.325	0.03	[−0.02, 0.07]	.260
	Contact	−0.01	[−0.05, 0.03]	.679	0.03	[−0.02, 0.08]	.208
	Closeness	0.01	[−0.03, 0.05]	.724	0.03	[−0.02, 0.08]	.235
	Insecurity	−0.01	[−0.05, 0.03]	.650	0.01	[−0.04, 0.06]	.646
	Importance	0.02	[−0.02, 0.06]	.404	0.04	[−0.01, 0.08]	.103
Openness	Conflict	0.00	[−0.03, 0.03]	.959	−0.01	[−0.05, 0.02]	.450
	Contact	−0.02	[−0.05, 0.01]	.266	0.00	[−0.04, 0.04]	.972
	Closeness	0.01	[−0.03, 0.04]	.630	0.04	[0.00, 0.07]	.053
	Insecurity	0.01	[−0.02, 0.04]	.492	−0.01	[−0.05, 0.02]	.441
	Importance	0.02	[−0.01, 0.06]	.196	0.02	[−0.01, 0.05]	.232
Unconventionality	Conflict	0.02	[−0.04, 0.07]	.601	−0.02	[−0.09, 0.05]	.627
	Contact	−0.03	[−0.08, 0.03]	.390	0.05	[−0.03, 0.12]	.225
	Closeness	−0.01	[−0.07, 0.06]	.812	0.07	[−0.01, 0.14]	.087
	Insecurity	0.02	[−0.04, 0.08]	.580	−0.04	[−0.11, 0.03]	.292
	Importance	0.01	[−0.06, 0.05]	.873	0.07	[−0.01, 0.14]	.073
Aesthetic interest	Conflict	−0.01	[−0.04, 0.03]	.636	−0.01	[−0.05, 0.03]	.575

	Contact	−0.02	[−0.06, 0.01]	.198	−0.01	[−0.05, 0.04]	.811
	Closeness	0.01	[−0.03, 0.05]	.538	0.03	[−0.02, 0.07]	.229
	Insecurity	0.01	[−0.02, 0.05]	.541	−0.03	[−0.07, 0.00]	.074
	Importance	0.03	[−0.01, 0.07]	.154	−0.01	[−0.05, 0.02]	.467
Intellectual interest	Conflict	0.01	[−0.04, 0.06]	.712	0.04	[−0.02, 0.09]	.173
	Contact	−0.03	[−0.07, 0.02]	.246	0.00	[−0.05, 0.06]	.949
	Closeness	0.00	[−0.04, 0.05]	.929	0.03	[−0.03, 0.08]	.322
	Insecurity	0.04	[−0.01, 0.09]	.120	0.02	[−0.03, 0.07]	.413
	Importance	0.00	[−0.04, 0.05]	.928	0.01	[−0.05, 0.06]	.801
Agreeableness	Conflict	0.01	[−0.03, 0.05]	.755	−0.01	[−0.06, 0.03]	.549
	Contact	−0.00	[−0.04, 0.04]	.965	−0.03	[−0.07, 0.01]	.143
	Closeness	0.01	[−0.03, 0.05]	.570	−0.00	[−0.04, 0.04]	.957
	Insecurity	0.02	[−0.02, 0.06]	.268	−0.03	[−0.07, 0.01]	.176
	Importance	0.04	[0.00, 0.08]	.041	−0.01	[−0.05, 0.04]	.800
Nonantagonsim	Conflict	−0.04	[−0.10, 0.03]	.275	−0.01	[−0.07, 0.06]	.864
	Contact	0.01	[−0.04, 0.06]	.699	−0.05	[−0.11, 0.00]	.060
	Closeness	0.03	[−0.03, 0.09]	.304	−0.00	[−0.06, 0.06]	.922
	Insecurity	0.01	[−0.05, 0.06]	.866	−0.06	[−0.12, 0.00]	.066
	Importance	0.06	[0.00, 0.12]	.035	0.00	[−0.06, 0.06]	.976
Prosocial orientation	Conflict	0.00	[−0.05, 0.05]	.984	−0.04	[−0.09, 0.01]	.146
	Contact	0.00	[−0.04, 0.05]	.870	−0.03	[−0.08, 0.03]	.319
	Closeness	0.02	[−0.03, 0.06]	.533	0.00	[−0.05, 0.05]	.983
	Insecurity	0.03	[−0.02, 0.07]	.266	0.01	[−0.05, 0.06]	.869
	Importance	0.02	[−0.03, 0.07]	.358	−0.03	[−0.09, 0.03]	.378
Conscientiousness	Conflict	0.00	[−0.03, 0.04]	.852	0.01	[−0.03, 0.05]	.734
	Contact	0.01	[−0.03, 0.05]	.567	0.04	[0.00, 0.08]	.050
	Closeness	0.00	[−0.03, 0.04]	.906	0.01	[−0.03, 0.05]	.502
	Insecurity	−0.02	[−0.05, 0.02]	.288	−0.04	[−0.08, −0.00]	.043
	Importance	0.00	[−0.03, 0.04]	.868	−0.02	[−0.05, 0.02]	.378
Orderliness	Conflict	0.02	[−0.02, 0.06]	.310	−0.00	[−0.05, 0.04]	.865
	Contact	0.01	[−0.04, 0.05]	.796	0.05	[0.01, 0.09]	.028
	Closeness	−0.01	[−0.05, 0.03]	.667	0.02	[−0.03, 0.06]	.390
	Insecurity	−0.00	[−0.04, 0.04]	.890	−0.03	[−0.07, 0.02]	.241
	Importance	0.01	[−0.03, 0.05]	.764	−0.02	[−0.06, 0.02]	.359
Goal striving	Conflict	0.01	[−0.03, 0.05]	.715	0.01	[−0.04, 0.06]	.668
	Contact	0.01	[−0.03, 0.06]	.609	0.05	[0.00, 0.10]	.038
	Closeness	0.01	[−0.03, 0.06]	.563	0.01	[−0.04, 0.06]	.722
	Insecurity	−0.02	[−0.06, 0.02]	.350	−0.01	[−0.06, 0.04]	.725
	Importance	−0.02	[−0.06, 0.03]	.509	−0.02	[−0.08, 0.03]	.397
Dependability	Conflict	−0.02	[−0.06, 0.03]	.502	−0.01	[−0.06, 0.05]	.759
	Contact	−0.02	[−0.07, 0.02]	.29	0.02	[−0.03, 0.07]	.522
	Closeness	0.00	[−0.04, 0.05]	.886	0.02	[−0.04, 0.07]	.525
	Insecurity	−0.01	[−0.06, 0.03]	.534	−0.04	[−0.09, 0.01]	.140
	Importance	0.01	[−0.03, 0.06]	.555	−0.02	[−0.07, 0.04]	.569
			Others				
Neuroticism	Conflict	0.03	[−0.02, 0.07]	.288	0.03	[−0.01, 0.07]	.163
	Contact	0.01	[−0.04, 0.06]	.640	−0.01	[−0.05, 0.03]	.612

	Closeness	−0.02	[−0.07, 0.03]	.524	−0.00	[−0.04, 0.04]	.926
	Insecurity	0.01	[−0.04, 0.07]	.607	0.02	[−0.02, 0.06]	.428
	Importance	−0.01	[−0.06, 0.05]	.853	−0.00	[−0.04, 0.04]	.834
Negative affect	Conflict	0.04	[−0.02, 0.09]	.213	0.07	[0.01, 0.12]	.016
	Contact	0.01	[−0.05, 0.07]	.687	−0.03	[−0.08, 0.03]	.314
	Closeness	−0.01	[−0.07, 0.05]	.711	−0.05	[−0.11, 0.01]	.073
	Insecurity	0.06	[0.00, 0.12]	.039	0.07	[0.01, 0.12]	.019
	Importance	−0.01	[−0.06, 0.05]	.781	−0.02	[−0.08, 0.03]	.404
Self-reproach	Conflict	0.01	[−0.04, 0.06]	.630	0.04	[−0.02, 0.09]	.200
	Contact	0.01	[−0.05, 0.06]	.794	−0.01	[−0.07, 0.06]	.866
	Closeness	0.00	[−0.05, 0.05]	.944	0.02	[−0.04, 0.08]	.449
	Insecurity	−0.01	[−0.06, 0.05]	.817	0.05	[−0.01, 0.11]	.106
	Importance	−0.00	[−0.06, 0.05]	.950	0.02	[−0.04, 0.07]	.552
Extraversion	Conflict	0.01	[−0.03, 0.06]	.555	−0.03	[−0.07, 0.01]	.184
	Contact	0.00	[−0.05, 0.05]	.980	0.03	[−0.01, 0.07]	.123
	Closeness	−0.03	[−0.08, 0.01]	.168	0.01	[−0.03, 0.06]	.545
	Insecurity	0.03	[−0.02, 0.07]	.228	−0.06	[−0.10, −0.02]	.006
	Importance	−0.01	[−0.05, 0.04]	.740	0.00	[−0.04, 0.04]	.958
Positive affect	Conflict	−0.02	[−0.07, 0.03]	.449	0.00	[−0.05, 0.06]	.886
	Contact	0.03	[−0.02, 0.09]	.222	0.00	[−0.05, 0.06]	.732
	Closeness	−0.01	[−0.06, 0.04]	.645	0.03	[−0.03, 0.08]	.387
	Insecurity	−0.01	[−0.06, 0.04]	.731	−0.01	[−0.07, 0.04]	.711
	Importance	−0.02	[−0.07, 0.04]	.577	−0.01	[−0.06, 0.05]	.858
Sociability	Conflict	0.02	[−0.03, 0.07]	.434	−0.06	[−0.11, −0.00]	.039
	Contact	−0.00	[−0.05, 0.05]	.973	0.05	[−0.01, 0.10]	.093
	Closeness	−0.05	[−0.10, −0.00]	.044	0.02	[−0.04, 0.07]	.595
	Insecurity	0.02	[−0.03, 0.07]	.449	−0.04	[−0.10, 0.01]	.109
	Importance	0.01	[−0.04, 0.05]	.852	0.01	[−0.04, 0.06]	.725
Activity	Conflict	0.05	[0.00, 0.11]	.042	0.01	[−0.05, 0.06]	.805
	Contact	−0.02	[−0.07, 0.04]	.544	0.08	[0.02, 0.14]	.012
	Closeness	−0.02	[−0.07, 0.04]	.505	−0.02	[−0.08, 0.04]	.476
	Insecurity	0.05	[0.00, 0.11]	.046	−0.06	[−0.11, −0.00]	.038
	Importance	−0.04	[−0.09, 0.01]	.123	−0.01	[−0.06, 0.05]	.744
Openness	Conflict	−0.01	[−0.05, 0.03]	.633	−0.02	[−0.06, 0.03]	.458
	Contact	−0.01	[−0.05, 0.04]	.758	−0.00	[−0.05, 0.05]	.950
	Closeness	0.02	[−0.03, 0.06]	.480	0.06	[0.01, 0.11]	.013
	Insecurity	−0.03	[−0.07, 0.01]	.180	0.00	[−0.04, 0.05]	.835
	Importance	0.00	[−0.04, 0.05]	.850	0.06	[0.01, 0.10]	.018
Unconventionality	Conflict	0.02	[−0.05, 0.10]	.528	−0.04	[−0.12, 0.04]	.283
	Contact	−0.01	[−0.08, 0.06]	.813	0.06	[−0.02, 0.15]	.149
	Closeness	−0.04	[−0.12, 0.03]	.277	0.09	[0.01, 0.18]	.036
	Insecurity	0.02	[−0.05, 0.10]	.531	−0.03	[−0.12, 0.05]	.476
	Importance	−0.04	[−0.11, 0.03]	.246	0.04	[−0.05, 0.12]	.367
Aesthetic interest	Conflict	−0.01	[−0.05, 0.04]	.837	0.01	[−0.04, 0.06]	.727
	Contact	0.01	[−0.04, 0.06]	.654	0.00	[−0.05, 0.06]	.917
	Closeness	0.01	[−0.03, 0.06]	.630	0.01	[−0.05, 0.06]	.788
	Insecurity	−0.02	[−0.07, 0.02]	.343	0.01	[−0.04, 0.06]	.694

	Importance	−0.01	[−0.05, 0.04]	.774	0.02	[−0.03, 0.07]	.407
Intellectual interest	Conflict	−0.01	[−0.07, 0.04]	.642	−0.02	[−0.08, 0.05]	.633
	Contact	−0.01	[−0.07, 0.05]	.645	−0.04	[−0.11, 0.03]	.227
	Closeness	0.04	[−0.02, 0.10]	.178	0.08	[0.02, 0.14]	.013
	Insecurity	−0.06	[−0.12, 0.00]	.052	−0.00	[−0.06, 0.06]	.967
	Importance	0.01	[−0.05, 0.07]	.790	0.09	[0.03, 0.15]	.006
Agreeableness	Conflict	0.01	[−0.04, 0.06]	.656	−0.02	[−0.08, 0.03]	.403
	Contact	0.03	[−0.02, 0.08]	.243	0.01	[−0.04, 0.06]	.747
	Closeness	0.01	[−0.04, 0.06]	.735	−0.02	[−0.07, 0.04]	.546
	Insecurity	0.03	[−0.03, 0.08]	.332	−0.04	[−0.09, 0.01]	.157
	Importance	−0.02	[−0.07, 0.04]	.533	0.00	[−0.05, 0.06]	.917
Nonantagonsim	Conflict	0.00	[−0.06, 0.07]	.955	−0.01	[−0.08, 0.06]	.829
	Contact	0.01	[−0.06, 0.07]	.843	0.02	[−0.05, 0.08]	.588
	Closeness	0.00	[−0.06, 0.06]	.946	−0.02	[−0.09, 0.04]	.531
	Insecurity	0.01	[−0.05, 0.08]	.682	−0.05	[−0.11, 0.02]	.161
	Importance	−0.01	[−0.07, 0.06]	.820	0.01	[−0.06, 0.08]	.792
Prosocial orientation	Conflict	0.01	[−0.05, 0.07]	.755	−0.04	[−0.10, 0.02]	.219
	Contact	0.07	[0.01, 0.13]	.016	−0.01	[−0.08, 0.06]	.806
	Closeness	0.01	[−0.05, 0.07]	.730	−0.02	[−0.09, 0.04]	.477
	Insecurity	0.01	[−0.05, 0.06]	.821	−0.01	[−0.08, 0.06]	.747
	Importance	−0.04	[−0.10, 0.02]	.213	−0.01	[−0.08, 0.05]	.669
Conscientiousness	Conflict	−0.02	[−0.06, 0.02]	.383	0.02	[−0.03, 0.07]	.411
	Contact	0.03	[−0.02, 0.07]	.214	−0.00	[−0.05, 0.04]	.864
	Closeness	−0.01	[−0.06, 0.04]	.678	−0.02	[−0.07, 0.02]	.333
	Insecurity	−0.04	[−0.09, 0.00]	.076	0.00	[−0.05, 0.05]	.981
	Importance	−0.01	[−0.06, 0.04]	.628	0.00	[−0.05, 0.05]	.904
Orderliness	Conflict	−0.02	[−0.07, 0.03]	.389	−0.01	[−0.06, 0.05]	.842
	Contact	0.02	[−0.03, 0.07]	.507	0.02	[−0.03, 0.08]	.409
	Closeness	−0.01	[−0.06, 0.04]	.727	−0.00	[−0.06, 0.06]	.933
	Insecurity	−0.03	[−0.08, 0.03]	.341	0.00	[−0.05, 0.06]	.896
	Importance	−0.01	[−0.06, 0.05]	.802	−0.02	[−0.08, 0.04]	.583
Goal striving	Conflict	−0.03	[−0.09, 0.02]	.261	0.03	[−0.03, 0.09]	.292
	Contact	0.02	[−0.04, 0.08]	.532	−0.02	[−0.08, 0.04]	.503
	Closeness	−0.01	[−0.06, 0.05]	.860	−0.00	[−0.06, 0.06]	.923
	Insecurity	−0.04	[−0.10, 0.01]	.125	−0.02	[−0.08, 0.04]	.560
	Importance	0.01	[−0.05, 0.07]	.755	0.03	[−0.03, 0.09]	.258
Dependability	Conflict	−0.01	[−0.06, 0.05]	.855	0.00	[−0.06, 0.07]	.894
	Contact	0.02	[−0.04, 0.08]	.479	0.01	[−0.06, 0.08]	.742
	Closeness	0.01	[−0.04, 0.07]	.637	−0.01	[−0.08, 0.06]	.750
	Insecurity	−0.04	[−0.09, 0.02]	.222	−0.02	[−0.09, 0.05]	.638
	Importance	−0.02	[−0.08, 0.04]	.561	0.04	[−0.03, 0.11]	.248

Note. $\gamma_{R1 \rightarrow P2}$ = effect of relationship characteristic at first measurement occasion on personality at second measurement occasion, $\gamma_{R2 \rightarrow P3}$ = effect of relationship characteristic at second measurement occasion on personality at third measurement occasion, CI = confidence interval of parameter estimate.

Chapter 4

Study 3

Testing Competing Hypotheses On The Interplay Of Importance And Support Of the Basic Psychological Needs At Work And Personality Development With Response Surface Analysis

Deventer, J., Humberg, S., Lüdtke, O., Nagy, G., Retelsdorf, J., & Wagner, J. (under review). Testing Competing Hypotheses On The Interplay Of Importance And Support Of the Basic Psychological Needs At Work And Personality Development With Response Surface Analysis.

Abstract

Even though emerging adulthood is generally characterized by increases in emotional stability, agreeableness, and conscientiousness, substantial amounts of variability in personality change indicate meaningful individual differences in personality development. Various environmental contexts have been associated with personality development; however, little attention has been paid to individuals' psychological perceptions of their environmental context so far. A common framework for describing environments psychologically is basic psychological needs theory (BPNT), which assesses environments on the basis of their levels of autonomy, competence, and relatedness support. We aimed to better understand the factors that drive personality development by relating both the support of basic psychological needs (BPN) and the individual importance ascribed to BPN support to predict Big Five personality change 1.5 years later. To do so, we focused on the important context of the first job in a longitudinal study of young Germans (N_{T1} = 1,886; M_{ageT1} = 18.41). We derived multiple hypotheses based on theory and previous research and tested them simultaneously against each other with an information theoretic approach including response surface analyses. Results differed across the Big Five: Controlling for personality at T1, people who ascribed greater importance to BPN support, had higher perceptions of BPN support, and had an incongruence between the two at T1 were higher in emotional stability and extraversion at T2. The pattern was more complex for openness, whereas individuals ascribing more importance to BPN support at T1 were more agreeable and conscientious at T2. Findings are discussed for theory and future research of personality development.

Testing Competing Hypotheses On The Interplay Of Importance And Support Of the Basic Psychological Needs At Work And Personality Development With Response Surface Analysis

Personality is defined as relatively enduring, automatically occurring individual differences in people's feelings, thoughts, and behaviors across situations and time (e.g., Roberts, 2009). Mean-levels of personality change substantially during *emerging adulthood* (ages 18 to 25; Arnett, 2000), which is filled with major developmental tasks and challenges (Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000). However, large interindividual differences in intraindividual change indicate that emerging adults differ meaningfully with respect to their personality development (e.g., Lüdtke, Roberts, Trautwein, & Nagy, 2011; Roberts, Walton, & Viechtbauer, 2006; Scollon & Diener, 2006; Schwaba & Bleidorn, 2017; Soto, John, Gosling, & Potter, 2011). In aiming to identify determining factors, researchers have investigated various environmental contexts, such as life events (e.g., marriage, first job) or phases of transitions (e.g., from high school to university) and have found them to be associated with personality change, demonstrating that the underlying mechanisms and processes need further investigation (e.g., Bleidorn, 2015; Bleidorn, Hopwood, & Lucas, 2016; Roberts, Caspi, & Moffitt, 2001, 2003; Roberts & Nickel, 2017). In this regard, it is necessary not only to consider certain environmental contexts but to specifically investigate the individuals' psychological perceptions of the respective environmental contexts and the expectations attached to this context (e.g., Bleidorn, 2015; Lodi-Smith & Roberts, 2007). Investigating the interplay between perception and expectation of an environmental context on personality change would allow for understanding why and how individuals differ in their personality development in comparable environmental contexts.

A renowned framework that describes environmental contexts from a psychological perspective is basic psychological needs theory (BPNT). BPNT suggests that human beings strive to fulfill three basic psychological needs (BPN): the *need for autonomy*, the *need for competence*, and the *need for relatedness*. The fulfillment of these needs is considered to be related to aspects of motivation, well-being, emotion, and behavior (Deci & Ryan, 2008). As every environmental context can be classified according to how autonomous, competent, and related to others a person feels (e.g., Deci & Ryan, 2000), BPNT provides a useful and well-founded framework from which to assess the individual's psychological perception of environmental contexts.

Thus, the aim of this study was to investigate how environmental characteristics in the major context of a person's first job, assessed via perceived BPN support and the importance attached to BPN support, are associated with personality development across 1.5 years. On the basis of theory and previous research, we simultaneously tested competing hypotheses against each other using an information-theoretic (IT) approach with response surface analyses (RSAs). We used the first two waves of a longitudinal German study (*N* = 1,886; Retelsdorf, Lindner, Nickolaus, Winther, & Köller, 2013) in which emerging adults in an apprenticeship training (VET) were assessed.

Personality Development in Emerging Adulthood

The period of emerging adulthood (Arnett, 2000) has consistently been shown to be a time of major changes in personality (e.g., Lucas & Donnellan, 2011; Roberts et al., 2006). That is, during emerging adulthood, most people display mean-level changes in the direction of increases in emotional stability,[1] agreeableness, and conscientiousness (*maturity principle*; Roberts, Wood, & Caspi, 2008). Equally consistent is the finding that emerging adults differ substantially in how their personalities develop. That is, several studies have shown that reliable interindividual differences in personality change exist for all five personality traits in this time period (e.g., Mõttus, Allik, Hřebíčková, Kööts-Ausmees, & Realo, 2016; Lüdtke et al., 2011; Roberts et al., 2006). However, determining factors and predictors of these individual differences in personality development are still largely unknown (e.g., Roberts & Nickel, 2017).

Initial findings in the debate on driving factors of personality development have demonstrated that various environmental contexts are powerful (e.g., Bleidorn, Kandler, & Caspi, 2014; Briley & Tucker-Drob, 2014; Hopwood, Donnellan, Blonigen, Krueger, McGue, Iacono, & Burt, 2011). In this regard, emerging adulthood has been shown to offer a variety of challenging new contexts within a relatively dense period of time, and some of these contexts have been found to be related to subsequent personality change (for an overview, see Schwaba & Bleidorn, 2017; Roberts & Davis, 2016). For example, emerging adults are expected to take their first steps not only toward establishing a solid career but also toward establishing a supportive social network, finding a romantic partner, and starting a family of their own (Arnett, 2000). With respect to these developmental contexts of emerging adulthood, graduation from high school was found to be primarily associated with increases in conscientiousness (Bleidorn, 2012). Transitioning from high school to university or the workforce was additionally associated with increases in agreeableness and emotional stability

(e.g., Lüdtke et al., 2011). Beginning a romantic relationship was related to increases in emotional stability, extraversion, and conscientiousness (e.g., Lehnart, Neyer, & Eccles, 2010; Neyer & Asendorpf, 2001; Wagner, Becker, Lüdtke, & Trautwein, 2015). On the other hand, parenthood was sometimes associated with increases in emotional stability (Jokela, Kivimäki, Elovainio, & Keltikangas-Järvinen, 2009) and decreases in conscientiousness (Specht, Egloff, & Schmuckle, 2011), but at other times, no effect of this environmental context on subsequent personality change was revealed (e.g., van Scheppingen, Jackson, Specht, Hutteman, Denissen, & Bleidorn, 2016).

In emerging adulthood, the environmental context of work is one of the most important and potentially most challenging contexts because it involves significant changes in, for example, a person's daily life schedule, task requirements, and identity formation (Sutin & Costa, 2010). In this manner, work experiences have usually been found to be related to mean-level increases in conscientiousness (e.g., Hudson, Roberts, & Lodi-Smith, 2012; Leikas & Salmela-Aro, 2015; Lodi-Smith & Roberts, 2007; Specht et al., 2011). However, diverse work experiences were shown to predict personality traits differentially, and people's reactions to these experiences were found to fluctuate substantially (Roberts et al., 2003).

Significant variability in change has emerged in all of the investigated contexts. That is, emerging adults seem to differ substantially from each other with respect to personality development. Whereas various scholars have provided evidence for important environmental contexts in which personality change occurs, open questions regarding the determining factors that act in these environments and can be held responsible for the observed interindividual differences in subsequent personality change still remain (for an overview, see Bleidorn et al., 2016).

Toward a More Psychologically Oriented Assessment of Environmental Contexts

Aiming to understand interindividual differences in personality development in significant environmental contexts, we followed current directions and went beyond categorizing whether someone was simply immersed in a certain context. Rather, we chose to describe the individual's psychological perception of the environmental experience. To state this another way, is it indispensable not only to know which environmental contexts individuals engage in (e.g., the workforce) but also to understand how each individual perceives his or her environmental context psychologically (for similar arguments, see Rauthmann et al., 2014). For example, say Alex and Jesse are both starting their careers at the same age and in the same industry, that is, both emerging adults can be considered to have entered the workforce. Let's

even consider that both emerging adults have similar experiences from an objective point of view, for example, they are both confronted with challenging new tasks, they must deal with hierarchical organizational structures, they must take on responsibilities, and so forth. Nevertheless, it seems plausible that Alex and Jesse might differ with respect to their subjective psychological perceptions of these work experiences. Alex might perceive her working context as supportive in taking on responsibilities, whereas Jesse perceives his environment as less encouraging or supportive.

The perception of the environmental context might become additionally meaningful when the level of importance the individual ascribes to the respective context is included. For example, perceiving a similar amount of support on the job can result in different emotional reactions depending on the level of importance individuals ascribe to perceiving support on the job. Say, Jesse ascribes high importance to support on the job. His emotional and behavioral response to receiving low levels of support on the job might be more anxious or stressed than receiving high support. Thus, the interplay between the perception of and the importance ascribed to an environmental context might determine a person's emotions and subsequent behavior, thus potentially impacting their personality development in the long run (e.g., Le, Donnellan, & Conger, 2014). Therefore, examining an individual's perception of and importance ascribed to the respective environmental context should provide meaningful information on the predictive power of the respective environmental context for future personality change.

Basic psychological needs as a framework for psychological assessments of environments. A renowned framework that can be applied to describe environmental contexts from a psychological perspective is basic psychological needs theory (BPNT), which is embedded in the larger framework of self-determination theory (SDT; e.g., Deci & Ryan, 2008). BPNT postulates three fundamental needs that human beings strive to satisfy in their environment and whose support is considered to be beneficial for effective functioning and psychological health regarding, for example, well-being, motivation, and behavior (e.g., Deci & Ryan, 2000). The basic needs are the need for autonomy, the need for competence, and the need for relatedness. Thereby, the *need for autonomy* refers to the need to self-organize and feel volitional towards one's behavior (Ryan & Deci, 2008), including the feeling of being the origin of one's behavior (De Charms, 1968). The *need for competence* refers to experiencing effectiveness in exercising and expressing oneself in one's actions (Ryan & Deci, 2008). Finally, the *need for relatedness* concerns feelings of belongingness and connectedness with others (Baumeister & Leary, 1995; Deci & Ryan, 1991). Experiencing support of BPN in one's

environmental contexts is understood as a fundamental requirement for pursuing a growth-orientation, an activity, or connectedness to other beings in the contexts of, for example, work (for empirical overviews, see Deci, Olafsen, & Ryan, 2017; Van den Broeck, Ferris, Chang, & Rosen, 2016), social relationships (e.g., Deci & Ryan, 2014), or education (e.g., Klassen, Perry, & Frenzel, 2012; Niemiec & Ryan, 2009). BPN support is also assumed to be associated with higher or lower expressions of personality traits (La Guardia & Ryan, 2007). That is, the perceived degree of BPN support in an environmental context is thought to result in individual differences regarding tendencies of a person's cognition, affect, or behavior (Deci & Ryan, 1985), and thus, in personality.

The basic psychological needs in personality research. Even though BPNT offers a convincing opportunity to assess environmental contexts from the individual's psychological perception, and despite the postulated association between support for BPN and individual differences in emotions and behavior, only a few studies have empirically investigated the relations between BPN and personality (Sheldon & Prentice, 2017). Results from cross-sectional studies showed that individuals who experienced more support of autonomy, competence, or relatedness in their environmental contexts were also less anxious (e.g., Gillet, Fouquereau, Lafrenière, & Huyghebaert, 2016) and displayed less negative affect (Van den Broeck, Vansteenkiste, & De Witte, 2008). La Guardia and Ryan (2007) demonstrated that individuals who reported that they felt more autonomy support in their relationships were simultaneously more extraverted, agreeable, open, and conscientious and more emotionally stable. Further, feeling that all of the three basic needs were supported was positively associated with prosocial engagement (Gagné, 2003; Van den Broeck et al., 2016) and commitment (Van den Broeck et al., 2016), which can be conceptually linked to agreeableness and conscientiousness respectively. A meta-analysis of cross-sectional studies of BPN in the work context identified small to medium effects between autonomy support and the Big Five traits except for openness, whereas competence support showed associations with agreeableness, openness, and emotional stability, and relatedness support was associated with only conscientiousness and emotional stability (Van den Broeck et al., 2016). However, to our knowledge, no longitudinal studies have been conducted on the effects of the support of BPN in environmental contexts on Big Five personality trait development.

To address this gap, we utilized BPN support as a psychological description of environmental contexts. Additionally, we considered the level of importance individuals ascribe to BPN support, thus, following previous suggestions that individuals' goals or needs are relevant to subsequent behavior (e.g., Denissen, van Aken, Penke, & Wood, 2013;

Hennecke, Bleidorn, Denissen, & Wood, 2014). Therefore, we longitudinally investigated perceived BPN support and importance ascribed to BPN support on subsequent personality while controlling for initial personality at the beginning of VET.

Effects of BPN Support and Importance of BPN Support on Personality Change

How should BPN support, importance ascribed to BPN support and the interplay of these two variables relate to personality development in the first job? The literature provides multiple, partly contradictory expectations on this question. In our understanding, hypotheses on the effects of BPN support and the importance ascribed to BPN support on personality change can be grouped into three patterns. First, personality change might be directly linked to previous BPN support and/or the importance ascribed to BPN support by main effects. We call this pattern the hypotheses of *main effects*. Second, it is likely that BPN support or importance ascribed to BPN support are not meaningful for personality development per se, but rather their directed discrepancy. According to the *linear discrepancy hypotheses*, the effects of BPN support and importance attached to BPN support on subsequent personality change are particularly pronounced if either of the two predictors takes on a higher value than the other. Third, personality change might be particularly pronounced if BPN support and the importance of BPN support are related in a specific way (e.g., when they take on the same values, or when they differ by a specific amount; *optimal discrepancy hypotheses*). In the following, we present an overview of eight potential hypotheses describing the interplay between BPN support, the importance a person attaches to BPN support, and personality change[2] (for overviews, see Table 1 and Figure 1).

