# Tapping the Power of Employee Perceptions: Development and Validation of a Sound Structural Measurement Model for Employee Surveys


**Inauguraldissertation**

zur Erlangung des Doktorgrades der Philosophie

an der Ludwig-Maximilians-Universität München

vorgelegt von

**Björn Dominik Matthaei**

aus Burlington, Vermont

2018

Erstgutachter: Prof. Dr. Felix C. Brodbeck

Zweitgutachter: Prof. Dr. Dieter Frey

Datum der mündlichen Prüfung: 04. Februar 2019

## Abstract

Organizations more and more attempt to utilize employee survey data for evidence-based management (EbM) and organizational change. However, employee survey models are often underdeveloped in structure and seldom systematically validated, what limits their value for these purposes. The aim of the presented thesis was to address this gap with three studies developing, validating and applying the first published integrative science-based employee survey process model. Based on a review of scientific employee survey models, in the *first study*, seven potential process models are proposed. These models are comparatively tested by applying structural-equation-modelling to a meta-analytical synthesis of N = 123 meta-analyses from psychology, management science and business research. We find evidence for a mediation model with two general dimensions of employees' perceived work environment affecting their job attitudes and organizational outcomes. In the *second study*, this model is validated in three large-scale empirical field studies. The studies support causality of the models' structural assumptions as well as its generalizability to an analysis on work unit level. With the *third study*, a case example of working with survey data generated with the newly developed model to acquire evidence for EbM in practice is presented. Overall, the research contributes to the employee survey literature by developing a first all-around scientifically sound employee survey model with validated causal model structure and offering first evidence for the relevance of multi-level modeling in employee survey models. Further, it contributes theoretically to the understanding of people outcomes and organizational adaptability emergence from employees' work environment perceptions. In sum, this thesis provides a survey model with which organizations can apply survey data for EbM to improve organizational development and managerial decision-making.

## Zusammenfassung

Angesichts sich konstant verändernder politischer und wirtschaftlicher Rahmenbedingungen versuchen immer mehr Unternehmen, Daten aus Mitarbeiterbefragungen als Ausgangspunkt für gezielte Organisationsentwicklung und für Evidenzbasiertes Management (EbM) zu nutzen. Existierende Messmodelle für Mitarbeiterbefragungen sind jedoch in ihren strukturellen Annahmen oft unterentwickelt und kaum systematisch validiert, was ihren Nutzen für diese Zwecke einschränkt. Ziel der vorliegenden Doktorarbeit ist es deshalb, diese Lücke zu schließen und über drei Studien das erste integrative wissenschaftliche Strukturmodell für Mitarbeiterbefragungen zu entwickeln, zu validieren und in der Praxis beispielhaft für EbM anzuwenden. Ausgehend von einem Review aktuell wissenschaftlich publizierter Messmodelle für Mitarbeiterbefragungen werden, in Studie 1, sieben potenzielle Strukturmodelle deduziert. Auf der Basis einer meta-meta-analytischen Synthese von 123 Meta-Analysen aus den Bereichen Psychologie, Management Science und Business Research werden diese sieben Modelle deduzierten mittels meta-meta-analytischen Strukturgleichungsmodellen vergleichend getestet. Die Ergebnisse stützen ein Mediationsmodell, das zwei zentrale Dimensionen der wahrgenommenen Arbeitsumgebung beschreibt, die die Arbeitseinstellungen von Mitarbeitern und organisationale Leistungsindikatoren beeinflussen. Dieses sogenannte Transformation-Transaction Model wird in Studie 2 in drei großen Feldstudien empirisch validiert. Die Ergebnisse stützen die Kausalität der strukturellen Annahmen des Modells sowie dessen Generalisierbarkeit für Auswertungen und Analysen auf Abteilungsebene. Zuletzt präsentiert Studie 3 als Anwendungsbeispiel, wie aus Mitarbeiterbefragungsdaten, die auf Basis des neu entwickelten Modells erhoben wurden, in der Praxis Evidenz für EbM generiert werden kann. Zusammengefasst leistet

die vorliegende Doktorarbeit einen wichtigen Beitrag zur Mitarbeiterbefragungsliteratur, indem sie ein erstes wissenschaftlich fundiertes Mitarbeiterbefragungsmodell mit validierter kausaler Modellstruktur entwickelt und darüber hinaus erste Hinweise für die Relevanz von Multilevel-Modellierung in Mitarbeiterbefragungsmodellen liefert. Theoretisch trägt die Arbeit ferner zu einem vertieften Verständnis davon bei, wie die Wahrnehmungen der Arbeitsumgebung von Mitarbeitern deren Arbeitseinstellungen und die Anpassungsfähigkeit der Organisation beeinflussen können. Insgesamt, wird mit dem Transformation-Transaction Model ein Mitarbeiterbefragungsmodell präsentiert, über das Organisationen Befragungsdaten zielgerichtet für EbM verwenden können, um ihre Organisationsentwicklung zu fördern und Management-Entscheidungen zu verbessern.

## Acknowledgement

Throughout my dissertation, I have received a lot of support, personally and professionally, that helped me keep moving forward. Therefore, I would like to thank all the people who stood next to me during this demanding but wonderful journey. I am indebted to them all.

First of all, I would like to thank Prof. Dr. Felix C. Brodbeck for his exceptionally motivational mentoring and supervision. Thank you for taking all the time and for always being approachable – it really facilitated the creation of this work. I will always remember the Schwabinger late night kitchen discussions on employee surveys, organizational culture, psychology and philosophy. I am also grateful to my second adviser Prof. Dr. Dieter Frey and to Prof. Dr. Martin Högl for his readiness to attend the disputation.

Further, I would like to express my deepest gratitude to Silvia Nierbauer for her wholehearted support throughout my dissertation, and for always having an open ear when necessary. I would also like to thank Yeliz Toklu, for the invaluable daily professional exchange and the many stimulating discussions. All the pleasant moments with you make work even more enjoyable.

Most importantly, I would like to thank Lucy, the love of my life, for her patience, perseverance and for always being there. Your support and love give me the strength to pursue my goals. Finally yet importantly, of course, I want to thank my wonderful parents, my sister, Svenja, and my brother, Thorben, for their unconditional love, and for making me the person I am today.

## Table of Contents

## List of Tables

## List of Figures

## List of Abbreviations

| | |
|---|---|
| EbM | Evidence-based management |
| HR | Human Resource |
| OD | Organizational Development |
| TFTA model | Transformation-Transaction employee survey model |
| MMASEM | Meta-meta-analytic structural equation modeling |

# 1 General Introduction

Change and unpredictability are an ever-present reality in modern society and modern organizations. Especially, market and political environments are changing fast these days. Innovative ideas, so called “disruptive technologies” (Christensen, Horn, & Johnson, 2008), “transform their industries” (Finz-enz, 2010, p. 3). Within such challenging environments, it helps organizations to display adequate agility in order to remain adaptable to change. Enabling organizations to adapt quickly to change is a task of modern Human Resource (HR) management. Acquiring and developing talent and installing recurring feedback instruments and mechanisms to quickly learn are just some of HR managements levers to promote organizational adaptability. Despite growing pressure for HR departments to prepare their organizations for disruptive changes, HR management and practice has not fully aligned to tackle the new demands (Finz-enz, 2010). To meet these challenges, more and more companies’ HR departments attempt to introduce data and evidence driven management (Bersin, 2016; Galbraith, 2014) through approaches like “evidence-based management” (EbM). With EbM they try to make use of available evidence and data analytics to reduce managing by feelings in favor of deciding based on information (e.g., Rousseau, & Gunia, 2016; Strohmeier, & Piazza, 2015; Shah, Irani, & Sharif, 2017). Successful implementation of evidence-based management in HR requires access to relevant and accurate people data (Bersin, 2016; Finz-enz, 2010). Regularly these contain basic metrics like “total head count”, “time to hire”, “retention rate”, “compensation” and sometimes employees’ performance evaluations. A key internal data provider for evidence-based management (Bersin, 2016), however is often overlooked within these systems and by HR management - the employee survey.

Employee surveys, that are conducted by over 75 % of all large companies in the US and Germany (Hossiep & Frieg, 2013; Wiley, 2010), can provide insights extending beyond the basic HR data and into the "black box" of human perception, evaluation, processing and emergence of behavior. By surveying individual perceptions of a wide range of elements of the work environment as well as each employees' job attitudes and sometimes even behavioral intentions, well-designed employee surveys can expose the missing link in the value creation chain between organizational investments constituting the organizational work environment and organizational performance (e.g., Kraut, 2006; Wiley, 2010). Furthermore, regular employee surveys are a HR instrument that already is key to fostering organizational adaptability by periodically initiating organizational change processes with their results (e. g. Borg, 2014; Domsch, & Ladwig, 2013; Kraut, 2006).

To realize the potential of an employee survey for evidence-based management and organizational development it has to be thoughtfully designed. If based on a scientifically sound theoretical model, an employee survey can integrate generalizable scientific knowledge with locally generated organization-specific data (Mauersberger, Kugler, & Brodbeck, 2017).

Employee survey models describe, which elements of the employees perceived work environment should be measured and how they relate to and affect their job attitudes and finally organizational outcomes. Researchers, however, repeatedly noted that existing employee survey measurement models often lack either a well-grounded theoretical underpinning or a sound empirical foundation (e.g., Borg & Mastrangelo, 2008; Burke, 2017; Di Pofi, 2002; Mauersberger et al., 2017). Especially the relationships between the

to be measured concepts and relevant external outcomes, the structural assumptions of employee survey models as well as their causal nature, are seldom specified and hardly ever empirically validated (Di Pofi, 2002; Mauersberger et al., 2017). To know how different variables of the model interact and via which process and processing they influence organizational performance, however, is necessary to draw valid and generalizable conclusions on linkages and levers from the employee surveys results (Kraut, 2006). Therefore, for evidence-based management a well-validated employee survey process model is needed, that attempts to measure all variables relevant for the organization and HR practice.

Aiming to contribute to this important specification and validation gap in employee survey model literature, the presented thesis develops and for the first time validates a structural employee survey measurement model and, thereby, improves employee surveys value for evidence-based management. To set a basis for this endeavor, the following chapters will provide background information on the concept of evidence-based management (*Chapter 1.1*), employee surveys in general (*Chapter 1.2*) and culminate in a brief overview of the research conducted in this work in *Chapter 1.3*.

## 1.1 Evidence-based Management and HRM

Evidence-based management (EbM) means translating principles based on best evidence into organizational principles (Rousseau, 2006, p. 256). Its aim is to develop managers into experts and enable them to make organizational decisions based on social science and organizational research and less based on personal preference and unsystematic experience (Rousseau & Gunia, 2016; Rousseau, 2006).

Decision quality is a direct function of availability, reliability and validity of information used as the decision's basis. By improving information quality and managers understanding of organizational research and scientific methods, EbM enables higher-quality managerial decisions and yields outcomes more in line with organizational goals (Rousseau, 2006). Ultimately better decision-making, representing a comparative advantage for companies and managers over their less competent counterparts, is achieved (Rousseau, 2006).

To achieve the highest information quality EbM advocates bringing together generalizable knowledge regarding cause-effect connections derived from scientific methods with analyzing local or organization specific data to generate local evidence (e. g. Brodbeck, 2008; Pfeffer & Sutton, 2006; Rousseau, 2006). Resulting is a synthesis of generalizable and local evidence referred to as "big 'E' evidence" (generalizable knowledge) and "little 'e' evidence" (local evidence). With this two-sided perspective EbM manages the balancing act of neither pretending that one size fits all, by only looking at scientific generalizable knowledge, nor falling victim to the uniqueness paradox (Martin, Feldman, Hatch, & Sitkin, 1983), which describes the erroneous tendency of businesses to belief that particulars of the organization, its practices and problems are special and unique (Rousseau, 2006; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000).

To implement EbM, at first ways of getting access to and learning about evidence have to be established. This includes creating pathways to infuse evidence, e. g. via academic journals, into the organization, training managers to value and recognize evidence, as well as acquiring local data to generate "little e evidence". Second, a culture

of evidence-based decision making has to be developed. And third, processes that constantly reevaluate currently accepted evidence have to be installed. According to Denise Rousseau (2006), the following features characterize well-established EbM:

- Learning about cause-effect connections in professional practices;
- Isolating the variations that measurably affect desired outcomes;
- Creating a culture of evidence-based decision making and research participation;
- Using information-sharing communities to reduce overuse, underuse, and misuse of specific practices;
- Building decision supports to promote practices the evidence validates, along with techniques and artifacts that make the decision easier to execute or perform (e. g. checklists, protocols, or standing orders);
- Having individual organizational, and institutional factors promote access to knowledge and its use.

EbM has a long history. Already Barnard (1938) promoted the development of a natural science of organization. Since then however science and practice struggled to connect due to missing visions and models how to do so (Rousseau, 2006). The first domain that effectively institutionalized evidence-based practice is medicine. About 40 years ago patients were treated by physicians based mostly on tradition acquired often dating back tenths of years and individual experience, what resulted in a rise of troubling variation in treatment quality. “Underlying this issue was the tendency for medical schools to teach their own specific approaches to clinical problems, without clear (or at least explicit) links to scientific evidence” (Rousseau & Gunia, 2016). Today extensive infrastructures, like the U.S. National Institutes for Health and Institute for Medicine or the Cochrane Collaboration, promote evidence-based health care, by providing accessible

up-to-date information on evidence regarding diagnosis, diseases, health issues, medication etc. for doctors all across the globe.

Contrary to medicine, the "research-practice gap" in management remains quite big (Finz-enz, 2010; Rousseau & Gunia, 2016; Rousseau, 2006). Research findings have not transferred well into the workplace. Managers still mostly rely on personal experience and exclude more systematic knowledge. Looking for evidence as decision guidance they often follow bad advice from business books or consultants based on questionable evidence. As Rousseau (2006, p. 257f) depicts it: "Because Jack Welch or McKinsey says it, that doesn't make it true. (Several decades of research on attribution bias indicate that people have a difficult time drawing unbiased conclusions regarding why they are successful, often giving more credit to themselves than the facts warrant. Management gurus are in no way immune.)"