Hypotheses of main effects. In line with BPNT, the *Basic Needs Support Hypothesis* posits that only perceived BPN support is positively associated with personality change (Figure 1a). BPNT strongly emphasizes the impact that BPN support in a person's environment has on individual development (e.g., Deci & Ryan, 1985, 2000). BPN support has been shown to be cross-sectionally related to, for example, high performance, adjustment, active commitment, and self-esteem (e.g., Baard, Deci, & Ryan, 2004; Greguras & Diefendorff, 2009; Ümmet, 2015). Longitudinally, BPN support has predicted aspects of well-being such as lower turnover intentions, work engagement, and organizational citizenship behavior in the context of work (e.g., Olafsen, Deci, & Halvari, 2018; Roche & Haar, 2013; Trépanier, Fernet, & Austin, 2015) as well as lower anxiety and lower depression in school children (e.g., Yu, Li, Wang, & Zhang, 2016). On the basis of such findings, BPN support should be positively related to personality development.

In contrast to the previous hypothesis, the *Importance of Basic Needs Hypothesis* postulates that only the importance of BPN support is positively related to subsequent personality change (Figure 1b). Considering the processes of self-regulation that are needed to attain psychological or physical goals, people regulate and adapt their behavior in reaction to their innate needs or goals (e.g., Denissen et al., 2013; Fishbach, Zhang, & Koo, 2009; Hennecke et al., 2014; Koo & Fishbach, 2008). In this regard, the motivation to attain and the importance of the desired outcome have been found to be associated with behavior changes in clinical studies (e.g., Kelly & Greene, 2014) and in the work context (for a review, see Kanfer, Frese, & Johnson, 2017). In the case of BPN, people who perceive relatedness support to be important might subsequently display behavior that increases the likelihood that they will fulfill their need for relatedness support (e.g., more extraverted or more agreeable behavior).
The *Importance and Support Hypothesis* combines the first two hypotheses by positing that both perceived BPN support and the importance of BPN support matter for personality change (Figure 1c).

Discrepancy hypotheses. Another possibility is that personality change depends on the perception of BPN support compared to importance ascribed to BPN support. In this regard, a central measure is a person's directed discrepancy between BPN support and BPN importance. It takes on a positive value for individuals who obtain higher BPN support than they ascribe importance to, and a negative value if BPN support trails behind BPN importance. The hypotheses of discrepancy posit that this directed discrepancy linearly relates to personality change. The *Positive Effect of Discrepancy Hypothesis* assumes that a person's value in some personality trait should increase more (or decrease less), the higher this person's value in the directed discrepancy of BPN support and BPN importance. That is, this hypothesis posits that personality change should be higher the more BPN support exceeds importance ascribed to BPN support, and that personality change should be lower the more importance ascribed to BPN support exceeds perceived BPN support (Figure 1d). Reasoning for the first of these assumptions, individuals experiencing more BPN support than they ascribe importance to might feel challenged by the requirement to deal with the "too high" support and might adapt their personality respectively. For example, Sam, who would prefer a rather mediocre level of relatedness support in his job, might feel challenged when his job environment in fact offers a rather high level of relatedness support (e.g., when he is often asked to communicate), and this might in the long run lead to increases in his extraversion, openness, or emotional stability. To make the second part more explicit, let's consider the example of Alex, for whom the importance attached to autonomy support exceeds her perceptions of autonomy support at her

job. Thus, Alex perceives much less autonomy support than is important to her, and this comes down to a lack of autonomy support. Previous research has supported detrimental effects of lack of need satisfaction on affect, physical stress reactions, or depression in cross-sectional and longitudinal studies (e.g., Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011; Olafsen, Niemiec, Halvari, Deci, & Williams, 2017). These findings support the hypothesis that the larger the gap between need importance and its actual satisfaction (i.e., when the need is not satisfied), the greater the increases that will be observed in, for example, anxiety and emotional overstress and potentially the greater the decreases that will be observed in emotional stability over time.

It can also be argued for the opposite hypothesis. The *Negative Effect of Discrepancy Hypothesis* postulates a negative effect of the directed discrepancy of BPN support and BPN importance on personality change. This hypothesis posits that personality change should be lower the more BPN support exceeds BPN importance, and higher the more BPN importance exceeds perceived BPN support (Figure 1e).). Arguments for the first part of this hypothesis can be traced back by considering the example of Jesse, who perceives that the amount of autonomy support he gets on the job exceeds his level of autonomy importance, for example, he might experience more responsibilities, self-management requirements, and so forth, than he ascribes importance to. Reasonably, Jesse might feel overwhelmed, stressed, and potentially overstrained. In this case, Jesse might need all his inner resources to cope with his stressful environment, and thus, decreases in energy-consuming behavior (e.g., engaging with others or being open to new tasks or requirements; Soto, 2015). Concerning the second expectation of the hypothesis, it can be argued that the more BPN importance exceeds BPN support, the more need should a person feel to advocate his or her needs, which could positively affect personality development. For example, Jacky, who would prefer a high autonomy support at her job but is provided with rather mediocre support, might be motivated to stand up and even go into conflict with her boss, aiming to change her working conditions (e.g., demanding the right to take more decisions on her own). Such interpersonal challenges might increase her extraversion level and, at the long run, increase her emotional stability (especially if she successfully convinces her boss to provide higher autonomy support).

Hypotheses of optimal discrepancy. The concept of congruence between a person's attributes and features of the environmental context is called person-environment fit (e.g., Caplan, 1987; Holland, 1997). The *Strict Congruence Hypothesis* states that people's level of congruence should be predictive of personality change (Figure $1f_a$, $1f_b$). Within this assumption it was, first, argued that personality change should be *maximized* the more similar a people's

BPN support is to their respective BPN importance (Figure $1f_a$). Congruence has been widely discussed as important for optimal functioning, well-being, or organizational citizenship behavior (e.g., Greguras & Diefendorff, 2009; Hoffman & Woehr, 2006; Kristof-Brown, Li, & Schneider, 2016). In this regard, it was reasoned that congruence between a person and the environment, and thus, between the importance an individual attaches to BPN support and the BPN support the person perceives, predicts more emotional stability, agreeableness, and conscientiousness (i.e., greater maturity). Contrasting this positive effect of congruence on personality development, it was, second, also found that higher PE-fit was associated with higher levels of personality consistency, and personality development more likely reinforced the fit to the given environmental context (Roberts & Robins, 2004). This finding constitutes the assumption that personality change might be *minimized* when BPN support and BPN importance are congruent. To sum, the Strict Congruence Hypothesis states that individual differences in the level of congruence between the person and the environment should predict differences in personality change, while theory and research remain indefinite about whether this association should be positive or negative. Additional main effects of support and importance are also conceivable, and these are represented in the *Congruence and Main Effects Hypothesis*. It states that congruence is associated with more personality change, and that in addition, personality change should be higher at higher levels of the predictors (Figures $1g_a$ and $1g_b$).

A final hypothesis suggests that some specific *Optimal Margin* of BPN support and BPN importance lead to the highest, or to the lowest, personality change (Figures $1h_a$ and $1h_b$). First, personality change might be maximized when perceived BPN support exceeds the importance of BPN support by a specific optimal amount (Figure $1h_a$). Let's take Alex whose relatedness support exceeds the extent to which she views relatedness as important by a specific amount (e.g., confrontations with social encounters or invitations to social activities), thereby slightly expanding her comfort zone. Similar processes of exposition or adaptation as observed in treatment, therapy, or intervention studies (e.g., to address social anxiety) that have been found to be longitudinally related to personality changes (e.g., Nelis, Kotsou, Quoidbach, Hansenne, Weytens, Dupuis, & Mikolajczak, 2011; Smits, Julian, Rosenfield, & Powers, 2015) could take place. In particular, the personality traits of emotional stability and extraversion appear to increase as reactions to different types of interventions (for a systematic review, see Roberts, Luo, Briley, Chow, & Hill, 2018). Thus, it seems reasonable to hypothesize that not only are people able to cope with a little overstretching but that they might even adjust and change their personalities in the long run. However, change in reaction to adaptation or

exposition processes can be understood as both increases and decreases in the respective personality traits. Speaking for the second part, it can also be argued that there should be a specific margin of BPN support and BPN importance at which personality change is minimized (Figure $1h_b$).

The Present Study

In this study, our goal was to test effects of the important environmental context of a person's first job on subsequent personality change during emerging adulthood. In this endeavor, we assessed the environmental context of work from the participants' psychological perspective by utilizing the framework of BPN support and included the importance that the individual attached to BPN support. On the basis of theory and previous research, we tested eight hypotheses on the interplay between BPN support and the importance of BPN support on personality change across the first 1.5 years that participants spent at their first job. Thereby, we included theoretical assumptions and empirical evidence from varying research fields such as personality development, self-determination theory, and work and organizational psychology. To capture the various approaches and conceptualizations of the constructs, the hypotheses depict the current inconsistencies that exist in the literature regarding the effects of BPN support and BPN importance on personality change. Therefore, we aimed to test the hypotheses with an information-theoretic approach (e.g., Burnham & Anderson, 2002) combined with methods of response surface analysis (RSA; Edwards, 2002; for a similar approach see Humberg et al., in press). In order to organize the hypotheses of interest, we grouped them into three sets of hypotheses.

Method

Participants

Participants were drawn from the first two waves of the study "Mathematics and Science Competencies in Vocational Education and Training" (ManKobE; e.g., Retelsdorf et al., 2013) which was conducted in line with the ethical guidelines of the American Psychological Association (APA) for research with human participants. The ManKobE study assessed emerging adults undergoing vocational education and training (VET) as industrial clerks (N_{T1} = 551), laboratory assistants (N_{T1} = 283), or technicians (N_{T1} = 1052) in three German states (N = 1,886; M_{ageT1} = 18.41, SD_{ageT1} = 1.82, 29% women). VET is a special educational career pathway that is characterized by the combination of higher education at vocational schools and the acquisition of job-specific skills via hands-on practical training in

the respective industrial field. The double-tracked system is realized by a reiterated cycle including periods of time spent at vocational schools as well as periods of time spent on the job.

The trainees were first assessed at the beginning of VET (August to November 2012, $N_{T1} = 1{,}886$), and the second assessment took place 16.50 ($SD = 1.01$) months later $N_{T2} = 1{,}460$). Attrition analyses between trainees who participated at both time points (continuers) and participants who dropped out after the first assessment (dropouts) revealed no substantial differences between continuers and dropouts for all Big Five personality variables as well as for additional background variables such as age, sex, type of secondary schooling, graduation degree, or immigration background (all ds< |0.05|).

Measures

Personality. Personality was measured with 42 items from the German version of the Big Five Inventory (BFI; Lang, Lüdtke, & Asendorpf, 2001) for assessing the personality dimensions emotional stability, extraversion, openness to experience, agreeableness, and conscientiousness. Items were answered on a 5-point scale ranging from 1 (*applies not at all*) to 5 (*applies totally*). Cronbach's alpha reliabilities for the Big Five traits at the two measurement occasions were .71, and .67 for emotional stability, .82, and .82 for extraversion, .73, and .71 for openness, .68, and .69 for agreeableness, and .75, and .76 for conscientiousness, respectively.

BPN support. We used an adapted scale for the perceived support of BPN on the job (Prenzel, Kramer, & Drechsel, 2002). Participants rated statements regarding how often BPN support was provided in the context of work on a 6-point scale ranging from 1 (*never*) to 6 (*very often*). For commensurability[3] reasons, we transformed the scale to range from 0 to 1 with the two-step proportion of maximum scaling procedure (POMS; Little, 2013; Moeller, 2015). Autonomy support was assessed with seven items (*e.g., I am encouraged to work independently; I am allowed to manage my time on my own; I am allowed to fulfill tasks my way*), whereas competence support (e.g., *I have the opportunity to practice what I have learned; My performance is getting attention; My achievements are acknowledged*) and relatedness (e.g., *I am treated as a colleague; I have the feeling I belong; I have the feeling that my colleagues understand me*) were assessed with six items each. Cronbach's alpha reliabilities for BPN support at the two measurement occasions were .79 and .84 for autonomy, .87 and .91 for competence, and .93 and .93 for relatedness.

Importance ascribed to BPN support. To assess the level of importance the young trainees attached to autonomy support, competence support, and relatedness support, the participants were asked to rate the same characteristics that were presented for perceived BPN support with respect to the statement, "In my job it is important to me that…" on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). We conducted POMS scaling for this scale as well to achieve commensurability with BPN support. Cronbach's alpha reliabilities for importance attached to BPN support at the two measurement occasions were .82 and .89 for autonomy, .88 and .90 for competence, and .92 and .94 for relatedness.

Analyses

In order to empirically compare the competing hypotheses on how the interplay between BPN support (T_1) and importance of BPN support (T_1) relates to personality change, we followed the analytical strategy of Humberg et al. (in press) and adapted it to our initial model set. That is, we first transformed each of the theoretically derived hypotheses into a corresponding statistical model by drawing from the literature on response surface analysis, where polynomial regression models were presented to reflect different hypotheses on how the interplay of two variables (in our case, BPN support and importance ascribed to BPN support) affects an outcome variable (personality change; e.g., Edwards, 2002; see Humberg et al., in press; Humberg et al., 2018; Schönbrodt, 2016). The specification of the polynomial regression models and the corresponding constraints on the regression parameters are shown in Table 1. A detailed description of the different regression models is provided in supplement A1. In addition to the eight hypotheses derived from theory and previous research, we extended the model set by adding three statistical models (null model, full model, and curvilinear model) that must be included for technical reasons when evaluating multiple hypotheses with an IT approach (for more information, see Supplemental Material A1).

Second, for each combination of basic needs domain (autonomy, competence, relatedness) and Big Five trait (emotional stability, extraversion, openness, agreeableness, conscientiousness), we tested the postulated hypotheses against each other with an information-theoretic approach. Thereby, each of the resulting 15 model comparison procedure was threefold: First, we checked for a meaningful association between the predictors and personality change by investigating whether the full model (all other models were nested in the full model) explained significantly more variance than the null model, and we continued with the model comparison analyses only if the full model explained significantly more variance than the null model. Second, we estimated all models with the *sem* function in the R package

lavaan (version 0.5.23.1097; Rosseel, 2012). In a third step, we computed the models' *Akaike weights* (Akaike, 1973), applying the R package *AICcmodavg* (version 2.1.1; Mazerolle, 2017) while excluding models that were estimated to be redundant based on the Akaike weights[4] (Arnold, 2010; Burnham & Anderson, 2002, Humberg, in press). The Akaike weights w are the central element of the model comparison analyses and drive the interpretation of the results. The Akaike weight of a model reflects the likelihood that this specific model provides the most parsimonious explanation of the data, out of all alternative models that are considered. In other words, the weights provide a direct estimate of a model's empirical *evidence* in the data. This strategy takes account to the fact that several hypotheses might provide similarly good explanations of the data. For this reason, we based the interpretation of the results not on a single best model, but instead considered the *confidence set* of models. The confidence set not only consists of the best model but also includes all models whose cumulated Akaike weights exceed 95% of being the best model in the tested set. When the full model was included in the confidence set, we interpreted it by applying RSA tools (Box & Draper, 1987; Edwards, 2002, 2007; Humberg, Nestler, & Back, 2018).

All analyses were conducted in RStudio (RStudio Team, 2016). We used the *RSA* package (version 0.9.11, Schönbrodt, 2017) to plot the models. Missing data were treated with full information maximum likelihood (FIML) estimation.

Results

Descriptive Statistics

Table 2 presents information on the means, standard deviations, stabilities, and correlations of all variables. Regarding mean-level personality trait change between the two assessment intervals, all personality traits decreased from T1 to T2. That is, the emerging adults reported that they had become less emotionally stable (d = -0.34), less extraverted (d = -0.30), less open (d = -0.09), less agreeable (d = -0.41), and less conscientious (d = -0.49) on average. Personality consistency was moderate with values of r = .50 for emotional stability, r = .65 for extraversion, r = .58 for openness and agreeableness, and r = .57 for conscientiousness, indicating that extraversion was most stable, and emotional stability was most prone to changes. With respect to initial correlations, the importance of BPN support was more strongly related to perceived BPN support (autonomy: r = .38; competence: r = .41; relatedness: r = .48) than the personality traits were to either BPN support (.15 < r < .30) or importance of BPN support (.13 < r < .30).

Results of Model Comparison Analyses

The results of the model comparison analyses are presented separately for the personality traits: emotional stability (Table 3), extraversion (Table 4), openness (Table 5), agreeableness (Table 6), and conscientiousness (Table 7). All tables include the 95% confidence set of models. The respective RSA graphs of the models contained in the confidence sets can be found in the Supplemental Material (Figure A1 to Figure A5). In the following, we present the results for each personality trait. The amount of variance accounted for by the predictor variables above and beyond initial personality ranged from approximately 0.1% to 1.5% and can be found in the Tables 3 to 7.

Emotional stability. Considering the effect of autonomy support and importance ascribed to autonomy support on change in emotional stability, the Importance and Support Model had just as much evidence (Akaike weight of $w = 0.38$) as the Congruence and Main Effects Model ($w = 0.37$). The set was completed by the Importance of Basic Needs model ($w = 0.16$) and the Full Model ($w = 0.06$). Accordingly, both the Importance and Support Model and the Congruence and Main Effects Model were 2.4 times more likely than the Importance of Basic Needs Model (*evidence ratio* .38/.16 = 2.4) and 6 times more likely than the Full Model (.38/.06 = 6.3). All models in the confidence set indicated a positive linear effect of importance ascribed to autonomy support on emotional stability such that trainees scoring higher on autonomy importance at T1 subsequently displayed more increases in emotional stability (Importance of Basic Needs Only Model). Both the Importance and Support model and the Congruence and Main Effects model provide strong evidence for an additional positive effect of autonomy support, which indicates that the emerging adults increased more in emotional stability the higher both importance of autonomy support and perceived autonomy support at the first job. However, evidence was inconclusive about a potential additional effect of congruence: Adding to the two linear main effects, the Congruence and Main Effects Model provided evidence that more congruence between importance of autonomy support and experienced autonomy support might have been associated with lower increases in emotional stability. Thus, this means that it is actually incongruence that is associated with larger increases in emotional stability. The Importance of Basic Needs model provides rather small evidence that autonomy importance alone, but not autonomy support or congruence, might have played a role for change in emotional stability. The Full Model had only little evidence in the data and should not be overinterpreted. Overall, the models in the confidence set provided strong evidence for positive main effects of both predictor variables, a finding that is in line

with the Importance and Support Hypothesis, and some evidence spoke for an additional negative effect of congruence on personality development.

For competence, however, the null model was included in the confidence set with a likelihood of 12% of being the best model in the set, which indicated that the alternative models explained only a small amount of variance, and the results of the competitive test should not be overinterpreted. This little exploratory power of the predictor variables was also reflected in the rather inconclusive evidence for the competing models, which supported contradictory effects: The Congruence and Main Effects model provided evidence for positive main effects of both competence support and importance of competence, and for an additional negative effect of congruence between the two variables (analogous to the congruence effect for autonomy). The Basic Needs Support model and the Importance of Basic Needs model, however, had (almost) as much evidence in the data as the first model, but spoke for a single main effect of competence support or of importance attached to competence support, respectively. The full model should not be interpreted, because it was similarly supported by the data as the null model. To sum up, competence support, importance ascribed to competence support, and their interplay did not seem to explain much of the variation in emotional stability at T2 (controlled for T1), and very tentative evidence indicated that, if there were effects at all, there were positive linear main effects of support and/or importance and possibly an additional negative effect of congruence.

With respect to effects of relatedness on personality change, the confidence set was almost identical to autonomy except for additional evidence for the Basic Needs Support Hypothesis. Thus, the model set indicated a positive linear effect of relatedness support and a positive linear effect of the importance the person attached to relatedness support. These effects indicate that the higher trainees were on relatedness support and the higher the importance of relatedness support was to them at T1, the more they increased emotional stability at T2. In addition, some evidence spoke for the notion that congruence between the two predictors again yielded smaller increases in the emerging adults' emotional stability than incongruence between the importance of relatedness support and experienced relatedness support. Some evidence also pointed towards the notion that importance of relatedness support alone might suffice to explain interindividual variation in emotional stability development (Importance of Basic Needs Model). With very low evidence, the Full Model indicated that the positive effect of importance might diminish at higher importance levels and might eventually even turn negative at very high levels. All in all, the models in the confidence set provided strong

evidence for positive main effects of both predictor variables and also essential evidence for a congruence effect.

Extraversion. For autonomy, the Full Model did not explain significant variance in extraversion at T2 beyond the amount explained by extraversion at T1. That is, the importance of autonomy support, perceived autonomy support, and change in extraversion were not significantly related.

With respect to competence, the confidence set provided strong evidence for both positive main effects of importance of competence support and perceived competence support and again a negative effect of congruence (Congruence and Main Effects Hypothesis). Rather little evidence supported the assumption that only the importance that people attach to competence support, but not perceived support or the interplay of these variables, plays a role for extraversion development.

In contrast to the confidence set for competence, the Congruence and Main Effects Model for relatedness was not superior to the Importance of Basic Needs Model as they were shown to have equal evidence in the data. In addition, the Full Model had substantial evidence. Again, the coefficients of the full model reflected a strong positive effect of the importance of relatedness, a positive effect of relatedness support, and a negative effect of congruence on change in extraversion were reinforced. Once more, higher levels (vs. lower levels) in the predictors were associated with larger increases in extraversion. Very little evidence spoke for a simple congruence effect without main effects. All in all, we found evidence for the notion that incongruence (vs. congruence) between the predictor variables was associated with larger increases in extraversion. We also found evidence for the main effect of importance such that higher levels of importance ascribed to relatedness support in the context of a person's first job were associated with larger increases in extraversion.

Openness. For autonomy, both models in the confidence set consistently indicated a positive effect of importance of autonomy on increases in openness. The Negative Effect of Discrepancy model, which had substantial evidence in the data, spoke for an additional negative effect of the directed discrepancy of autonomy support and importance. That is, the evidence for this model indicated that the more an individual's importance of autonomy exceeds the experienced level of autonomy support the more increased openness. Contrary, the more autonomy support exceeded importance of autonomy the more decreased openness. Thus, both models indicated a positive effect of importance, and any uncertainty that existed in model selection referred only to the question of whether there was an additional negative effect of autonomy support.

For competence, the Full Model did not explain a significant amount of variance in openness at T2 beyond the amount explained by openness at T1; importance of competence support, perceived competence support, and their quadratic and interaction terms did not significantly predict change in openness.

The confidence set for relatedness included the Null Model, indicating a careful interpretation of the results as the power of the models to explain variation in the development of openness might be rather small. Again, the Negative Effect of Discrepancy Model was favored, but substantial evidence for the full model was also provided. In line with the findings of autonomy, strong evidence for the Negative Effect of Discrepancy model suggests a negative effect of the directed discrepancy of relatedness support and importance of relatedness. The Full Model provided even more evidence for this negative effect of discrepancy but indicated that, in addition, openness increased most for people whose importance and support levels were both either very low or very high. There was also very little, thus, rather negligible evidence for a congruence effect, and for a mere main effect of relatedness importance. In summary, the Negative Effect of Discrepancy Hypothesis was received most evidence in the data.

Agreeableness. All models in the confidence set for autonomy indicate a positive linear main effect of the importance of autonomy support on change in agreeableness. Both the Importance and Support Model and the Congruence and Main Effects Model provided evidence for an additional positive effect of autonomy support, and the latter also indicated a negative effect of congruence with little evidence.

Regarding competence, it was again the Importance of Basic Needs Model that gained high evidence in the confidence set. The Full Model had only little evidence in the data. Both the Importance of Basic Needs Model and the Full Model indicated that when the importance of competence support was higher at T1, agreeableness subsequently increased more.

With respect to relatedness, the Importance of Basic Needs Model was clearly the best model out of the alternatives, indicating that higher importance of relatedness at T1 was positively associated with change in agreeableness subsequently.

Conscientiousness. For autonomy, all models in the confidence set provided the most evidence for a positive effect of importance of autonomy on subsequent change in conscientiousness (Importance of Basic Needs Hypothesis). Again, the Congruence and Main Effects Model provides tentative evidence for an additional positive effect of the experienced autonomy support as well as a negative effect of congruence.

Regarding competence, all models in the confidence set again provided evidence for a positive effect of importance of competence. The most evidence was again added by the

Congruence and Main Effects Model, suggesting an additional positive effect of perceived competence support and a negative effect of congruence. The Full Model additionally indicated that the positive effect of importance might be stronger for higher importance levels than for lower levels and that the effect might be much stronger for people with low levels of competence support than for people with medium to high levels of competence support.

With respect to relatedness, the confidence set was identical to the confidence set for autonomy, that is, the most evidence was provided for a positive effect of importance of relatedness on change in conscientiousness. Some evidence for the Congruence and Main Effects Model again pointed to an additional positive effect of relatedness support and a negative effect of congruence.

Discussion

In this longitudinal study, our goal was to test contextual environmental factors on personality development in the important context of a person's first job in emerging adulthood. To do so, we assessed 1,886 emerging adults in the major environmental context of their first job with respect to their individual psychological perceptions of BPN support and the level of importance they attached to BPN support in their work context. On the basis of theory and research, we evaluated three sets of hypotheses represented by models describing possible effects of BPN support and importance attached to BPN support on personality change 1.5 years later.

In assessing environmental contexts from a psychological perspective, we followed recent arguments to take steps toward a more psychologically oriented understanding of individuals' perceptions in the environmental contexts associated with personality change (e.g., Bleidorn, 2015). By utilizing the framework of BPNT to psychologically describe environmental contexts, we joined two important lines of research to further understand interindividual differences in feelings, thoughts, and behavior: personality development research and self-determination theory (Deci & Ryan, 2008). In the following, we briefly summarize the results and describe the overall picture that is painted by the findings of the model comparisons, discuss the results, and refer to important implications and limitations for theory and future research.

Personality Development and BPN Support—Different Trait, Different Model

Contrary to previous studies, the emerging adults working at their first job decreased in all of the Big Five personality traits and, thus, they did not develop according to the maturity principle in the first 1.5 years of their first job experience. This is a surprising finding because the context of a person's first job has been associated with development toward more emotional stability, agreeableness, and conscientiousness (e.g., Lodi-Smith & Roberts, 2007; Specht et al., 2011). Regarding the effect of BPN support and the importance of BPN support on subsequent personality change, almost identical results for autonomy, competence, and relatedness were revealed for a given personality trait. However, the patterns differed across the Big Five traits.

For change in emotional stability and change in extraversion, we found nearly conclusive evidence for positive main effects of BPN support and BPN importance, and also essential evidence for an additional effect of congruence. That is, both higher BPN support in the job environment and higher importance attached to this support as well as incongruence between the two were indicated to be essential for increases in emotional stability and extraversion. A similar pattern held for conscientiousness with essential evidence for a mere main effect of BPN importance. Specifically, emerging adults reporting a high importance of BPN support at the beginning of their job subsequently increased more in conscientiousness. Agreeableness differed such that only main effects—especially the importance of BPN support—seemed to be meaningful. Openness constituted a special case in which only the Negative Effect of Discrepancy Model gained evidence. The emerging adults were shown to increase more in openness the more the importance they attached to BPN support exceeded their perceived BPN support, whereas individuals decreased in openness the more their BPN support exceeded their respective levels of BPN importance.

Overall, when considering results for all five personality traits, we found essential evidence for (mostly positive) main effects of BPN support and of BPN importance (category of main effects hypotheses). They were often combined with a negative effect of congruence (category of congruence effect hypotheses). Also, we found some specific negative discrepancy effects on openness development (category of discrepancy hypotheses). In the following, we will discuss the findings in more detail.

Support, importance, and congruence—their theoretical value for understanding personality development. In line with theoretical assumptions and previous research, BPN support was positively or negatively associated with increases in personality. However, in most analyses, we found strong evidence that importance the emerging adults ascribed to BPN support was also relevant for increases in personality. We even found some evidence that

importance alone could explain variation in personality change. Thus, our study showed that both perceived BPN support at a person's first job and individuals' needs, goals, or requirements are important for personality change. Conceptually, one might propose that the meaningfulness of the importance of BPN support for personality change only originated in an initially close relationship between personality traits and the importance individuals attach to needs. That is, the level of importance attached to BPN support might be a result of personality. However, because initial correlations in this study indicated very low associations between importance attached to BPN support and the personality traits ($.13 \leq r \leq .30$), it can be reasoned that the importance of BPN support can be considered informative to personality development above and beyond personality.

Thus, the present study reinforces theoretical assumptions regarding personal or social goals and norms as driving factors to achieve a desired outcome by means of self-regulated behavior (e.g., Denissen et al., 2013; Hennecke et al., 2014). As an implication, future theory and research on personality development should further investigate environmental contexts from a psychological perspective, including personal goals, values, or the level of importance attached to the respective context (e.g., Rauthmann et al., 2014).

Further, incongruence between BPN support and the importance of BPN support was associated with more increases in the respective personality traits than congruence. Roberts and Robins (2004) found that initial congruence between the person and the aggregated collective perception of the environment was associated with changes toward reinforcing this fit. Transferring the findings of their study, emerging adults in our study whose goals or needs were initially congruent with the aggregated perception of the shared environment (e.g., the job context) might have subsequently reinforced their personalities toward PE fit. If this thesis held, it would allow for conclusions on the VET environment. That is, fitting the environment of the first job in VET might mean to be less emotionally stable, less extraverted, less open, less agreeable, and less conscientious. However, this daring thesis lacks any basis or rationale and would therefore need further investigation in future research. Also, both selection and socialization effects might have played a role such that experiencing incongruence between the importance of BPN support and perceived BPN support drove subsequent adjustment to the context (e.g., Denissen, Ulferts, Lüdtke, Muck, & Gerstorf, 2014). To conclude, even though higher PE fit was reported to be associated with specific behavioral and emotional aspects (e.g., Greguras & Diefendorff, 2009; Hoffman & Woehr, 2006; Kristof-Brown et al., 2016), it does not seem to be associated with personality maturation in the context of the first 1.5 years in the working environment.

The special case of openness. Openness to experience constitutes a special case in the interplay of BPN support, importance of BPN support, and personality change. There was strong evidence for the Negative Effect of Discrepancy Hypothesis for openness, indicating that when the importance of BPN support exceeded perceived BPN support, the decreases in openness were smaller, and the more BPN support exceeded BPN importance, the more decreases in openness were observed. However, only a very small amount of variance could be explained. This finding goes counter to assumptions of BPNT, postulating that the satisfaction of needs should be associated with aspects of well-being (e.g., Deci & Ryan, 2000), which in turn have been associated with higher openness (e.g., Hill, Turiano, Mroczek, & Roberts, 2012; Soto, 2015; Steel, Schmidt, & Shultz, 2008). Nevertheless, the associations between aspects of well-being and subsequent change in openness in these studies were not as strong as for other personality traits. Both previous and the current findings indicate that changes in openness to experience unfold differently than they do for the other traits. Future research will need to address the processes and mechanisms that are specifically related to the development of openness to experience.