Especially in the HR sector changing towards management decision making processes based on information and scientific knowledge rather than on intuition or gut feeling is a long overdue development (Finz-enz, 2010; Strohmeier & Piazza, 2015). Floating on the global "big data" trend wave, that started about seven years ago (Bersin, 2016; Rousseau & Gunia, 2016), companies and HR teams across the globe slowly but surely recognize the valuable information organizational research and data analytics offer for decision making in management (Bersin, 2016; Galbraith, 2014). Terms like "HR analytics", "people analytics", "talent analytics", "HR intelligence" or "big data in HR" (hereinafter together referred to as "people analytics"), have become current buzzwords in popular HR literature, with all the risk of triteness and superficiality that buzzword status conveys (Rousseau, 2006). The common understanding of these buzzwords is probably

best summarized as non-theory-driven analytics of HR data to gather local or organization specific evidence relevant for management decisions. Thus, comparing people analytics to EbM a significant difference becomes apparent. While people analytics focus mainly on generating local evidence, EbM extends this approach by including generalizable knowledge regarding cause-effect connections derived from scientific methods and a general scientific theory-driven and epistemological approach to generating local evidence. People analytics therefore may be seen as a part of the “small e evidence” subfield of evidence-based management.

Bersin (2016) studied the current usage of people analytics in different industries and found, that only a small set of advanced companies (4 %) were already analyzing people-related data in a strategic way and claims that these were making far better decisions in recruiting, promotion or pay. Based on his studies he developed a maturity model for analytics, establishing four maturity levels. Starting with “operational reporting” (level 1) and “advanced reporting” (level 2) and ranging up to “advanced analytics” (level 3) and “predictive analytics” (level4). 86 % of the studied companies people analytics so far did not exceed “advanced reporting”, leaving a huge potential for these companies to improve (for percentages and explanation of levels see Figure 1.1).


*Figure 1.1.* Talent Analytics Maturity Model (Bersin, 2016).

HR units planning to make the large step from a conventional reporting towards more proficient people analytics and EbM and challenge the need of organizations for a disruptive human capital management technology based on analytics (Finz-enz, 2010), need access to the right data and HR metrics and have to be able to correctly interpret them (Finz-enz, 2010; Strohmeier & Piazza, 2015). With HR data warehouses, that provide a single system of record for basic HR metrics, in place today at most companies (Bersin, 2016) there is a powerful foundation available for evidence-based management in HR. Enriching this data with more complex and advanced HR metrics, like employee survey data depicting employee' perceptions and attitudes forming their behavior, enables HR management to support decision makers all across the organization with valuable evidence and improve decision quality to a great extent.

## 1.2 Employee Surveys

Employee surveys also referred to as organizational surveys or engagement surveys are commonly defined as "systematic process of data collection designed to quantitatively measure specific aspects of an organizational member's experience as it relates to work" (Church & Waclawski, 1998, p. 4). This however is a broad definition, which can apply even to very specific surveys in an organization like internal customer survey for example. The large mostly full census employee surveys this work focuses on, are probably best defined by Bungard and Jöns (1997, p. 6, translated by Mauersberger, 2012) as an HR instrument that is implemented by the board in agreement with the works council in the following way: "All, or a sample of employees will be surveyed with a more or less standardized questionnaire. The participation of the staff is voluntary and the survey results cannot be traced back to individual's answers. The goal of an employee survey is the systematic analysis of the employees' attitudes and expectations. Results will be presented to the employees, and the data analysis will lead to the identification of focus areas for improvement. The actions that are derived from an employee survey can be evaluated in the following survey. Therefore, an employee survey serves as an instrument for continuously improving the organization."

Employee surveys are wide spread, if not universal among large companies (Kraut, 2006; Wiley, 2010). A poll of leading survey firms in the USA by the Kraut Associates (2003) indicated that probably over 75 % of the Fortune 1000 companies conduct employee surveys regularly. In a survey of 249 of the most profitable German companies Hossiep and Frieg (2008, 2013) 80 % reported to have at least once conducted an employee survey. 64 % indicated to conduct employee surveys regularly. Hossiep and

Frieg (2013) argue this percentage will probably increase in the future, as best practice drips down from the most profitable companies to smaller and less profitable ones.

***Types of Employee Surveys.*** Since their upcoming in the 1950s the focus of employee surveys has changed substantially. Borg and Mastrangelo (2008) identified five different types of employee surveys that were developed in the last decades, each with its own purpose, method, and type of integration. These five types are described in detail Table 1.1.

Table 1.1

*Main types of Employee Surveys Models (Borg & Mastrangelo, 2008, p. 10)*

| Type | Purpose | Embedding |
|---|---|---|
| Employee poll | Understand how employees/groups see things | Wait and see, then decide on further actions |
| Benchmarking employee survey | Compare employees' attitudes and perceptions with those in other organizations | Repeat regularly to see trends |
| Climate employee survey (of the "shop floor") with feedback | Improve climate and satisfaction, fix "local" problems | Non. The employee survey is a standalone, singular project that is run from time to time |
| Unfreeze-and-involve management program | Improve satisfaction and performance, involving all employees and levels | Repeat regularly, build follow-up processes, empower managers and employees to use results. |
| Systemic employee survey | Measure soft factors to improve management | Integral part of the management system (e.g., bonus allocation), linked with other business data. |

The development of the main survey types can be understood as an advancement up to the systemic or strategic employee survey, although all of them are still in use today and can have their very own indication. Paralleling Borg and Mastrangelo's (2008)

observation, Kraut (2006) acknowledged that since the early 2000s the focus of employee surveys has changed away from pure attitude and opinion survey towards a broader focus on organizational functioning and performance. More and more organizations recognize the critical influence of employee-based factors on a large variety of organizational performance indicators, like the success or failure of organizationally-driven change programs (Shah, Irani, & Sharif, 2017), for individual job performance (e.g., Judge, Thoresen, Bono, & Patton, 2001; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Rich, Lepine, & Crawford, 2010), innovation (e.g., Büschgens, Bausch, & Balkin, 2013; Eisenbeiss, van Knippenberg, & Boerner, 2008) and even profit and productivity (e. g. Whiteman, van Rooy, & Viswesvaran, 2010; Harter, Schmidt, & Hayes, 2002). Attempting to harness these factors systemic employee surveys best tap the full potential of an employee survey. They base on models linking employee attitudes and perception to an organizations bottom-line performance and are embedded as an integral part of the management systems such as performance appraisal (Bungard, Müller, & Niethammer, 2007). If scientifically substantiated, these models allow valid and reliable measurement of core concepts, derivation of hypotheses and interpretation of locally generated survey data based on scientifically generalizable knowledge for evidence-based management in practice.

***Purpose of Employee Surveys.*** As their different types indicate, employee surveys can serve many purposes ranging from assessment to driving organizational change (Kraut, 2006; cf. Table 1.1). Employee surveys are a way of involving employees' and their knowledge as a resource in strategic decision-making and the implementation of the following changes (Borg, 2003a). Their content topics vary depending on their specific purpose, but usually are comprised of various concepts of organizational behavior such as

leadership, job attitudes, and working conditions (Borg, 2003a). Most companies are planning employee surveys with a business purpose in mind, such as the EFQM certification, assessing employees' opinions on a newly implemented strategy (Mauersberger, 2012) or driving continuous organizational development and change (Deitering, 2006). While of course employee surveys can have several purposes, most tend to have only one or few (Kraut, 2006). Smith (2003) and Kraut (2006) provided comprehensive lists of the miscellaneous purposes' employee surveys can have. Taken together they are:

- Document corporate experience. Survey results are often the only contemporaneous documented evidence of employee's attitudes and opinions at a certain point in an organizations history.
- Pinpoint areas of concern. Diagnosing organizational situations similar to an annual heath checkup – a broad attempt to find out how things are going.
- Observe long-term trends. This is a follow-up to see if any changes have occurred since the previous survey. This can evolve into a way of life to continually seek organizational improvement.
- Monitor program impact. Attempting to see if attitudes changed in response to organizational changes, for example in compensation or training.
- Add a communication channel. Especially in big firms, as a broad, disciplined and periodic tool surveys aid in upward communications from employees. The type of questions asked also send a powerful message downward about managements concerns. For example, the extent to which a survey quantifies corporate values, especially relating to the treatment of employees, establishes managerial discipline regarding them.

- Gain input for future decisions. Surveys can be used to make decisions by getting employee preferences on topics like training programs, flextime schedules and other aspects of organizational life.
- Conduct organizational behavior research. Surveys aid our understanding of factors that have an impact on issues like employee turnover, service quality or job performance and can predict organizational outcomes.
- Drive and measure organizational change. Surveys provide useful measures of success that can guide changes, such as work/family or quality initiatives, customer satisfaction emphasis or merger and acquisitions. As a feedback loop for managers employee surveys reveal needs for action and enable to take pinpoint improvement measures. Merely asking about certain concepts heightens they visibility and importance. Survey results can assess progress and provide further leverage.

Overall, the value of employee surveys for companies, thus, is their potential to improve organizational functioning in general (Kraut, 2006). The data they generate can serve as organizational diagnosis (Bungard, Müller, & Niethammer, 2007), identify effect mechanisms and sources of or levers to change organizational problems (e.g., Kraut, 2006) and aid in development of change programs (e.g., Burke, 2017; Church & Oliver, 2006; Kraut 2006). Precondition to validly derive all these conclusions from employee survey results, however, is that the survey is based on a scientifically substantiated model.

At first, it is essential that the model comprises and thus indicates to practitioners all constructs that are relevant for employees' attitudes and performance, while still being parsimonious enough to be applied in practice with a justifiable number of items (cf.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999). If relevant concepts of factors are neglected, conclusions from data analyses might be biased, sources of organizational phenomena might not be attributable and effect mechanisms and processes how employees perceived work environment influences job attitudes and performance outcomes might not be identifiable.

Second, the models' operationalization of these concepts must allow to reliably and validly measure them. This assures that the concepts really exist and actually are measured (cf. American Educational Research Association et al., 1999).

Third, the models' structure, meaning its assumption about the relationships between its components and external outcomes, need to be validated as well (cf. American Educational Research Association et al., 1999). Only a validated structure allows to derive hypotheses and conclusions on organizational functioning, cause-effect relationships and consequently change levers from survey results.

To be able to tap this potential of employee surveys and use the data they generate for evidence-based management in practice, it, thus, at first is necessary to apply evidence-based management yourself and build on scientific literature, methods and evidence to choose or develop a scientifically substantiated employee survey measurement model. For many years now, scholars argue, that science-based survey and their embedding in management systems represent the future of employee survey in organizations (e.g., Borg, 2014; Domsch & Ladwig, 2013; Kraut, 2006; Smith, 2003). According to Hossiep and Frieg (2013, p. 63), however, less than 20 % of the companies

conducting regular employee surveys consult scientific sources when developing their survey questionnaires and items.

This gap might originate from three issues of the current employee survey model landscape. First, as most HR consultancies offer employee surveys as part of their portfolio, the internet is flooded by employee survey models, for which, if at all publicly available, communications and publications do not or are not transparent enough to meet scientific standards. Identifying the few scientifically published survey models in the haystack, thus, represents a huge challenge for practitioners. Second, many scientific survey models are complex to understand and require a lot, sometimes beyond 100, survey items to be covered completely (cf. Burke, 2017; Mauersberger, et al., 2017). As organizations often see time employees need to fill out surveys as time lost to work, they are usually not willing to conduct long surveys. Third, as mentioned earlier, scholars repeatedly noted, that even the existing "scientific" employee survey models seem to lack either a well-grounded theoretical underpinning or a sound empirical foundation (e.g., Borg & Mastrangelo, 2008; Burke, 2017; Di Pofi, 2002; Mauersberger et al., 2017), potentially making even them not fully suited to use survey data generated for evidence-based management.

### 1.3 Research Overview

The primary aim of my thesis is to address these issues and develop an integrative science-based employee survey process model that can tap the huge potential employee survey data offers for evidence-based management in organizations. With this work, I rise to the occasion and develop an employee survey measurement model valuable for researches and practitioners alike, and make an essential step towards closing the

research-practice gap in the field of employee surveys. After an introduction into employee surveys and evidence-based management in *Chapter 1*, in the next chapters, the development, validation and practical application of this employee survey measurement model will be described:

In *Chapter 2*, the first paper of my thesis entitled "Developing and Testing a Sound Structural Measurement Model for Employee Surveys: The Transformation-Transaction (TFTA) Model" is presented. In the paper, we review existing scientific employee surveys models and derive seven potential structural survey models from their strengths and shortcomings. Thereafter, we competitively tested these models synthesizing meta-analytic evidence with meta-meta-analytic structural equation modeling (MMASEM), resulting in a single model representing a close approximation of the true relationships. With this model, we introduce the first ever published employee survey measurement model with a meta-analytically validated model structure.

In *Chapter 3*, the second paper of my thesis entitled "Testing Causality and Multilevel Effects in a Sound Structural Employee Survey Measurement Model" is presented. We explore if the newly developed survey model and its causal structural assumptions hold true in practice. Further, generalizability of its assumptions to higher levels of analysis is tested. Three large-scale empirical field studies support the model's validity, its causal assumptions, and generalizability to higher levels of analysis empirically. Thereby Chapter 3 presents the first systematic analysis of causality and multi-level generalizability for employee survey models.

In *Chapter 4*, the third paper of my thesis and a case example for employee survey data-based evidence-based management in practice entitled "EbM in Practice: The Loss

and Gains from Increased Span of Control. An Empirical Analysis of its Effects on Subordinates´ Perceived Supervisor Support and Overall Job Attitude" is presented. It represents a real-life case example of building on survey data generated with the newly developed model to conduct evidence-based management in practice. We describe how a company approached us to analyze the potential impact increasing their span of control in management teams might have on team members' job attitudes. Further, it is lined out, how scientific literature was consulted to derive hypotheses and tested with employee survey data. At last, the consequences drawn by the company from the evidence presented are described.