Personality development and the explanatory power of BPN. Despite the clear findings on the interplay of BPN support, the importance of BPN support, and personality change, it is important to note that the models explained only 26% (emotional stability), ≈ 34% (openness, agreeableness, conscientiousness), and 43% (extraversion) of the variance in personality traits at T2. Thereby, only 1% of the explained variance could be consistently attributed to the predictor variables, leaving the remainder to personality stability. Thus, the importance of BPN support and perceived BPN support in the context of an emerging adult's first job do play a role but a rather small one in explaining personality change. However, small effects of predictors that account for personality change are common in personality development research (Ahadi & Diener, 1989; Neyer & Asendorpf, 2001). Nevertheless, we believe this study adds important information to the current debate on the environmental factors that drive personality development in emerging adulthood.

Limitations and Outlook

Our study is one of the first to test environmental factors from a psychological perspective on subsequent personality change and thereby contributes to knowledge in personality development research. However, some features of our study can be improved in future research.

First, even though the study was conducted with a large sample of emerging adults in their first job, future studies will need to replicate the findings with samples that are balanced with respect to gender and industry branch, and that include young adults with different life paths. As Roberts and Robins (2004) indicated, it is likely that emerging adults experiencing PE fit will reinforce the attributes that constitute the fit between their personal desires, needs, and goals and the features of the environmental context.

Second, by utilizing the BPNT framework, we approached the psychological assessment of the environmental context from a new perspective, thus highlighting the interplay between BPN support and the importance of BPN support in the job context. Thus, future research could address or include potential alternatives for assessing environmental contexts (e.g., DIAMONDS; Rauthmann et al., 2014), but it should also investigate the processes and mechanisms that drive personality development. In this regard, experience sampling studies such as daily diary approaches (Allemand & Mehl, 2017; Mehl & Conner, 2012; Wrzus & Mehl, 2015) for assessing sequential changes in the environment might be useful (e.g., Wrzus & Roberts, 2017). In order to learn more about the longitudinal processes, it might be useful to investigate the longitudinal reciprocal interplay between psychological descriptions of the environment (e.g., BPN) and personality change to also obtain an understanding of how personality longitudinally predicts BPN support as well as the importance of BPN support.

Third, from a methodological perspective, we followed the established procedure to achieve commensurability between the scales on which the two predictors were measured. Nevertheless, it remains challenging to adapt two different scales to a psychologically commensurable range. Ideally, future research should assess the constructs of interest on the same scale.

Conclusion

In the present study, we applied the BPNT framework to personality development research in describing the important environmental context of an emerging adult's first job from a psychological perspective. We found that both importance of basic needs and perceived needs support, and also their degree of (in)congruence were relevant to explain interindividual differences in personality change. Future research might build on our research by assessing environmental contexts from individuals' psychological perspectives. Replications using the basic psychological needs framework and the DIAMONDS framework should be conducted (Rauthmann et al., 2014) and can be extended from situational descriptions to broader contexts.

Daily assessments might be especially useful for gaining more knowledge of the mechanisms that underlie environmental contexts associated with personality change.

Footnotes

[1] To support readability, we will speak of emotional stability instead of neuroticism. Thus, when we refer to previous findings, we present the results in the direction of emotional stability.

[2] To support readability, we will speak of personality change in the following presentation of hypotheses. However, it is important to keep in mind that the outcome variable of interest is personality at T2 controlled for initial personality.

[3] Thereby, two preconditions have to be fulfilled. First, the predictor scales have to be commensurable in order to ensure that comparing individuals' scores on these variables is theoretically meaningful. In order to achieve commensurability between BPN support and the importance of BPN support, we followed the two-step proportion of maximum scaling (POMS) procedure (Little, 2013; Moeller, 2015) resulting in both scales ranging from 0 to 1. The advantage of the POMS scaling procedure is that the absolute distances between the scale responses are maintained. Second, data must be distributed such that there are sufficient discrepant predictor pairs (e.g., Shanock, Baran, Gentry, Pattison, & Haggestad, 2010). We z-standardized the "POMS" scaled predictors and determined the number of participants whose score on one predictor variable was one standard deviation above or below their score on the other predictor (see Supplemental Material A2 for results; Shanock et al., 2010). The results indicated sufficient discrepant predictor pairs.

[4] Following the argumentation and rationale presented by Humberg et al. (in press) we considered the log likelihood (*LL*) of two nested models to be essentially the same when the algebraic difference between the two *LL*s was smaller than 1. When holding the number of parameters constant, a LL difference of 1 corresponds to an AICc difference of 2 which is often interpreted in the way that the two models offer comparably good representations of the data (e.g., Symonds & Moussali, 2011).

References

Ahadi, S., & Diener, E. (1989). Multiple determinants and effect size. *Journal of Personality and Social Psychology, 56*, 398-406. doi: 10.1037//0022-3514.56.3.398

Akaike, H. (1973). Information theory as an extension of the maximum likelihood principle. In B. N. Petrov & F. Csaki (Eds.), *Second international symposium on information theory* (pp. 267–281). Budapest: Akademiai Kiado.

Allemand, M., & Mehl, M. R. (2017). Personality assessment in daily life: A roadmap for future personality development research. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 437-454). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*, 469-480. doi: 10.1037/0003-066X.55.5.469

Arnold, T. W. (2010). Uninformative parameters and model selection using Akaike's information criterion. *Journal of Wildlife Management*, *74*, 1175–1178. doi:10.2193/2009-367

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, *34*, 2045-2068. doi: 10.1111/j.1559-1816.2004.tb02690.x

Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., Bosch, J. A., & Thøgersen-Ntoumani (2011). Self-determination theory and diminished functioning: The role of interpersonal control and psychological need thwarting. *Personality and Social Psychological Bulletin*, *37*, 1459-1473. doi: 10.1177/0146167211413125

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529. doi: 10.1037/0033-2909.117.3.497

Bleidorn, W. (2012). Hitting the road to adulthood: Short-term personality development during a major life transition. *Personality and Social Psychology Bulletin*, *38*, 1594-1808. doi: 10.1177/0146167212456707

Bleidorn, W. (2015). What accounts for personality maturation in early adulthood? *Current Directions in Psychological Science*, 24, 245-252. doi:10.1177/0963721414568662

Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2016). Life events and personality trait change. *Journal of Personality*, 86, doi: 10.1111/jopy.12286

Bleidorn, W., Kandler, C., Caspi, A. (2014). The behavioural genetics of personality development in adulthood – classic, contemporary, and future trends. *European Journal of Personality*, *28,* 244-255. doi: 10.1002/per.1957

Box, G. E. P., Draper, N. R. (1987). *Empirical model-building and response surfaces*. Oxford, England: John Wiley & Sons

Burnham, K. P., & Anderson, D. R. (2002). *Model selection and multimodel inference: A practical information-theoretic approach* (2nd ed.). New York, NY: Springer.

Briley, D. A., & Tucker-Drob, E. M. (2014). Genetic and environmental continuity in personality development: A meta-analysis. *Psychological Bulletin*, *140*, 1303-1331. doi: 10.1037/a0037091

Caplan, R. D. (1987). Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior*, 31, 248–267. doi: 10.1016/0001-8791(87)90042-X

De Charms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York, NY: Academic Press.

Deci, E. L., Olafsen, A. H., & Ryan, R. M. (2017). Self-determination theory in work organizations: The state of a science. *Annual Review of Organizational Psychology and Organizational Behavior*, *4*, 19-43. doi: 10.1146/annurev-orgpsych-032516-113108

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, *19*, 109-134. doi: 10.1016/0092-6566(85)90023-6

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln: University of Nebraska Press.

Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227-268. doi: 10.1207/S15327965PLI1104_01

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory. A macrotheory of human motivation, development, and health. *Canadian Psychology*, 49, 182-185. doi: 10.1037/a0012801

Deci, E. L., & Ryan, R. M. (2014). Autonomy and need satisfaction in close relationships: Relationships motivation theory. In Weinstein N. (Eds.) Human Motivation and Interpersonal Relationships. Springer, Dordrecht

Denissen, J. J. A., Ulferts, H., Lüdtke, O., Muck, P. M., & Gerstorf, D. (2014). Longitudinal transactions between personality and occupational roles: A large and heterogeneous study of job beginners, stayers, and changers. *Developmental Psychology*, *50*, 1931-1942. doi: 10.1037/a0036994

Denissen, J. J. A., Van Aken, M. A. G., Penke, L., & Wood, D. (2013). Self-regulation underlies temperament and personality: An integrative developmental framework. *Child Development Perspectives*, *4*, 255-260. doi: 10.1111/cdep.12050

Edwards, J. R. (2002). Alternatives to difference scores: Polynomial regression analysis and response surface methodology. In F. Drasgow & N. W. Schmitt (Eds.), *Advances in measurement and data analysis* (pp. 350–400). San Francisco, CA: Jossey-Bass.

Edwards, J. R. (2007). Polynomial regression and response surface methodology. In C. Ostroff & T. A. Judge (Eds.), *Perspectives on Organizational Fit* (pp. 361–372). San Francisco: Jossey-Bass.

Fishbach, A., Zhang, Y., & Koo, M. (2009). The dynamics of self-regulation. *European Review of Social Psychology*, *20*, 315-344. doi: 10.1080/10463280903275375

Gagné, M. (2003). The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and Emotion*, *27*, 199-223. doi: 10.1023/A:1025007614869

Gillet, N., Fouquereau, E., Lafreniére, M. K., & Huyghebaert, T. (2016). Examining the roles of work autonomous and controlled motivations on satisfaction and anxiety as a function of role ambiguity. *The Journal of Psychology*, *150*, 644-665. doi: 10.1080/00223980.2016.1154811

Greguras, G. J., & Diefendorff, J. M. (2009). Different fits satisfy different needs: Linking person-environment employee commitment and performance using self-determination theory. *Journal of Applied Psychology*, *94*, 465-477. doi: 10.1037/a0014068

Hennecke, M., Bleidorn, W., Denissen, J. J. A., & Wood, D. (2014). A three-part framework for self-regulated personality development across adulthood. *European Journal of Personality*, *28*, 289-299. doi: 10.1002/per.1945

Hill, P. L., Turiano, N. A., Mroczek, D. K., & Roberts, B. W. (2012). Examining concurrent and longitudinal relations between personality traits and social well-being in adulthood. *Social Psychological and Personality Science*, *3*, 698-705. doi: 10.1177/1948550611433888

Hoffman, B. J., & Woehr, D. J. (2006). A quantitative review of the relationship between person-organization fit and behavioral outcomes. *Journal of Vocational Behavior*, *68*, 389-399. doi: 10.1016/j.jvb.2005.08.003

Holland, J. L. (1997). *Making vocational choices*. Odessa, FL: PAR

Hopwood, C. J., Donnellan, M. B., Blonigen, D. M., Krueger, R. F., McGue, M., Iacono, W. G., & Burt, S. A. (2011). Genetic and environmental influences on personality trait stability

and growth during the transition to adulthood: A three-wave longitudinal study. Journal of Personality and Social Psychology, 100, 545-556. doi: 10.1037/a0022409

Hudson, N. W., & Roberts, B. W. (2012). Personality trait development and social investment in work. *Journal of Research in Personality*, *46*, 334-344. doi: 10.1016/j.jrp.2012.03.002

Humberg, S., Dufner, M., Schönbrodt, F. D., Geukes, K., Hutteman, R., Küfner, A. C. P., van Zalk, M. H., Denissen, J. J. A., Nestler, S., & Back, M. D. (in press). Is accurate, positive, or inflated self-perception most advantageous for psychological adjustment? A competitive test of key hypotheses. *Journal of Personality and Social Psychology*. Retrieved from osf.io/9w3bh

Humberg, S., Dufner, M., Schönbrodt, F. D., Geukes, K., Hutteman, R., van Zalk, M. H. W., Denissen, J. J. A., Nestler, S., & Back, M. D. (2018). Enhanced versus simply positive: A new condition-based regression analysis to disentangle effects of self-enhancement from effects of positivity of self-view. *Journal of Personality and Social Psychology*, 114, 303-322. doi:10.1037/pspp0000134

Humberg, S., Nestler, S., & Back, M. D. (2018). Response surface analysis in personality and social psychology: Checklist and clarifications for the case of congruence hypotheses. *Social Psychological and Personality Science*, 13, 1-11. doi: 10.1177/1948550618757600

Jokela, M., Kivimäki, M., Elovaninio, M., & Keltikangas-Järvinen, L. (2009). Personality and having children: A two-way relationship. *Journal of Personality and Social Psychology*, *96*, 218-230. doi: 10.1037/a0014058

Kanfer, R., Frese, M., & Johnson, R. E. (2017). Motivation related to work: A century of progress. *The Journal of Applied Psychology*, *102*, 338-355. doi: 10.1037/apl0000133

Kelly, J., & Greene, M. C. (2014). Where there's a will there's a way: A longitudinal investigation of the interplay between recovery motivation and self-efficacy in predicting treatment outcome. *Psychology of Addictive Behaviors : Journal of the Society of Psychologists in Addictive Behaviors*, *28*, 928-934. doi: 10.1037/a0034727

Klassen, R. M., Perry, N. E., & Frenzel, A. C. (2012). Teachers‘ relatedness with students: An underemphasized component of teachers' basic psychological needs. *Journal of Educational Psychology*, *104*, 150-165. doi: 10.1037/a0026253

Koo, M., & Fishbach, A. (2008). Dynamics of self-regulation: How (un)accomplished goal actions affect motivation. *Journal of Personality and Social Psychology*, *94*, 183-195. doi: 10.1037/0022-3514.94.2.183

Kristof-Brown, A. L., Li, C. S., & Schneider, B. (2016). Fitting in and doing good: A review of person-environment fit and organizational citizenship behavior research. In P. M.

Podsakoff, S. B. Mackenzie, & N. P. Podsakoff (Eds.), *The Oxford handbook of organizational citizenship behavior*. *Oxford University Press*

La Guardia, J. G., & Ryan, R. M. (2007). Why identities fluctuate : Variability in traits as a function of situational variations in autonomy support. *Journal of Personality*, *75*, 1205-1228. doi: 10.1111/j.1467-6494.2007.00473.x

Lang, F. R., Lüdtke, O., & Asendorpf, J. B. (2001). Testgüte und psychometrische Äquivalenz der deutschen Version des Big Five Inventory (BFI) bei jungen, mittelalten und alten Erwachsenen [Psychometric properties and psychometric equivalence of the German version of the Big Five Inventory (BFI) in young, middle old, and old adults]. *Diagnostica*, *47*, 111-121. doi: 10.1026//0012-1924.47.3.111

Le, K., Donnellan, M. B., & Conger, R. (2014). Personality development at work : Workplace conditions, personality changes, and the corresponsive principle. *Journal of Personality*, *82*, 44-56. doi: 10.1111/jopy.12032

Lehnart, J., Neyer, F. J., & Eccles, Jacquelynne (2010). Long-term effects of social investment : The case of partnering in young adulthood. *Journal of Personality*, 78, 639-670. doi: 10.1111/j.1467-6494.2010.00629.x

Little, T. D. (2013). *Longitudinal structural equation modeling*. New York, NY: The Guilford Press.

Lodi-Smith, J., & Roberts, B. W. (2007). Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review*, *11*, 68-86. doi:10.1177/1088868306294590

Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, *103*, 847-861. doi: 10.1037/a0024298

Lüdtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology*, *101*, 620-637. doi: 10.1037/a0023743

Mazerolle, M. J. (2016) AICcmodavg: Model selection and multimodel inference based on (Q)AIC(c) (version 2.0.4). Retrieved from https://cran.r-project.org/package=AICcmodavg

Mehl, M. R. & Conner, T. S. (Eds.) (2012). *Handbook of research methods for studying daily life*. Guilford Press: New York, NY.

Moeller, J. (2015): A word on standardization in longitudinal studies: don't. *Frontiers in Psychology*, *6*, 1389. doi: 10.3389/fpsyg.2015.01389

Mõttus, R., Allik, J., Hřebičková, M., Kööts-Ausmees, L., & Realo, A. (2016). Age differences in the variance of personality characteristics. *European Journal of Personality*, 30, 4-11. doi: 10.1002/per.2036

Nelis, D., Kotsou, I., Quoidbach, J., Hansenne, M., Weytens, F., Dupuis, P., & Mikolajczak, M. (2011). Increasing emotional competence improves psychological and physical well-being, social relationships, and employability. *Emotion, 11,* 354–366. doi: 10.1037/a0021554

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology*, 81, 1190-1204. doi: 10.1037/0022-3514.81.6.1190

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom. Applying self-determination theory to educational practice. *Theory and Research in Education*, *7,* 133-144. doi: 10.1177/1477878509104318

Olafsen, A. H., Deci, E. L., & Halvari, H. (2018). Basic psychological needs and work motivation: A longitudinal test of directionality. *Motivation and Emotion*, *42*, 178-189. doi: 10.1007/s11031-017-9646-2

Olafsen, A. H., Niemiec, C. P., Halvari, H., Deci, Edward L., & Williams, G. C. (2017). On the dark side of work: A longitudinal analysis using self-determination theory. *European Journal of Work and Organizational Psychology*, *26*, 275-285. doi: 10.1080/1359432X.2016.1257611

Prenzel, M., Kramer, K., & Drechsel, B. (2002). Self-determined and interested learning in vocational education. In K. Beck (Ed.), *Teaching-Learning Processes in Vocational Education* (pp. 37-61). Frankfurt a. M., Germany: Peter Lang.

Rauthmann, J. F., Gallardo-Pujol, D., Guillaume, E. M., Todd, E., Nave, C. S., Sherman, R. A., Ziegler, M., Jones, A. B., & Funder, D. C. (2014). The situational eight DIAMONDS: A taxonomy of major dimensions of situation characteristics. *Journal of Personality and Social Psychology*, *107*, 677-718. doi: 10.1037/a0037250.supp

Retelsdorf, J., Lindner, C., Nickolaus, R., Winther, E., & Köller, O. (2013). Forschungsdesiderate und Perspektiven – Ausblick auf ein Projekt zur Untersuchung mathematisch-naturwissenschaftlicher Kompetenzen in der beruflichen Erstausbildung (ManKobE). *Zeitschrift für Berufs- und Wirtschaftspädagogik*, Beiheft 26, 227-234.

Roberts, B. W. (2009). Back to the future: Personality and Assessment and personality development. *Journal of Research in Personality*, *43*, 137-145. doi:10.1016/j.jrp.2008.12.015

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2001). The kids are alright: Growth and stability in personality development from adolescence to adulthood. *Journal of Personality and Social Psychology*, *81*, 670-683. doi: 10.1037//0022-3514.81.4.670.

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, *84*, 582–593. doi:10.1037/0022-3514.84.3.582

Roberts, B. W., & Davis, J. P. (2016). Young adulthood is the crucible of personality development. *Emerging Adulthood*, 4, 1-9. doi:10.1177/2167696816653052

Roberts, B. W., & DelVecchio (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126, 3-25. doi: 10.1037/0033-2909.126.1.3

Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin*, *143*, 117-141. doi: 10.1037/bul0000088

Roberts, B. W., & Nickel, L. B. (2017). A critical evaluation of the neo-socioanalytic model of personality. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 157-177). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Roberts, B. W., & Robins, R. W. (2004). Person-environment fit and its implications for personality development: A longitudinal study. *Journal of Personality*, *72*, 89-110. doi: 10.1111/j.0022-3506.2004.00257.x

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*, 1-25. doi: 10.1037/0033-2909.132.1.1

Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research* (pp. 375-398). New York, NY: The Guilford Press.

Roche, M., & Haar, J. (2013). A metamodel approach towards self-determination theory: A study of New Zealand managers' organisational citizenship behaviours. *The International Journal of Human Resource Management*, *24*, 3397-3417. doi: 10.1080/09585192.2013.770779.

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, *48*, 1–36. doi: 10.18637/jss.v048.i02

RStudio Team (2016). RStudio: Integrated Development for R. RStudio, Inc., Boston, URL http://www.rstudio.com/

Ryan, R. M., & Deci, E. L. (2008). Self-determination theory and the role of basic psychological needs in personality and the organization of behavior. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 654-678). New York, NY, US: Guilford Press.

Schönbrodt, F. D. (2016). *Testing fit patterns with polynomial regression models*. Retrieved from osf.io/3889z

Schwaba, T., & Bleidorn, W. (2017). Personality development in emerging adulthood. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 25-38). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology*, *91*, 1152-1165. doi: 10.1037/0022-3514.91.6.1152

Shanock, L. R., Baran, B. E., Gentry, W. A., Pattison, S. C., & Heggestad, E. D. (2010). Polynomial regression with response surface analysis: A powerful approach for examining moderation and overcoming limitations of difference scores. *Journal of Business and Psychology*, 25, 543–554. doi: 10.1007/s10869-010-9183-4

Sheldon, K. M., & Prentice, M. (2017). Self-determination theory as a foundation for personality researchers. *Journal of Personality*, Accepted manuscript. doi: 10.1111/jopy.12360

Smits, J. A. J., Julian, K., Rosenfield, D., & Powers, M. B. (2012). Threat reappraisal as a mediator of symptom change in cognitive-behavioral treatment of anxiety disorders: A systematic review. *Journal of Consulting and Clinical Psychology*, *80*, 624-635. doi: 10.1037/a0028957

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology*, 100, 330-348. doi: 10.1037/a0021717

Soto, C. J. (2015). Is happiness good for your personality? Concurrent and prospective relations of the Big Five with subjective well-being. *Journal of Personality*, *83*, 45-55. doi: 10.1111/jopy.12081

Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the big five. *Journal of Personality and Social Psychology*, 101, 862-882. doi: 10.1037/a0024950

Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological Bulletin*, *134*, 138-161. doi: 10.1037/0033-2909.134.1.138

Sutin, A. R., & Costa, P. T. (2010). Reciprocal influences of personality and job characteristics across middle adulthood. *Journal of Personality*, *78*, 257-288. doi: 10.1111/j.1467-6494.2009.00615.x

Symonds, M. R. E., & Moussalli, A. (2011). A brief guide to model selection, multimodel inference and model averaging in behavioural ecology using Akaike's information criterion. *Behavioral Ecology and Sociobiology*, 65, 13-21. doi:10.1007/s00265010-1037-6

Trépanier, S., Fernet, C., & Austin, S. (2015). A longitudinal investigation of workplace bullying, basic need satisfaction, and employee functioning. *Journal of Occupational Health Psychology, 20*, 105-116. doi: 10.1037/a0037726

Ümmet, D. (2015). Self-esteem among college students: A Study of Satisfaction of Basic Psychological Needs and Some Variables. *Procedia - Social and Behavioral Sciences*, *174*, 1623–1629. doi: 10.1016/j.sbspro.2015.01.813.

Van den Broeck, A., Ferris, D. L., Chang, C., & Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *Journal of Management*, *42*, 1195-1229. doi: 10.1177/0149206316632058

Van den Broeck, A., Vansteenkiste, M., & De Witte, H. (2008). Self-determination theory: A theoretical and empirical overview in occupational health psychology. In J. Houdmont (Ed.), *Occupational health psychology: European perspectives on research, education, and practice.* (pp. 63–88). Nottingham ; UNITED KINGDOM: Nottingham University Press.

Van Scheppingen, M. A., Jackson, J. J., Specht, J., Hutteman, R., Denissen, J. J. A., & Bleidorn, W. (2016). Personality trait development during the transition to parenthood: A test of social investment theory. *Social Psychological and Personality Science*, 7, 452-462. doi:10.1177/1948550616630032

Wagner, J., Becker, M., Lüdtke, O., & Trautwein, U. (2015). The first partnership experience and personality development: A propensity score matching study in young adulthood. *Social Psychological and Personality Science*, *6*, 455-463. doi:10.1177/1948550614566092

Wrzus, C., & Mehl, M. R. (2015). Lab and/or Field? Measuring Personality Processes and Their Social Consequences. *European Journal of Personality*, *29*, 250–271. doi: 10.1002/per.1986

Yu, C., Li, X., Wang, S., & Zhang, W. (2016). Teacher autonomy support reduces adolescent anxiety and depression: An 18-month longitudinal study. *Journal of Adolescence*, *49*, 115-123. doi: 10.1016/j.adolescence.2016.03.001

Table 1

Initial Set of Hypotheses and Respective Statistical Models

Hypotheses on the interplay between BPN support, importance of BPN support, and Big Five personality change.	Regression models		Figure 1
Basic Needs Support Hypothesis: "The more a person perceives BPN support, the larger the increase (or the smaller the decrease) in personality."	**Basic Needs Support Model**	$P_2 = b_0 + b_1S + b_2I + b_6P_1$ with $b_1 > 0, b_2 = 0$	a
Importance of Basic Needs Hypothesis: "The higher a person rates the importance of BPN support, the stronger is the association with personality change."	**Importance of Basic Needs Model**	$P_2 = b_0 + b_1S + b_2I + b_6P_1$ with $b_1 = 0$	b
Importance and Support Hypothesis: "The higher a person rates the importance of BPN support and the more a person perceives BPN support, the stronger is the association with personality change."	**Importance and Support Model**	$P_2 = b_0 + b_1S + b_2I + b_6P_1$ with $b_1 > 0$	c
Positive Effect of Discrepancy Hypothesis: "The larger the directed discrepancy of perceived BPN support and importance of BPN support, the larger the increase (or the smaller the decrease) in personality."	**Positive Effect of Discrepancy Model**	$P_2 = b_0 + b_1S + b_2I + b_6P_1$ with $b_1 > 0, b_2 < 0$	d
Negative Effect of Discrepancy Hypothesis: "The larger the directed discrepancy of perceived BPN support and importance of BPN support, the smaller the increase (or the larger the decrease) in personality."	**Negative Effect of Discrepancy Model**	$P_2 = b_0 + b_1S + b_2I + b_6P_1$ with $b_1 < 0, b_2 > 0$	e
Strict Congruence Hypothesis: "The more congruent BPN support and BPN importance, the more increases (or decreases) personality."	**Strict Congruence Model**	$P_2 = b_0 + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$ with $b_1 = b_2 = 0; b_3 = b_5; b_4 = -2b_3$	f_a, f_b

Congruence and Main Effects Hypothesis: "The more congruent and the higher BPN support and BPN importance, the more increases (or decreases) personality."	**Congruence and Main Effects Model**	$P_2 = b_0 + b_1S + b_2 I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$ with $b_1 = b_2$, $b_3 = b_5$, $b_4 = -2b_3$	g_a, g_b
Optimal Margin Hypothesis: "The more BPN support exceeds the reported level of BPN importance by a specific fixed amount, the more increases (or decreases) personality, and people with higher levels of BPN support and importance increase more (or decrease more) than people at lower levels.	**Optimal Margin Model**	$P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$ with $b_3 = b_5$, $b_4 = -2b_3$	h_a, h_b
Supplementary hypotheses	Regression models		Figure 1
Curvilinear Basic Needs Hypothesis: "There is a positive association between BPN support and personality change which diminishes at higher levels of BPN support or turns negative at an inflection point."	**Curvilinear Basic Needs Model**	$P_2 = b_0 + b_1S + b_3S^2 + b_6P_1$ with $b_3 < 0$	i
Null model	**Null Model**	$P_2 = b_0 + b_6P_1$	
Global model	**Full Model**	$P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$	

Note. P_2 denotes the outcome variable personality at T2, *S* denotes perceived basic needs support, *I* denotes importance attached to basic needs support, and P_1 denotes personality at T1.

Table 2

Descriptive Statistics of the Big Five Personality Traits and Basic Psychological Needs

	M_{T1}	SD_{T1}	M_{T2}	SD_{T2}	d	r_{T1T2}	ES	E	O	A	C	A_S	C_S	R_S	A_I	C_I	R_I
Personality traits																	
Emotional stability	3.45	0.62	3.26	0.58	**-0.34**	**.50**	**1**										
Extraversion	3.56	0.68	3.38	0.68	**-0.30**	**.65**	**.35**	**1**									
Openness	3.29	0.58	3.24	0.54	**-0.09**	**.58**	**.08**	**.28**	**1**								
Agreeableness	3.61	0.57	3.43	0.57	**-0.41**	**.58**	**.23**	**.12**	**.12**	**1**							
Conscientiousness	3.72	0.56	3.48	0.57	**-0.49**	**.57**	**.32**	**.32**	**.22**	**.43**	**1**						
Basic needs support																	
Autonomy	4.31	0.90	-	-	-	-	**.22**	**.22**	**.15**	**.19**	**.28**	**1**					
Competence	4.54	1.01	-	-	-	-	**.22**	**.22**	**.17**	**.18**	**.26**	**.67**	**1**				
Relatedness	4.95	1.05	-	-	-	-	**.27**	**.23**	**.15**	**.23**	**.30**	**.65**	**.75**	**1**			
Importance of needs support																	
Autonomy	3.75	0.66	-	-	-	-	**.14**	**.23**	**.22**	**.14**	**.20**	**.38**	**.31**	**.31**	**1**		
Competence	4.09	0.70	-	-	-	-	**.16**	**.25**	**.22**	**.21**	**.30**	**.34**	**.41**	**.40**	**.68**	**1**	
Relatedness	4.33	0.71	-	-	-	-	**.13**	**.21**	**.17**	**.27**	**.30**	**.35**	**.38**	**.48**	**.60**	**.76**	**1**

Note. M = Mean, SD = standard deviation, d = Cohen's d, r_{T1T2} = correlation T1 and T2; ES to R_I = variable correlations at T1; ES = Emotional Stability, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness, A_S = Autonomy Support, C_S = Competence Support, R_S = Relatedness Support, A_I = Importance of Autonomy, C_I = Importance of Competence, R_I = Importance of Relatedness. Bold numbers are significant at $p < .01$.

Table 3

Results of the Model Evaluation Analyses for the Personality Trait Emotional Stability

95% Confidence set of models	*w*	b_1	b_2	b_3	b_4	b_5	R^2 model	R^2 predictors	Final conclusion across all BPN domains
Autonomy									
Importance & support	0.38	0.16	0.23	0	0	0	0.264	0.010	Essential evidence for positive main effects of support and importance (Importance and Support Hypothesis), and for an additional negative effect of congruence (Congruence and Main Effects Hypothesis). Some tentative evidence for simple main effect of BPN importance (Importance of Basic Needs Hypothesis).
Congr. & main effects	0.37	0.20	0.20	0.10	-0.19	0.10	0.264	0.010	
Importance of BPN	0.16	0	0.30	0	0	0	0.261	0.008	
Full model	0.06	0.20	0.21	0.26	-0.21	-0.38	0.265	0.011	
Competence									
BPN support model	0.29	0.14	0	0	0	0	0.256	0.002	
Congr. & main effects	0.29	0.11	0.11	0.13	-0.27	0.13	0.257	0.004	
Importance of BPN	0.21	0	0.14	0	0	0	0.256	0.002	
Null model	0.12	0	0	0	0	0	0.254	0.000	
Full model	0.10	0.23	0.03	0.57	-0.23	-0.31	0.259	0.005	
Relatedness									
Importance & support	0.29	0.12	0.20	0	0	0	0.262	0.009	
Congr. & main effects	0.28	0.16	0.16	0.07	-0.15	0.07	0.262	0.008	
Importance of BPN	0.24	0	0.27	0	0	0	0.261	0.007	
Full model	0.12	0.23	0.12	0.43	0.21	-0.61	0.265	0.011	
BPN support model	0.07	0.20	0	0	0	0	0.259	0.005	

Note. For each analysis, the 95% confidence set of models is provided. *w* = Akaike weight of the respective model = the model's likelihood of being the best model in the set. Regression coefficients b_1 to b_5 refer to the full polynomial model $P_2 = b_0 + b_1 S + b_2 I + b_3 S^2 + b_4 SI + b_5 I^2 + b_6 P_1$; R^2 model = R^2 of the respective model; R^2 predictors = R^2 accounted for by the predictor variables (without personality at T1). *Importance & Support* = linear effects of basic needs support and importance of basic needs support. *BPN support model* = basic needs support only model; *Importance of BPN* = importance of basic needs only model; *Congr. & main effects* = congruence and main effects model. The final conclusions were drawn after considering the area of data, interpreting the full model if included in the confidence set, and identifying common effects of the models in the confidence set.

Table 4

Results of the Model Evaluation Analyses for the Personality Trait Extraversion

95% Confidence set of models	*w*	b_1	b_2	b_3	b_4	b_5	R^2 model	R^2 predictors	Final conclusion
Autonomy									
Competence									Strong evidence for Congruence and Main Effects Hypothesis.
Congr. & main effects	0.82	0.16	0.16	0.46	-0.91	0.46	0.431	0.007	
Importance of BPN	0.17	0	0.26	0	0	0	0.428	0.005	
Relatedness									Some evidence for mere BPN importance main effects (Importance of Basic Needs Hypothesis)
Congr. & main effects	0.36	0.12	0.12	0.39	-0.78	0.39	0.428	0.005	
Importance of BPN	0.35	0	0.22	0	0	0	0.427	0.004	
Full model	0.21	0.14	0.25	0.61	-0.24	0.44	0.431	0.007	
Strict congruence	0.04	0	0	0.25	-0.50	0.25	0.425	0.001	

Note. For each analysis, the 95% confidence set of models is provided. w = Akaike weight of the respective model = the model's likelihood of being the best model in the set. Regression coefficients b_1 to b_5 refer to the full polynomial model $P_2 = b_0 + b_1S + b_2 I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$; R^2 model = R^2 of the respective model; R^2 predictors = R^2 accounted for by the predictor variables (without personality at T1). *Strict congruence* = strict congruence model; *Importance of BPN* = importance of basic needs only model; *Congr. & main effects* = congruence and main effects model. The final conclusions were drawn after considering the area of data, interpreting the full model if included in the confidence set, and identifying common effects of the models in the confidence set.

Table 5

Results of the Model Evaluation Analyses for the Personality Trait Openness to Experience

95% Confidence set of models	*w*	b_1	b_2	b_3	b_4	b_5	R^2 model	R^2 predictors	Final conclusion
Autonomy									
Negative discrepancy	0.87	-0.18	0.25	0	0	0	0.348	0.007	
Importance of BPN	0.12	0	0.18	0	0	0	0.344	0.003	
Competence									
Relatedness									Negative Effect of Discrepancy Hypothesis
Negative discrepancy	0.50	-0.17	0.21	0	0	0	0.345	0.005	
Full model	0.35	-0.10	0.28	0.25	0.31	0.21	0.348	0.007	
Strict congruence	0.06	0	0	0.22	-0.44	0.22	0.342	0.002	
Importance of BPN	0.05	0	0.11	0	0	0	0.342	0.001	
Null model	0.04	0	0	0	0	0	0.340	0.000	

Note. For each analysis, the 95% confidence set of models is provided. *w* = Akaike weight of the respective model = the model's likelihood of being the best model in the set. Regression coefficients b_1 to b_5 refer to the full polynomial model $P_2 = b_0 + b_1S + b_2 I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$; R^2 model = R^2 of the respective model; R^2 predictors = R^2 accounted for by the predictor variables (without personality at T1). *Negative Discrepancy* = negative effect of discrepancy model. *Importance of BPN* = importance of basic needs only model; *Strict congruence* = strict congruence model. The final conclusions were drawn after considering the area of data, interpreting the full model if included in the confidence set, and identifying common effects of the models in the confidence set.

Table 6

Results of the Model Evaluation Analyses for the Personality Trait Agreeableness

95% Confidence set of models	w	b_1	b_2	b_3	b_4	b_5	R^2 model	R^2 predictors	Final conclusion
Autonomy									
Importance & Support	0.37	0.11	0.22	0	0	0	0.353	0.008	Importance of Basic Needs Hypothesis.
Importance of BPN	0.35	0	0.27	0	0	0	0.352	0.007	
Congr. & main effects	0.26	0.16	0.16	0.03	-0.05	0.03	0.353	0.008	
Competence									Some evidence for positive effect of autonomy support and of congruence between autonomy importance and support
Importance of BPN	0.85	0	0.33	0	0	0	0.356	0.010	
Full model	0.15	-0.18	0.39	-0.43	0.11	-0.12	0.358	0.013	
Relatedness									
Importance of BPN	0.99	0	0.39	0	0	0	0.360	0.015	

Note. For each analysis, the 95% confidence set of models is provided. w = Akaike weight of the respective model = the model's likelihood of being the best model in the set. Regression coefficients b_1 to b_5 refer to the full polynomial model $P_2 = b_0 + b_1S + b_2 I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$; R^2 model = R^2 of the respective model; R^2 predictors = R^2 accounted for by the predictor variables (without personality at T1). *Importance & Support* = linear effects of basic needs support and importance of basic needs support. *Importance of BPN* = importance of basic needs only model; *Congr. & main effects* = congruence and main effects model. The final conclusions were drawn after considering the area of data, interpreting the full model if included in the confidence set, and identifying common effects of the models in the confidence set.

Table 7

Results of the Model Evaluation Analyses for the Personality Trait Conscientiousness

95% Confidence set of models	*w*	b_1	b_2	b_3	b_4	b_5	R^2 model	R^2 predictors	Final conclusion
Autonomy									
Importance of BPN	0.84	0	0.34	0	0	0	0.338	0.010	Conclusive evidence for Importance of Basic Needs Hypothesis.
Congr. & main effects	0.16	0.19	0.19	0.21	-0.42	0.21	0.338	0.010	
Competence									
Congr. & main effects	0.61	0.16	0.16	0.43	-0.86	0.43	0.339	0.010	Essential evidence for the Congruence and Main Effects Hypothesis.
Importance of BPN	0.24	0	0.28	0	0	0	0.337	0.008	
Full model	0.16	0.06	0.20	0.03	-1.02	0.68	0.341	0.012	
Relatedness									
Importance of BPN	0.86	0	0.39	0	0	0	0.343	0.014	
Congr.& main effects	0.14	0.21	0.21	0.22	-0.45	0.22	0.342	0.014	

Note. For each analysis, the 95% confidence set of models is provided. *w* = Akaike weight of the respective model = the model's likelihood of being the best model in the set. Regression coefficients b_1 to b_5 refer to the full polynomial model $P_2 = b_0 + b_1S + b_2 I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$; R^2 model = R^2 of the respective model; R^2 predictors = R^2 accounted for by the predictor variables (without personality at T1). *Importance of BPN* = importance of basic needs only model; *Congr. & main effects* = congruence and main effects model. The final conclusions were drawn after considering the area of data, interpreting the full model if included in the confidence set, and identifying common effects of the models in the confidence set.

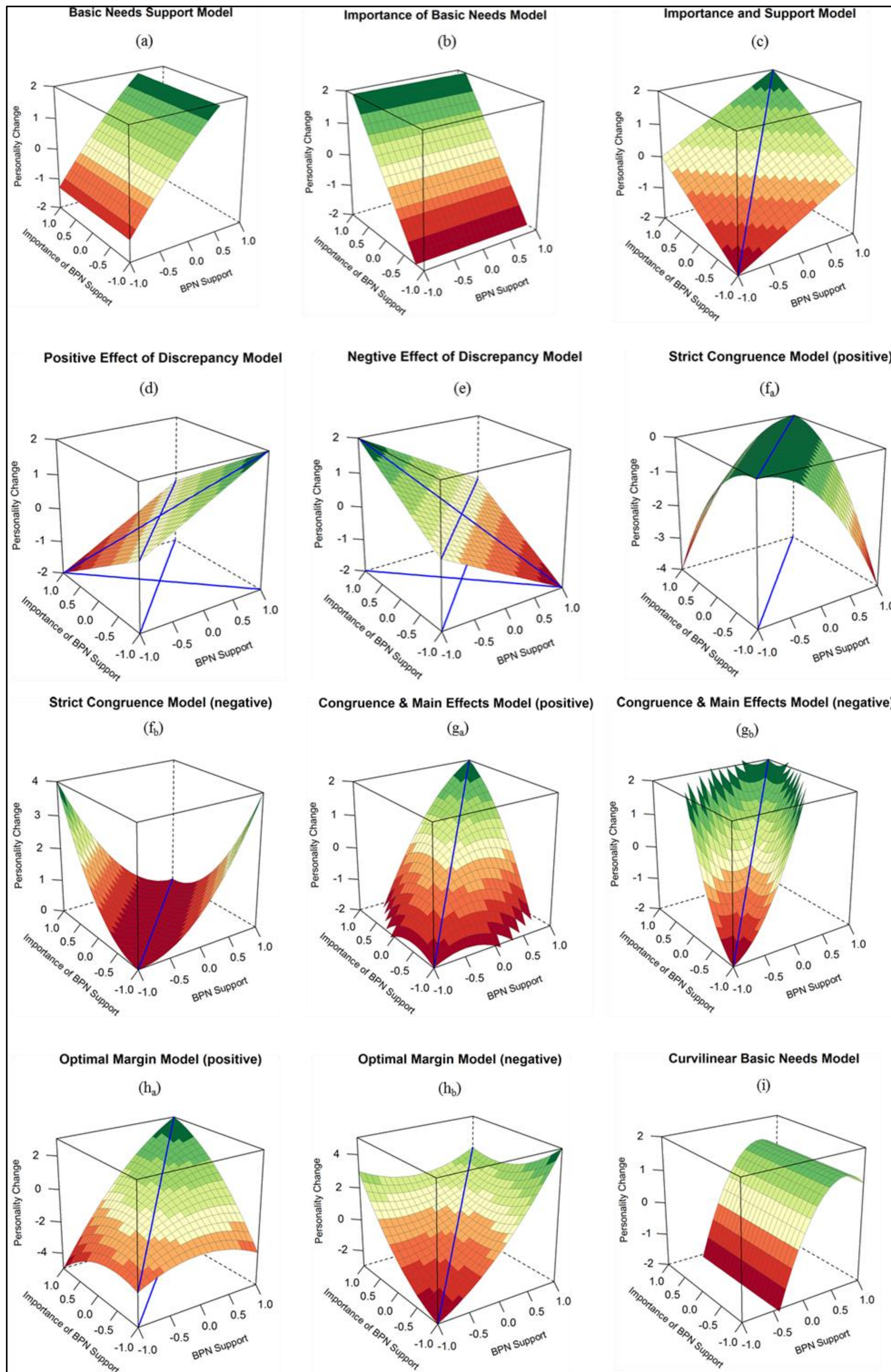

*Figure 1.*Prototypical model representations of the tested models.

APPENDIX Study 3

A1 – Translating The Theoretical Hypotheses Into Statistical Hypotheses

The *Basic Needs Support Hypothesis* postulates a positive effect of perceived basic needs support at the VET company (S) on change in personality (P_2), controlled for personality at T1 (P_1), with no effect of importance of basic needs support (I):

Basic Needs Support Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$

with $b_1 > 0, b_2 = b_3 = b_4 = b_5 = 0$ (1)

Here, the constraints on the regression coefficients ensure that the model indeed reflects the suggested effect stated in the Basic Needs Support Hypothesis: The constraint on the coefficient of basic needs support (b_1) is constrained to be positive, so that the model reflects a beneficial effect of support. . The coefficient of the importance of basic needs (b_2) and of all second-order terms (b_3, b_4, and b_5) are constrained to zero, because the hypothesis states that only support, not importance, should have an effect.

The *Importance of Basic Needs Hypothesis* claims an association between the importance of basic needs support I on increases (decreases) in personality P_2 with no effect of basic needs support S:

Importance of Basic Needs Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$,

with $b_1 = b_3 = b_4 = b_5 = 0$. (2)

Here, the model constraints ensure that the model includes only a (positive or negative) effect of basic needs importance, not of basic needs support, as stated in the respective hypothesis.

In order to allow for the possibility that both the Basic Needs Support and the Importance of Basic Needs Hypothesis might be supported by the data, we also consider the *Importance and Support Hypothesis* as a potential alternative hypothesis. It constitutes a combination of the *Basic Needs Support Model* and the *Importance of Basic Needs Hypothesis Model* in the way that a positive effect of S and an effect of I are expected:

Importance and Support Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$,

with $b_1 > 0, b_3 = b_4 = b_5 = 0$. (3)

In this model of two linear main effects, the coefficient for basic needs support (b_1) is constrained to be positive as only positive effects of perceived basic needs support at the company are expected whereas importance of basic needs support (b_2) can take on positive and negative values and is thus not restricted.

The *Positive Effect of Discrepancy Hypothesis* states that the directed discrepancy between basic needs support S and importance of basic needs support I is positively associated with increases (less decreases) of personality P_2:

Positive Effect of Discrepancy Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$,
with $b_1 > 0, b_2 < 0, b_3 = b_4 = b_5 = 0.$ (4)

Here, the effect of basic needs support (b_1), controlled for importance of basic needs, is restricted to be positive. This reflects that when holding BPN importance constant, people who have perceive more BPN support should have higher P_2 personality values as they are the persons with a higher directed discrepancy of BPN support and BPN importance. Analogously, the coefficient of BPN importance (b_2) is restricted to take on negative values. This ensures that when holding support constant, those people are predicted to have higher values in personality at T2 who have lower importance values, because these are again the people with a higher directed discrepancy of BPN support and BPN importance (see Humberg et al., 2018, for further details).

The *Negative Effect of Discrepancy Hypothesis* indicates that the algebraic difference between basic needs support S and importance of basic needs support I is negatively associated with increases (less decreases) in personality P_2:

Negative Effect of Discrepancy Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$,
with $b_1 < 0, b_2 > 0, b_3 = b_4 = b_5 = 0.$ (5)

Here, the coefficients are restricted in the exact opposite direction as in the positive effect of discrepancy model. For analogous reasons as outlined above, the model predicts lower P2 values for people with a higher the directed difference of BPN support and BPN importance (Humberg et al., 2018).

Furthermore, increases (less decreases) in personality might be highest (lowest) when basic needs support matches the level of importance of basic need support. This idea is considered in the *Strict Congruence Hypothesis*:

Strict Congruence Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1,$
with $b_3 < 0, b_4 = b_5 = 0.$ (6)

The *Congruence and Main Effects Hypothesis* presumes that increases (less decreases) in personality P_2 is highest (lowest) when basic needs support S fits the level of reported importance of basic need support I and that, for a fixed discrepancy of S and I, P_2 is higher at higher levels of S and I.

Congruence and Main Effects Model: $P_2 = b_0 + b_1S + b_2 I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$,
with $b_1 = b_2, b_3 = b_5, b4 = -2b3.$ (7)

The *Optimal Margin Hypothesis* postulates that increases (less decreases) in personality P_2 is maximized when basic need support S extends importance of basic needs I by a constant C and extension at higher levels are associated with more increases (less decreases) of personality:

Optimal Margin Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$

with $b_3 = b_5, b4 = -2b3$ (8)

The shift constant C' can then be computed as $C' = -(b_1-b_2) / (4b_3)$.

In addition to the statistical models that were directly derived from our hypotheses, we extended the model set by two statistical models that must be included for technical reasons when evaluating multiple hypotheses with an information-theoretic approach.

First, we included the *full model* as the global model in which all theoretically meaningful models are nested:

Full Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + b_6P_1$ (9)

Inclusion of the full model can be understood as serving the function of preventing us from over-interpreting the evidence for the suggested hypotheses when data in fact follow a pattern that was not posited by any of the hypotheses. Alternatively, this model can also reflect evidence for hypotheses that are in the set, but indicate fine nuances of the suggested relationships (e.g., a monotonous but diminishing effect instead of a strictly linear association). The full model is capable of detecting such deviations from the suggested effects because, unlike all theoretically derived models, the full model freely estimates the coefficients of the linear, squared, and interaction terms. In addition, the full model must be used in a first step of the analysis to test whether basic needs support, importance of basic needs support as well as their respective squared and interaction terms accounted for a significant amount of variance in the Big Five personality traits at T2 (i.e., beyond the variance explained by T1 personality). If this was not the case for either of the three basic psychological needs or personality traits, it would not be meaningful to compare the empirical support for the theoretically relevant hypotheses, because when there is no relevant relationship between the two predictor variables and the personality traits, it cannot be informative to compare alternative suggestions that aim at explaining this (nonexistent) relationship (Burnham & Anderson, 2002; Dochterman & Jenkins, 2011).

Second, we also included the *null model* representing the case of unrelated predictor variables with increases (less decreases) in personality:

Null Model: $P_2 = b_0 + b_6P_1$ (10)

Inclusion of the Null Model into the model set serves the function of preventing us from interpreting negligible effects: When we find support for the Null Model, this would indicate that we need to interpret results with care, because the amount of variance explained by the other models might be very small.

Theoretically, it is possible that many positive psychological effects might not be of a linear, but rather of a diminishing nature (Pierce & Aguinis, 2013). Therefore, we also consider the possibility that the association between basic needs support and personality change diminishes at higher levels of basic need support or turns even negative at a reflection point (*curvilinear basic needs support hypothesis*):

Curvilinear Basic Needs Support Model: $P_2 = b_0 + b_1S + b_2I + b_3S^2 + b_4SI + b_5I^2 + P_1$,

with $b_3 < 0$, $b_2 = b_4 = b_5 = 0$. (11)

Overall, we needed to empirically compare eleven statistical models on the relationship between basic needs support, importance of basic needs support, and personality change.

Table A2

Frequencies of Predictor Discrepancies and Agreement

Level of discrepancy	Percentage
Autonomy	
S higher than I	26
Agreement	42
S lower than I	32
Competence	
S higher than I	18
Agreement	45
S lower than I	37
Relatedness	
S higher than I	20
Agreement	54
S lower than I	27

Note. *S* denotes basic needs support, *I* denotes importance of basic needs support.

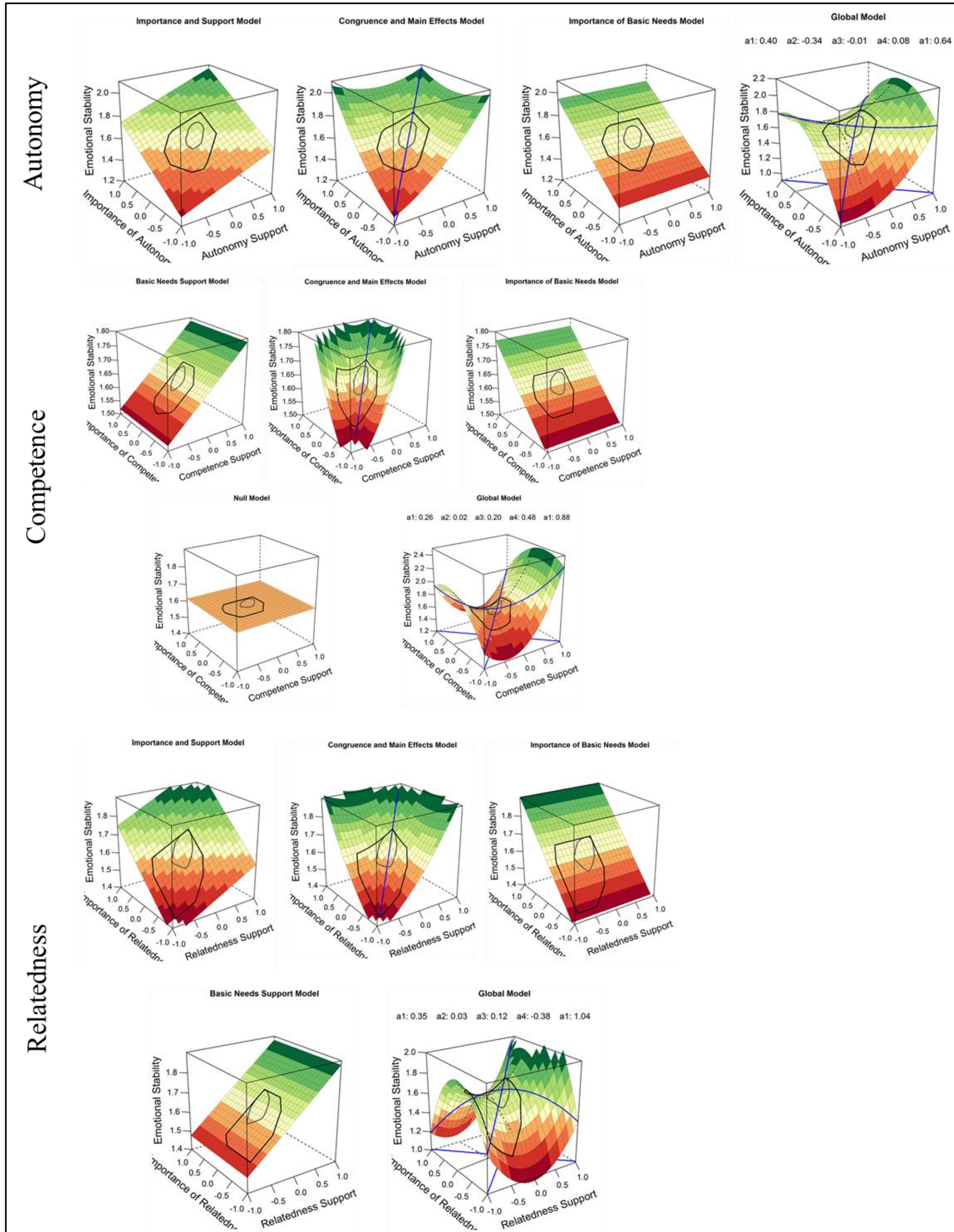

Figure A1. Response surface plots of the model comparison analyses for emotional stability.

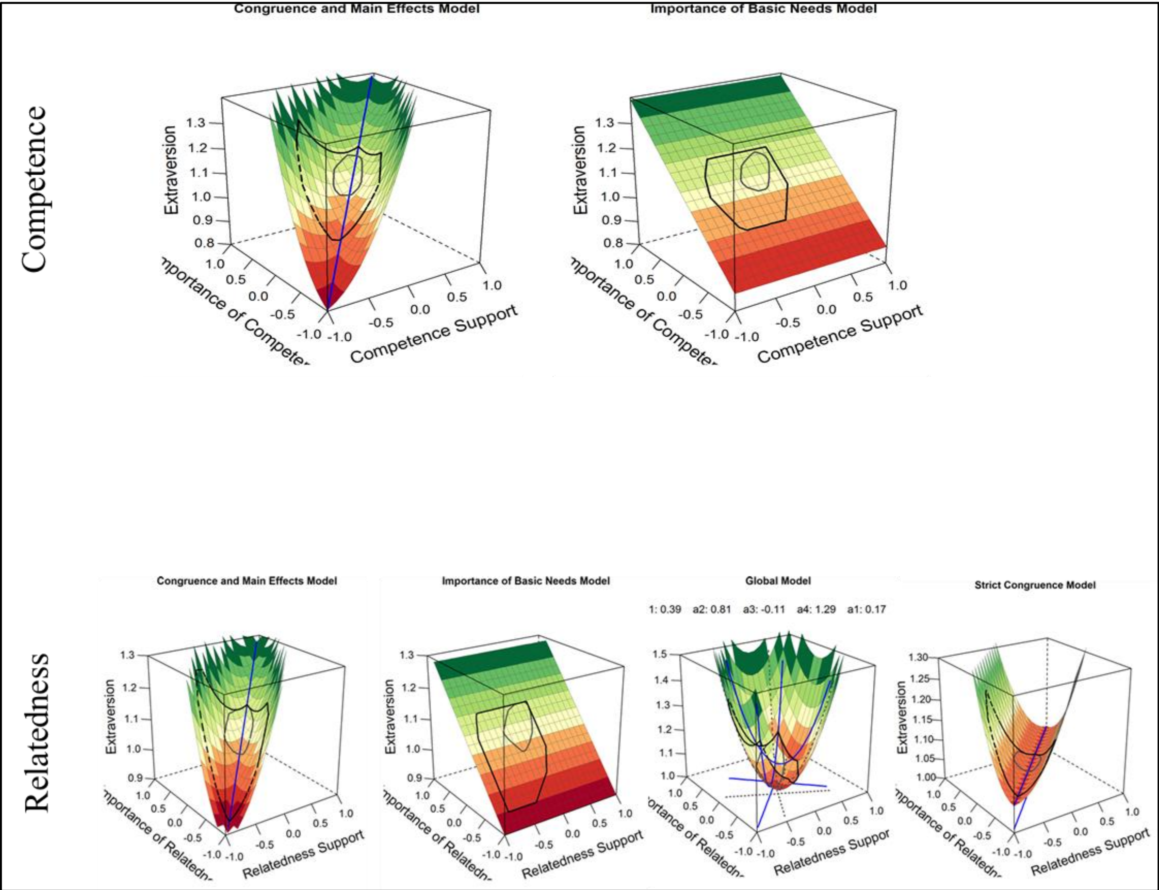

Figure A2. Response surface plots of the model comparison analyses for extraversion.

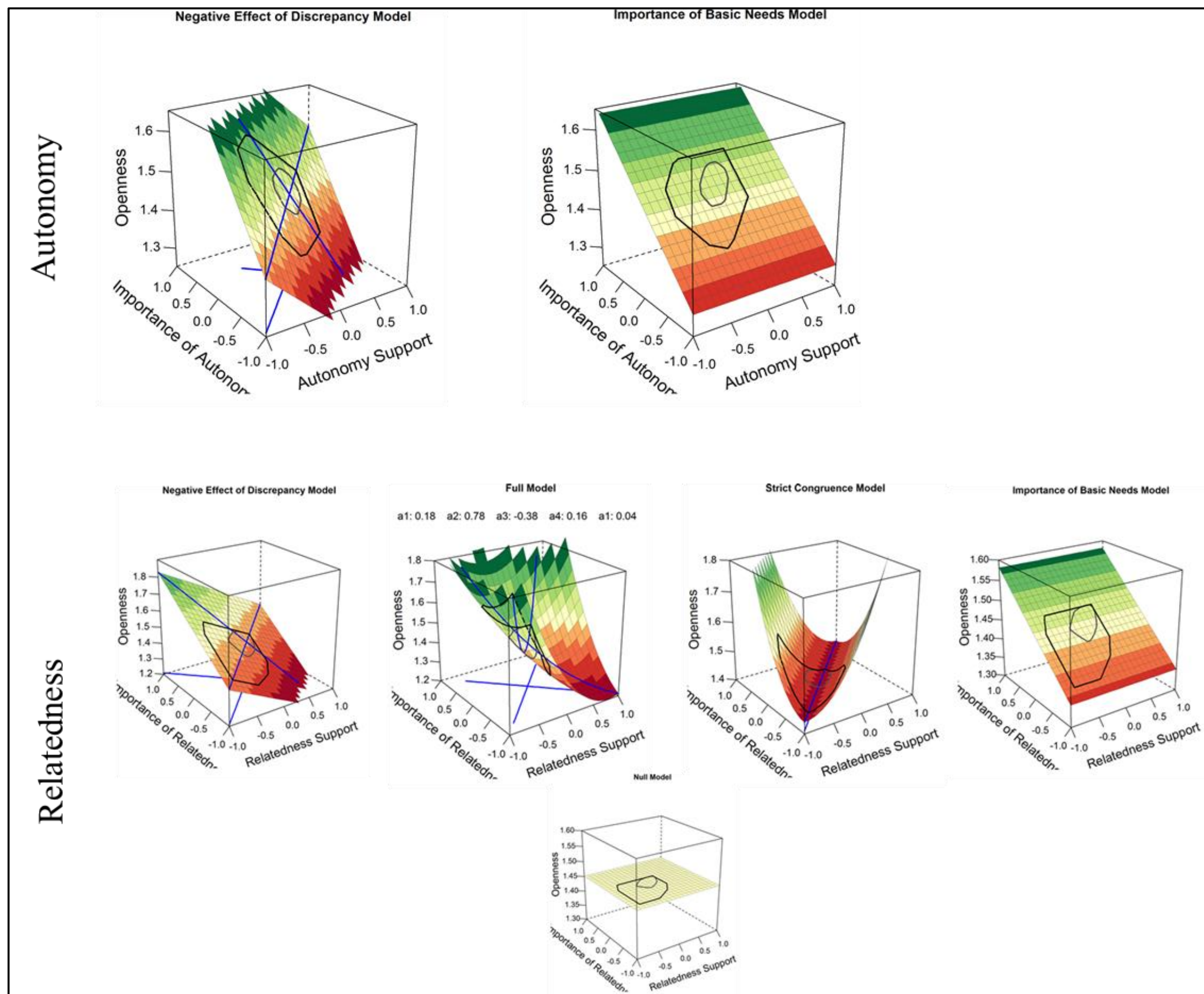

Figure A3. Response surface plots of the model comparison analyses for openness.

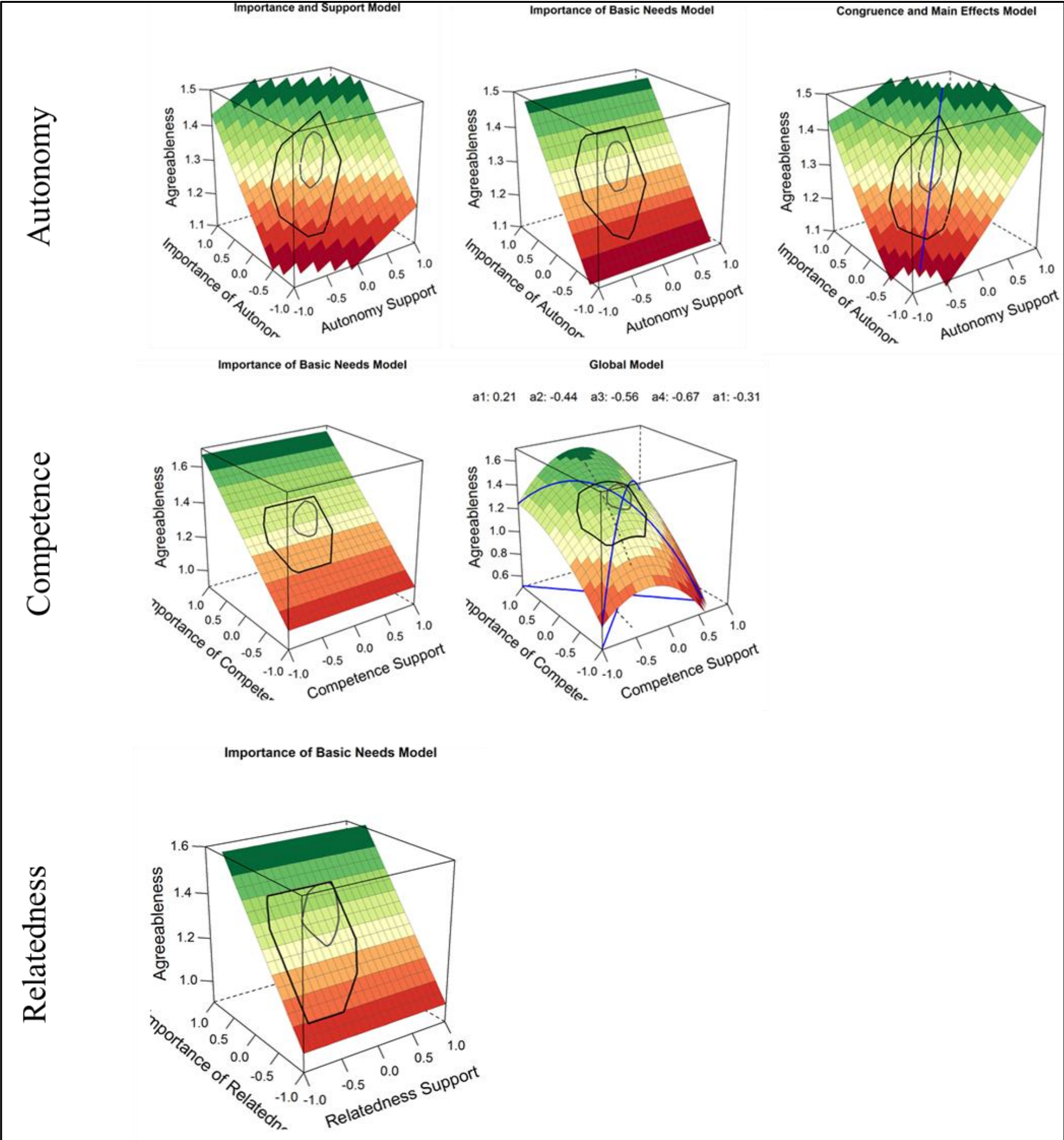

Figure A4. Response surface plots of the model comparison analyses for agreeableness.