In *Chapter 5*, a general discussion of the research presented in the previous chapters is provided. In particular, the main results are discussed, and the most important contributions to employee survey model literature, organizational adaptability and other research domains are being highlighted. Finally, limitations as well as important implications for future research and praxis are presented.

Overall, with my thesis I aim to develop and validate an integrative science-based employee survey process model that can support organizations in their struggle to constantly adapt to a changing environment by providing insights into the "black box" of human perception, evaluation, processing and emergence of behavior. The developed model enables practitioners to tap the potential employee survey data offers for evidence-based management, to identify levers for goal-directed change and for development of change programs.

An overview of the research presented in my thesis is shown in Figure 1.2.

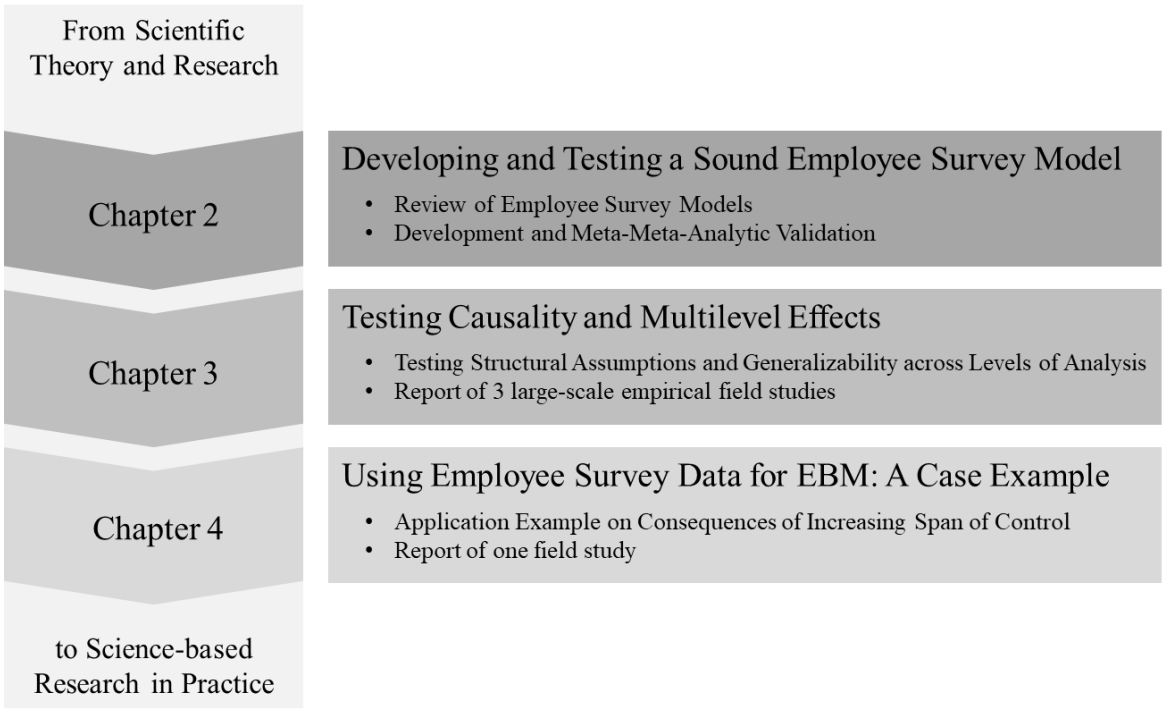



Figure 1.2. Research overview of the present thesis.

# 2 Developing and Testing a Sound Structural Measurement Model for Employee Surveys: The Transformation-Transaction (TFTA) Model[1]

## 2.1 Abstract

Organizations more and more utilize employee survey data for evidence-based management and organizational change. However, employee survey models are often underdeveloped in structure and seldom systematically validated. A scientific approach suggests making theoretically substantiated assumptions about what to measure and about how constructs interact with each other and relate to people and organizational outcomes. Based on a review of scientific employee survey models, we propose seven possible structural measurement models. These models were comparatively tested by applying structural-equation-modelling (SEM) to a meta-analytical synthesis of N = 123 meta-analyses (i.e. MMASEM) from the domains of industrial and organizational psychology, management science and business research. We find strong evidence for a two-dimensional mediation model of work environment characteristics and work attitudes, as perceived by employees and managers, which relate to organizational outcome variables. The tested model can be used in organizations to improve people and organizational outcomes by specifying directions for organizational development (OD). Routes of future research for strengthening evidence-based approaches to employee surveys and OD are discussed in the light of the theories reviewed and the findings reported.

[1] The review and meta-meta-analysis presented in this chapter has been presented at the "33rd Annual Conference of the Society of Industrial and Organizational Psychology (SIOP)" in April 2018 in Chicago, IL, USA. An adapted version of this chapter has been submitted to the Academy of Management Journal. Professor Felix C. Brodbeck supervised this research and is the second author of this work. When using the term "we", I refer to Felix C. Brodbeck and myself.

## 2.2 Introduction

Nowadays, market environments for organizations are changing unprecedentedly fast (Bennett & Lemoine, 2014) where "disruptive technologies" (Christensen et al., 2008) can transform whole industries within a few years (Finz-enz, 2010). For instance, Amazon reinvented book selling, Spotify revolutionized the music business and Uber is on its way to substitute professional taxi services by private entrepreneurs. Within this challenging environment organizations have to remain adaptable to change to stay successful and on top of the technology curve.

In an attempt to enable their organizations to adapt more quickly many HR and OD departments are exploring big data methodology (viz. people analytics, business analytics, Bersin, 2015; Fitz-enz, 2010) and principles of evidence-based management (EbM; Rousseau, 2006; Shah, Irani, & Sharif, 2017). In people analytics and business analytics local data is systematically analyzed to generate local evidence as guidance for decision-making. Taking it a step further, EbM grounds analytics of local data on existing scientific evidence and theoretical reasoning to make use of best available evidence. Thereby "eminence-based" or "eloquence-based" (cf. Isaacs & Fitzgerald, 1999) as well as "feeling-based" management (Brodbeck, 2008; Pfeffer & Sutton, 2006; Rousseau & Gunia, 2016) can be discounted.

A key internal data provider for business analytics and EbM, however, is often overlooked - the employee survey. Employee surveys describe a "systematic process of data collection designed to quantitatively measure specific aspects of an organizational member's experience as it relates to work" (Church & Waclawski, 1998, p. 4). Conducted regularly by most large companies in Europe and the US (Hossiep & Frieg, 2013; Wiley,

2010), they can provide insights extending beyond basic HR data and into the "black box" of employees' work environment perceptions, attitudes and the emergence of "organizational behavior" as a whole. Thus, employee surveys can expose the missing link in the value creation chain between organizational investments constituting the organizational work environment and organizational performance (Burke, 2017; Fitz-enz, 2010; Kraut, 2006; Wiley, 2010). Furthermore, regular employee surveys are a basic HR instrument that is key to fostering organizational adaptability and enable organizational change by giving feedback and initiating follow-up change processes (e.g., Borg, 2014; Burke, 2017; Church, Golay, Rotolo, Tuller, Shull, & Desrosiers, 2012; Kraut, 2006). All in all, employee surveys provide information for managerial decisions for improving organizational functioning (Kraut, 1996) and therefore represent a tool perfectly suited to help HR departments to prepare their companies for the volatile political and market environments as well as potential future disruptive changes (cf. Fitz-enz, 2010; Kraut, 2006).

To realize the potential of an employee survey for EbM and organizational development it has to be thoughtfully designed, for example, by developing a scientifically substantiated measurement model, for which generalizable scientific knowledge (big "E" evidence, cf. Rousseau, 2006: 260) and locally generated organization-specific data (little "e" evidence, cf. Rousseau, 2006: 260) is integrated with worldwide data (Mauersberger et al., 2017). There are various theoretical models available which can serve as a basis for questionnaire design, data analysis, and reporting of employee surveys as well as action planning based on employee surveys (Borg & Mastrangelo, 2008). Researchers however repeatedly noted, that many of the existing employee survey measurement models lack either a well-grounded theoretical

underpinning or a sound empirical foundation or even both (Borg & Mastrangelo, 2008; Mauersberger et al., 2017). This is a worrisome observation.

Obviously, a well-grounded theoretical underpinning represents the minimum requirement for measurement models of any kind. Only a well-elaborated theoretical foundation of a measurement model allows researches and practitioners to understand what exactly is to be measured with which purpose and thus gives first confidence, that the proposed measures might be able to transfer actual empirical relatives into adequate numerical relatives. As Kurt Lewin (1951: 162) put it: "… there is nothing so practical as a good theory." However, a theoretical model can only be useful, when it has been made subject to extensive empirical testing and validation. For employee survey purposes this includes validation of (a) the models' specification of what constructs of relevance for people and organizational outcomes are to be measured and (b) the relationships and interactions of its variables, constituting the models structure.

Especially the structure of survey models is often insufficiently specified and lacks sound validation, an omission that several times has been directed towards future theory development and testing - which is still pending (e.g., Burke, 2017; Di Pofi, 2002; Mauersberger et al., 2017). To know how the different variables of a model interact and via which process they influence organizational outcomes, however, is essential for drawing valid and generalizable conclusions from the employee surveys results, for example, about linkages and levers for organizational change and development (Kraut, 2006). Furthermore, when lacking meta-analytic validation, employee survey models' constructs might not be completely well-defined, developed and measured and, thus, eventually less generalizable internationally, across industries and companies.

Practitioners working with insufficiently validated models might yield misleading survey results, erroneous decision-making and in the end insufficient business performance.

The objective of this paper is to review existing employee survey measurement models and identify their concordance, strengths as well as their particular shortcomings. Based on the measurement models identified, we synthesize seven potential survey structure models that are likely depicting the structure of the relationships between characteristics of the perceived work environment and their influences on individual and organizational outcome variables. We also analyze how well these models suit all requirements their use for EbM brings with it. Finally, we test the synthesized models comparatively by applying meta-meta-analytic structural equation modeling (MMASEM) to a data set of N = 123 meta-analyses covering all relevant content facets modern employee surveys should comprise.

## 2.3 Reviewing Major Employee Survey Measurement Models

For reviewing employee survey models, quality criteria for their soundness need to be established. These are described next. Thereafter, we describe the search criteria and the procedure chosen for identifying the most suitable scientific survey models. Finally, the models obtained are clustered into altogether four different model types on the basis of their structural differences and similarities and briefly described and discussed one by one with respect to the quality criteria described in the outset.

### 2.3.1 Quality Criteria for Sound Employee Survey Measurement Models

Gliner, Morgan, and Leech (2009) suggested applying the standards established by the American Educational Research Association, American Psychological Association, &

National Council on Measurement in Education (1999) when determining an instrument´s validity. Combining these standards with known drawbacks of existing employee survey models we derive five quality criteria for employee survey measurement models: Evidence based relations to other variables, evidence-based content, evidence-based structure, evidence based international measurement equivalence, and an easy applicableness in practice.

***Evidence based relations to other variables.*** At first a measurement model´s included psychological concepts have to be relevant. This includes predictive validity, convergent and discriminant validity as well as generalizability of the model. To assure predictive validity, included psychological concepts have to show a high scientific relevance to organization's outcomes on different levels that has documented proof in sound empirical studies, preferably meta-analyses, which statistically integrate cumulative empirical knowledge, and to draw conclusions whether psychological concepts have an impact on desired outcomes or not (e.g., Schmidt & Hunter, 2014). A high predictive validity and generalizability usually implies, that the model´s components have bases in relevant theories and concepts of organizational behavior. Findings from organizational praxis in employee survey contexts and management literature can complement meta-analytical knowledge. Thus, a focus on meta-analyses and complementary newer original empirical studies when developing an employee survey measurement model can ensure a sound basis in scientific knowledge, which is essential for the "big E evidence" part of EbM (cf. Rousseau, 2006).

***Evidence based content.*** The second quality criterion, addresses the comprehensiveness of the measurement model. The model should include all relevant

concepts in an organizational employee survey context. This signifies the overall ability of the model to explain past and future observations, manifesting in explained variance portions of relevant outcomes. Following Ockham´s razor a measurement model should be parsimonious while at the same time not oversimplifying. A well-developed measurement model, therefore, should be based on intensive literature research and attempt to include all important actionable concepts and validated relationships of the organizational employee survey context, while dismissing irrelevant concepts or relationships.

***Evidence based structure.*** The proposed model structure, meaning the factorial structure as well as the hypothesized relationships between the model's components, should be empirically validated by confirmatory factor analysis (CFA) or structural equation modeling (SEM) and at best even meta-analytically validated. Furthermore, the model structure should provide additional and valuable information for research or practice, like for example explicating causal drivers for relevant outcome criteria.

***International measurement equivalence.*** Complying with the fourth quality criterion employee survey measurement models need to demonstrate cross-cultural measurement equivalence. As a result of globalization, employee surveys are increasingly applied in an international context (e.g., Scott & Mastrangelo, 2006). Existing measurement models often indirectly assume that the same items in the same degree equally measure the underlying constructs. Research shows that this is not always true (Mauersberger et al., 2017; cf. Brodbeck, Chhokar, & House, 2007; Hattrup, Müller & Aguirre, 2008). Measurement equivalence ensures that the instruments measure the same psychological concepts independent of and identically in the cultural background of the

individual employee. Having proven international measurement equivalence, an employee survey model is generalizable to different cultures besides the culture of its origin.

***Easy applicableness in practice.*** Whereas the first four quality criteria ensure the scientific soundness of measurement models, their practicability needs also be ensured. Scientific models are commonly formulated in precise conceptual language, often detailed out explicitly within theoretical frameworks (cf. Burke & Litwin, 1992), where clearly defined constructs need to be adequately measured, for example, by questionnaire with several scales, each corresponding to the underlying construct, which necessitates the use of many survey items. These characteristics make scientifically validated survey models difficult to understand and to use in organizational praxis. Thus, easy to use survey measurement models should first comprise a simple model structure, that makes it easy for practitioners to understand the "big picture" of the survey's results, second they should be measurable with a limited number of items, and third the results obtained by using them should imply straightforward directions for follow-up processes resulting in organizational change (e.g., Borg & Zimmermann, 2006). To increase the benefit a model offers for practitioners, especially when using the survey's results for EbM, the model should, furthermore, specify how its individual components relate to each other and finally influence relevant and tangible outcome variables. Only this specification in advance allows practitioners to identify levers for goal-directed change on the basis of their survey results.

Fulfilling the five above described criteria paves the way for a scientific survey model into praxis, where it has to prove its easy applicableness for practitioners in multinational companies across the world.

### 2.3.2 Search Criteria and Procedure for Reviewing Employee Survey Models

For our review, we searched for scientific employee survey measurement models that (a) have a detailed description in the scientific literature, (b) have a composition of more than one psychological concept such as job attitudes, and (c) include unambiguously reviewable concepts. Models not possessing an organizational surveying purpose, such as the EFQM-model and the Balanced Scorecard (Kaplan & Norton, 1996) were not considered in the review. The survey models were located through electronic and manual searches of databases, well-known employee survey textbooks, and the internet. Initially, we conducted an intensive literary review of acknowledged employee survey textbooks (e.g., Borg, 2003a; Borg & Mastrangelo, 2008; Bungard & Jöns, 1997; Bungard, Müller, & Niethammer, 2007; Church & Waclawski, 2001; Deitering, 2006; Domsch & Ladwig, 2013; Kraut, 2006), followed by searching databases such as PsycINFO™ (APA), Web of Science™ (Thomson Reuters) and Publish or Perish™ (www.harzing.com). In addition, internet research using Google completed the investigation that includes the practitioner's perspective. The search utilized key words comprising "employee survey model", "employee survey framework", "organizational assessment survey", and relative subject terms. There is probably an employee survey model to be found for each and every HR consulting and consequently our research yielded in numerous models. However, most of these models originate solely from practice and often lack of a thorough theoretical foundation. These models were excluded from the review, due to not meeting the set limits. Our final search and selection resulted in altogether 11 different models which satisfied the criteria set above (see Table 2.1). Based on communalities in content and scope we clustered them into four types of survey models: 1.) Single best predictor survey models, 2.) organizational culture survey models, 3.) strategic survey models and 4.)

holistic survey models. We do not view our review as exhaustive. This is probably best highlighted by a review of only organizational culture focused assessment instruments conducted by Jung et al. (2009), which identified a total of seventy culture assessment instruments. However, we are confident that our search yielded the most prominent model representatives for each of the survey types and that each of those representatives can stand for numerous other survey models that often are only slight variations or modifications (cf. Jung et al., 2009). In the following we will describe each of the four survey types and their representative models (for a summary, see Table 2.1).

Table 2.1

*Results of the review of employee survey measurement models*

| Models | Evidence based relations to relevant organizational outcomes | Evidence based structure | Evidence based content (comprehensiveness of the model) | International measurement equivalence | Easy applicableness in practice |
|---|---|---|---|---|---|
| *Single best predictor models* | | | | | |
| Harrison, Newman & Roths model (2006) | **Meta-analysis supports** that "Individual Effectiveness" predicts performance, turnover, lateness and absenteeism (Harrison, et al., 2006) | **Structural assumptions meta-analytically validated** (Harrison et al., 2006) | Very narrow scope (Borg & Mastrangelo, 2008);<br>Does not comprise concepts of the perceived work environment | - | Condensed model, not containing any elements of the work environment.<br>No standardized questionnaire. |
| Gallup's Employee Engagement (Harter, Schmidt, Agrawal, Plowman, & Blue, 2016; Harter, Schmidt & Hayes, 2002) | **Meta-analyses support** that employee engagement predicts performance on a business unit and organizational level (Harter et al. 2016; Harter, Schmidt, Asplund, Killham, & Agrawal, 2010; Harter et al., 2002) | Factorial structure meta-analytically supported analysis (Harter et al., 2002) | Does only comprise a very limited number of concepts of the perceived work environment | Cross-cultural analysis of Gallup's Q12 employee engagement instrument (Harter & Agrawal, 2011). | Measurable with **only 13 items** (Harter et al., 2002). **Actionable nature of the concepts** (Harter et al., 2002) supports follow-up processes. |
| Productive Energy Model (Cole, Bruch, & Vogel, 2012) | Support for convergent, and discriminant-validity as well as predictive validity for firm performance (Cole et al., 2012) | Validated factorial structure (Cole et al., 2012) | Does not comprise concepts of the perceived work environment | Measurement equivalence was established for four European countries in addition to the USA (Cole et al., 2012) | Condensed model, not containing any elements of the work environment. **14-item standard instrument** (Cole et al., 2012). |

Table 2.1 (continued)

| Models | Evidence based relations to relevant organizational outcomes | Evidence based structure | Evidence based content (comprehensiveness of the model) | International measurement equivalence | Easy applicableness in practice |
|---|---|---|---|---|---|
| *Organizational culture focused survey models* | | | | | |
| Denison Organizational Culture Survey (Denison & Neale, 1996; Denison et al., 2012) | Components link performance criteria, such as sales growth and customer satisfaction (Boyce, 2010; Gillespie, Denison, Haaland, Smerek & Neale, 2008) | Validated factorial structure (Bonavia, Gacso & Thomas, 2009; Fey & Denison, 2003; Gillespie et al., 2008; Taylor, Levy, Boyacigiller & Beechler, 2008) Theoretical structural assumptions regarding organizations flexibility and stability (Denison et al., 2012) | Does not include important elements like individual's job attitudes and performance. | **Internationally validated for Asia and seven more countries** including Russia, Brazil and South Africa (Fey & Denison, 2003; Denison, Haaland & Goelzer, 2003) | Sixty questions measure the model in total (Denison et al., 2012) forming 12 indices. |
| *Strategically focused survey models* | | | | | |
| High Performance-Engagement Model (Wiley, 2010) | Components relate to retention and other outcomes (Wiley, 2009, 2010) | - | Focuses mainly on subjective and objective outcome variables. Preconditions on the organizational and individual level are in neglect. | - | **Measurable with 28 Items** (Wiley, 2010). An exemplary questionnaire is provided. |
| ACE model (Schiemann, 2007; Schiemann & Morgan, 2006) | - | - | ACE formula is too narrow and some important individual level aspects are missing (Borg & Mastrangelo, 2008) | - | No standard questionnaire. Measurable with 35 to 50 items (short version 25 items). **Answers flow into 3 indices. Very easy to understand model.** |

Table 2.1 (continued)

| Models | Evidence based relations to relevant organizational outcomes | Evidence based structure | Evidence based content (comprehensiveness of the model) | International measurement equivalence | Easy applicableness in practice |
|---|---|---|---|---|---|
| *Holistic survey models* | | | | | |
| RACER Model (Borg & Mastrangelo, 2008) | Grounded on meta-analytic findings, but not validated this way. | Model makes structural assumption, but no validating research so far. | Transformational concepts, pivotal for organizational change and adaptability are missing. | - | Complex model, but still understandable for managers. No standardized questionnaire. |
| Voice Climate Survey (Langford, 2009) | Components predict manager reports of performance and other outcome variables (Langford, 2009) | Validated factorial structure (Langford, 2009; Langford & Presbitero, 2012) | Extensive and **comprehensive survey model** that attempts to comprise all relevant variables | Internationally validated for Australia and the Philippines (Langford & Presbitero, 2012) | 102 standardized items yielding in 7 indices (Langford, 2009). |
| Organizational Climate Measure (Patterson et al., 2005) | Some components predict innovativeness ratings and productivity (Patterson et al., 2005) | Only weak empirical support for factorial structure (Patterson et al., 2005) | **Comprehensive survey model** that attempts to comprise all variables relevant for organizational climate (Patterson et al., 2005) | - | 17 scales measured with standardized 95 items (Patterson et al., 2005). |
| Burke-Litwin - Organizational Assessment Survey (BLOAS; Burke & Litwin, 1992; Burke, 2017) | Studies support predictive validity for self-reported performance and indicators of objective organizational performance (Falletta, 1999; Pratt, 2004; Stone, 2010) | **Some support for structural assumptions** from longitudinal analysis of a simplified version of the model and mixed results for its assumed relationships to organizational outcomes (Anderson-Rudolf, 1996) | Extensive and **comprehensive survey model** that attempts to comprise all variables relevant for organizational performance and change (cf. Burke, 2017). | - | 12 factors measured by 90 standardized questions (Stone, 2015). Practitioners benefit from **specified relations of the model components.** Explicit **focus on organizational development** (cf. Burke, 2017). |
| Strategic Fitness Model™ (Brodbeck, 2015; Mauersberger, Kugler & Brodbeck, 2017) | Developed through integrating **meta-analytic evidence** with positive relationships of all components to individual and organizational outcomes (Mauersberger et al., 2017; Mauersberger, 2012) | Validated factorial structure (Mauersberger et al., 2017); Theoretical structural assumptions regarding organizations flexibility and stability (Brodbeck, 2013, 2015) | Extensive and **comprehensive survey model** that attempts to comprise all variables relevant within perceived work environment and for individual and organizational performance (Mauersberger et al., 2017) | **Cross-cultural measurement equivalence** across 9 of the 10 GLOBE-clusters (Mauersberger et al., 2017) | **Full model measurable with 22 items** forming 5 indices. Explicit **focus on organizational development** in a follow-up process. |

*Note*. Models were clustered to types; model types are displayed in italic. High levels of evidence are displayed in bold font. Evaluation criteria are a selection of the standards established by the American Education Research Association (1999) when determining an instrument´s validity (cf. Gliner, Morgan, & Leech, 2009).
™ Strategic Fitness Model by Logit Management Consulting, Munich.

### 2.3.3 Types of Employee Survey Measurement Models Obtained in the Review

***Single best predictor survey models.*** Models of this type refer to one general proximal factor, sometimes consisting of several sub-factors, as the most powerful predictor for relevant outcomes and focus primarily on measuring this (high-level) factor (cf. Harrison et al., 2006; Harter & Schmidt, 2008). Usually this factor is termed employee´s job attitudes or employee engagement.

One of the major and probably the groundbreaking model of this type is Harrison, Newman, and Roth's (2006) model. It explains antecedents and consequences of individual performance from meta-analytical findings. The content domains of this model are job satisfaction and organizational commitment together forming the "overall job attitudes" as a fundamental evaluation of one´s work experiences. These then positively influence the "Individual Effectiveness", a higher-order variable consisting of the performance outcomes in-role performance, extra-role performance, turnover, lateness and absenteeism. Conducting meta-analytic structural equation modeling, their meta-analytic research confirmed their model and found the overall job attitudes strongly predicting individual effectiveness (Harrison et al., 2006). However, this model is not primarily intended and build to serve as basis for organizational surveys. With its narrow focus on job attitudes and their relationship to performance outcomes, it neglects the influenceable prerequisites, which provide valuable information for survey follow-up goal-directed change activities, and outcomes on the organizational level (cf. Borg & Mastrangelo, 2008).

Perhaps the most renowned employee survey measurement model focusing on engagement is Gallup's Employee Engagement (Harter, Schmidt, Agrawal, Plowman & Blue, 2016; Harter, Schmidt & Hayes, 2002). The model consists of twelve survey items that measure

the antecedents of engagement and are collapsed into one “Employee Engagement” index and one item that measures the overall job satisfaction. Harter et al. (2002: 269) conceptualize employee engagement as “... the individual’s involvement and satisfaction with as well as enthusiasm for work”, while the term employee engagement is used to underline the actionable nature of the concept (Harter et al., 2002). This conceptualization of engagement has been criticized in academia for its overlap with well-known traditional constructs such as job satisfaction and organizational commitment (e.g., Schaufeli & Bakker, 2010). However, Harter and Schmidt (2008) argue, that subtle conceptual distinctions among different work attitude constructs, as suggested by I-O psychologists, may not be made by employees, when filling out a questionnaire and further refer to Harrison et al.´s (2006) meta-analytically identified overall job attitudes factor. Gallup´s employee engagement survey items were developed in an iterative process combining qualitative methods such as expert-interviews with statistical analyses to empirical detect redundancies. A sample of topics that was preselected by the authors was consecutively reduced by excluding items that do not explain additional statistical variances (Harter et al., 2016). The model includes typical concepts for an employee survey questionnaire such as the availability of tools, cooperation, and recognition (cf. Borg, 2003a). Multiple meta-analyses confirm that Gallup’s employee engagement predicts performance at a business unit level (Harter et al. 2016; Harter et al., 2002) and even causally impacts key outcomes on the organizational level (Harter, Schmidt, Asplund, Killham & Agrawal, 2010). Another advantage of this model is that the standard survey items are actionable for managers which likely results in a high level of acceptance by practitioners. At the same time the development of Gallup’s Employee Engagement Model, however, was more inductive than based on scientific theory or based on meta-analytical results. The model focuses on a limited number of measured concepts and omits potentially impactful concepts like transformational leadership, cooperation or

communication which, thus, cannot be analyzed in organizational diagnosis and for evidence-based management.

The Productive Energy Model (Boesche, Bruch, & Kunz, 2008; Bruch & Vogel, 2009; Cole, Bruch, & Vogel, 2012) deviates a bit from both aforementioned models, since it does not focus on job attitudes or engagement as single best predictor for individual and organizational outcomes, but on the so called "productive energy" of employees. It provides an overview about what organizations should do to improve the degree of productive energy on both the individual and the collective (organizational) level. Productive energy supposedly positively influences organizational outcome variables such as customer satisfaction and venture growth (Cole et al., 2012). Productive energy on the individual level consists of three facets: (a) affects which are the sharing of positive feelings and emotional arousal experiences, (b) cognitions that summarize mental faculties to focus attention, shut out distractions, and the desire to do a good job, and (c) agentic behaviors that are operationalized through the pace, intensity, and volume with which members purposefully invest physical resources. These three individual level facets are amplified and manifest via interaction processes as a higher level, collective construct. The concept of (collective) productive energy provides organizations with the possibility of classification among four dimensions that describe the quality and intensity of the energy states. The model's benefits are that it originates from organizational behavior knowledge and that high-ranking journals post its description (cf. Cole et al., 2012). In addition, the 14-item standard instrument is measurement equivalent in four European countries in addition to the USA and its overall reliability and validity can be considered as good (Cole et al., 2012). However, the Productive Energy Model is not meta-analytically validated and its content domains again are narrow in scope. The model does not comprise any concepts of the work environment that might serve as antecedent factors of productive energy. Thus, no indication is given as to what levers to pull or push in order to

improve productive energy, nor were impacts of presumed antecedent factors on productive energy empirically tested.