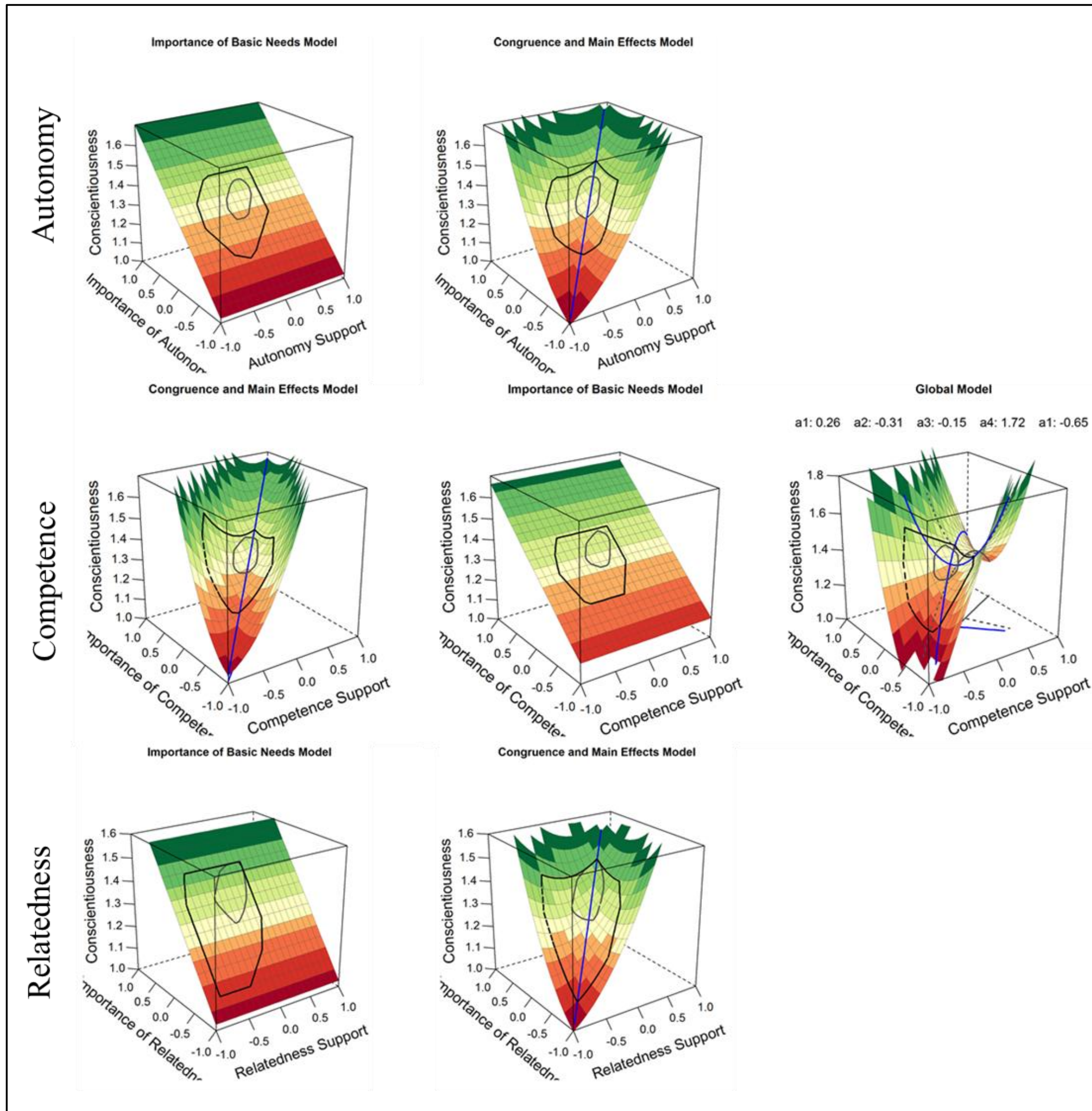

Figure A5. Response surface plots of the model comparison analyses for conscientiousness.

Chapter 5

General Discussion

The present dissertation on personality development in emerging adulthood aimed to investigate Big Five personality trait development and its driving factors in the two major contexts of social relationships and work. The three empirical studies demonstrated the context of work and the context of social relationships as important environments for personality development in the time of emerging adulthood. In the context of the first job experience, study 1 was the first to specifically investigate personality development in a part of the "forgotten half" (Arnett, 2000), that is, non-college emerging adults undergoing vocational education and training. Therefore, study 1 depicted personality development and the reciprocal, longitudinal interaction with two important indicators of functioning in this special group of emerging adults. Study 2 was based in the context of social relationships and aimed to capture the pattern of personality-relationship transactions in the major normative life transition from high school to post-secondary education or work. Study 3 was conducted in the context of the first job experience and aimed to reveal how the interplay between profound characteristics of the person (i.e., importance ascribed to basic psychological need support) and features of the environment (i.e., perceived basic psychological need support) relate to subsequent personality development. The research conducted provides important new insights for the field of personality development research regarding theoretical and methodological implications. In the following, I will first briefly summarize the findings to set a ground for the derived implications, limitations, and outlook for future research.

The Central Empirical Findings in a Nutshell

Within three longitudinal, empirical studies, three major research questions of personality development research in emerging adulthood were addressed and revealed the following findings.

In the first study, personality development was investigated in a large sample of emerging adults undergoing the post-secondary educational pathway of 3-year apprenticeship training. The findings demonstrated a personality development that is partly conforming and partly contradicting previous research findings. Regarding personality consistency, the young trainees displayed significant increases in rank-order consistency across the 3-year span which is in line with previous findings of the cumulative continuity principle (e.g., Roberts & DelVecchio, 2000). However, the well-established maturity principle (e.g., Roberts, Walton, & Viechtbauer, 2006) could not be confirmed: The emerging adults revealed substantial decreases

for all Big Five personality traits across the 3-year training span. Personality predicted changes in the two central indicators of functioning (i.e., life satisfaction and job strain) but these indicators were not shown to be accountable for the large interindividual differences observed in personality change.

Study 2 revealed four main findings for the role of social relationships and their longitudinal interplay with personality development in the normative life transition from high school to post-secondary education. First, the previously suggested imbalance in personality-relationship transaction effects was confirmed with the majority of effects occurring from personality characteristics to subsequent change in social relationships than vice versa (e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001). However, the general importance of the context of social relationships for personality development could be reinforced with specific personality-relationship transactions (i.e., insecurity and conflict frequency with emotional stability and its facets) reoccurring across the different types of interaction partners in emerging adulthood (e.g., Mund & Neyer, 2014; Neyer & Asendorpf, 2001; Neyer, Mund, Zimmermann, & Wrzus, 2014). Second, it was possible to underline the assumption that personality facets should be at a more comparable level with social relationship characteristics than the Big Five traits (Mund & Neyer, 2014) with the majority of effects appearing at the facet level. Third, the postulated role of change-to-change associations (i.e., cross lagged effects from change in one domain on change in the other domain; Grimm et al., 2012) to better reflect reciprocal effects between the person and the environment could not be confirmed. Fourth, the findings indicated that reciprocity between personality and relationship effects might primarily occur with increasing stability of the social relationship networks, that is, sometime after instead of during a major life transition (Asendorpf & Wilpers, 1998; Mund & Neyer, 2014; Neyer et al., 2014; Wrzus, Hänel, Wagner, & Neyer, 2013; Wrzus, Zimmermann, Mund, & Neyer, 2017). Overall, study 2 allowed for two central conclusions: First, it supported the theoretically recommended important role of the context of social relationships for personality development. Second, the study provided a perfect example of the necessity to investigate processes of personality development to be able to explain the varying results in personality-relationship transactions across studies.

Study 3 presents a first attempt to studying a specific part of processes of personality development and allows for three conclusions. First, the basic psychological needs (e.g., Deci & Ryan, 2008) provided a solid theoretical framework to study characteristics of the person and aspects of the environment from a psychological perspective. Second, the type of interplay between characteristics of the person and features of the environment differed across traits. That

is, the person-environment constellation predicting subsequent personality change differed depending on the personality trait of interest. The interplay of perceived support of the BPN and the individual importance ascribed to BPN support on Big Five personality change revealed as follows: Controlling for personality at T1, emerging adults who ascribed greater importance to BPN support at the work place, who perceived higher BPN support at the work place, and who experienced an incongruence between the two (i.e., no P–E fit) at the start of VET were subsequently higher in emotional stability and extraversion. Thus, incongruence was associated with more personality change than P–E fit which is in line with previous findings (Harms, Roberts, & Winter, 2006; Roberts & Robins, 2004). Third, the pattern was more complex for openness. However, individuals ascribing more importance to BPN support at the beginning of the training were subsequently more agreeable and more conscientious 1.5 years later. Finally, study 3 showed the interplay of a person's psychological needs importance and the degree to which the environment is perceived to provide need support to be differentially associated with Big Five trait personality development.

Theoretical Implications

The present work has multiple implications for both theoretical frameworks and claims as well as for methodological approaches and analyses. I will first refer to the theoretical implications, to second, elaborate on two important methodological aspects. The theoretical implications pertain to different areas of the field of psychology ranging from the field of personality psychology to motivational psychology. Thus, the scope of the studies' findings spans a variety of aspects in different neighboring fields of personality psychology. In order to present the respective implications in an organized and graspable manner, I will begin with the implications for the research domain most obviously affected: personality development research. From there on, I will proceed to the broader implications for other domains of personality psychology.

Person-Environment Transactions in Emerging Adulthood

The present dissertation was based on the conceptual understanding of personality development as a result of transactional longitudinal processes between person characteristics and features of the environment (Magnusson, 1990). All three studies presented provide further evidence for the assumption that both the person and the two environmental contexts of social relationships and work are important players for subsequent personality development in emerging adulthood. Despite the overall support for Dynamic Transactionism Theory, the work

also suggests specific implications for the role of the person and the role of the environment in the understanding of person-environment transactions.

The role of the person. Overall, the present dissertation strengthens the significance of psychological person characteristics, such as individual expectancies or the individual perception of the environment, for differential personality development. That is, the findings of the presented studies support the current directions in personality psychology to increasingly and systematically take specific features of the person as explaining factors for differences in personality development into account (e.g., Wrzus & Roberts, 2017; Bleidorn, 2015; Bleidorn, Hopwood, & Lucas, 2016). Thereby, three specific characteristics are striking.

Age. The first important aspect that has been intensively stressed by previous research is the significance of age (e.g., McCrae & Costa, 1999). Undoubtedly, age is differentially associated with personality development (e.g., Donnellan & Lucas, 2008; Lucas & Donnellan, 2009, 2011; Roberts & DelVecchio, 2000; Roberts et al., 2006; Soto, John, Gosling, & Potter, 2011). In previous discussions, the reasons for this finding were mainly seen in the strong associations between age and the simultaneous occurrence of specific, age graded biological and environmental transitions (e.g., Bleidorn, Klimstra, Denissen, Rentfrow, Potter, & Gosling, 2013; Briley & Tucker-Drob, 2014; Kandler, 2012; Lehnart, Neyer, & Eccles, 2010; Lodi-Smith & Roberts, 2007; McCrae et al., 2000; Roberts & Wood, 2006). That is, during each age span the individual is confronted with age-graded, normative environmental contexts that are less likely to be encountered in other age periods (e.g., Baltes, Lindenberger, & Staudinger, 1998; Neyer et al., 2014; Syed, 2015). Thereby, the social investment principle conceptualizes the adaptation to new social role demands within these normative contexts to be primarily accountable for the successive development of personality (e.g., Roberts & Wood, 2006). Accordingly, the confrontation with new social role demands should ultimately trigger personality development irrespective of the individual's age.

However integrating the present work in the picture drawn by previous findings, job entry and social relationships possibly have a different role for personality development within emerging adulthood. Job entry, which was previously shown to be associated with increases in conscientiousness in the middle of emerging adulthood (e.g., Hudson, Roberts, & Lodi-Smith, 2012; Lodi-Smith & Roberts, 2017), seems to play out differently with respect to personality development in early emerging adulthood. Study 1 revealed a personality development counter the maturity principle across a 3-year span. Also, study 2 indicated transactions between personality and the social relationship environment to follow a different pattern in emerging adulthood than previously displayed for young to middle-aged adults: During emerging

adulthood, personality-relationship transactions were imbalanced in number and size (e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Sturaro, Denissen, Van Aken, & Asendorpf, 2008) whereas during early to middle adulthood the effects were balanced (Mund & Neyer, 2014). As a consequence, the present work calls for a potential revision of the understanding of age as a sole reflection of the occurrence of new social role demands in important environments.

Age does not only reflect the present challenges and developmental tasks (e.g., the confrontation with new social role demands), but also mirrors the sum of achieved psychological and biological developmental stages (Baltes et al., 1998). That is, age serves as a proxy for the sum of previously accomplished developmental transitions and life stages which often set the ground for the successful accomplishment of subsequent developmental processes (Erikson, 1950). Thus, whether an environmental context triggers personality to change possibly depends on the attained developmental stage of the person entering that specific context (e.g., Eccles et al., 1993). In this respect, individuals who have not yet fully mastered previous developmental tasks might have difficulty to successfully adapt to new environmental requirements. Correspondingly, the present work encourages future research to explicitly test the scope of the social investment principle in specific environments for different psychological developmental stages of the emerging adults. The following section considers the role of psychological developmental processes of emerging adulthood potentially associated with personality development.

Developmental processes. It is in the time from late adolescence to early emerging adulthood that fundamental, developmental processes occur in a variety of life domains such as genetics, physiology, psychological attributes, or social relationships (e.g., Blakemore, 2012a, 2012b; Masten & Cicchetti, 2010; Nurmi, 1993; Simmons, 2017; Wrzus et al., 2013). The confrontation with an additional, challenging new environment such as the working context or the formation of new social bonds might come in at a time during which the emerging adults have possibly not yet fully mastered and integrated the previous developmental tasks of adolescence and early emerging adulthood. As previous studies on the role of the environmental context of the first job have mostly studied older emerging adults (Denissen, Ulferts, Lüdtke, Muck, & Gerstorf, 2014) or even young adults (Hudson et al., 2012; Roberts, Caspi, & Moffitt, 2003; Sutin & Costa, 2010; Wu, 2016), it is possible that personality maturation was observed because the challenges and developmental tasks of late adolescence and early emerging adulthood have long been mastered in this age span. Similarly, personality-relationship transactions were found to only be balanced in young to middle adulthood (Mund & Neyer,

2014) which might be due to the previous accomplishment of simultaneous developmental processes. Two psychological developmental processes stand out and qualify to be explicitly included in future research.

First, during early emerging adulthood individuals have been shown to undergo extensive processes of identity exploration (Klimstra & Doeselaar, 2017). This process is characterized by an in-depth consideration, testing, and reflection of alternatives in different life domains (e.g., social relationships, vocational interests, leisure activities, personal needs) before fully committing to either of the considered alternatives (e.g., Crocetti, Rubini, Luyckx, & Meeus, 2008; Klimstra, 2013). Thereby, the environmental contexts are setting the stages for these developmental processes to be successfully carried out (e.g., Kroger, Martinussen, & Marcia, 2010; Marcia, 1966; Watermann, 1999). Thus, the features of the environmental contexts of, for example, social relationships and work, likely play a different role depending on the developmental stage of the person engaging in them. Therefore, when entering the job market or engaging in the formation of new social relationships falls together with a time of life during which processes of identity exploration are in the focus the specific characteristics of the environmental context might not yet come at play as strongly as in late emerging adulthood or adulthood (Carlsson, Wängqvist, & Frisén, 2015). Correspondingly, personality traits and the key developmental tasks of identity development were shown to be related in early emerging adulthood but not during later stages of emerging adulthood (e.g., Cramer, 2017; Klimstra, Luyckx, Germeijs, Meeus, & Goossens, 2012; Luyckx, Teppers, Klimstra, & Rassart, 2014).

Second, in the time from late adolescence to early emerging adulthood, the acquisition of self-regulation strategies (i.e., adapting one's behavior to maximize the likelihood to achieve one's personal goals or needs) is considered to be an important developmental task as they facilitate the successful pursuit of needs and goals (Denissen, Hennecke, Penke, & Wood, 2013; Hennecke, Bleidorn, Denissen, & Wood, 2014; Hutteman, Hennecke, Orth, Reitz, & Specht, 2014). In this regard, study 3 suggests that processes of self-regulation determine emerging adults' personality development more strongly than the environmental context. Similarly, study 2 showed social relationships characteristics to be more important for personality development in the time interval following the life transition. This also points to the possibility that the environmental contexts become increasingly important with the decreasing presence of other developmental tasks and challenges (Briley & Tucker-Drob, 2014). Together, the findings point to the possibility that developmental processes of personality unfold differentially in early versus late emerging adulthood and adulthood. Therefore, developmental processes might limit or widen the role a certain environmental context plays dependent on the developmental stage

of the individual, and thus, to the degree to which previous transitions have successfully been accomplished. However, future research will need to explicitly test these considerations by comparing individuals with different developmental stages across different age groups (e.g., Klimstra, 2013; Klimstra et al., 2012; Syed & Seiffge-Krenke, 2013).

Experience and Expectancy. Previous experiences and established expectancies determine emotional and behavioral reactions towards a given environmental context (for an overview, see Wrzus & Roberts, 2017).

First, the individual's developmental stage should provide a good approximation of the previously encountered experiences comprised in certain environmental contexts (e.g., Damon & Lerner, 2008; Kolb, 2015). Experiences in significant contexts should boost personality development as the confrontation and recognition of social role demands is seen as a prerequisite for the social investment principle to act (Roberts & Wood, 2006). Thus, previous exposition to contexts posing similar social role demands should facilitate the subsequent adaptation. In this regard, emerging adults of different age and educational backgrounds possibly differ systematically in their levels of previous experiences and encounters with, for example, the working context. As about 70% of college students take on small first jobs to finance their college years before entering the working context as full-time employees (Carnevale, Smith, Melton, & Price, 2015), they possibly engage in more adult working contexts both psychologically and physically (e.g., job fairs, long-term internships, mentoring programs). In contrast, non-college emerging adults are more likely to enter the workforce, apprenticeship training or similar programs right after high school graduation with less preparation time (Reicherts & Pihet, 2000). The short-term job experiences in college students should sensitize the emerging adults for the social role expectations they will face when entering the workforce on a full-time basis (e.g., Roberts & Wood, 2006). In line with the assumptions of the TESSERA framework (Wrzus & Roberts, 2017), these repetitive encounters with the new social role demands should result in long-term psychological processes of personality adaptation (e.g., Back et al., 2011; Penton-Voak, Thomas, Gage, McMurran, McDonald, & Munafõ, 2013; Poonamallee, Harrington, Nagpal, & Musial, 2018). However, emerging adults entering the context of work right after high school have most likely not gained any previous experiences with the social role demands they are faced with during apprenticeship training. Thus, encounters with the respective characteristics of the job context and associated social role expectations did likely not take place before immersing to the context of work. The trainees might feel rather insecure in prospect of the new context of work and company life (Reicherts & Pihet, 2000). In line with these assumptions, study 2 showed that feelings of insecurity were

consistently shown to be associated with decreases in emotional stability. It seems plausible that individuals with few previous experiences to rely on regarding the demands of a new context might feel insecure, and decrease in emotional stability when facing that unfamiliar environment. The importance of dealing with an upcoming environmental context was also stressed in a similar argumentation regarding the transition to parenthood: Van Scheppingen and colleagues (2016) argued that the desire to become a parent might be preceded by an in-depth process of anticipating the social role demands of parenthood. This process should lead to social role recognition and adaptation even before the birth of the first child (Van Scheppingen, Jackson, Specht, Hutteman, Denissen, & Bleidorn, 2016). Following these lines of argumentation, personality development would have to be seen to be more strongly related to processes of expectancy and perception within the person (e.g., Van der Velde, Feij, & Taris, 1995).

Second, expectancies and goal orientations can form both the perception of and the reaction towards environmental contexts (e.g., Sommerville, Woodward, & Needham, 2005; Spence, Poortinga, Butler, & Pidgeon, 2011; Vernon, 2017). Even though the present work did not investigate whether expectancies form the perception of environmental contexts, study 3 was able to show that the personal perception of a context was predictive of subsequent personality development. The perception and evaluation of environmental contexts has been shown to not only be associated with characteristics of the environment but also with personal goals, (e.g., Cañal-Bruland & van der Kamp, 2009; Tabachnick, Miller, & Relyea, 2008), others' goals (e.g., Hudson, Nicholson, Ellis, & Bach, 2016), personal needs (e.g., Patrick, Ryan, & Kaplan, 2007), or one's abilities to take action in the environmnet (Witt, 2011). This indicates that the perception of the environment is adapted and possibly focused on the achievement of innate goals and needs. In line with the role of self-regualtion strategies (Denissen et al., 2013; Hennecke et al., 2014), it is likely that the perception and evaluation of environmental contexts is processed on the basis of information specifically relevant to need and goal fullfilments (e.g., Rauthmann, 2012; Reis, 2008). Accordingly, study 3 showed that the role of need supply in an environmental context is not as important as the individual's importance ascribed to need supply for personality development. Thus, the findings of this work stress the importance to further investigate the role of needs and goals determining the individuals' perception of environmental contexts. This would allow for the understanding of the processes that occur in different environmental contexts and subsequently determine personality development.

Summary. The work of this dissertation strongly indicates that the role of central person characteristics (e.g., developmental stage, expectancies, perception) has not yet been sufficiently understood and possibly accounts for specific aspects of personality development as opposed to the characteristics of central environmental contexts (Bleidorn et al., 2016; Wrzus & Roberts, 2017). Three aspects were highlighted: First, the developmental stage of individuals might function as a central explaining factor of differential personality development in environmental contexts. It was specifically hypothesized that personality development in the direction of the maturity principle might depend on the successful accomplishment of previous developmental tasks. Otherwise, the new context might not be associated with the expected positive personality development, but rather reflect a too demanding, too early transition during which the intake of new social role demands cannot yet be accomplished because of the persistence of previously started processes. Second, personality development might be moderated by previous experiences that allow for a gradual intake of new social role demands via anticipation or role models (e.g., Luhmann & Eid, 2009). Third, individuals' goals and needs towards environmental contexts were shown to be essentially important for subsequent personality development (Roberts, O'Donnell, & Robins, 2004). The latter strengthens the role of self-regulation for personality development (Denissen et al., 2013; Hennecke et al., 2014). Therefore, the present work suggests to specifically rework theoretical frameworks with respect to the theoretically plausible scope of principles and mechanisms taking developmental stages or processes, expectancies, and self-regulation strategies into account. In this regard, it was specifically proposed to rework the role of psychological developmental transitions in different age groups and how they relate to personality development. This would not only allow for a more specific testing of the role of developmental stages and personal needs in subsequent research but also facilitate the understanding of principles and mechanisms. Specifically, the work suggests the inclusion of the number and/or the quality of previous experiences as person characteristics to reflect the amount of preceding psychological encounters with the environmental context of interest. This would allow for a more accurate understanding of the underlying short-term and long-term person-environment processes (Wrzus & Roberts, 2017).

The role of environmental contexts. Regarding the role of environmental contexts, the studies of this dissertation displayed the contexts of social relationships and work once more to be meaningful for personality development (e.g., Lodi-Smith & Roberts, 2007; Lüdtke, Roberts, Trautwein, & Nagy., 2011; Roberts et al., 2003; Wagner, Becker, Lüdtke, & Trautwein, 2015). However, both study 2 and study 3 also provide first hints that the

understanding of the role of the environment in person-environment transactions might need further adaptation towards a more stage-setting concept of environmental contexts.

Social Relationships. In line with the theoretical assumptions of emerging adulthood being characterized by the fundamental task to detach from the close ties with one's family and to engage in the foundation of a family on one's own (e.g., Arnett, 2006; Havighurst, 1972), the relationships with the romantic partner and kin (as compared to friends and others) were shown to be most frequently associated with personality development (study 2). Further, supporting the theoretical assumptions of emerging adulthood as a phase of feeling in-between, insecurity with the various interaction partners was the most prominent quality involved in personality-relationship transactions (study 2). Thus, together with the study of Mund and Neyer (2014), the present work was able to show that different interaction partners were more strongly or more loosely associated with personality development in emerging adulthood and adulthood, and that the role of social relationships might differ with the phase of life. Additionally, study 3 emphasized the role of both the individual's importance and the actual experience of social belongingness: It was shown that importance and experience of relatedness were primarily associated with emotional stability and extraversion. For the development of agreeableness and conscientiousness, however, only importance of social belongingness support played a significant role. Thereby, study 3 supports previous findings in the study of personality-relationship transactions (including study 2) that qualitative aspects of social relationships are differentially associated with the Big Five traits (e.g., Lüdtke et al., 2011; Mund & Neyer, 2014; Neyer & Asendorpf, 2001; Wagner et al., 2015).

Work. Similar to the findings regarding the role of social relationships, the context of work seems to have a different meaning for early emerging adults in their first job experience than was previously revealed for middle to old emerging adults or adults (e.g., Le, Donnellan, & Conger, 2014; Lodi-Smith & Roberts, 2007; Roberts et al., 2003; Specht, Egloff, & Schmukle., 2011; Sutin & Costa, 2010). Whereas in previous studies, the context of work was most often related to increases in conscientiousness and agreeableness (e.g., Boyce, Wood, Daly, & Sedikides, 2015; Denissen et al., 2014; Hudson et al., 2012; Lodi-Smith & Roberts, 2007), the present work showed that the first job experience does not ultimately lead to personality maturation (study 1). Instead, the context of work was shown to be differentially meaningful for the Big Five personality traits. Study 3 demonstrated the individual's importance of BPN support to be significant for all traits whereas BPN support provided by the work environment was most strongly related to the development of emotional stability, extraversion, and openness. This is an interesting finding because of two reasons. First, in the

spirit of the social investment principle, the context of work has been theoretically perceived to primarily concern aspects of conscientiousness and agreeableness due to its bucket of social role expectations that tap on the facets of this trait most strongly (e.g., taking responsibilities, obiding to authority structures, working climate; Lodi-Smith & Roberts, 2007; Roberts et al., 2003). Second, previous research on the context of work demonstrated important occasions such as job termination (e.g., Boyce, Wood, Daly, & Sedikides, 2015; Specht et al., 2011) or job changes (e.g., Denissen et al., 2014) to be rather related to agreeableness and conscientiousness instead of the other traits. Therefore, the present work suggests that the role of the context of work for the different personality traits depends on its operationalization. That is, previous studies focused on more objective events of the working context (e.g., job promotion, termination, etc.) whereas this work assessed the environment from a subjective, affective perspective (i.e., perceived support provision of the basic psychological needs). It seems reasonable that a more affective operationalization of the working context (i.e., basic psychological needs) is more strongly related to the personality traits that have been shown to encompass emotionally charged facets (e.g., anxiety, hostility, impulsiveness as facets of emotional stability; Chapman, 2007; Parks-Leduc, Feldman, & Bardi, 2015; Pytlik Zillig, Hemenover, & Dienstbier, 2002; Saucier, 1998). Together, the present work suggests that the role of the environmental context and its differential associations with Big Five trait development depends on the chosen operationalization.

Overall. Whereas the behavioristic approach perceives the environment as the main and sole condition for a personality to develop (e.g., Skinner, 2011), Dynamic Transactionism considers continuous, reciprocal transactions between the person and the environment across time as the driving factors (e.g., Endler & Magnusson, 1976). This consideration implies both the person and the features of the environment to serve as essential players (e.g., Magnusson, 1990). However, the present work puts this assumption partially into question and calls for a more differentiated view of the role of environmental contexts as setting the stage for processes to be carried out. That is, in this work, the environmental contexts were consistently shown to have a small impact for the development of some personality traits (e.g., openness; especially study 2 & study 3) which is reasonbale considering the high consistency of personality traits in general (Roberts & DelVecchio, 2000). In this regard, Wrzus and Roberts (2017) comprehend environmental contexts as triggering situations for the experience of physiological (Wood & Neal, 2007) or psychological states (e.g., Rauthmann et al., 2014; Wood & Denissen, 2015). As the present work consistently suggests aspects of the person (e.g., self-regulation, needs, perception) to be more important for personality development than characteristics of the

respective environments, it is to be studied, whether it is actually the specific characteristics of the environment triggering the elicitation of the respective states or if it is specific person characteristics that allow these situations to serve as triggers or not. To make this more explicit, let's consider a simplified, exemplary situation: A person sees another person stumbling across a stone and falling on their knees. From a social role demand perspective, the observer should approach that person and offer a helping hand (e.g., Berkowitz, 1972; Schwartz, 1977). Depending on the observer's characteristics such as feeling comfortable to speak to an unknown person, taking responsibility, or feeling competent, the observer might feel anxious, stressed, happy, confident etc. about the prospective situation and will take action accordingly. Thus, in this simplified example, the environmental context should be seen to trigger a variety of characteristics such as personal beliefs, other beliefs, or habitual behavior to come at play. However, the action the observer will take might primarily rely on the observer's person characteristics. Thus, the environmental context could be seen to provide the stage for the person characteristics to perform their play. Broadly speaking, the environmental contexts might function as a mirror simply reflecting specific features of the person. Correspondingly, study 3 showed that the personal needs were more significant for personality development than the environmental features. Therefore, the understanding of the role of the environmental context might need adaptation regarding the assumption that person-environment transactions occur continuously. Possibly, the role of the environment is rather discontinuous depending on the occurrence of significant, recognizable differences between the environmental context and a person's innate tendencies or schemata (i.e., the environment might only serve as a meaningful transaction partner if it requires the individuals to expand their existing reaction patterns, Wrzus & Roberts, 2017).

Summary. Summarizing the role of the environmental context, the present work suggests that social relationships and work are important contexts of emerging adulthood. However, the environment might not continuously serve as a meaningful player, but rather set the stage for individual developmental processes to be carried out. In this regard, the personality traits were shown to be differentially associated with the respective contexts.