Overall the single best predictor survey models usually have a narrow focus on their respectively proposed best predictor of relevant outcomes and measure this variable or factor in a highly sophisticated manner. Other representatives of this group are the 3D-Engagement Model (Winter, Feinstein & Müller, 2015) or Macey, Schneider, Barbera and Young`s sample Engagement Survey (2009). By applying a narrow focus on specific but highly relevant concepts these models forego a well-rounded analysis of the work environment and the potential to explain more variance within relevant outcomes by including additional predictors. This limits their possibilities to identify and analyze antecedents of their focused proximal predictor and levers to goal-directedly change them. Obviously, most of these models are not intended to be surveyed alone, without additional items measuring variables of the work environment, but the models do not offer a theoretical framework for this purpose themselves. Conceptually, the research conducted around these models, however indicates, that there actually might be a general attitudinal factor underlying attitudinal variables, like job satisfaction, organizational commitment or work engagement, which are frequently measured people outcomes in employee surveys.

***Organizational culture focused survey models.*** This second group of survey models analyzes organizational culture and its impact on organizational performance by investigating observable and measurable manifestations of culture, such as values and behavioral norms (Ashkanasy, Broadfoot, & Falkus, 2000; Denison, Nieminen, & Kotrba, 2012). Two recent reviews of this survey model type chronicle a large number of standardized quantitative instruments, which have been developed since the mid-1980s (Jung et al., 2009). However, only a

few of them specifically serve employee survey purpose (Jung et al. 2009) and have received validating research beyond their initial publication (Denison et al., 2012). Overall Denison et al. (2012) as well as Jung et al. (2009) report that research support is generally inadequate to establish reliability and validity for the majority of their reviewed organizational culture measurement models.

Only one of the models can rely on extensive research. The Denison Organizational Culture Survey (Denison & Neale, 1996; Denison et al., 2012) provides a diagnostic tool for understanding an organization's culture and its impact on performance. The model highlights four cultural traits that an organization should master in order to be successful. They are *Mission*, *Adaptability*, *Involvement*, and *Consistency*. Of those four traits, Denison et al. (2012) explain, mission and consistency provide cultural support for stability, whereas adaptability and involvement provide cultural support for flexibility of an organization. Each of the traits breaks down into three indices, such as for "Mission" these indices are "Strategy", "Vision", and "Goals". Sixty questions measure the model in total. The Denison model has some advantages: It has organizational behavior research grounding that covers a wide range of concepts, its factorial structure is empirically validated (Bonavia, Gacso, & Thomas, 2009; Fey & Denison, 2003; Gillespie, Denison, Haaland, Smerek, & Neale, 2008; Taylor, Levy, Boyacigiller, & Beechler, 2008), and its components can link to performance criteria, such as sales growth and customer satisfaction (Boyce, 2010; Gillespie et al., 2008). Furthermore, the model was internationally validated for Asia and seven countries including Russia, Brazil and South Africa (Denison, Haaland & Goelzer, 2003; Fey & Denison, 2003). However, the Denison Organizational Culture Survey neither has a meta-analytically based theory nor was it meta-analytically validated so far. It also does not include individual's job attitudes and performance at all. Therefore, without including additional concepts, the model cannot give practitioners insights into the overall level

of individual job attitudes in their organization or the linkages between organizational culture, job attitudes and individual work performance. Questions that are often pivotal when conducting employee surveys.

Other models that can be clustered into the organizational culture focused survey model type and can rely on at least some supporting research or are still relatively new, are the Organizational Culture Survey (van der Post, de Coning & Smit, 1997, 1998), the Questionnaire of Dimensions of Organizational Culture (Ginevičius & Vaitkūnaitė, 2006) and the Value Performance Index (Schönborn, 2010). For a comprehensive review of these measurement models we recommend Denison et al. (2012). Although some researchers have argued, that culture should not be considered the answer to all organizational problems (cf. Jung et al., 2009; Caroselli, 1992), the research on these survey models indicates, that culture elements can provide valuable information when conducting employee surveys and using their results for evidence-based management.

***Strategically focused survey models.*** The third group of employee survey measurement models focuses on strategy implementation and employee´s alignment to business goals, as well as on measuring people outcomes like employee engagement to predict organizational performance.

The blueprint model of this type is the High-Performance Model (Wiley, 2009). It consists of four components, each with various underlying factors. The model's development utilizes literary research and linkage analyses of its own datasets. The model components are (1) Leadership Practice which is measurable through categories such as Quality Emphasis and Customer Orientation, (2) Employee Results that are describable by Teamwork, Engagement, Retention, etc., (3) Customer Results that are operationalized with concepts such as Customer

Satisfaction and Customer Loyalty, and finally (4) Business Performance with its classical key figures like Sales Growth and Market Share. A later version of the model, the High Performance-Engagement model (Wiley, 2010), collapses all these categories into one "performance excellence index" and adds an "Engagement Index" to measure pride, satisfaction, commitment and advocacy (Wiley, 2010, p. 84). Obviously visible from the category listing, the High Performance Model focuses mainly on subjective and objective outcome variables. Preconditions on the organizational and individual level that can lead to employee engagement are in neglect and do not seem to have been systematically selected. Although Wiley (2009, 2010) confirms the importance of the model components to retention and other outcomes with linkage analyses, the cross-cultural measurement equivalence of the instrument and a meta-analytical foundation of the antecedents and outcomes is missing.

Another survey model focusing on strategy implementation is the ACE model (Schiemann, 2007; Schiemann & Morgan, 2006), which stresses the importance of employee's alignment to the business goals. Only the proper combination of the three main components of the ACE model: Alignment (with the business strategy), Capabilities (to deliver customer value) and Engagement (commitment and involvement) can capture "People Equity" (Schiemann & Morgan, 2006). In an inductive process, the ACE-model utilizes mainly management literature, the author's management experience, and partly literature on satisfaction, morale, and organizational culture for its development. Certain elements directly influence the three main components, such as human resources systems and the corporate structure. The three main components are indirectly influenceable through "Enablers", such as values and the strategy (Schiemann & Morgan, 2006, p. 82). Behind the ACE model are different variables and aspects such as setting smart goals, understanding the strategy (Alignment), working conditions, skills and knowledge (Capabilities), work satisfaction and commitment (Engagement). There is no

sound theoretical foundation supporting the ACE model, and particularly the Capability-construct is a very wide notion and therefore difficult to interpret. Borg and Mastrangelo (2008) further criticize, that the ACE formula is too narrow and in employee recognition and performance rewards some important individual level aspects are missing.

Overall strategic employee survey measurement models have a narrow focus on strategy and performance outcomes. For an organizational assessment, as intended by most employee surveys, they do not capture the complete picture of relevant variables. Nevertheless, they underline the importance of taking strategy and strategy alignment into account when developing an employee survey model, which attempts to predict high portions of variance in relevant organizational outcomes.

***Holistic survey models.*** Holistic employee survey measurement models represent the most complete survey model type and usually aim at organizational diagnosis and development. They integrate proximal organizational performance predictors like employee´s job attitudes and employee engagement with modeling relevant variables from the perceived organizational work environment. This enables them to identify antecedents of their proximal performance predictors from the work environment. Perceptions of the work environment are often referred to as "organizational climate" (Kuenzi & Schminke, 2009; Patterson et al., 2005; Rousseau, 1988), which is why most of these models describe themselves either as organizational climate measures or organizational assessment models. We identified seven major models of this type. Six of which were developed more or less recently and with only one being already created in the early 90s.

One of the more prominent recently developed comprehensive models is the RACER Model (Borg, 2003a; Borg & Mastrangelo, 2008). It broadens the ACE model by extending it

with two more variables: The first R represents recognizing results (receiving feedback and seeing one's contribution to division/company success) and the last R receiving rewards (e.g., pay and praise). Both newly integrated concepts have a strong valid base in several meta-analyses, although this base is not explicitly described in the RACER model. The Performance Satisfaction motor (PS-motor), which theoretically grounds the RACER-model, describes the relationships between the model´s main components (cf. Borg, 2003a). It takes up the elements of the RACER-model but focuses on job satisfaction and individual's performance. Furthermore, it shows the relationship between both concepts together with their antecedents and a number of feedback loops. As the analogy with a motor suggests, one element such as a weak feedback culture can negatively affect the entire system. The PS-motor combines different acknowledged theories of organizational behavior such as Thorndike's Law of Effects and Locke and Latham's goal setting theory (2002). The theory proposes that in-role performance depends directly on three key elements: motivation (influenced by goal clarity, confidence in the achievement of the goal and the expected utility of reaching the goal), the technical/organizational working environment, and the necessary skills/know-how of the employees. The PS-motor and the RACER-model are obviously complex, but still understandable for non-psychologists and therefore practical employee survey models. Despite their practical value, both models show some weaknesses in establishing validity. Although they are rooted in recognized psychological theories, they lack consistent grounding in and validation based on new meta-analytical knowledge. Furthermore, no evidence for the measurement equivalence of both models was presented so far. In addition, both models focus on behavioristic variables, which imply that transformational concepts, pivotal for organizational change and adaptability, such as the Transformational Leadership Theory (e.g., Bass, 1999) are missing.

The Voice Climate Survey (Langford, 2009) is another recent addition to the holistic survey models. Originating from an Australian consulting company, the Voice Climate Survey was developed loosely oriented at Stone´s human resource and leadership model (1998) and refined in an exploratory phase of three years. It comprises seven higher order factors, the 7 P´s. Five of which represent the work practices and two, "Passion" and "Progress", represent the outcomes. As a factorial model, the Voice Climate Survey makes no assumptions regarding the interactions or relationships of its work practice factors with each other or its outcome factors. The proposed factorial structure was confirmed in two consecutive large scale studies (Langford, 2009; Langford & Presbitero, 2012). Although Langford (2009) demonstrated predictive validity for independent manager reports of performance and other outcome variables, no relationships with hard outcomes measures were reported so far. Furthermore, as its development indicates, the Voice Climate survey is not based on gold-standard scientific, meaning meta-analytic, knowledge. In a first step towards cross-cultural validation Langford and Presbitero (2012) successfully applied the model on the Philippines. To assure cross-cultural measurement equivalence many more steps like this are necessary.

The Organizational Climate Measure (Patterson et al., 2005) is a multidimensional measure of organizational climate and based upon Quin and Rohrbaugh´s Competing Values model (e.g., 1981; see also Hartnell, Ou, & Kinicki, 2011). It consists of 17 work practice scales, including "Involvement", "Formalization", "Innovation & Flexibility" and "Performance Feedback", divided into the four quadrants "Human Relations", "Internal Process", "Open Systems" and "Rational Goal". A total of 82 items measure the full model. Again, no interactions or relationships between the organizational climate components influencing people or organizational outcomes are hypothesized in the model. While the Organizational Climate Measure was able to demonstrate sound psychometric qualities for the 17 lower-order work

practices, Patterson et al. found only weak empirical support for the four hypothesized higher-order factors. They showed predictive validity of some of their lower-order scales with retrospective innovativeness ratings at a later time and a productivity measure. However, no subsequent studies provide further support for the model's factorial structure or its cross-cultural measurement equivalence.

Senior amongst the holistic survey measurement models is the Burke-Litwin - Organizational Assessment Survey (BLOAS; Burke, 2017; Burke & Litwin, 1992). Its basis, the Burke-Litwin Model, is an open system model of input, throughput and output with feedback loops, developed already in 1992. As one of very few employee survey measurement models it hypothesizes causal relationships between its components. It proposes, that the "external environment" of an organization directly affects its "leadership", "mission and strategy" and "culture", in sum the "Transformational Variables". These in turn affect the "management practices", "structure", "systems" and "work unit climate", in sum the "Transactional Variables". And together transformational and transactional variables affect the "motivation" which affects "performance". As with many of the other survey models described in this paper the development of the BLOAS based on a theoretical framework, but its components and assumptions on what causes what and in what order evolved from practice (Burke & Litwin, 1992: 524). In total, the survey, as it is today, consists of twelve factors measured by 90 questions (Stone, 2015). Besides the "external environment" dimension, all other scales exhibited good internal consistency in multiple studies (Di Pofi, 2002; Stone, 2010; Stone 2015). No published studies report an analysis of predictive validity for the BLOAS. However, Stone (2015) refers to four unpublished dissertation theses, which provide some evidence for the predictive validity of the model (Anderson-Rudolf, 1996; Falletta, 1999; Pratt, 2004; Stone, 2010). The various evidence on the factorial structure of the BLOAS seems to be somewhat stable (Stone, 2015). The only published

evidence regarding the proposed causal relationships of the model's components, however, comes from an older version of the survey model used by Anderson-Rudolf (1996). Anderson-Rudolf applied cross-sectional structural equation modeling to test a simplified version of the BLOAS and found support for "Leadership" and "Culture" affecting "Management Practices" that affect "Climate". "Climate" in turn, however, only significantly affected "Organizational Performance" at one of two times of measurement. Overall, the BLOAS is a theoretically well-grounded and comprehensive employee survey model that attempts to comprise all variables relevant for organizational performance and change (cf. Burke, 2017). However, the model as a whole as well as its specific assumptions have not been meta-analytically validated yet. Furthermore, there is no evidence available on the cross-cultural measurement equivalence of the BLOAS. In summary, the BLOAS is a practical yet complex employee survey model, which would benefit from additional validation of its proposed structure and cross-cultural measurement equivalence.