The Neo-Socioanalytic Model

Regarding the organization of the different domains of personality development research in the Neo-Socioanalytic Model, the present work confirmed the importance of the contexts of work and belongingness (e.g., Roberts & Nickel, 2017). However, both theoretical considerations and the empirical findings of study 3 call for a small modification regarding the uptake of an association between motives and values and personality traits.

Broadly speaking, the basic psychological needs are considered motivational components that are inherent and fundamental to human beings (Deci & Ryan, 2000; Ryan & Deci, 2008), and as such, are grouped to the concept of motives and values in the Neo-Socioanalytic Model. As the model considers motives and values to be embedded in the concept of personality traits, it does to date not consider any direct associations between motives and values and personality traits (Roberts & Nickel, 2017; Roberts & Wood, 2006). However, previous theoretical considerations and empirical investigations posit innate needs and goals to be directly associated with personality development (e.g., Denissen et al., 2013; Hennecke et al., 2014). Additionally, the present work suggests the implementation of an association between motives and values and personality traits as study 3 showed the level of importance ascribed to the basic psychological needs as predictive for subsequent personality change above and beyond personality traits. Thus, innate motives and values should not be considered to be fully encompassed by personality traits. Rather, they should be conceptualized to reflect distinct characteristics of the person that are important for personality development (e.g., Dweck, 2017; Hudson & Roberts, 2014; Stoll, Rieger, Lüdtke, Nagengast, Trautwein, & Roberts, 2017).

Principles of personality development. The present work has implications for the three well-established principles of personality development, the cumulative continuity principle, the maturity principle, and the social investment principle.

In line with previous research findings, the cumulative continuity principle could be reinforced in the time period of emerging adulthood (Leikas & Salmela-Aro, 2015; Lüdtke et al., 2011; Roberts & DelVecchio, 2000). Extending previous work, study 1 provided first evidence that the cumulative continuity principle should also hold for emerging adults undergoing a non-college educational pathway. Thus, in terms of rank-order consistency development, emerging adults seem to increase during post-secondary education irrespective of the chosen educational pathway (studies 1 & 2). Thus, the present work provides further evidence for the generalizability of the cumulative continuity principle in emerging adulthood across different post-secondary educational pathways.

However, the maturity principle was partly confirmed (study 2) and partly challenged (study 1). The present work incorporates the first longitudinal study to suggest a consistent pattern of mean-level change counter the maturity principle in emerging adulthood. Even though previous studies have reported partial contradictions to the maturity principle regarding decreases in emotional stability (e.g., Leikas & Salmela-Aro, 2015) or decreases in conscientiousness (e.g., Asendorpf & Wilpers, 1998), the study on emerging adults undergoing a non-college post-secondary educational pathway is the first to reveal this pattern consistently

for all Big Five traits across 3 years. Drawing on both the social investment principle and previous empirical work suggesting the environmental context of the first job experience to foster increases in conscientiousness (e.g., Bleidorn et al., 2016; Lodi-Smith & Roberts, 2007; Leikas & Salmela-Aro, 2015; Specht et al., 2011), the personality development observed in study 1 challenges the generalizability of both principles. As characteristics of the person that typically result in differences of personality development or in problematic response tendencies, such as age (e.g., Soto & Tackett, 2015; Van den Akker et al., 2014), gender (e.g., Bolle et al., 2015; Durbin, Hicks, Blonigen, Johnson, Iacono, & McGue, 2016; Vecchione, Alessandri, Barbaranelli, & Caprara, 2012), or level of academic ability (e.g., Rammstedt, Goldberg, & Borg, 2010; Soto, John, Gosling, & Potter, 2008) were controlled for or ruled out as explaining factors by additional analyses, the crucial factors might either lie in unconsidered person characteristics or in the unique features of the observed environmental context (e.g., Lodi-Smith & Roberts, 2007). In this regard, the present dissertation emphasizes the need to not take personality maturation for granted when emerging adults enter the context of work, but to further understand the characteristics of both the person (i.e., demographic, biological, and psychological) and of the environmental context (e.g., level of assessment, unique characteristics) that determine whether the emerging adults display a personality development according to or counter the maturity principle. Thereby it is possible to determine the contingencies for the social investment principle to hold (see sections above).

Basic Psychological Needs Theory Revised

The integration of two common strands of personality development research and basic psychological needs theory yielded major implications for both personality psychology and for the BPNT framework (Deci & Ryan, 2008; Ryan & Deci, 2000). The implications for personality psychology were referred to in the sections above. Regarding implications for the BPNT, study 3 offers important new insights.

First, BPNT has almost solely focused on the importance of the environmental context in terms of the degree of need support provision and did not explicitly consider interindividual differences in people's desires to experience need support (La Guardia & Ryan, 2007; Ryan, Bernstein, & Brown, 2010; Ryan & Deci, 2000, 2008; Olafsen, Deci, & Halvari, 2018). Even though the framework of self-determination theory includes general causality orientations (e.g., Deci & Ryan, 1985) that capture interindividual differences in the orientation to experience autonomy, to be oriented toward external factors, and to believe that the achievement of desired outcomes is not in one's scope, this scale does not assess individuals' desires to experience BPN support. In study 3 however, features of the person regarding their importance of

experiencing BPN support were consistently shown to be almost more important for personality development than perceived BPN support of the environment. Future research will not only need to replicate this finding but should also test, whether this is true for other indicators of optimal functioning such as well-being and life satisfaction (Aldrup, Klusmann, & Lüdtke, 2017; Baard, Deci, & Ryan, 2004; Gillet, Fouquereau, Lafrenière, & Huyghebaert, 2016; Patrick, Knee, Canevello, & Lonsbary, 2007). Nevertheless, the theoretical conception of the role of the BPN for optimal functioning and personal development might substantially profit from an extension of the framework by considering individual differences in the level of importance ascribed to BPN support. In this regard, this work suggests that BPNT might need an upgrade in terms of orienting the model of the BPN to a more dynamic interactionist perspective including both the person and the environment as intertwined factors (Magnusson, 1990).

Second, to my knowledge study 3 is one of the first empirical investigations demonstrating profound interindividual differences in the desire to experience BPN support. Even though BPNT considers the BPN to be profound for human beings it might be possible that similar to other fundamental person characteristics such as self-esteem (Chung, Robins, Trzeniewski, Noftle, Roberts, & Widaman, 2014; Erol & Orth, 2011; Orth & Robins, 2014; Twenge, Carter, & Campbell, 2017), identity (Carlsson et al., 2015; Kroger et al., 2010; Lodi-Smith, Spain, Cologgi, & Roberts, 2017), or personality traits (Roberts & DelVecchio, 2000; Roberts et al., 2006), BPN importance also develops across the life time. Possibly, the importance ascribed to BPN support might be a function of age. As emerging adulthood has often been shown as the time of major developmental trends and as the time of enormous interindividual differences, it is plausible that these findings are also true for BPN importance (Arnett, 2000; Erikson, 1968; Havighurst, 1972). Future research might need to include the longitudinal development of BPN support and importance ascribed to BPN support to the development of personality and other characteristics of interest to get a more comprehensive picture of the interplay of person and environment characteristics.

Person-environment Fit

Even though previous research demonstrated the fit between person characteristics and features of the environment to be optimal for subsequent indicators of functioning (e.g., Cooman et al., 2009; Deniz, Noyan, & Ertosun, 2015; Greguras & Diefendorff, 2009; Kristof-Brown, Li, & Schneider, 2016; for reviews, see; Hoffman & Woehr, 2006; Van Vianen, 2018), this work alines previous findings that this assumption does not hold for the maturity principle of personality development (Harms et al., 2006; Roberts & Robins, 2004). Instead, the present

work suggests two conclusions: First, for the traits of emotional stability and extraversion, it is rather incongruence instead of congruence between the person and the environment that triggers subsequent increases in the respective traits. This finding supports the assumption of self-regulation strategies that the pursuit of, for example, innate states, goals, or psychological needs drives successive behavior (Denissen et al., 2013; Hennecke et al., 2014). For example, in psychotherapeutic interventions such as exposure interventions for anxiety disorders (e.g., Dubas & Robichaud, 2007), the widening of the comfort zone (i.e., experience of incongruence) is explicitly used to enduce change in behavior and emotions (e.g., Grafanaki, 2013; Rogers, 1959). Second, besides P–E fit there are more possible compositions between the person and the environment that constitute a state that allows for increases in the Big Five personality traits. For example, increases in the maturity related variables agreeableness and conscientiousness were primarily shown to be driven by the importance ascribed to BPN support. In this case, the environment did not emerge to play an important role. Thus, in terms of person-environment transactions, this work strongly calls for a more distinctive consideration of potential person-environment constellations to relate to personality development.

Methodological Implications

From a methodological perspective, I will elaborate on two key points. The first point refers to the optimal method of assessment and the study design that should capture the theoretically implied constructs and allow for the detection of mechanisms. The second key point concerns the adequate choice of modeling the nature of person-environment transactions. In this regard, the present work reveals implications for the application of (extended) bivariate latent difference score models (Grimm et al., 2012; Hamaker, Kuiper, & Grasman, 2015; McArdle, 2009) and the power of response surface analysis (e.g., Edwards, 2001, 2002).

Assessing Personality Development

The key issues in this dissertation refer to the adequate level of personality assessment and the timing of measurement intervals.

Levels of assessment. Study 2 supports the theoretical claims and fosters the existing empirical evidence that a thorough consideration of the level of comparison in studying person and environment characteristics is essential (e.g., traits vs. facets; Mund & Neyer, 2014). In this regard, personality facets were shown to be at a more comparable level to social relationship characteristics than personality traits in the study of personality-relationship transactions (Mund & Neyer, 2014; Lehnart et al., 2010). Transferring this finding to the overall study of person-environment transactions, the level of fluctuation and consistency of the respective

characteristics should be taken carefully and the personality level of assessment (facet vs. trait) should be chosen accordingly (Luhmann et al., 2014). This allows for a more solid methodological ground for a fair testing of dynamic, continuous patterns of person-environment transactions (Mund & Neyer, 2014). Possibly, including personality facets would also resolve the imbalance between person-environment transactions in other domains of personality development research such as *identity formation* (i.e., the process of forming an explicit representation of who one is; Klimstra, 2013; Klimstra et al., 2012; Luyckx et al., 2014) or the BPN which were also shown to have only small impact on Big Five personality development (study 3).

With respect to assessing environmental contexts, this dissertation (study 3) provided a first approach to capture environmental contexts on three psychologically relevant dimensions by utilizing the BPN framework (Ryan & Deci, 2008). This should be considered an important step in personality development research as it allows for three new possibilities: First, the psychological meaning of the experienced environmental context can be parsimoniously assessed from the individual's perspective (e.g., Deci, Olafsen, & Ryan, 2017). Second, the assessment framework of the BPN allows for comparability between different environmental contexts, and third, the BPN can be considered to cover the psychological impact of environmental contexts at a very profound level that is linked to many other domains previously shown to be important for personality development such as life satisfaction or well-being (e.g., Deci et al., 2017; Olafsen et al., 2018; Ryan et al., 2010; Van den Broeck, Ferris, Chang, & Rosen, 2016). Together, the BPNT is offered as a useful tool to understand environmental contexts and their significance for individuals from a psychological point of view and can easily be aligned to other contextual assessment tools (e.g., DIAMONDS; Rauthmann et al., 2014).

Time intervals – the hidden drivers of personality development. The aspect of time is threefold: First, it refers to the importance of the life stage during which individuals are observed in the respective environments. Second, it refers to the timing of measurement occasions (e.g., before, during, after a transition) which determines the scope of the research findings. Third, it concerns the essential role of the number of measurement occasions and the time interval between them. As the first point has been extensively discussed above, I will continue with the second and third point.

With respect to the timing of measurement occasions, the presented research was conducted in comparably short panel studies (cf., Roberts, Caspi, & Moffitt, 2001; Sturaro et al., 2008; Wortman, Lucas, & Donnellan, 2012) which allowed for a more detailed understanding of developmental patterns at the research levels of description, context, and

interplay. This was especially important as many of the suggested principles of personality development were based on longer time spans across 4 to 10 years (e.g., Roberts et al., 2001; Roberts & Mroczek, 2008) and previous work in the context of childhood revealed significant developments within one year (e.g., Denissen et al., 2013; Soto, 2016; Soto & Tackett, 2015; Van den Akker, Deković, Asscher, & Prinzie, 2014). Thus, the present work followed the claims for the investigation of shorter time periods to complement research on life span perspectives (Allemand & Mehl, 2017; Luhmann et al., 2014; Wrzus & Mehl, 2015). However, when aiming for an understanding of processes and mechanisms, even short-term panel studies only allow for conclusions on the potential explaining factors as processes are commonly observed microanalytically, that is, within hours, days, or a few weeks (e.g., Geukes, van Zalk, & Back, 2018; Voelkle & Wagner, 2017; Wrzus & Roberts, 2017). Similar to developmental processes observed in childhood, personality could follow, for example, continuous, short-term "ups" and "downs" that allow for a profound solidification and therefore, healthier transition, across time (Baltes et al., 1998; Roisman, Masten, Coatsworth, & Tellegen, 2004). The patterns of dips (Soto, 2016) seem to follow broader repetition cycles during adolescence (e.g., Denissen et al., 2013; Soto & Tackett, 2015; Van den Akker et al., 2014) with possibly narrower repetitive patterns with increasing age. However, future research will need to reveal the time span during which these processes occur in the different phases of life. Thereby, it is essentially important to explicit theoretical claims on the life transitions and life events during which personality change is expected. This way it should be possible to determine significant assessment points to capture the transitions of interest (Luhmann et al., 2014). Based on the current state of research it seems reasonable to conduct two types of studies: First, analyzing panel data with measurement intervals across months instead of years would help to reflect medium-term personality development. Second, in order to understand the profound processes of personality development, it seems necessary to reflect personality development at the hour, day-to-day, and week level and relate the observed development to relevant factors of the person and the environment (e.g., Baumert et al., 2017; Geukes et al. 2017; Geukes et al., 2018; Schmidt et al., 2017; Wrzus & Roberts, 2017). In this regard, Roberts and Nickel (2017) suggested a variety of mechanisms for both continuity and change of personality that will need specific testing in, for example, longitudinal, daily-diary, or experience sampling studies (Bolger & Laurenceau, 2013; Little, 2013; Luhmann et al., 2014).

Regarding the number of measurement occasions and their time intervals, a common conclusion of the three studies presented in this dissertation refers to the yet vague role of time intervals during emerging adulthood. Even though it is agreed on that time is one of the most

crucial factors in the study of personality development, personality development research is not yet able to conclude on the various questions associated with the chosen time frame (e.g., Luhmann et al., 2014). Luhmann and colleagues (2014) summarized six notions regarding the role of time that have not been sufficiently addressed in previous research: (1) people can differ before the occurrence of a transition or event, (2) change can be non-linear or discontinuous, (3) change can be reversible, (4) change can occur before the occurrence of the event of interest, (5) control groups are needed to disentangle age or cohort effects from transition effects, and (6) a broader range of life transitions (i.e., non-normative, normative, or no events) should be observed. In the following, I will briefly elaborate on how this dissertation contributes to these notions. First, studies 1 and 2 are of longitudinal nature with three measurement occasions. This allowed for a more comprehensive understanding of personality development as three measurement occasions allow for non-linear or reversed developmental patterns to be observed (e.g., Borghuis et al., 2017; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009; Schwaba & Bleidorn, 2017; Schwaba et al., 2018). Indeed, study 1 emphasized the importance of multiple measurement occasions as this allowed for the revelation of unknown patterns. This finding points to open questions in personality development research and suggests an adapted understanding of the roles of the person and the environment in Dynamic Transactionism Theory (e.g., Durbin et al., 2016). Second, study 2 contributed to the growing body of large, longitudinal studies that incorporate an assessment before the occurrence of the life transition specifically allowing for conclusions on the effects of that same transition (Bleidorn, 2012; Van Scheppingen et al., 2016; Zimmermann & Neyer, 2013). Third, study 1 was concerned with the timing of the normative life transition to the context of work that previous studies mostly investigated in emerging adults after college education (e.g., Roberts et al., 2003). Even though no control group could be used, these studies provide important insights on the aspect of the timing of life transitions at different stages of life. Thus, the present work was able to address and contribute to four out of the six notions on the deeper understanding of time in personality development. Nevertheless, the studies also reinforce the lacks in personality development research as unfortunately, differences between people before the major life transition were only observable in study 2, a control group was missing for all three studies, and additional measurement bursts would allow for more insights on the (non)linearity, reversibility, or discontinuous personality of development in emerging adulthood.

Analyzing Longitudinal Person-environment Transactions

First, the utilization of (extended) bivariate latent difference score models as means to approach effects between aspects of the person and characteristics of the environment is

undergoing constant discussion from a methodological perspective (e.g., Hamaker et al., 2015; Little, 2013; Schuurman, Ferrer, Boer-Sonnenschein, & Hamaker, 2016). The implementation of change-to-change effects (Grimm et al., 2012) was shown to be meaningful for the theoretical conception of person-environment transactions in balancing the number of personality and relationship effects (e.g., Mund & Neyer, 2014). However, from my perspective a final conclusion on the theoretical adequacy of the extended bivariate latent difference score model should be on hold until more solid theoretical conceptualizations and empirical knowledge on the mechanisms of personality development is gained. This might have profound implications for the theory on person-environment transactions that possibly call for different modeling strategies.

Second, the application of an information-theoretic approach (Burnham & Anderson, 2002) with means of response surface analysis (RSA; Edwards, 2002) was shown to allow for a more differentiated understanding of the role of the interplay between the person, the environment, and personality development. Two conclusions should be taken from this research. First, the information-theoretic approach appeared to simultaneously test and compare competing hypotheses. As such it should be considered to be parsimonious and advantageous as compared to testing all possible hypotheses individually (Burnham & Anderson, 2002).

Especially in the field of personality development with many different theoretical claims regarding the type of processes of personality development, the present work showed that the information-theoretic approach could be used more intensively to provide answers on the interplay of the person, the environment, and personality development (Denissen et al., 2017; Humberg et al., 2018; Humberg, Nestler, & Back, 2018; Quintus, Egloff, & Wrzus, 2017; Wagenmakers & Farrell, 2004). Second, the application of RSA was again shown to be a powerful tool to study the person and the environment as well as their interplay beyond P–E fit (study 3). In this regard, future research might further benefit from the utilization of RSA as it points to the differential unfolding of processes of personality development and their preconditions regarding both the person and the environment (e.g., Edwards, 2001, 2002).

Limitations and Outlook

Despite the numerous theoretical and methodological contributions to the research field of personality development, the present dissertation also implies limitations that provide substantial directories to be addressed in future research. From a broader perspective, the limitations can be grouped to concern sample characteristics, the number and timing of measurement occasions, and the modeling of longitudinal data.

Sample Characteristics

The present work contributed substantially to the body of studies on emerging adulthood by investigating a specific part of the “forgotten half” (e.g., Arnett, 2000). However, all of the emerging adults in the three studies were undergoing some kind of post-secondary education (e.g., college, VET, military service). Thus, the lack of knowledge on personality development in the group of emerging adults who have not followed any educational system since leaving high school could not be resolved by this dissertation. It is plausible, though, that emerging adults not following the educational system after high school might substantially differ from those preceding post-secondary education and encounter environmental contexts whose significance for personality development have remained unknown. Further, this work could not contribute to the question of how specific person- and environment characteristics explain the observed results. One of these aspects should be specifically mentioned. Regarding the studies on VET trainees, it was not possible to base the findings on a balanced sample in terms of gender, cultural background, or industry branch to investigate their differential impact for the findings on personality maturation. Similarly, study 2 only included emerging adults with the *Abitur* (i.e., the best possible high school diploma) and is therefore likely to be highly selective in terms of previous experiences. For example, Bleidorn (2012) showed that emerging adults tended to increase in emotional stability, agreeableness, and conscientiousness in anticipating high school graduation across one year. In the discussion, it was argued that developmental stages regarding, for example, identity development, might be differentially important for the role of work and social relationships in personality development. Consequently, future research should investigate and compare personality development in samples of (a) emerging adults undergoing no post-secondary education after high school, (b) emerging adults in different developmental stages of, for example, identity development, and (c) VET trainees balanced in terms of industry branch, gender, and cultural background.

Number and Timing of Measurement Occasions

The present work clearly shows that additional measurements across an overall longer time period are needed for studying the contexts of both social relationships and the context of work. Regarding the context of social relationships, previous research showed that both short-term and long-term effects of life transitions are to be expected (Asendorpf & Wilpers, 1998; Luhmann et al., 2014; Mund & Neyer, 2014; Lehnart & Neyer, 2006). These findings have to be integrated in the theoretical understanding of Dynamic Transactionism and should thus also be reflected by the methodological approaches taken; specifically in the timing and number of

measurement occasions. In order to understand both long-term and short-term effects of (transitions to) environmental contexts three major adaptations are obligatory (Luhmann et al., 2014). First, it is necessary to include more than one measurement occasion before the expected transition takes place to observe potential changes occurring before the event. Second, increasing the number of follow-up measurements would allow for the understanding of the time frame that effects of the respective environmental context need to unfold their association with personality development. This rather unspecific approach is necessary, because solid theoretical claims on the time frame during which effects of an environmental context are expected to be observed are largely missing and empirical data might help to form our understanding on time much better. Third, the distance between measurement occasions should be adapted according to theoretically or empirically plausible time frames to allow for the detection of potential non-linear, reversed, or discontinuous types of change (Bolger & Laurenceau, 2013; Luhmann et al., 2014). Previous notions on this topic suggest daily measurement bursts or experience sampling studies to uncover mechanisms of state to trait changes (Bolger & Laurenceau, 2013; Geukes et al., 2018; Wagner et al., 2015; Wrzus & Roberts, 2017).

Modeling Longitudinal Data

The present dissertation showed response surface analysis (RSA; e.g., Edwards, 2002) to be a powerful tool to simultaneously test the role of the interplay between the person and the environment for personality development. However, RSA did not allow for an application to more than one measurement interval. Thus, important longitudinal information available could not be used to its full potential. In order to further use RSA in the study of personality development it would be helpful to overcome the present limitation of including multiple measurement occasions. This is crucial as future research will most likely extend the number of measurement occasions resulting in a broad range of longitudinal studies that are interested in the interplay of the person and the environment on subsequent personality development. Further, the most suitable approach to studying effects between the person and features of the environment is undergoing constant discussion (e.g., Grimm et al., 2012; Hamaker et al., 2015; McArdle, 2009). Not only has the application of cross-lagged panel models been discussed to require an extension by change-to-change effects to better account for Dynamic Transactionism theory (Grimm et al., 2012; Mund & Neyer, 2014) but has more recently been profoundly criticized to be referring more strongly to between-person differences instead of within-person differences (Hamaker et al., 2015; Hamaker & Wichers, 2017). With respect to these current discussions, the present work contributes important information. First, in the study of person-

environment transactions, the extension of the bivariate latent difference score models (i.e., the change-to-change effects) were shown to account for the theoretical conception of reciprocal personality-relationship effects – at least on the change-to-change level. This finding underlines the urgency to rework current theoretical conceptions of personality development and therefore the usability of the analytical tools applied; specifically how processes between the person and the environment are theoretically perceived to unfold. This should have profound implications for the ongoing discussion on the most suitable modeling of longitudinal data.

Conclusion

The present dissertation investigated Big Five personality trait development and its contingencies in emerging adulthood. Specifically, the roles of the two central contexts of social relationships and work were examined. Both of the environmental contexts were shown to be meaningful for personality development in emerging adulthood. However, the role of the working context played out differently for young emerging adults than expected from previous findings of adulthood: The trainees' personality development did not conform to the maturity principle. Similarly, further evidence for a differential role of social relationships in emerging adulthood as compared to adulthood was suggested: Social relationship characteristics seem to play a more important role in non-transition phases than was previously revealed for adulthood. Thus, the studies' findings suggest a slightly adapted understanding of the role of person characteristics and the role of features of the environment that will need explicit testing in future research by taking into account, for example, the individual's developmental stage. Further, it was shown that incongruence between the person and the environment is more strongly associated with personality development than person-environment fit. In this regard, the individual's importance ascribed to basic needs support was more closely related to personality development than the basic need supply of the environment. The latter finding suggests that needs and goals are substantial for successive emotional and behavioral patterns, that is, personality.

References

Adams, G. R., & Fitch, S. A. (1981). Ego stage and identity status development: A cross-lag analysis. *Journal of Adolescence*, *4*(2), 163–171.

Akse, J., Hale, W. W., Engels, R. M., Raaijmakers, Q. A., & Meeus, W. H. (2007). Stability and change in personality type membership and anxiety in adolescence. *Journal of Adolescence*, *30*(5), 813–834. doi: 10.1016/j.adolescence.2006.09.007

Aldrup, K., Klusmann, U., & Lüdtke, O. (2017). Does basic need satisfaction mediate the link between stress exposure and well-being? A diary study among beginning teachers. *Learning and Instruction*, *50*, 21–30.doi: 10.1016/j.learninstruc.2016.11.005

Allemand, M., & Martin, M. (2016). On correlated change in personality. *European Psychologist*, *21*(4), 237–253. doi: 10.1027/1016-9040/a000256

Allemand, M., & Mehl, M. R. (2017). Personality assessment in daily life: A roadmap for future personality development research. In J. Specht (Ed.), *Personality Development Across the Lifespan* (pp. 437-454). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Allemand, M., Zimprich, D., & Hendriks, A. A. J. (2008). Age differences in five personality domains across the life span. *Developmental Psychology*, *44*(3), 758–770. doi: 10.1037/0012-1649.44.3.758

Allemand, M., Zimprich, D., & Hertzog, C. (2007). Cross-sectional age differences and longitudinal age changes of personality in middle adulthood and old age. *Journal of Personality*, *75*(2), 323–358. doi: 10.1111/j.1467-6494.2006.00441.x

Allport, G.W. (1961). *Pattern and growth in personality*. New York: Holt, Rinehart & Winston.

Anusic, I., & Schimmack, U. (2016). Stability and change of personality traits, self-esteem, and well-being: Introducing the meta-analytic stability and change model of retest correlations. *Journal of Personality and Social Psychology*, *110*(5), 766–781. doi: 10.1037/pspp0000066

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*, 469-480. doi: 10.1037/0003-066X.55.5.469

Arnett, J. J. (2006). Emerging Adulthood: Understanding the New Way of Coming of Age. In J. J. Arnett & J. L. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 3–19). Washington, DC, US: American Psychological Association. doi: 10.1037/11381-001

Arnett, J. J. (2015). *Emerging adulthood: The winding road from the late teens through the twenties* (2nd ed.). New York, NY: Oxford University Press.

Asendorpf, J. B., Denissen, J. J. A., Klimstra, T. A., & Lüdtke, O. (2017). Cross-lagged analysis in personality research: Research questions and recommendations. *Unpublished manuscript*.

Asendorpf, J. B., & Van Aken, M. (2003). Validity of Big Five personality judgements in childhood: A 9 year longitudinal study. *European Journal of Personality*, *17*(1), 1–17. doi: 10.1002/per.460

Asendorpf, J. B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology*, *74*(6), 1531–1544. doi:10.1037/0022-3514.74.6.1531

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, *34*, 2045-2068. doi: 10.1111/j.1559-1816.2004.tb02690.x

Back, M. D., Baumert, A., Denissen, J. J. A., Hartung, F.-M., Penke, L., Schmukle, S. C., …, & Wrzus, C. (2011). PERSOC: A unified framework for understanding the dynamic interplay of personality and social relationships. *European Journal of Personality*, *25*(2), 90–107. doi:10.1002/per.811

Badger, S., Nelson, L. J. , & Barry, C. M. (2006). Perceptions of the transition to adulthood among Chinese and American emerging adults. *International Journal of Behavioral Development*, *30*(1), 84–93. doi: 10.1177/0165025406062128

Baltes, P. B., Lindenberger, U., & Staudinger, U. M. (1998). Life span theory in developmental psychology. In R. M. Lerner (Ed.), *Handbook of Child Psychology: Vol. 1. Theoretical Models of Human Development* (5th ed.), pp. 1029–1143. New York: Wiley.

Bates, M. E., & Pandina, R. J. (1989). Individual differences in the stability of personality needs: Relations to stress and substance use during adolescence. *Personality and Individual Differences*, *10*(11), 1151–1157. doi: 10.1016/0191-8869(89)90078-0

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529. doi: 10.1037/0033-2909.117.3.497

Baumert, A., Schmitt, M., Perugini, M., Johnson, W., Blum, G., Borkenau, P., Costantini, G., … Wrzus, C. (2017). Integrating personality structure, personality process, and personality development. *European Journal of Personality*, 31, 503–528. doi: 10.1002/per.2115.

Berkowitz, L. (1972). Social norms, feelings, and other factors affecting helping and altruism. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology: Vol. 6.*, pp. 63–108. doi: 10.1016/S0065-2601(08)60025-8

Billstedt, E., Skoog, I., Duberstein, P., Marlow, T., Hällström, T., André, M., Lissner, L., Björkelund, C., Östling, S., & Waern, M. (2014). 37-year prospective study of neuroticism and extraversion in women followed from mid to late life. *Acta Psychiatrica Scandinavica*, *129*(1), 35–43. doi: 10.1111/acps.12093

Blakemore, S.-J. (2012a). Imaging brain development: The adolescent brain. *NeuroImage*, *61*(2), 397–406. doi:10.1016/j.neuroimage.2011.11.080

Blakemore, S.-J. (2012b). Development of the social brain in adolescence. *Journal of the Royal Society of Medicine*, *105*(3), 111–116. Doi: 10.1258/jrsm.2011.110221

Bleidorn, W. (2012). Hitting the road to adulthood: Short-term personality development during a major life transition. *Personality and Social Psychology Bulletin*, *38*(12), 1594–1608. doi: 10.1177/0146167212456707

Bleidorn, W. (2015). What accounts for personality maturation in early adulthood? *Current Directions in Psychological Science*, *24*(3), 245–252. doi: 10.1177/0963721414568662

Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2016). Life events and personality trait change. *Journal of Personality*, *86*(1), 83–96. doi: 10.1111/jopy.12286

Bleidorn, W., Kandler, C., & Caspi, A. (2014). The behavioural genetics of personality development in adulthood – classic, contemporary, and future trends. *European Journal of Personality*, *28*(3), 244–255. doi: 10.1002/per.1957

Bleidorn, W., Kandler, C., Riemann, R., Angleitner, A., & Spinath, F. M. (2009). Patterns and sources of adult personality development: Growth curve analyses of the NEO PI-R scales in a longitudinal twin study. *Journal of Personality and Social Psychology*, *97*(1), 142–155. Doi: 10.1037/a0015434

Bleidorn, W., Klimstra, T. A., Denissen, J. J. A., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2013). Personality maturation around the world: A cross-cultural examination of social-investment theory. *Psychological Science*, *24*(12), 2530–2540. doi: 10.1177/0956797613498396

Bolger, N., & Laurenceau, J.-P. (2013). *Intensive longitudinal methods : An introduction to diary and experience sampling research*. New York, NY: Guilford Press.

Borghuis, J., Denissen, J. J. A., Oberski, D., Sijtsma, K., Meeus, W. H. J., Branje, S., … Bleidorn, W. (2017). Big five personality stability, change, and codevelopment across adolescence and early adulthood. *Journal of Personality and Social Psychology*, *113*(4), 641–657. doi: 10.1037/pspp0000138

Bowlby, J. (1982). *Attachment and loss: Vol. 1 Attachment* (2nd ed.). New York: Basic Books.

Boyce, C. J., Wood, A. M. , Daly, M. , & Sedikides, C. (2015). Personality change following unemployment. *Journal of Applied Psychology*, *100*(4), 991–1011. doi: 10.1037/a0038647

Branje, S. J. T., Van Lieshout, C. F. M., & Van Aken, M. A. G. (2004). Relations between Big Five personality characteristics and perceived support in adolescents' families. *Journal of Personality and Social Psychology*, *86*(4), 615–628. doi: 10.1037/0022-3514.86.4.615

Bratko, D., & Butkovic, A. (2007). Stability of genetic and environmental effects from adolescence to young adulthood: Results of Croation longitudinal twin study of personality. *Twin Research and Human Genetics*, *10*(1), 151–157. Doi: 10.1375/twin.10.1.151

Briley, D. A., & Tucker-Drob, E. M. (2014). Genetic and environmental continuity in personality development: A meta-analysis. *Psychological Bulletin*, *140*(5), 1303–1331. doi: 10.1037/a0037091

Buhl, H. M., & Lanz, M. (2007). Emerging Adulthood in Europe: Common traits and variability across five European countries. *Journal of Adolescent Research*, *22*(5), 439–443. doi: 10.1177/0743558407306345

Burnham, K. P., & Anderson, D. R. (2002). *Model selection and multimodel inference: A practical information-theoretic approach* (2nd ed.). New York, NY: Springer.

Cable, D. M., & Edwards, J. R. (2004). Complementary and supplementary fit: A theoretical and empirical integration. *Journal of Applied Psychology*, *89*(5), 822–834. Doi: 10.1037/0021-9010.89.5.822

Cañal-Bruland, R., & Van der Kamp, J. (2009). Action goals influence action-specific perception. *Psychonomic Bulletin & Review*, *16*(6), 1100–1105. doi: 10.3758/PBR.16.6.1100

Cantoni, L. J. (1955). A study of emotional adjustment: The correlation of student and adult forms of the Bell Adjustment Inventory over a period of thirteen years. *Educational and Psychological Measurement, 15,* 137–143.

Caplan, R. D. (1987). Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior*, *31*(3), 248–267. doi: 10.1016/0001-8791(87)90042-X

Caputo, D. V., Psathas, G., & Plapp, J. M. (1966). Test–retest reliability of the EPPS. *Educational and Psychological Measurement, 26,* 883–886.

Carlsson, J., Wängqvist, M., & Frisén, A. (2015). Identity development in the late twenties: A never ending story. *Developmental Psychology*, *51*(3), 334–345. doi: 10.1037/a0038745

Carnevale, A. P., Smith, N., Melton, M., & Price, E. W. (2015). Learning while earning: The new normal. Retrieved from (18.07.2018): https://cew.georgetown.edu/cew-reports/workinglearners/

Caspi, A., & Moffitt, T. E. (1993). When do individual differences matter? A paradoxical theory of personality coherence. *Psychological Inquiry*, *4*(4), 247–271. doi: 10.1207/s15327965pli0404_1

Chapman, B. P. (2007). Bandwidth and fidelity on the NEO-Five Factor Inventory: Replicability and reliability of Saucier's (1998) item cluster subcomponents. *Journal of Personality Assessment*, *88*(2), 220–234. doi:10.1080/00223890701268082

Chung, J. M., Robins, R. W., Trzesniewski, K. H., Noftle, E. E., Roberts, B. W., & Widaman, K. F. (2014). Continuity and change in self-esteem during emerging adulthood. *Journal of Personality and Social Psychology*, *106*(3), 469–483. doi: 10.1037/a0035135

Clausen, J. S. (1991). Adolescent competence and the shaping of the life course. *American Journal of Sociology*, *96*, 805–842. doi: 10.1086/229609

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale: Lawrence Erlbaum Associates.

Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 3-25). New York, NY, US: Oxford University Press. doi: 10.1093/med:psych/9780195126709.003.0001

Cooman, R., Gieter, S., Pepermans, R., Hermans, S., Du Bois, C., Caers, R., & Jegers, M. (2009). Person-organization fit: Testing sozialization and attraction-selection-attrition hypotheses. *Journal of Vocational Behavior*, *74*(1), 102–107. doi: 10.1016/j.jvb.2008.10.010

Costa, P. T., & McCrae, R. R. (1988). Personality in adulthood: A six-year longitudinal study of self-reports and spouse ratings on the NEO Personality Inventory. *Journal of Personality and Social Psychology*, *54*(5), 853–863. doi: 10.1037//0022-3514.54.5.853

Cramer, P. (1998). Freshman to senior year: A follow-up study of identity, narcissism, and defense mechanisms. *Journal of Research in Personality, 32,* 156–172.

Cramer, P. (2017). Identity change between late adolescence and adulthood. *Personality and Individual Differences*, *104*, 538–543. doi: 10.1016/j.paid.2016.08.044

Crocetti, E., Rubini, M., & Meeus, W. H. J. (2008). Capturing the dynamics of identity formation in various ethnic groups: Development and validation of a threedimensional model. *Journal of Adolescence*, *37*(8), 983–996. doi: 10.1007/s10964-007-9222-2

Crook, M. N. (1943). A retest with the Thurstone Personality Schedule after six and one-half years. *Journal of General Psychology, 28,* 111–120.

Davis, M. H., & Franzoi, S. L. (1991). Stability and change in adolescent self-consciousness and empathy. *Journal of Research in Personality, 25,* 70–87.

Davis, T. N., & Satterly, D. J. (1969). Personality profiles of student teachers. *British Journal of Educational Psychology, 39,* 183-187.

De Charms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York, NY: Academic Press. Carlsson, J., Wängqvist, M., & Frisén, A. (2015). Identity development in the late twenties: A never ending story. *Developmental Psychology*, *51*(3), 334–345. doi: 10.1037/a0038745

Damon, W., & Lerner, R. M. (2008). *Child and adolescent development: An advanced course*. Hoboken, NJ: John Wiley & Sons, Inc.

Deci, E. L., Olafsen, A. H., & Ryan, R. M. (2017). Self-determination theory in work organizations: The state of a science. *Annual Review of Organizational Psychology and Organizational Behavior*, *4*, 19–43. doi: 10.1146/annurev-orgpsych-032516-113108

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, *19*, 109-134. doi: 10.1016/0092-6566(85)90023-6

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln: University of Nebraska Press.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268. doi: 10.1207/S15327965PLI1104_01

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory. A macrotheory of human motivation, development, and health. *Canadian Psychology*, *49*(3), 182–185. doi: 10.1037/a0012801

Deci, E. L., & Ryan, R. M. (2014). Autonomy and Need Satisfaction in Close Relationships: Relationships Motivation Theory. In: Weinstein N. (eds), *Human Motivation and Interpersonal Relationships* (pp. 53–73). Springer, Dordrecht.

Denissen, J. J., Ulferts, H., Lüdtke, O., Muck, P. M., & Gerstorf, D. (2014). Longitudinal transactions between personality and occupational roles: A large and heterogeneous study of job beginners, stayers, and changers. *Developmental Psychology*, *50*(7), 1931–1942. doi:10.1037/a0036994

Denissen, J. J. A., Van Aken, M. A. G., Penke, L., & Wood, D. (2013). Self-regulation underlies temperament and personality: An integrative developmental framework. *Child Development Perspectives*, *7*(4), 255–260. doi: 10.1111/cdep.12050

Deniz, N., Noyan, A., & Ertosun, Ö. G. (2015). Linking person-job fit to job stress: The mediating effect of perceived person-organization fit. *Procedia – Social and Behavioral Sciences*, 207, 369–376. doi: 10.1016/j.sbspro.2015.10.107

Dobewall, H., & Aavik, T. (2016). Rank-Order Consistency and Profile Stability of Self- and Informant-Reports of Personal Values in Comparison to Personality Traits. *Journal of Individual Differences*, *37*(1), 40–48. doi: 10.1027/1614-0001/a000186

Donnellan, M. B., & Lucas, R. E. (2008). Age differences in the Big Five across the life span: Evidence from two national samples. *Psychology and Aging*, *23*(3), 558–566. doi: 10.1037/a0012897

Dugas, M. J., & Robichaud, M. (2007). *Cognitive-behavioral treatment for generalized anxiety disorder: From science to practice*. New York, NY: Routledge.

Durbin, C. E., Hicks, B. M., Blonigen, D. M., Johnson, W., Iacono, W. G., & McGue, M. (2016). Personality trait change across late childhood to young adulthood: Evidence for nonlinearity and sex differences in change. *European Journal of Personality*, *30*(1), 31–44. doi: 10.1002/per.2013

Dweck, C. S. (2017). From needs to goals and representations: Foundations for a unified theory of motivation, personality, and development. *Psychological Review*, *124*(6), 689–719. doi: 10.1037/rev0000082

Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist, 48*(2), 90-101. doi: 10.1037/0003-066X.48.2.90

Edwards, J. R. (2001). Ten difference score myths. *Organizational Research Methods*, *4*(3), 265–287. doi: 10.1177/109442810143005

Edwards, J. R. (2002). Alternatives to difference scores: Polynomial regression analysis and response surface methodology. In F. Drasgow & N. W. Schmitt (Eds.), *Advances in measurement and data analysis* (pp. 350–400). San Francisco, CA: Jossey-Bass.

Edwards, J. R. (2007). Polynomial regression and response surface methodology. In C. Ostroff & T. A. Judge (Eds.), *Perspectives on Organizational Fit* (pp. 361–372). San Francisco: Jossey-Bass.

Edwards, J. R., & Rothbard, N. P. (1999). Work and family stress and well-being: An examination of person-environment fit in the work and family domains. *Organizational Behavior and Human Decision Processes*, *77*(2), 85–129. doi: 10.1006/obhd.1998.2813

Endler, N. S., & Magnusson, D. (1976). Toward an interactional psychology of personality. *Psychological Bulletin*, *83* (5), 956–974. doi: 10.1037/0033-2909.83.5.956

Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.

Erol, R. Y., & Orth, U. (2011). Self-esteem development from age 14 to 30 years: A longitudinal study. *Journal of Personality and Social Psychology*, *101*(3), 607–619. doi: 10.1037/a0024299

Facio, A., Resett, S., Micocci, F., & Mistrorigo, C. (2007). Emerging adulthood in Argentina: An age of diversity and possibilities. *Child Development Perspectives*, *1*(2), 115–118. doi:10.1111/j.1750-8606.2007.00025.x

Ferguson, C. J. (2010). A meta-analysis of normal and disordered personality across the life span. *Journal of Personality and Social Psychology*, *98* (4), 659–667. doi: 10.1037/a0018770

Finn, C., Zimmermann, J., & Neyer, F. J. (2017). Personality development in close relationships. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 357–370). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00002-8

Fishbach, A., Zhang, Y., & Koo, M. (2009). The dynamics of self-regulation. *European Review of Social Psychology*, *20*(1), 315–344. doi: 10.1080/10463280903275375

Fishman, A. A. (2016). How generational differences will impact America's aging workforce: strategies for dealing with aging Millenials, Generation X, and Baby Boomers. *Strategic HR Review*, *15*(6), 250–257. doi: 10.1108/SHR-08-2016-0068

Fornés-Vives, J., García-Banda, G., Frías-Navarro, D., Hermoso-Rodríguez, E., & Santos-Abaunza, P. (2012). Stress and neuroticism in Spanish nursing students: A two-wave longitudinal study. *Research in Nursing and Health*, *35*(6), 589–597. doi: 10.1002/nur.21506

Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, *26*(4), 331–362. doi: 10.1002/job.322

Galdiolo, S., & Roskam, I. (2014). Development of personality traits in response to childbirth: A longitudinal dyadic perspective. *Personality and Individual Differences*, *69*, 223–230. doi: 10.1016/j.paid.2014.06.002

Galinha, I. C., Garcia-Martin, M. A., Oishi, S., Wirtz, D, & Esteves, F. (2016). Cross-cultural comparison of personality traits, attachment security, and satisfaction with relationships as predictors of subjective well-being in India, Sweden, and the United States. *Journal of Cross-Cultural Psychology*, *47*(8), 1033–1052. doi: 10.1177/0022022116658262

Geukes, K., van Zalk, & Back, M. D. (2018). Understanding personality development: An integrative state process model. *International Journal of Behavioral Development*, *42*(1), 43–51. doi : 10.1177/0165025416677847

Gillet, N., Fouquereau, E., Lafreniére, M. K., & Huyghebaert, T. (2016). Examining the roles of work autonomous and controlled motivations on satisfaction and anxiety as a function of role ambiguity. *The Journal of Psychology*, *150*, 644-665. doi: 10.1080/00223980.2016.1154811

Grafanaki, S. (2013). Experiencing congruence and incongruence. *Person-centered & Experiential Psychotherapies*, *12*(3), 183–186. doi: 10.1080/14779757.2013.839361

Greguras, G. J., & Diefendorff, J. M. (2009). Different fits satisfy different needs: Linking person-environment employee commitment and performance using self-determination theory. *Journal of Applied Psychology*, *94*(2), 465–477. doi: 10.1037/a0014068

Grimm, K. J., An, Y., McArdle, J. J., Zonderman, A. B., & Resnick, S. M. (2012). Recent changes leading to subsequent changes: Extensions of multivariate latent difference score models. *Structural equation modeling: A multidisciplinary journal*, *19*(2), 268–292. doi:10.1080/10705511.2012.659627

Hamaker, E. L., Kuiper, R., & Grasman, R. P. P. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods*, *20*(1), 102–116. doi: 10.1037/a0038889

Hamaker, E. L., & Wichers, M. (2017). No time like the present: Discovering the hidden dynamics in intensive longitudinal data. *Current Directions in Psychological Science*, *26*(1), 10–15. doi: 10.1177/0963721416666518

Harms, P. D., Roberts, B. W., & Winter, D. (2006). Becoming the Harvard man: Person-environment fit, personality development, and academic success. *Personality and Social Psychology Bulletin*, *32*(7), 851–865. doi: 10.1177/0146167206287720

Havighurst, R. J. (1972). *Developmental tasks and education*. New York: David McKay

Heaney, C. A., & Israel, B. A. (2008). Social networks and social support. In K. Glanz, Barbara K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education* (pp. 189–207). San Fransisco, CA: Jossey-Bass

Helson, R., & Moane, G. (1987). Personality change in women from college to midlife. *Journal of Personality and Social Psychology*, *53*(1), 176–186. doi: 10.1037//0022-3514.53.1.176

Hennecke, M., Bleidorn, W., Denissen, J. J. A., & Wood, D. (2014). A three-part framework for self-regulated personality development across adulthood. *European Journal of Personality*, *28*(3), 289–299. doi: 10.1002/per.1945

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Bran Sciences*, *33*(2-3), 61–135. doi: 10.1017/S0140525X0999152X

Herzhoff, K., Kushner, S. C., & Tackett, J. L. (2017). Personality development in childhood. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 9–24). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00002-8

Hinde, R. A. (1979). *Towards understanding relationships*. London, England: Academic Press.

Hoffman, B. J., & Woehr, D. J. (2006). A quantitative review of the relationship between person-organization fit and behavioral outcomes. *Journal of Vocational Behavior*, *68*(3), 389–399. doi: 10.1016/j.jvb.2005.08.003

Hogan, R., & Blickle, G. (2018). Socioanalytic theory: Basic concepts, supporting evidence and practical implications. In V. Zeigler-Hill, & T. K. Shackelford (Eds.), *The SAGE handbook of personality and individual differences: Volume I: The science of personality and individual differences*. Thousand Oaks, CA: SAGE. doi: 10.4135/9781526451163.n

Holland, J. L. (1997). *Making vocational choices*. Odessa, FL: PAR

Hopwood, C. J., Donnellan, M. B., Blonigen, D. M., Krueger, R. F., McGue, M., Iacono, W. G., & Burt, S. A. (2011). Genetic and environmental influences on personality trait stability and growth during the transition to adulthood: A three-wave longitudinal study. *Journal of Personality and Social Psychology*, *100*(3), 545-556. doi: 10.1037/a0022409

Hudson, N. W., Roberts, B. W., & Lodi-Smith, J. (2012). Personality trait development and social investment in work. *Journal of Research in Personality*, *46*(3), 334–344. Doi: 10.1016/j.jrp.2012.03.002

Hudson, M., Nicholson, T., Ellis, R., & Bach, P. (2016). I see what you say: Prior knowledge of other’s goals automatically biases the perception of their actions. *Cognition*, *146*, 245–250. doi: 10.1016/j.cognition.2015.09.021

Humberg, S., Dufner, M., Schönbrodt, F. D., Geukes, K., Hutteman, R., van Zalk, M. H. W., Denissen, J. J. A., Nestler, S., & Back, M. D. (2018). Enhanced versus simply positive: A new condition-based regression analysis to disentangle effects of self-enhancement from effects of positivity of self-view. *Journal of Personality and Social Psychology*, 114, 303-322. doi:10.1037/pspp0000134

Humberg, S., Nestler, S., & Back, M. D. (2018). Response surface analysis in personality and social psychology: Checklist and clarifications for the case of congruence hypotheses. *Social Psychological and Personality Science*, 13, 1-11. doi: 10.1177/1948550618757600

Hutteman, R., Hennecke, M., Orth, U., Reitz, A. K., & (2014). Developmental tasks as a framework to study personality development in adulthood and old age. *European Journal of Personality*, *26*(3), 267–278. doi: 10.1002/per.1959

Jokela, M., Kivimäki, M., Elovaninio, M., & Keltikangas-Järvinen, L. (2009). Personality and having children: A two-way relationship. *Journal of Personality and Social Psychology*, *96*(1), 218–230. doi: 10.1037/a0014058

Kandler, C. (2012). Nature and nurture in personality development: The case of neuroticism and extraversion. *Current Directions in Psychological Science*, *21*(5), 290–296. doi: 10.1177/0963721412452557

Kandler, C., Bleidorn, W., Riemann, R., Spinath, F., Thiel, W., & Angleitner, A. (2010). Sources of cumulative continuity in personality: A longitudinal multiple-rater twin study. *Journal of Personality and Social Psychology*, *98*(6), 995–1008. doi: 10.1037/a0019558

Kandler, C., Kornadt, A. E., Hagemeyer, B., & Neyer, F. J. (2015). Patterns and sources of personality development in old age. *Journal of Personality and Social Psychology*, *109*(1), 175–191. doi: 10.1037/pspp0000028

Kandler, C., & Zapko-Willmes, A. (2017). Theoretical perspectives on the interplay of nature and nurture in personality development. In J. Specht (Ed.), *Personality development across the lifespan* (pp.101–115). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Karney, B. R., & Bradbury, T. N. (1997). Neuroticism, marital interaction, and the trajectory of marital satisfaction. *Journal of Personality and Social Psychology, 72*(5), 1075–1092. doi: 10.1037//0022-3514.72.5.1075

Keltikangas-Järvinen, L. (1989). Stability of Type A behavior during adolescence, young adulthood, and adulthood. *Journal of Behavioral Medicine, 12*(4), 387–396. doi: 10.1007/BF00844931

Klassen, R. M., Perry, N. E., & Frenzel, A. C. (2012). Teachers‘ relatedness with students: An underemphasized component of teachers' basic psychological needs. *Journal of Educational Psychology*, *104*(1), 150–165. doi: 10.1037/a0026253

Klimstra, T. A. (2013). Adolescent personality development and identity formation. *Child Development Perspectives*, *7*(2), 80–84. Doi: 10.1111/cdep.12017

Klimstra, T. A., Hale, W. W., Raaijmakers, Q. A. W., Branje, S. J. T., & Meeus, W. H. J. (2009). Maturation of personality in adolescence. *Journal of Personality and Social Psychology*, *96*(4), 898–912. doi: 10.1037/a0014746

Klimstra, T. A., Luyckx, K., Germeijs, V., Meeus, W. H. J., & Goossens (2012). Personality traits and educational identity formation in late adolescents: Longitudinal associations and academic progress. *Journal of Youth and Adolescence*, *41*(3), 356-361. doi: 10.1007/s10964-011-9734-7

Klimstra, T. A., & Van Doeselaar, L. (2017). Identity formation in adolescence and young adulthood. In J. Specht (Ed.), *Personality development across the lifespan* (pp.293–308). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (2nd ed.). New York: Pearson.

Koo, M., & Fishbach, A. (2008). Dynamics of self-regulation: How (un)accomplished goal actions affect motivation. *Journal of Personality and Social Psychology*, *94*(2), 183–195. doi: 10.1037/0022-3514.94.2.183

Kristof-Brown, A. L., Li, C. S., & Schneider, B. (2016). Fitting in and doing good: A review of person-environment fit and organizational citizenship behavior research. In P. M. Podsakoff, S. B. Mackenzie, & N. P. Podsakoff (Eds.), *The Oxford handbook of organizational citizenship behavior*. *Oxford University Press*

Kroger, J., Martinussen, M., & Marci, J. E. (2010). Identity status change during adolescence and young adulthood: A meta-analysis. *Journal of Adolescence*, *33*(5), 683–698. doi: 10.1016/j.adolescence.2009.11.002

Kupper, N., Boomsma, D. I., De Geus, E. J., Denollet, J., & Willemsen, G. (2011). Nine-year stability of type D personality: Contributions of genes and environment. *Psychosomatic Medicine*, *73*(1), 75–82. doi: 10.1097/PSY.0b013e3181fdce54

La Guardia, J. G., & Ryan, R. M. (2007). Why identities fluctuate : Variability in traits as a function of situational variations in autonomy support. *Journal of Personality*, *75*, 1205-1228. doi: 10.1111/j.1467-6494.2007.00473.x

Le, K., Donnellan, M. B., & Conger, R. (2014). Personality development at work: Workplace conditions, personality changes, and the corresponsive principle. *Journal of Personality*, *82*(1), 44–56. doi: 10.1111/jopy.12032

Lehnart, J., & Neyer, F. J. (2006): Should I stay or should I go? Attachment and personality in stable and instable romantic relationships. *European Journal of Personality*, *20*(6), 475–495. doi: 10.1002/per.606

Lehnart, J., Neyer, F. J., & Eccles, J. (2010). Long-term effects of social investment: The case of partnering in young adulthood. *Journal of Personality*, *78*(2), 639–670. doi: 10.1111/j.1467-6494.2010.00629.x

Leikas, S., & Salmela-Aro (2015). Personality trait changes among young Finns: The role of life events and transitions. *Journal of Personality*, *83*(1), 117–236. doi: 10.1111/jopy.12088

Little, T. D. (2013). *Longitudinal structural equation modeling*. New York, NY: The Guilford Press.

Lodi-Smith, J., & Roberts, B. W. (2007). Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review*, *11*, 68-86. doi:10.1177/1088868306294590

Lodi-Smith, J., Spain, S. M., Cologgi, K., & Roberts, B. W. (2017). Development of identity clarity and content in adulthood. *Journal of Personality and Social Psychology*, *112*(5), 755–768. doi: 10.1037/pspp0000091

Loevinger, J., Cohn, L. D., Bonneville, L. P., Redmore, C. D., Streich, D. D., & Sargent, M. (1985). Ego development in college. *Journal of Personality and Social Psychology, 48*(4), 947–962. doi: 10.1037//0022-3514.48.4.947

Luan, Z., Hutteman, R., Denissen, J. J.A., Asendorpf, J., & van Aken, M. A. G. (2017). Do you see my growth? Two longitudinal studies on personality development from childhood to young adulthood from multiple perspectives. *Journal of Research in Personality*, *67*, 44–60. doi: 10.1016/j.jrp.2016.03.004

Lucas, R. E., & Donnellan, M. B. (2009). Age differences in personality: Evidence from a nationally representative Australian sample. *Developmental Psychology*, *45*(5), 1353–1363. doi: 10.1037/a0013914

Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, *101*(4), 847–861. doi: 10.1037/a0024298

Lüdtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology*, *101*(3), 620–637. doi: 10.1037/a0023743

Luhmann, M., & Eid, M. (2009). Does it really feel the same? Changes in life satisfaction following repeated life events. *Journal of Personality and Social Psychology*, *97*(2), 363–381. doi: 10.1037/a0015809

Luhmann, M., Orth, U., Specht, J., Kandler, C., & Lucas, R. E. (2014). Studying changes in life circumstances and personality: It's about time. *European Journal of Personality*, *28*, 256-266. doi: 10.1002/per.1951

Luyckx, K., Schwartz, S. J., Goossens, L., & Pollock, S. (2008). Employment, sense of coherence, and identity formation: Contextual and psychological processes on the pathway to sense of adulthood. *Journal of Adolescent Research*, *23*(5), 566–591. doi: 10.1177/0743558408322146

Luyckx, K., Teppers, E., Klimstra, T. A., & Rassart, J. (2014). Identity processes and personality traits and types in adolescence: Directionality of effects and developmental trajectories. *Developmental Psychology*, *50*(8), 2144–2153. doi: 10.1037/a0037256

Magnus, K., Diener, E., Fujita, F., & Pavot, W. (1993). Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of Personality and Social Psychology*, *65*(5), 1046–1053. doi: 10.1037/0022-3514.65.5.1046

Magnusson, D. (1990). Personality research – challenges for the future. *European Journal of Personality*, *4*(1), 1–17. doi: 10.1002/per.2410040102

Malgwi, C. A., Howe, M. A., & Burnaby, P. A. (2005). Influences on Students' Choice of College Major, *Journal of Education for Business*, *80*(5), 275–282, doi: 10.3200/JOEB.80.5.275-282

Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, *3*(5), 551–558. doi: 10.1037/h0023281

Masten, A. S., & Cicchetti, D. (2010). Developmental cascades. *Development and Psychopathology*, *22*(3), 491–495. doi: 10.1017/S0954579410000222

Mayseless, O., & Keren, E. (2014). Finding a meaningful life as a developmental task in emerging adulthood: The domains of love and work across cultures. *Emerging Adulthood*, *2*(1), 63–73. doi: 10.1177/2167696813515446

McAdams, D. P., & Pals, J. L. (2006). A new big five: Fundamental principles for an integrative science of personality. *The American Psychologist*, *61*(3), 204–217. doi: 10.1037/0003-066X.61.3.204

McArdle, J. J. (2009). Latent variable modeling of differences and changes with londitudinal dara. *Annual Review of Psychology*, *60*, 577–605. doi: 10.1146/annurev.psych.60.110707.163612

McCrae, R. R., & Costa, P. T. (1991). Adding Liebe und Arbeit: The full five-factor model and well-being. *Personality and Social Psychology Bulletin*, *17*(2), 227–232.

McCrae, R. R., & Costa, P. T. (1999). A five-factor theory of personality. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed.). New York: Guilford, 1999.

McCrae, R. R., Costa, P. T., Ostendorf, F., Angleitner, A., Hřebíčková, M., Maria, M. D., …, & Sánchez-Bernardos, M. L. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology*, *78*(1), 173–186.

McGue, M., Bacon, S., & Lykken, D. T. (1993). Personality stability and change in early adulthood: A behavioral genetic analysis. *Developmental Psychology*, *29*(1), 96–109. doi: 10.1037/0012-1649.29.1.96

McLean, K. C. (2017). And the story evolves: The development of personal narratives and narrative identity. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 325–338). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Meeus, W. (2011). The study of adolescent identity formation 2000–2010: A review of longitudinal research. *Journal of Research on Adolescence, 21*(1), 75–94. doi: 10.1111/j.1532-7795.2010.00716.x

Meeus, W. (2016). Adolescent psychosocial development: A review of longitudinal models and research. *Developmental Psychology*, *52*(12), 1969–1993. doi: 10.1037/dev0000243

Milojev, P., & Sibley, C. G. (2017). Normative personality trait development in adulthood: A 6-year cohort-sequential growth model. *Journal of Personality and Social Psychology*, *112*(3), 510–526. doi: 10.1037/pspp0000121

Mõttus, R., Allik, J., Hřebičková, M., Kööts-Ausmees, L., & Realo, A. (2016). Age differences in the variance of personality characteristics. *European Journal of Personality*, *30*(1), 4–11. doi: 10.1002/per.2036

Mõttus, R., Johnson, W., & Deary, I. J. (2012). Personality traits in old age: Measurement and rank-order stability and some mean-level change. *Psychology and Aging*, *27*(1), 243–249. doi: 10.1037/a0023690

Mõttus, R., Soto, C. J., Slobodskaya, H. R. (2017). Are all kids alike? The magnitude of individual differences in personality characteristics tends to increase from early childhood to early adolescence. *European Journal of Personality*, *31*(4), 313–328. doi: 10.1002/per.2107

Morizot, J., & Le Blanc, M. (2003). Continuity and change in personality traits from adolescence to midlife: A 25 year longitudinal study comparing representative and adjudicated men. *Journal of Personality*, *71*(5), 705–755, doi: 10.1111/1467-6494.7105002

Mund, M., & Neyer, F. J. (2014). Treating personality-relationship transactions with respect: Narrow facets, advanced models, and extended time frames. *Journal of Personality and Social Psychology*, *107*(2), 352–368. doi: 10.1037/a0036719

Muntaner, C., Garcia-Sevilla, L., Fernandez, A., & Torrubia, R. (1988). Personality dimensions, schizotypal and borderline personality traits and psychosis proneness. *Personality and Individual Differences, 9*(2), 257-268. doi: 10.1016/0191-8869(88)90087-6

National Center for Education Statistics (2016). *Digest of education statistics 2016*. Retrieved June 11, 2018 from https://nces.ed.gov/programs/digest/d16/tables/dt16_105.30.asp

Negru, O. (2012). The time of your life: Emerging adulthood characteristics in a sample of Romanian high-school and university students. *Cognition, Brain, Behavior: An Interdisciplinary Journal, 16*(3), 357-367.

Nelson, D. L., Quick, J. C., & Eakin, M. E. (1988). A longitudinal study of newcomer role adjustment in US organizations. *Work & Stress*, 2, 239-253. doi: 10.1080/02678378808259172

Nelson, L. J., Badger, S., & Wu, B. (2004). The influence of culture in emerging adulthood: Perspectives of Chinese college students. *International Journal of Behavioral Development*, *28*(1), 26–36. doi: 10.1080/01650250344000244

Nelson, L. J., & Barry, C. (2016). Distinguishing Features of Emerging Adulthood. *Journal of Adolescent Research*, *20*(2), 242–262. doi: 10.1177/0743558404273074

Nelson, L. J., & Chen, X. (2007). Emerging adulthood in China : The role of social and cultural factors. *Child Development Perspectives*, *1*(2), 86–91. doi: 10.1111/j.1750-8606.2007.00020.x

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology*, *81*(6), 1190–1204. doi: 10.1037/0022-3514.81.6.1190

Neyer, F. J., & Asendorpf, J. B. (2018). Psychologie der Persönlichkeit [Psychology of Personality] (6th edition). Berlin, Germany: Springer.