Very recently Mauersberger et al. (2017) developed a model for international employee surveys on the basis of a meta-analytical review of the psychological construct space related to organizational behavior and performance called Strategic Fitness Model™ (Logit Management Consulting, Munich; cf. Brodbeck, 2015). The objective for developing the Strategic Fitness Model™ (SFM) was to develop a holistic survey model incorporating comprehensive meta-analytic results and ensuring cross-cultural measurement equivalence. Drawing on over 150 meta-analyses published until 2010, concepts for capturing employees' experiences, attitudes, and behaviors relevant to organizations' functioning were grouped based on conceptual similarity (Mauersberger, 2012; Mauersberger et al., 2017). Because employee surveys are based on individual's answers, only constructs that reflect individual's experience as they work in their immediate environment and their team were included in the model. The categorization yielded 20

first-order categories, which divide into five second-order categories. These five second-order categories are: (a) *corporate level leadership,* representing employees' perceptions of the company's vision, management, and system as they provide direction; (b) *socio-technical system,* which refers to employees' perceptions of the immediate work environment; (c) *transformational variables,* which include employees' perceptions of change and transformation oriented aspects at work; (d) *transactional variables,* which refer to employees' perceptions of social exchange processes that are designed to provide a stable reward and feedback system; (e) *people outcomes,* which include employees' perceptions of their performance, employees' work attitudes and (reverse coded) negative behavioral intentions (Mauersberger et al., 2017, p. 5f). All first- and second-order categories are displayed and described in detail in Appendix A. Appendix A also includes examples of psychological constructs that are covered by the first-order categories. By grounding their survey measurement models' development on a large part of available gold-standard scientific knowledge, the SFM integrates many of the concepts included or proposed by other survey models. For example, the model brings together the concepts of transformational and transactional variables appearing as well in the BLOAS, the strategic focus of the strategic survey models via its categories corporate level leadership and transformational leadership and the emphasis on employees' job attitudes as expressed by Harrison, Newman and Roth´s model and the Gallup Engagement Model. Even the proposed need for stability and flexibility of an organization as put forward by the Denison Organizational Culture Survey is comprised within the SFM. Brodbeck (2013, 2015) describes, the second-order categories corporate level leadership and transformational variables assure organizations flexibility, while the categories transactional variables and socio-technical system assure stability. The total model can be measured with as few as 22 items, for each facet one item (Brodbeck, 2015). For its empirical validation employee survey specialists independently sorted existing survey items to

the model´s components and achieved a good interrater reliability of Cohen's $\kappa = .85$ (Mauersberger et al., 2017). This is a very promising idea, since it allows practitioners and survey specialists to easily identify aspects of the model within their existing employee survey and use them for EbM analyses, without having to install a completely new questionnaire and reporting – an often costly and time-consuming process. Mauersberger et al. (2017) report meta-analytic evidence for positive relationships between all second-order categories of the model with organizational outcomes measured independently from employees' perception, like venture growth or profit. They, furthermore, support the models' factorial structure with confirmatory factorial analysis and provide evidence for the model's cross-cultural measurement equivalence across 9 of the 10 GLOBE-clusters (Gupta, Hanges, & Dorfman, 2002; House, Hanges, Javidan, Dorfman, & Gupta, 2004). Overall the SFM is a parsimonious and integrative survey measurement model. For a holistic survey model, it provides a clear and easy to measure framework and therefore should be easily applicable in practice. Still, the SFM is only a factorial model and does not specify any interactions or causal relationships between its variables and outcomes. The model, therefore, does not provide clear cut evidence for survey and EbM practitioners what variables might serve as levers for desired outcomes or via which process these outcomes are influenced.

### 2.3.4 Concordance, Strengths and Shortcomings of Existing Employee Survey Models

Overall authors and researchers were able to present good evidence for the predictive validity for most of the survey models. Seldom, however, was the predictive validity of the models' components meta-analytically analyzed. Harrison, Newman and Roth´s model (Harrison et al., 2006), Gallup's Engagement Model (Harter et al., 2016) and the SFM (Mauersberger et al., 2017) can claim this gold-standard level of predictive validity.

A majority of the models, furthermore, received support for their factorial structure. But only three survey models – Harrison, Newman and Roth´s model, the RACER model (Borg & Mastrangelo, 2008) and the Burke-Litwin Organizational Assessment Survey (BLOAS; Burke & Litwin, 1992; Burke, 2017) – went beyond factorial modeling and specified interactions and relationships between their model's components and thus attempted to structure the elements of the work environment as they are perceived by and influence employees. Despite this effort, the proposed structures of the models, as in the case of the BLOAS and the RACER Model, received just very limited empirical investigation and no meta-analytical validation, or are very limited in their scope. Besides these explicit structural formulations, the SFM and the Denison Organizational Culture Survey (Denison & Neale, 1996; Denison et al., 2012) assume structures without incorporating them into their models' formulations. They state that coexistent stability and flexibility of organizations is instrumental for organizational functioning and determined by different aspects of the perceived work environment (Brodbeck, 2013, 2015; Denison et al., 2012). As interesting as these hypotheses are, they have not been analyzed systematically by research on these models yet.

To effectively use employee surveys for evidence-based management and goal-directed change, their base models need to be comprehensive, linking employee attitudes and all relevant employee perceptions of the work environment to an organization´s bottom-line results (e.g., Kraut, 2006). Of the multiple holistic survey models the BLOAS and the SFM explicitly attempt to integrate all relevant concepts, while only the SFM systematically synthesizes comprehensive meta-analytical knowledge to achieve this goal. To develop the SFM its authors drew together scientific knowledge from over 150 meta-analyses. With a validated five-factor structure measured by only 22 items the SFM is probably the most parsimonious of the holistic survey models (Brodbeck, 2015; Mauersberger et al., 2017).

Having proven measurement equivalence across 9 of the 10 GLOBE Clusters summarizing over 50 countries, the SFM also is the only survey model that can be seen as globally generalizable (Mauersberger et al., 2017). Astonishingly, only for three other models attempts to establish cultural measurement equivalence were made (see Table 2.1). The overall omission to establish cross-cultural measurement equivalence is surprising, as most employee surveys today are conducted internationally (cf. Scott & Mastrangelo, 2006), with practitioners probably often not being aware of their survey models potentially not being measurement equivalent across all surveyed countries.

In a glaring omission most employee survey models, including the SFM, however, circumvented specifying interactions and relationships between the elements of the perceived work environment, employees' attitudes and organizational outcomes so far. A clear understanding of these relationships however is crucial for survey specialists and change managers in practice to grasp organizational phenomena and identify levers for goal-directed organizational change.

Thus, a well-validated, comprehensive and measurement equivalent survey model is needed, that structures the relevant aspects of the perceived work environment and depicts the processes, how these aspects interact with each other and how they influence people, work and organizational outcomes. Combining the strengths of existing survey models, like the factorial structure of the SFM and the structural assumptions of other survey models might serve as good starting points for this developmental enterprise.

## 2.4 Developing Theoretically Sound and Structurally Testable Employee Survey Models

All models described above comprise their own factorial partitioning of the perceived work environment and individual and organizational outcomes. The SFM theoretically integrates

many of these approaches to a manageable factorial model, which is supported by comprehensive meta-analytical evidence. We therefore built on the factorial structure of the SFM to develop further potential structural survey models. As mentioned before, the SFM proposes four second-order factors of the perceived work environment ("corporate-level leadership", "socio-technical system", "transformational variables" and "transactional variables") and an additional "people outcomes" second-order outcome factor (cf. Mauersberger et al., 2017). Conceptually, basic psychological research (e.g., theories of planned and reasoned action, Ajzen, 1991; Fishbein & Ajzen, 2010) suggests and most employee survey models assume, that perceptions of different elements of the work environment influence employees' job attitudes and behavior, which in turn drive organizational outcomes (e.g., Burke, 2017; Harrison et al., 2006; Harter et al., 2002; Mauersberger et al., 2017). This fundamental psychological sequence of distal predictors (perceptions of the work environment), proximal predictors (employees' attitudes and behaviors) and organizational outcomes thus forms the structural backbone of our attempt to develop several viable structural employee survey models, which can be traced to published theoretical and empirical work. Imposing this structural backbone on the SFMs factors results in a basic structural model (termed Model A) in which the four second-order SFM factors of the perceived work environment each directly influence the "people outcomes" second-order factor (see Figure 2.1).

Combining this basic SFM structural Model A with factorial and structural assumptions postulated by the other reviewed survey models results in several alternative structural models, that raise two general questions: First, are there really four independent factors of the perceived work environment or do these factors form higher-order factors in a certain configuration? And second, do the factors of the perceived work environment all directly influence people and organizational outcomes, or do they interact in a certain way in their influence on these

outcomes? We first address the question about potential higher-order factors representing similar aspects of the perceived work environment.

Looking at the few survey models that specify structures, the validated BLOAS Model (Burke, 2017; Burke & Litwin, 1992), suggests higher third-order factors of the perceived work environment which extend the SFM four factor model. The BLOAS distinguishes "transformational variables", comprising "mission and strategy", "leadership", "organizational culture" and "management practices" from "transactional variables", which comprise "structure", "systems", "task requirements and individual skills", "work unit climate" and "motivation" (cf. Burke & Litwin, 1992). Interestingly, in the BLOAS two-dimensional partitioning of perceived work environmental aspects, "transformational variables" can be seen to reflect *organizational flexibility and change*, whereas "transactional variables" reflect *organizational stability and inner order*, which both together drive long term success of organizations. The antagonistic concurrence of flexibility and stability for the benefit of long term organizational success is also suggested as part of the SFM (Brodbeck, 2015) and the Denison Organizational Culture Survey (Denison et al., 2012). With the SFM factors "corporate-level leadership" and "transformational variables" referred to as pivotal for flexibility and "socio-technical system" and "transactional variables" for stability the SFM overlaps strongly with the BLOAS' assignment of respective factors. Thus, a model partitioning the perceived work environment into the two higher third-order factors "general transformational variables" and "general transactional variables", over and above the four SFM factors (Model B) might also be plausible and might fit the meta-analytic data even better than the simple four factors structure suggested by the SFM Model A. The higher order factorial distinction between transformational and transactional variables has been brought forward in altogether three, quite well empirically tested, employee survey models reviewed above.

A more uniform perspective of the perceived work environment is formulated by Gallup's Employee Engagement model (Harter et. al, 2002), which draws together multiple elements of the perceived work environment like recognition, materials and equipment, mission, personnel development or roles and tasks to form a single index score. Gallup's Employee Engagement model does not partition elements of the perceived work environment at all, but rather collapses them into one general factor, that might as well be called "general quality of work environment". In a similar approach an index model linking all four second-order factors of the perceived work environment postulated by the SFM to one third-order general quality of work environment factor was tested by Mauersberger (2012) during the SFM's development and resulted in a SEM model with only slightly worse fit indices for the three tested companies than the final SFM SEM model comprising five second-order factors. Assuming a general quality of the work environment factor brings back memories of early research on organizational climate that attempted to utilize a broad global conceptualization of work climate to understand the total situational influences in organizations and their effects on individuals (Kozlowski & Klein, 2000; Kuenzi & Schminke, 2009). This global construct was plagued with difficulties in definition, theoretical foundation and methodological research issues right from the outset (Kuenzi & Schminke, 2009). However, researchers repeatedly observed a general halo effect underlying employee survey factors (Borg, 2003b; von Rosenstiel, 2000) and such single index models are still very popular in practice, as they appear to be very easy to understand and interpret and thus are often preferred by (top) management representatives in organizations when analyzing employee survey results. Thus, a model with a single factor summarizing the elements of the perceived work environment and influencing employees' attitudes, behaviors and organizational outcomes (Model C) should be considered when testing potential structural employee survey models as well.

Overall, the considered survey models suggest a four-, a two- and a one-factor model solution for partitioning the elements of the perceived work environment in employee surveys. To empirically and competitively test these different conceptual approaches, we derive one SEM model structure for each configuration (Models A, B, C) and for comprehensiveness we include a theoretically also possible three-factor model (Model D) and test it competitively to the other Models. Model D builds on Model A but assumes a latent third-order overall leadership quality factor combining the transformational variables and the transactional variables. Transactional and transformational leadership forming the foundations of the transformational and transactional variables have been shown to correlate as high as or higher than one expects for alternative measures of the same construct (Judge & Piccolo, 2004). As transformational and transactional variables might be associated by employees with the same referent, namely their managers, they might form unified perceptions of the aspects influences by this group. All models are depicted explained one by one in Figure 2.1.

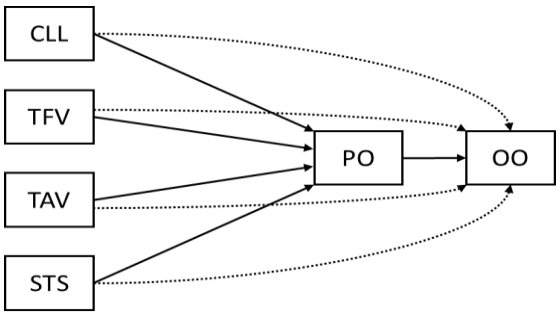
As the two-factor solution based on the BLOAS has also ties with the SFM and Denison's Organizational Culture Survey and in our opinion forms the best theoretical basis of the presented models, we expect Model B to fit better than the other four solutions.

*Hypothesis 1. The data shows a better fit to Model B than to Models A, C and D.*

Furthermore, it is reasonable to assume, that some of the dimensions subdividing the perceived work environment influence each other or mediate others influence onto outcomes. With a partial mediation of the influence of the "transformational variables" onto individual and organizational outcomes via the "transactional variables", the BLOAS proposes such a relationship (Burke & Litwin, 1992). We therefore also derive and test mediation variations of three of the four above described factorial models.