Neyer, F. J., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across young adulthood. *Journal of Personality*, *75*, 535–568. doi:10.1111/j.1467-6494.2007.00448.x

Neyer, F. J., Mund, M., Zimmermann, J., & Wrzus, C. (2014). Personality-relationship transactions revisited. *Journal of Personality*, *82*(6), 539–550. doi: 10.1111/jopy.12063

Newen, A. (2011). Wer bin ich? [Who am I?]. *Spektrum*. Retrieved from (13.06.2018): https://www.spektrum.de/news/wer-bin-ich/1063967

Nichols, R. C. (1967). Personality change and the college. *American Educational Research Journal, 4,* 173–190.

Niehoff, E., Petersdotter, L., & Freund, P. A. (2017). International sojourn experience and personality development: Selection and socialization effects of studying abroad and the Big Five. *Personality and Individual Differences*, 112, 55–61. doi: 10.1016/j.paid.2017.02.043

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom. Applying self-determination theory to educational practice. *Theory and Research in Education*, *7,* 133-144. doi: 10.1177/1477878509104318

Nurmi, J. (1993). Adolescent development in an age-graded context: The role of personal beliefs, goals, and strategies in the tackling of developmental tasks and standards. *International Journal of Behavioral Development*, *16*(2), 169–189.

Oblinger, D. (2003). Boomers, gen-xers, and millennials: Understanding the new students. *EDUCAUSE Review*, *38*(4), 36–45.

Ogawa, J. R., Sroufe, L. A., Weinfield, N. S., Carlson, E. A., & Egeland, B. (1997). Development and the fragmented self: Longitudinal study of dissociative symptomatology in a nonclinical sample. *Development and Psychopathology, 9*(4)*,* 855–879. doi: 10.1017/S0954579497001478

Olafsen, A. H., Deci, E. L., & Halvari, H. (2018). Basic psychological needs and work motivation: A longitudinal test of directionality. *Motivation and Emotion*, *42*, 178–189. doi: 10.1007/s11031-017-9646-2

Orth, U., & Robins, R. W. (2014). The development of self-esteem. *Current Directions in Psychological Science*, *23*(5), 381–387. doi: 10.1177/0963721414547414

Oxford English Dictionary (2018). Retrieved from: http://www.oed.com/view/Entry/141486?redirectedFrom=personality#eid

Parker, P. D., Lüdtke, O., Trautwein, U., & Roberts, B. W. (2012). Personality and relationship quality during the transition from high school to early adulthood. *Journal of Personality*, *80*(4), 1061–1089. doi: 10.1111/j.1467-6494.2012.00766.x

Parks-Leduc, L., Feldman, G., & Bardi, A. (2015). Personality traits and personal values: A meta-analysis. *Personality and Social Psychology Review*, *19*(1), 3–29. doi: 10.1177/1088868314538548

Patrick, H., Knee, C. R., Canevello, A., & Lonsbary, C. (2007). The role of need fulfillment in relationship functioning and well-being: A self-determination theory perspective. *Journal of Personality and Social Psychology*, *92*(3), 434–457. doi: 10.1037/0022-3514.92.3.434

Patrick, H., Ryan, A. M., & Kaplan, A. (2007). Early adolescents' perceptions of the classroom social environment, motivational beliefs, and engagement. *Journal of Educational Psychology, 99*(1), 83–98. doi: 10.1037/0022-0663.99.1.83

Pedersen, W. (1991). Mental health, sensation seeking and drug use patterns: A longitudinal study. *British Journal of Addiction, 86,* 195–204.

Penton-Voak, I. S., Thomas, J., Gage, S. H., McMurran, M., McDonald, S., & Munafõ, M. R. (2013). Increasing recognition of happiness in ambiguous facial expressions reduces anger and aggressive behavior. *Psychological Science*, *24*(5), 688–697. doi: 10.1177/0956797612459657

Peterson, B. E., & Lane, M. D. (2001). Implications of authoritarianism for young adulthood: Longitudinal analysis of college experiences and future goals. *Personality and Social Psychology Bulletin, 27,* 678–690.

Piccione, C., Hilgard, E. R., & Zimbardo, P. G. (1989). On the degree of stability of measured hypnotizability over a 25-year period. *Journal of Personality and Social Psychology, 56,* 289–295.

Pogue-Geile, M. F., & Rose, R. J. (1985). Developmental genetic studies of adult personality. *Developmental Psychology, 21,* 547–557.

Popham, S. M., & Holden, R. R. (1991). Psychometric properties of MMPI factor scales. *Personality and Individual Differences, 12,* 513–517.

Poonamallee, L., Harrington, A. M., Nagpal, M., & Musial, A. (2018). Improving emotional intelligence through personality development: The effect of the smart phone application based Dharma Life Program on emotional intelligence. *Frontiers in Psychology*, *9*, 169. doi: 10.3389/fpsyg.2018.00169

Precht, R. D. (2017). *Who am I and if so how many? A journey through your mind*. Constable.

Pullmann, H., Raudsepp, L., & Allik, J. (2006). Stability and change in adolescents‘ personality: A longitudinal study. *European Journal of Personality*, *20*(6), 447–459. doi: 10.1002/per.611

Pytlik Zillig, L. M., Hemenover, S. H., & Dienstbier, R. A. (2002). What do we assess when we assess a Big 5 trait? A content analysis of the affective, behavioral, and cognitive processes represented in Big 5 personality inventories. *Personality and Social Psychology Bulletin*, *28*(6), 847–858. doi: 10.1177/0146167202289013

Quintus, M., Egloff, B., & Wrzus, C. (2017). Predictors of volitional personality change in younger and older adults: Response surface analyses signify the complementary perspectives of the self and knowledgeable others. *Journal of Research in Personality*, *70*, 214–228. doi: 10.1016/j.jrp.2017.08.001

Rammstedt, B., Goldberg, L. R., & Borg, I. (2010). The measurement equivalence of big-five factor markers for persons with different levels of education. *Journal of Research in Personality*, *44*, 53-61. doi:10.1016/j.jrp.2009.10.005

Rauthmann, J. F. (2012). You say the party is dull, I say it is lively: A componential approach to how situations are perceived to disentangle perceiver, situation, and perceiver x situation variance. Social Psychological and Personality Science, 3(5). 519–528. doi: 10.1177/1948550611427609

Rauthmann, J. F., Gallardo-Pujol, D., Guillaume, E. M., Todd, E., Nave, C. S., Sherman, R. A., Ziegler, M., Jones, A. B., & Funder, D. C. (2014). The situational eight DIAMONDS: A taxonomy of major dimensions of situation characteristics. *Journal of Personality and Social Psychology*, *107*, 677-718. doi: 10.1037/a0037250.supp

Redmore, C. D. (1983). Ego development in the college years: Two longitudinal studies. *Journal of Youth and Adolescence, 12*(4), 301-306.

Reicherts, M., & Pihet, S. (2000). Job newcomers coping with stressful situations: A micro-analysis of adequate coping and well-being. *Swiss Journal of Psychology*, *59*, 303-316. doi: 10.1024//1421-0185.59.4.303

Reis, H. T. (2008). Reinvigorating the concept of situation in social psychology. *Personality and Social Psychology Review*, *12*(4), 311–329. doi: 10.1177/1088868308321721

Reitz, A. K., Zimmermann, J., Hutteman, R., Specht, J., & Neyer, F. J. (2014). How peers make a difference: The role of peer groups and peer relationships in personality development. *European Journal of Personality*, *28*(3), 279–288. doi: 10.1002/per.1965

Retelsdorf, J., Lindner, C., Nickolaus, R., Winther, E., & Köller, O. (2013). Forschungsdesiderate und Perspektiven – Ausblick auf ein Projekt zur Untersuchung mathematisch-naturwissenschaftlicher Kompetenzen in der beruflichen Erstausbildung (ManKobE). *Zeitschrift für Berufs- und Wirtschaftspädagogik*, Beiheft 26, 227-234.

Roberts, B. W. (1997). Plaster or plasticity: Are adult work experiences associated with personality changes in women? *Journal of Personality, 65*(2), 205–232. doi: 10.1111/j.1467-6494.1997.tb00953.x

Roberts, B. W. (2009). Back to the future: Personality and Assessment and personality development. *Journal of Research in Personality*, *43*(2), 137–145. doi: 10.1016/j.jrp.2008.12.015

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2001). The kids are alright: Growth and stability in personality development from adolescence to adulthood. *Journal of Personality and Social Psychology*, *81*(4), 670–683. doi: 10.1037//0022-3514.81.4.670.

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, *84*, 582–593. doi:10.1037/0022-3514.84.3.582

Roberts, B. W., & Chapman, C. N. (2000). Change in dispositional well-being and its relation to role quality: A 30-year longitudinal study. *Journal of Research in Personality*, *34*(1), 26–41. doi: 10.1006/jrpe.1999.2259

Roberts, B. W., & Davis, J. P. (2016). Young adulthood is the crucible of personality development. *Emerging Adulthood*, *4*(5), 318–326. doi: 10.1177/2167696816653052

Roberts, B. W., & DelVecchio (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, *126*(1), 3–25. doi: 10.1037//0033-2909.126.1.3

Roberts, B. W., Helson, R., & Klohnen, E. C. (2002). Personality development and growth in women across 30 years: Three perspectives. *Journal of Personality*, *70*(1), 79–102. doi: 10.1111/1467-6494.00179

Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin*, *143*(2), 117–141. doi: 10.1037/bul0000088

Roberts, B. W., & Mroczek, D. (2008). Personality Trait Change in Adulthood. *Current Directions in Psychological Science*, *17*(1), 31–35. doi: 10.1111/j.1467-8721.2008.00543.x

Roberts, B. W., & Nickel, L. B. (2017). A critical evaluation of the neo-socioanalytic model of personality. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 157–177). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Roberts, B. W., O'Donnell, & Robins, R. W. (2004). Goal and personality trait development in emerging adulthood. *Journal of Personality and Social Psychology*, *87*(4), 541–550. doi: 10.1037/0022-3514.87.4.541

Roberts, B. W., & Robins, R. W. (2004). Person-environment fit and its implications for personality development: A longitudinal study. *Journal of Personality*, *72*(1), 89–110. doi: 10.1111/j.0022-3506.2004.00257.x

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*(1), 1–25. doi: 10.1037/0033-2909.132.1.1

Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-socioanalytic model of personality. In D. Mroczek, & T. Little (Eds.), *Handbook of personality development* (pp. 11–39). Mahwah, NJ: Lawrance Erlbaum Associates. doi: 10.4324/9781315805610

Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research* (pp. 375–398). New York, NY: The Guilford Press.

Robins, R. W., Fraley, R. C., Roberts, B. W., & Trzesniewski, K. H. (2001). A longitudinal study of personality change in young adulthood. *Journal of Personality*, *69*(4), 617–640, doi: 10.1111/1467-6494.694157

Rogers, C. R. (1959). A Theory of Therapy, Personality, and Interpersonal Relationships: As Developed in the Client-Centered Framework. In S. Koch (Ed.), *Psychology: A Study of a Science. Formulations of the Person and the Social Context* (Vol. 3, pp. 184-256). New York: McGraw Hill.

Rohrer, J. M., Egloff, B., Kosinski, M., Stillwell, D., & Schmukle, S. C. (2017). In your eyes only? Discrepancies and agreement between self- and other-reports of personality from age 14 to 29. *Journal of Personality and Social Psychology*.

Roisman, G. I., Masten, A. S., Coatsworth, J. D., & Tellegen, A. (2004). *Child Development*, *75*(1), 123–133.doi: 10.1111/j.1467-8624.2004.00658.x

Rollnick, S., Miller, W., Butler, C. C., & Aloia, M. S. (2009). Motivational interviewing in health care: Helping patients change behavior. *COPD: Journal of Chronic Obstructive Pulmonary Disease*, *5*(3), 203. doi: 10.1080/15412550802093108

Ryan, R. M., Bernstein, J. H., & Brown, K. W. (2010). Weekends, work, and well-being: Psychological need satisfactions and day of the week effects on mood, vitality, and physical symptoms. *Journal of Social and Clinical Psychology*, *29*(1), 95–112. doi: 10.1521/jscp.2010.29.1.95

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. doi: 10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2008). Self-determination theory and the role of basic psychological needs in personality and the organization of behavior. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 654–678). New York, NY, US: Guilford Press.

Saks, A. M., & Ashforth, B. E. (1996). Proactive socialization and behavioral self-management. *Journal of Vocational Behavior*, *48*, 301-323. doi: 10.1006/jvbe.1996.0026

Saucier, G. (1998). Replicable item-cluster subcomponents in the neo five-factor inventory. *Journal of Personality Assessment*, 70, 263–276. doi: 10.1207/s15327752jpa7002_6

Schaffhuser, K., Wagner, J., Lüdtke, O., & Allemand, M. (2014). Dyadic longitudinal interplay between personality and relationship satisfaction: A focus on neuroticism and self-esteem. *Journal of Research in Personality*, *53*, 124–133. doi: 10.1016/j.jrp.2014.08.007

Schmidt, J., Klusmann, U., Lüdtke, O., Möller, J. & Kunter, M. (2017). What makes good and bad days for beginning teachers? A diary study on daily uplifts and hassles. *Contemporary Educational Psychology*, 48, 85-97. doi: 10.1016/j.cedpsych.2016.09.004

Schmiedek, F. (2017). Development of cognition and intelligence. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 309–323). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00003-X

Schofield, W. (1953). A study of medical students with the MMPI: II. Group and individual changes after two years. *Journal of Psychology, 37*(1)*,* 137–141.

Schultz, D. P., & Schultz, S. E. (2017). *Theories of Personality* (11th ed.). Boston, MA: Cengage Learning.

Schuurman, N. K., Ferrer, E., Boer-Sonnenschein, M., & Hamaker, E. L. (2016). How to compare cross-lagged associations in a multilevel autoregressive mode. *Psychological Methods*, *21*(2), 206–221. doi: 10.1037/met0000062

Schwaba, T., & Bleidorn, W. (2017). Individual differences in personality change across the adult life span. *Journal of Personality*, *86*(3), 450–464. doi: 10.1111/jopy.12327

Schwaba, T., Luhmann, M., Denissen, J. J. A., Chung, J. M., & Bleidorn, W. (2018). Openness to experience and culture-openness transactions across the lifespan. *Journal of Personality and Social Psychology.* Advance online publication. doi: 10.1037/pspp0000150

Schwartz, S. H. (1977). Normative influences on altruism. In J. Berkowitz (Ed.), *Advances in Experimental Social Psychology: Vol. 10*, pp. 221–279. doi: 10.1016/S0065-2601(08)60358-5

Schwartz, S. J., Luyckx, K., & Vignoles, V. L. (Eds.) (2011). *Handbook of identity theory and research*. New York, NY: Springer.

Schwartz, S. J., Zamboanga, B. L., Luyckx, K., Meca, A., & Ritchie, R. A. (2013). Identity in emerging adulthood: Reviewing the field and looking forward. *Emerging Adulthood*, *1*(2), 96–113. doi: 10.1177/2167696813479781

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology*, *91*(6), 1152–1165. doi: 10.1037/0022-3514.91.6.1152

Seiffge-Krenke, I., Luyckx, K., & Salmela-Aro, K. (2014). Work and love during emerging adulthood: Introduction to the special issue. *Emerging Adulthood*, *2*(1), 3–5. doi: 10.1177/2167696813516091

Selfhout, M., Burk, W., Branje, S., Denissen, J. J., van Aken, M., & Meeus, W. (2010). Emerging late adolescent friendship networks and big five personality traits: A social network approach. *Journal of Personality*, *78*(2), 509–538. doi: 10.1111/j.1467-6494.2010.00625.x

Shaw, E. J., & Barbuti, S. (2010). Patterns of persistence in intended college major with a focus on STEM majors. *NACADA Journal*, *30*(2), 19–34. doi: 10.12930/0271-9517-30.2.19

Sheldon, K. M., & Prentice, M. (2017). Self-determination theory as a foundation for personality researchers. *Journal of Personality*, Accepted manuscript. doi: 10.1111/jopy.12360

Shiner, R. L., Allen, T. A., & Masten, A. S. (2017). Adversity in adolescence predicts personality trait change from childhood to adulthood. *Journal of Research in Personality*, 67, 171–182. doi: 10.1016/j.jrp.2016.10.002

Shulman, S., & Connolly, J. (2013). The challenge of romantic relationships in emerging adulthood: Reconceptualization of the field. *Emerging Adulthood*, *1*(1), 27–39. doi: 10.1177/2167696812467330

Simmons, R. (Ed.). (1987). *Moving into Adolescence*. New York: Routledge.

Sirsch, U., Dreher, E., Mayr, E., & Willinger, U. (2009). What does it take to be an adult in Autria? Views of adulthood in Austrian adolescents, emerging adults, and adults. *Journal of Adolescent Research*, *24*(3), 275–292. doi: 10.1177/0743558408331184

Skinner, B. F. (2011). *About behaviorism*. Knopf Doubleday Publishing Group.

Sommerville, J. A., Woodward, A. L., & Needham, A. (2005). Action experience alters 3-month-old infants' perception of others' actions. *Cognition*, *96*(1), B1–11. doi: 10.1016/j.cognition.2004.07.004

Soto, C. J. (2016). The little six personality dimensions from early childhood to early adulthood: Mean-level age and gender differences in parents' reports. *Journal of Personality*, *84*(4), 409–422. doi: 10.1111/jopy.12168

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2008). Developmental psychometrics of big five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology*, *94*, 718-737. Doi: 10.1037/0022-3514.94.4.718

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology*, *100*(2), 330–348. doi: 10.1037/a0021717

Soto, C. J., & Tackett, J. L. (2015). Personality traits in childhood and adolescence: Structure, development, and outcomes. *Current Directions in Psychological Science*, 24, 358-362. Doi: 10.1177/0963721415589345

Specht, J. (2017). Personality development in reaction to major life events. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 341–356). Amsterdam: Elsevier. doi:10.1016/B978-0-12-804674-6.00002-8

Specht, J., Bleidorn, W., Denissen, J. J. A., Hennecke, M., Hutteman, R., Kandler, C., …, & Zimmermann, J. (2014). What drives adult personality development? A comparison of theoretical perspectives and empirical evidence. *European Journal of Personality*, *28*(3), 216–230. doi: 10.1002/per.1966

Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the big five. *Journal of Personality and Social Psychology*, *101*(4), 862-882. doi: 10.1037/a0024950

Spence, A., Poortinga, W., Butler, C., & Pidgeon, N. F. (2011). Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change*, *1*(1), 46–49. doi: 10.1038/NCLIMATE1059

Srivastava, S., John, O. P., Gosling, S. D., & Potter, J. (2003). Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology*, *84*(5), 1041–1053. doi: 10.1037/0022-3514.84.5.1041

Stacy, A. W., Newcomb, M. D., & Bentler, P. M. (1991). Social psychological influences on sensation seeking from adolescence to adulthood. *Personality and Social Psychology Bulletin, 17,* 701-708.

Statista (2018). Retrieved from (09.06.2018): https://de.statista.com/statistik/daten/studie/1329/umfrage/heiratsalter-lediger-frauen/

Statistisches Bundesamt (2018). Retrieved from (16.07.2018): https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/Bildungsstand/Aktuell.html

Stein, J. A., Newcomb, M. D., & Bentler, P. M. (1986). Stability and change in personality: A longitudinal study from early adolescence to young adulthood. *Journal of Research in Personality, 20,* 276-291.

Stevens, D. P., & Truss, C. V. (1985). Stability and change in adult personality over 12 and 20 years. *Developmental Psychology, 21*(3), 568–584. doi: 10.1037//0012-1649.21.3.568

Stewart, L. H. (1964). Change in personality test scores during·college. *Journal of Counseling Psychology, 11,* 211-220.

Stoll, G., Rieger, S., Lüdtke, O., Nagengast, B., Trautwein, U., & Roberts, B. W. (2017). Vocational interests assessed at the end of high school predict life outcomes assessed 10 years later over and above IQ and Big Five personality traits. *Journal of Personality and Social Psychology*, *113*(1), 167–184. doi: 10.1037/pspp0000117

Sturaro, C., Denissen, J. J. A., van Aken, M. A. G., & Asendorpf, J. B. (2008). Person-environment transactions during emerging adulthood. *European Psychologist*, *13*(1), 1-11. doi:10.1027/1016-9040.13.1.1

Su, R., Murdock, C., & Rounds, J. (2015). Person-environment fit. In P. J. Hartung, M. L. Savickas, & W. B. Walsh (Eds.), *APA handbooks in psychology. APA handbook of career intervention, Vol. 1. Foundations* (pp. 81–98). Washington, DC, US: American Psychological Association. doi: 10.1037/14438-005

Sutin, A. R., & Costa, P. T. (2010). Reciprocal influences of personality and job characteristics across middle adulthood. *Journal of Personality*, *78*(1), 257–288. doi: 10.1111/j.1467-6494.2009.00615.x

Syed, M. (2015). Emerging Adulthood: Developmental Stage, Theory, or Nonsense? In J. J. Arnett (Ed.), *The Oxford Handbook of Emerging Adulthood* (pp. 11–25). Oxford, UK: The Oxford University Press.

Syed, M., & Seiffge-Krenke, I. (2013). Personality development from adolescence to emerging adulthood: Linking trajectories of ego development to the family context and identity formation. *Journal of Personality and Social Psychology*, *104*(2), 371–384. doi: 10.1037/a0030070

Tabachnick, S. E., Miller, R. B., & Relyea, G. E. (2008). The relationships among students' future-oriented goals and subgoals, perceived task instrumentality, and task-oriented self-regulation strategies in an academic environment. *Journal of Educational Psychology, 100*(3), 629–642. doi: 10.1037/0022-0663.100.3.629

Tanner, J. L., & Arnett, J. J. (2011). Presenting “emerging adulthood”: What makes it developmentally distinctive. In J. J. Arnett, M. Kloep, L. B. Hendry, & J. L. Tanner (Eds.), *Debating Emerging Adulthood: Stage or Process?.* New York: Oxford University Press, Inc. Doi: 10.1093/acprof:oso/9780199757176.003.0002.

Trautwein, U., Neumann, M., Nagy, G., Lüdtke,. O., & Maaz, K. (Hrsg.). (2010). *Schulleistungen von Abiturienten: Die neu geordnete gymnasiale Oberstufe auf dem Prüfstand* [*School performance of high school graduates: The newly structured secondary school level (Gymnaisum) on trial*]. Wiesbaden: VS-Verlag für Sozialwissenschaften.

Tubes, E. C., & Christal, R. E. (1992). Recurrent personality factors based on trait ratings. *Journal of Personality*, *60*(2), 225–251. doi: 10.1111/j.1467-6494.1992.tb00973.x

Twenge, J. M., & Campbell, W. K. (2009). *The narcissim epidemic: Living in the age of entitlement*. New York, NY: Free Press.

Twenge, J. M., Campbell, W. K., & Freeman, E. C. (2012). Generational differences in young adults' life goals, concern for others, and civic orientation, 1966-2009. *Journal of Personality and Social Psychology*, *102*(5), 1045–1062. Doi: 10.1037/a0027408

Twenge, J. M., Carter, N. T., & Campbell, W. K. (2017). Age, time period, and birth cohort differences in self-esteem: Reexamining a cohort-sequential longitudinal study. *Journal of Personality and Social Psychology*, *112*(5), e9–e17. doi: 10.1037/pspp0000122

Twenge, J. M., Konrath, S., Foster, J. D., Campbell, W. K., & Bushman, B. J. (2008a). Egos inflating over time: A cross-temporal meta-analysis of the narcissistic personality inventory. *Journal of Personality*, *76*(4), 875–902. doi: 10.1111/j.1467-6494.2008.00507.x

Twenge, J. M., Konrath, S., Foster, J. D., Campbell, W. K., & Bushman, B. J. (2008b). Further evidence of an increase in narcissism among college students. *Journal of Personality*, *76*(4), 919–928. doi: 10.1111/j.1467-6494.2008.00509.x

United States Census Bureau (2017). Retrieved from (09.06.2018): https://www.census.gov/data/tables/time-series/demo/families/marital.html

United States Census Bureau (2018). Retrieved from (16.07.2018): https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_1YR_S1501&prodType=table

Vaidya, J. G., Gray, E. K., Haig, J., & Watson, D. (2002). On the temporal stability of personality: Evidence for differential stability and the role of life experiences. *Journal of Personality and Social Psychology*, *83*(6), 1469–1484. doi: 10.1037//0022-3514.83.6.1469

Van Aken, M. A. G., Denissen, J. J. A., Branje, S. J. T., Dubas, J. S., & Goossens, L. (2006). Midlife concerns and short-term personaity change in middle adulthood. *European Journal of Personality*, *20*(6), 497–513. doi: 10.1002/per.603

Van den Akker, A. L., Deković, M., Asscher, J., & Prinzie, P. (2014). Mean-level personality development across childhood and adolescence: A temporary defiance of the maturity

principle and bidirectional associations with parenting. *Journal of Personality and Social Psychology*, *107*(4), 736–750. doi: 10.1037/a0037248

Van den Broeck, A., Ferris, D. L., Chang, C., & Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *Journal of Management*, *42*, 1195–1229. doi: 10.1177/0149206316632058

Van der Velde, M. E. G., Feij, J. A., & Taris, T. W. (1995). Stability and change of person characteristics among young adults: The effect of the transition from school to work. *Personality and Individual Differences, 18,* 89–99. doi: 10.1016/0191-8869(94)00111-5

Van Scheppingen, M. A., Denissen, J. J. A., Chung, J. M., Tambs, K., & Bleidorn, W. (2018). Self-esteem and relationship satisfaction during the transition to motherhood. *Journal of Personality and Social Psychology*, *114*(6), 973–991. doi: 10.1037/pspp0000156

Van Scheppingen, M. A., Jackson, J. J., Specht, J., Hutteman, R., Denissen, J. J. A., & Bleidorn, W. (2016). Personality trait development during the transition to parenthood: A test of social investment theory. *Social Psychological and Personality Science*, *7*(5), 452–462. doi: 10.1177/1948550616630032

Van Vianen, A. E. M. (2018). Person-environment fit: A review of its basic tenets. Annual *Review of Organizational Psychology and Organizational Behavior*, *5*(1), 75–101. doi: 10.1146/annurev-orgpsych-032117-104702

Vecchione, M., Alessandri, G., Barbaranelli, C., & Caprara, G. (2012). Gender differences in the Big Five personality development: A longitudinal investigation from late adolescence to emerging adulthood. *Personality and Individual Differences*, *53*(6), 740–746. doi: 10.1016/j.paid.2012.05.033

Vernon, M. (1970). *Perception Through Experience*. London: Routledge.

Viken, R. J., Rose, R. J., Kaprio, J., & Koskenvuo, M. (1994). A developmental genetic analysis of adult personality: Extraversion and neuroticism from 18 to 59 years of age. *Journal of Personality and Social Psychology, 66*(4), 722–730. doi: 10.1037/0022-3514.66.4.722

Voelkle, M., & Wagner, J. (2017). Analyzing personality change: From average trajectories to within-person dynamics. In J. Specht (Ed.), *Personality Development Across the Lifespan* (pp. 497-516). London: Academic Press.

Voss, T., Wagner, W., Klusmann, U., Trautwein, U., & Kunter, M. (2017). Changes in beginning teachers‘ classroom management knowledge and emotional exhaustion during the induction phase. *Contemporary Educational Psychology*, *51*, 170-184. doi: 10.1016/j.cedpsych.2017.08.002

Wagenmakers, J.-E., & Farrell, S. (2004). AIC model selection using Akaike weights. *Psychonomic Bulletin & Review*, *11*(1), 192–196. doi: 10.3758/BF03206482

Wagner, J., Becker, M., Lüdtke, O., & Trautwein, U. (2015). The first partnership experience and personality development: A propensity score matching study in young adulthood. *Social Psychological and Personality Science*, *6*(4), 455–463. doi: 10.1177/1948550614566092

Wagner, J., Lüdtke, O., Roberts, B. W., & Trautwein, U. (2014). Who belongs to me? Social relationship and personality characteristics in the transition to young adulthood. *European Journal of Personality*, *28*(6), 586–603. doi: 10.1002/per

Waterman, A. S. (1999). Identity, the identity statuses, and identity status development: a contemporary statement. *Developmental Review*, *19*(4), 591–621. doi: 10.1006/drev.1999.0493

Watson, D., & Humrichouse, J. (2006). Personality development in emerging adulthood: Integrating evidence from self-ratings and spouse ratings. *Journal of Personality and Social Psychology*, *91*, 959-974. doi:10.1037/0022-3514.91.5.959

Wheeler, D. S., & Schwartz, J. C. (1989). Millon Clinical Multiaxial lnventory (MCMI) scores with a collegiate sample: Long-tenn stability and seif-other agreement. *Journal of Psychopathology and Behavioral Assessment, 11*(4)*,* 339-352. doi: 10.1007/BF00961532

Witt, J. K. (2011). Action’s effect on perception. *Current Directions in Psychological Science*, *20*(3), 201–206. doi: 10.1177/0963721411408770

Wood, D., & Denissen, J. J. A. (2015). A functional perspective on personality trait development. In N. R. Branscombe & K. Reynolds (Eds.), *Psychology of change: Life contexts, experiences, and identities* (pp. 97–115). New York, NY: Psychology Press

Wood, W., & Neal, D. T. (2007). A new look at habits and the habit-goal interface. *Psychological Review*, *114*, 843–863. doi:10.1037/0033-295X.114.4.843

Wortman, J., Lucas, R. E., & Donnellan, M. B. (2012). Stability and change in the Big Five personality domains: Evidence from a longitudinal study of Australians. *Psychology and Aging*, *27*(4), 867–874. doi: 10.1037/a0029322

Wrzus, C., Hänel, M., Wagner, J., & Neyer, F. J. (2013). Social network changes and life events across the life span: A meta-analysis. *Psychological Bulletin*, *139*, 53–80. doi: 10.1037/a0028601

Wrzus, C., & Mehl, M. R. (2015). Lab and/or field? Measuring personality processes and their social consequences. *European Journal of Personality*, *29*(2), 250–271. doi: 10.1002/per.1986

Wrzus, C., & Neyer, F. J. (2016). Co-development of personality and friendships across the lifespan. *European Psychologist*, *21*(4), 254–273, doi: 10.1027/1016-9040/a000277

Wrzus, C., & Roberts, B. W. (2017). Processes of personality development in adulthood: The TESSERA framework. *Personality and Social Psychology Review*, *21*(3), 253–277. doi: 10.1177/1088868316652279

Wrzus, C., Zimmermann, J., Mund, M., & Neyer, F. J. (2017). Friendships in young and middle adulthood: Normative patterns and personality differences. In M. Hojjat & A. Moyer (Eds.), *The psychology of friendship* (21–38). New York: Oxford University Press.

Wu, C. (2016). Personality change via work: A job demand-control model of big five personality changes. *Journal of Vocational Behavior*, *92*, 157–166. doi: 10.1016/j.jvb.2015.12.001

Yonge, G. D., & Regan, M. C. (1975). A longitudinal study ofpersonality and choice of major. *Journal of Vocational Belwvior, 7*(1), 41-65. doi: 10.1016/0001-8791(75)90033-0

Zimmermann, J., & Neyer, F. J. (2013). Do we become a different person when hitting the road? Personality development of sojourners. *Journal of Personality and Social Psychology*, *105*(3), 515–530. doi: 10.1037/a0033019

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