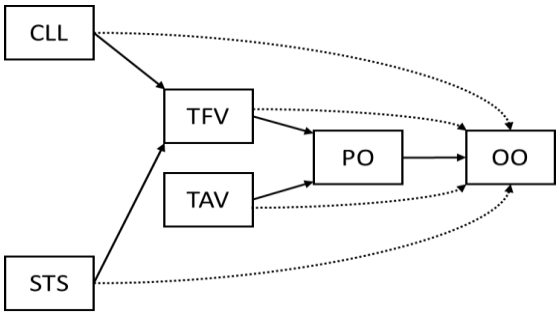
*Four factors of the perceived work environment*

Model A




**Four Factors of the Perceived Work Environment**
Closest to the formulation of the SFM (Mauersberger et al., 2017), this model assumes, that the factors corporate-level leadership, socio-technical system, transformational variables and transactional variables are interrelated though distinct aspects that share no major common variance. Each of these factors are proposed to have significant influence on the second-order outcome factor "people outcomes" and organizational outcomes. In accordance with the single best predictor survey models (cf. Harrison et al., 2006), the "people outcomes", should also directly influence organizational outcomes.

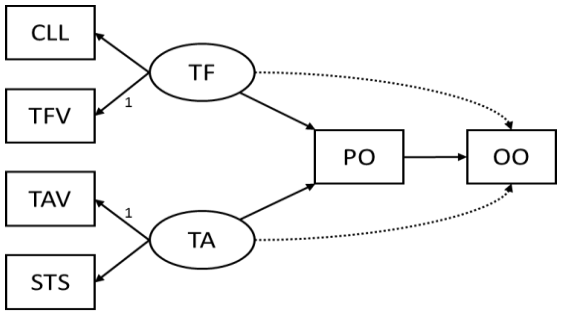
Model $A_m$




**Four Factors of the Perceived Work Environment with Mediation**
Within the SFM, the transformational variables comprise transformational leadership and "relevant associated concepts" (Mauersberger et al, 2017). Transformational variables appeal to followers' sense of values and are able to get them to see a higher vision and to encourage them to exert themselves in the service of achieving that vision (Burns, 1978; Herold, Fedor, Caldwell & Liu, 2008). Thus, the transformational variables might mediate corporate-level leaderships as well as the socio-technical systems influence on people outcomes (cf. Burke, 2017). Model Am mirrors Model A but specifies this mediation.

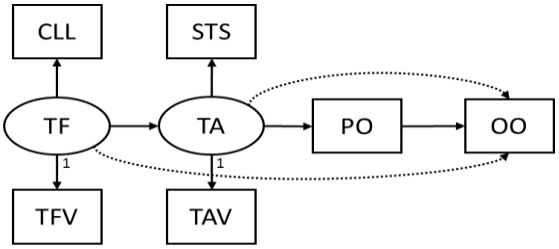
*Three factors of the perceived work environment*

Model B




**Two Factors of the Perceived Work Environment**
The two-dimensional model of the perceived work environment draws from the Burke and Litwin model (1992; Burke, 2017) by assuming a general transformational variables dimension summarizing corporate-level leadership and transformational variables and a general transactional variables dimension summarizing the socio-technical system and transactional variables from the SFM. This categorization of the SFM factors also corresponds to the flexibility and stability function of organizational work environment as put forward by Brodbeck (2015, 2013) and Denison et al. (2012).

Model $B_m$

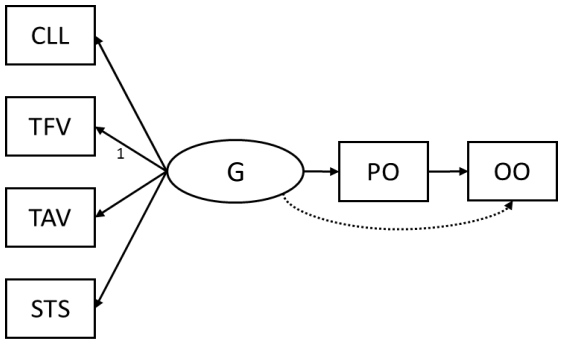



**Two Factors of the Perceived Work Environment with Mediation**
Model Bm builds on Model B but includes the structural relationships of the dimensions proposed by the BLOAS (e.g., Burke, 2017). Burke and Litwin (1992) assume a mediation of the effect of the general transformational variables dimension onto individual outcomes via the general transactional variables dimension.

*Figure 2.1.* Seven tested structural employee survey models.
Note. CLL = Corporate-level leadership; TFV = Transformational variables; TAV = Transactional Variables; STS = Socio-technical system; L = general leadership factor; TF = general transformational factor; TA = general transactional factor; G = general factor of the perceived work environment.

*One factor of the perceived work environment*

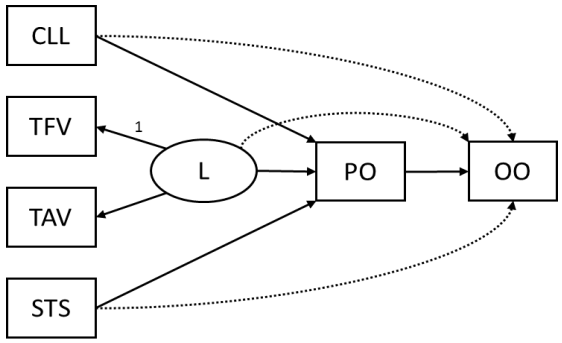
Model C




**One General Quality Factor of Perceived Work Environment**
This model hypothesizes one general dimension of work environment as it is perceived by employees. This dimension might be understood as a general perception of work environment quality and influences the perception of corporate-level management, the socio-technical system, transformational variables and transactional variables altogether.

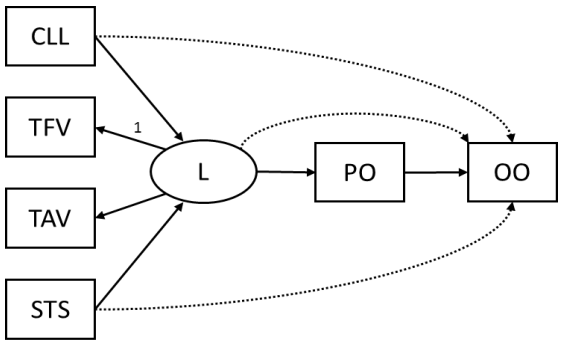
*Two factors of the perceived work*

Model D




**Three Factors of Perceived Work Environment**
Model D builds on Model A but assumes a latent overall leadership quality variable combining the transformational variables and the transactional variables. Transactional and transformational leadership the foundations of the transformational and transactional variables have been shown to correlate as high as or higher than one expects for alternative measures of the same construct (Judge & Piccolo, 2004). As transformational and transactional variables might be associated by employees with the same referent, namely their managers, they might form unified perceptions of the aspects influences by this group.

Model $D_m$




**Three Factors of Perceived Work Environment with Mediation**
This model specifies the mediation as described in Model Am for the three-dimensional subdivision of perceived work environment.

*Figure 2.1 cont'd.* Seven tested structural employee survey models.
*Note.* CLL = Corporate-level leadership; TFV = Transformational variables; TAV = Transactional Variables; STS = Socio-technical system; L = general leadership factor; TF = general transformational factor; TA = general transactional factor; G = general factor of the perceived work environment.

Obviously, a mediation variation of the one-dimensional Model C would make not much sense, as the general quality factor of the perceived work environment cannot mediate its own influence onto people and organizational outcomes. These model variations are constructed as follows (see Figure 2.1: Mediation variations of the models marked with an "$_m$"):

***Model $A_m$: Four Dimensions of Perceived Work Environment with Mediation***. Within the SFM, the second-order factor "transformational variables" comprise transformational leadership and "relevant associated concepts" (Mauersberger et al, 2017, see Appendix Table A). Transformational variables appeal to followers' sense of values and are able to get them to see a higher vision and to encourage them to exert themselves in the service of achieving that vision (Burns, 1978; Herold, Fedor, Caldwell & Liu, 2008). Thus, the second-order factor transformational variables might mediate the influences of corporate-level leadership as well as the socio-technical system on people outcomes (cf. Burke, 2017). Model $A_m$ mirrors model A but specifies this mediation.

***Model $B_m$: Two Dimensions of Perceived Work Environment with Mediation.*** Model $B_m$ builds on Model B but includes the structural relationships of the dimensions proposed by the BLOAS (e.g., Burke, 2017). Burke and Litwin (1992) assume a mediation of the effect of the third-order general transformational factor onto individual outcomes via the third-order general transactional factor.

***Model $D_m$: Three Dimensions of Perceived Work Environment with Mediation.*** This model specifies the mediation as described in Model $A_m$ for the three-dimensional subdivision of perceived work environment, so that the third-order leadership quality factor mediates the influences of corporate-level leadership as well as the socio-technical system on people outcomes.

Overall, this results in seven models that are made subject to meta-meta-analytical structural equation modeling to test their model fit. All models are shown in Figure 2.1. As the additional structural assumptions in the mediation models should yield additional explained variance and prior research found support for the influence of "general transformational variables" onto "general transactional variables" (Anderson-Rudolf, 1996) we expect the mediation models to fit better than their counterparts, with the two-dimensional-mediation Model (Model $B_m$) fitting best overall.

*Hypothesis 2. The proposed mediation models ($A_m$, $B_m$, $D_m$) fit the data better than their respective counterparts assuming independent factors of the perceived work environment.*

*Hypothesis 3. Model $B_m$ fits the data better than all other six proposed models.*

## 2.5 Method

Meta-meta-analysis or second-order meta-analysis is an overview of reviews, which allows to tackle ever broader research questions by synthesizing research from different areas (Cleophas & Zwinderman, 2017; Cooper & Koenka, 2012). For a comprehensive high level-analysis of work environment perception and its influence on individual and organizational outcomes, as intended in this paper, this synthesis of meta-analytically generated gold-standard scientific knowledge (Cooper & Koenka, 2012, Hunter & Schmidt, 2004) is most suitable.

### 2.5.1 Inclusion Criteria

In our meta-meta-analysis, we included meta-analyses, which focused on the relationships between employees' experiences and perception of the work environment, attitudes, and behaviors relevant for organizational functioning. Because a major goal of employee surveys is to gather information within the organization in order to improve organizational functioning, we

also included meta-analyses that investigated the relationship between employees' experiences, attitudes, and behaviors, on the one hand, and objective outcomes on the organizational level such as venture growth, turnover, innovation, and productivity, on the other hand. Following Mauersberger et al. (2017), several criteria were employed to include or excluded constructs: Because employee surveys are based on individual's answers, we limited the search to constructs that reflect individual's experience as they work in their immediate environment and their team as well as they relate to colleagues, supervisors, and management. Constructs that can only be assessed on the group or organizational level were only considered when being crucial outcome variables showing why specific individual level constructs matter to organizations. Furthermore, we focused on constructs that were conceptualized as variables subject to change. One major goal of employee surveys is to intervene and initiate change as well as develop individuals, teams and organizations. Therefore, concepts that describe characteristics that cannot (or rather can hardly) be changed, trained, or developed – like stable personality traits – were excluded. Mauersberger et al. (2017) used meta-analyses published until 2010 linking employees' perceptions of the work environment to people and organizational outcomes to develop the SFM. To not confound databases when evaluating the models in this meta-meta-analysis, we excluded these meta-analyses from our analysis.

### 2.5.2 Search Strategy

Meta-analyses were located through electronic and manual search of PsycINFO, Web of Science and Publish or Perish and Google Scholar databases using the subject term "meta-analysis" together with all first-order category terms of the SFM as they are listed in the Appendix in Table A. When new terms fitting the inclusion criteria were identified during the

search, these terms were also searched for meta-analyses. The final search in these databases was conducted in May, 2017. Overall, our search yielded 277 meta-analyses.

### 2.5.3 Screening of records and data extraction

Records were retrieved in full-text forms and screened by one of the authors using aforementioned and a priori defined inclusion criteria (see Figure 2.2). After screening and exclusions during the coding process 123 meta-analyses containing 1,445 meta-analytic coefficients from 25,653 primary studies and 15,128,742 observations were included in the meta-meta-analysis.

Data extraction from the meta-analyses was independently conducted by the author and three master's students, after they had been trained in coding correlation variables from meta-analyses into the first-order categories of the SFM using an extended version of Appendix Table A as detailed coding manual. Additional to coding dependent and independent variables from the meta-analyses to the SFM categories as well as effect sizes (mainly correlations) and their standard errors or confidence intervals, the year of publication and the measurement level of the variables were collected within the coding frame. To offer a small glimpse into the large final database, Table B in the Appendix comprises a shortened extract. The full database can be obtained from the author upon request. Each master's student coded a differently-sized subset of meta-analyses (Rater A = 19, Rater B = 88, Rater C = 16), so that there was one overlapping to the authors coding for each meta-analysis. With Cohens $\kappa$ = .88 ($\kappa_{Rater\ A}$ = .95, $\kappa_{Rater\ B}$ = .90 and $\kappa_{Rater\ C}$ = .85), interrater agreement in coding variables of meta-analyses' effect sizes into the first-order categories of the SFM was very high (Cohen, 1960; Fleiss, 1981). Disagreements were resolved by discussion between the two raters and the co-author.

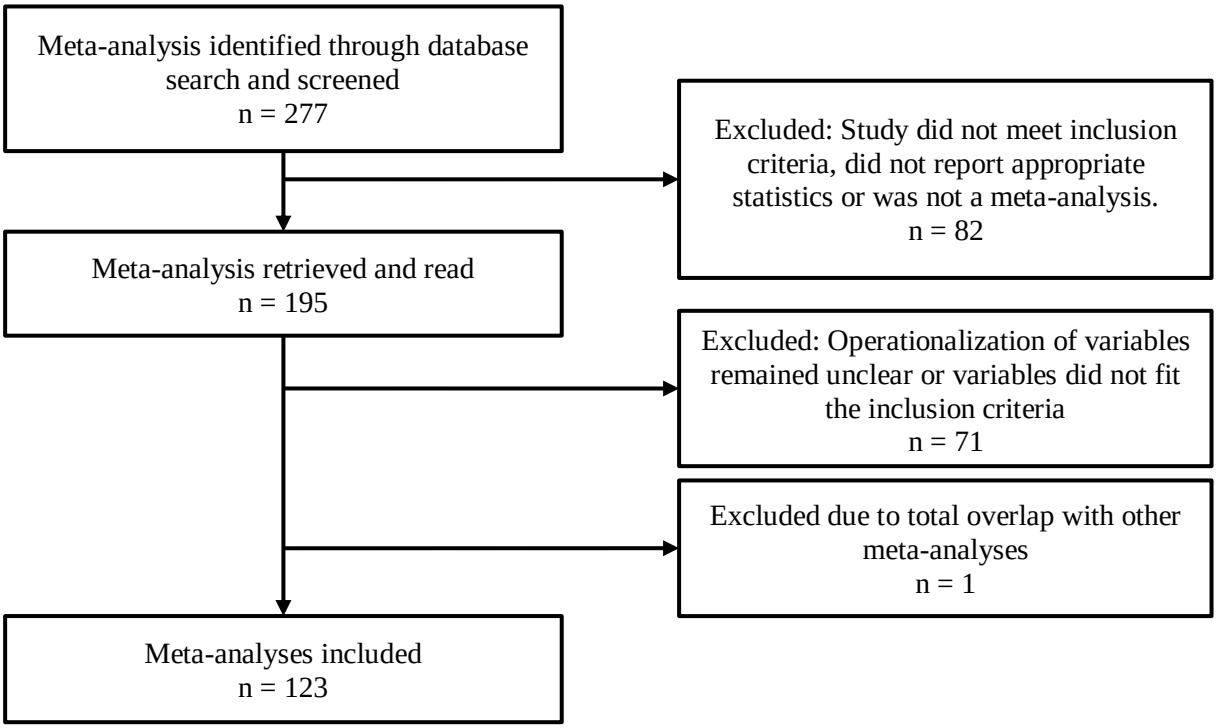



*Figure 2.2.* Meta-meta-analysis flow-chart of meta-analyses selection.

### 2.5.4 Correction of primary study overlap

To avoid bias from overlapping meta-analyses and assure independence of included effect sizes for meta-meta-analytical structural equation modeling, we first identified a total of 67 (4.4 %) meta-analytic coefficients describing the same relationship of constructs and comprising overlapping primary studies. In a second step, we rated their meta-analyses' methodological quality using the Assessment of Multiple Systematic Reviews (AMSTAR; Shea et al. 2007; cf. Cooper & Koenke, 2012) and excluded coefficients from meta-analysis with significantly worse methodological quality than their overlapping counterpart (three or more points worse on the AMSTAR scale). To choose from the remaining overlapping coefficients with comparable methodological quality, we chose the number of primary studies as decision criterion (cf. Lipsey & Wilson, 1993), because a larger number of studies probably implies higher levels of evidence (Cooper & Koenke, 2012).

### 2.5.6 Calculation of effect size

Nearly all retrieved estimates were corrected *r*-class effect sizes. Only one meta-analysis reported Cohens d. These effect sizes were transformed into correlations. As *r* is not an interval scale, all *r*s were transformed into Fisher's Z by (Cheung, 2015; Lipsey &Wilson, 2001)

$$Z = 0.5 \ln[(1 + r)/(1 - r)].$$

For the purposes of interpretation, the results of the meta-meta-analysis were transformed back to *r* by (Lipsey &Wilson, 2001)

$$r = (e^{2Z} - 1)/(e^{2Z} + 1).$$

Z-transformation of correlations also allows correct calculation of standard errors (Lipsey & Wilson, 2001).

### 2.5.6 Meta-meta-analytic procedure

We preferred the total sample size as basis for invariance weighting of effect sizes over the number of included studies (Cheung, 2015; Lipsey & Wilson, 2001), as it is the more conservative approach[2]. This further fits our research goal, as we attempt to draw inferences for the population of employees engaged in employee surveys and not on study characteristics and their influence on studies outcomes (Cheung, 2015).

Homogeneity of effect sizes was tested with a Q test of homogeneity (Lipsey & Wilson, 2001). Homogeneity was rejected for all effect size groups. Therefore, we used a random effects

[2] We also conducted all analyses with inverse variance weight based on the number of primary studies contributing to each meta-analytic effect size. Results showed same significances, while total correlation coefficients tended to be slightly higher and effect sizes displayed more homogeneity. Thus, reporting results calculated with total sample size inverse variance weight is the more conservative approach. Results of this analysis can be provided upon request.

model meta-analytic analog to the one-way ANOVA with maximum likelihood estimation from Wilsons macros for IBM SPSS 24 (Wilson, 2017) to calculate the total effect sizes as described by Lipsey and Wilson (2001). Treating originating meta-analysis as a moderator within the ANOVA, we controlled for interdependence of effect sizes retrieved from identical meta-analyses.

### 2.5.7 Meta-meta-analytical structural equation modeling (MMASEM)

Researchers have combined meta-analysis and structural equation modeling (SEM) in various contexts of organizational research (Cheung, 2015; Landis, 2013). Meta-analytic structural equation modeling (MASEM) uses a full meta-analytic correlation matrix generated through meta-analysis as input to fit structural equation models. With this approach, one can empirically test the viability of competing structural models by combining available evidence from the potentially disparate literatures (Landis, 2013; Viswesvaran & Ones, 1995).

To our knowledge structural equation modeling has so far not been applied to correlation matrices generated through meta-meta-analysis. However, since meta-meta-analytic correlation coefficient fulfill the same quality criteria as meta-analytic correlation coefficients (cf. Cooper & Koenka, 2012; Hunter & Schmidt 2004), SEM should be equally applicable. This approach allows us to analyze highly aggregated and broad theoretical models of organizational functioning, as they are proposed in this study, and whose breadth of scope makes it very difficult to analyze them fully in a single empirical study or even meta-analysis (cf. Cooper & Koenka, 2012).

We subjected our meta-meta-analytically generated correlation matrix to correlation-based MASEM on a random-effects model (Cheung, 2015: 239), technically making it meta-meta-analytical structural equation modeling (MMASEM). This approach fits SEM to a

correlation matrix generated through a random effects model. For fitting the models, we applied the sem-package for R (Fox, 2006). Recommended as conservative by Landis (2013), we used the harmonic mean of the cell sample sizes as sample size for conducting the SEM analysis (see also Cheung, 2015). As the independence model is likely wrong in applied research, RMSEA (Steiger, 1990) is the preferable fit index for MASEM (Cheung, 2015). However, for comprehensiveness we further report CFI (Bentler, 1990) and AGFI (Jöreskog & Sörbom, 1989) indices.

## 2.6 Results

Table 2.2 shows the meta-meta-analytic corrected correlations between the second-order factors of the SFM, their respective random effects variance components and the number of meta-analytic coefficients, primary studies and sample sizes contributing to each cell. All random effects variance components are relatively small ($v$ < .06). The correlations between all second-order factors are significant (p < .001) and of medium to large effect size (Lipsey & Wilson, 2001). The factors summarizing the perceived work environment correlate slightly less with the outcome factors (people outcomes and organizational outcomes; $.19 \geq r \geq .38$) than with each other ($.22 \geq r \geq .47$).

Table 2.2

*Meta-meta-analytic correlation matrix of SFM second-order factors and organizational outcomes*

| Construct | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Corporate-level leadership | | | | | |
| 2. Socio-technical system | .41 * | | | | |
| *v* | .004 | | | | |
| *m* meta-analytic coefficients | 10 | | | | |
| *k* total studies | 87 | | | | |
| *N* total observations | 26,207 | | | | |
| 3. Transformational variables | .43 * | .41 * | | | |
| *v* | .014 | .003 | | | |
| *m* meta-analytic coefficients | 12 | 14 | | | |
| *k* total studies | 115 | 195 | | | |
| *N* total observations | 43,270 | 47,770 | | | |
| 4. Transactional variables | .47 * | .22 * | .46 * | | |
| *v* | .032 | .010 | .053 | | |
| *m* meta-analytic coefficients | 33 | 63 | 38 | | |
| *k* total studies | 323 | 983 | 844 | | |
| *N* total observations | 109,739 | 736,067 | 455,526 | | |
| 5. People Outcomes | .38 * | .31 * | .38 * | .28 * | |
| *v* | .034 | .031 | .040 | .033 | |
| *m* meta-analytic coefficients | 74 | 156 | 163 | 534 | |
| *k* total studies | 1,540 | 3,094 | 2,758 | 8,898 | |
| *N* total observations | 607,502 | 2,143,288 | 1,340,601 | 6,117,178 | |
| 6. Organizational Outcomes | .23 * | .19 * | .36 * | .21 * | .25 * |
| *v* | .001 | .004 | .003 | .007 | .011 |
| *m* meta-analytic coefficients | 21 | 63 | 28 | 116 | 120 |
| *k* total studies | 448 | 1,488 | 534 | 2,667 | 1,679 |
| *N* total observations | 202,986 | 360,068 | 754,089 | 1,103,132 | 1,081,319 |

*Note*. *p < .001. *v* = Random effects variance component.

As results of MMASEM, fit indices for each model are reported in Table 2.3. Two trends are apparent in these results. First, models with more general or more unified conceptualizations of perceived work environment tend to fit better than models with more diversified conceptualizations, as evidenced by all indices. That is, the one-dimensional Model C (RMSEA = .104, CFI = .930 and AGFI = .931) fits better than Models B (RMSEA = .315, CFI = .520 and AGFI = .542) and D (RMSEA = .317, CFI = .513 and AGFI = .401), which in turn fit better than the four-dimensional Model A (RMSEA = .374, CFI = .322 and AGFI =.121). This finding supports a higher third-order structure of the perception of work environment by employees beyond the second-order factors of the SFM. It contradicts Hypothesis 1, according to which the two-dimensional Model B should fit best. A second trend evident in Table 2.3 is the superiority of SEM models proposing a mediation process by which third-order factors of work environment characteristics influence individual and organizational outcomes. The mediational models $A_m$ (RMSEA = .322, CFI = .496 and AGFI = .411), $B_m$ (RMSEA = .078, CFI = .971 and AGFI = .959) and $D_m$ (RMSEA = .207, CFI = .792 and AGFI = .762) fit better than their respective counterparts with an equal number of proposed dimensions, and Model $B_m$ obtained the best overall fit. Model $B_m$ demonstrates fit indices that can be considered a close approximation to the true structural relationships in the population (Hu & Bentler, 1999: CFI =.96, AGFI =.96, and RMSEA =.07). The significant chi-square suggests there is still room for improvement, but this statistic is sensitive to trivial model departures in our very large samples (cf. Harrison et al., 2006). To assure superior model fit of Model $B_m$ over the other models, we compared its model fit with the second-best fitting model, Model C (Hu & Bentler, 1999). The results show that Model $B_m$ fits the data significantly better than Model C ($\Delta\chi^2 = 6915.40$, $p < .001$). These results support hypotheses 2 and 3.

In Figure 2.3 path coefficients for Model $B_m$ are shown. Besides the direct influence of the general transformational factor onto organizational outcomes all path coefficients for Model $B_m$ are significantly positive ($p < .001$). Thus, the model closely oriented at the Burke-Litwin model's structure and proposing a mediation of a latent transformational variables' influence on outcomes via general transactional variables is empirically supported.

Table 2.3

*Results of Meta-meta-analytic Structural Equation Modelling*

| | | Fit indices | | | | |
|---|---|---|---|---|---|---|
| | Mediation | $\chi^2$ | df | RMSEA | CFI | AGFI |
| Four dimensions of perceived work environment | | | | | | |
| Model A | | 115,877.00* | 6 | .374 | .322 | .121 |
| Model $A_m$ | x | 86,072.89* | 6 | .322 | .496 | .411 |
| Three dimensions of perceived work environment | | | | | | |
| Model D | | 83,178.54* | 6 | .317 | .513 | .401 |
| Model $D_m$ | x | 35,518.30* | 6 | .207 | .792 | .762 |
| Two dimensions of perceived work environment | | | | | | |
| Model B | | 81,864.26* | 6 | .315 | .520 | .542 |
| Model $B_m$ | x | 5,010.80* | 6 | .078 | .971 | .959 |
| One dimension of perceived work environment | | | | | | |
| Model C | | 11,926.16* | 8 | .104 | .930 | .931 |

*Note.* * $p < .001$. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; AGFI = Adjusted Goodness of Fit Index.

## 2.7 Discussion

For utilizing employee survey data for EbM, employee survey measurement models have to make scientifically substantiated assumptions, about what to measure and about how the constructs measured interact with each other and relate to relevant organizational outcomes. A review of 11 scientifically published survey measurement models revealed, that multiple models offer comprehensive listings of which relevant constructs should be measured. As to how these constructs influence organizational outcomes, most models implicitly rely on the classical notion, as it is for example formulated in the reasoned action approach (Fishbein & Ajzen, 2010), that employees' behavior and organizational outcomes are impacted by employees' general job attitudes, which in turn are formed by their perception of the work environment. However, only very few of the models make assumptions on how the components of the perceived work environment that they propose to be measured relate to and interact with each other, to in the end influence individual and organizational outcomes. Furthermore, these few models' structural assumptions lack empirical validation. To address this gap, we built on state-of-the-art survey measurement models and developed and tested seven theoretically sound and structurally testable ES models applying MMASEM.

We find strong evidence for a model that synthesizes the Strategic Fitness Models™ factors (Brodbeck, 2015, Mauersberger et al., 2017) with the Burke-Litwin model of organizational performance and change's structure (1992; Burke, 2017). This model, which we termed Transformation-Transaction (TFTA) Model, comprises two higher-order dimensions of the perceived work environment: A general transformational factor and a general transactional factor which mediates the transformational factors influence on relevant individual and organizational outcomes. This transformational factor is associated with leadership in an

organization context bringing about the change and is “discontinuous and revolutionary” in nature (Burke, 2017, p. 229), affecting the deep structure of the system and requiring significantly new behavior of the organizations members. While the transactional factor is more concerned with management, systems, structures and day-to-day operations (Burke, 2017, p. 230).

The supported mediation model indicates that transformational elements, despite directly influencing people and organizational outcomes, mainly influence transactional elements such as transactional leadership, organizational systems, cooperation or feedback, which in turn affect people and organizational outcomes. It seems that basic structures and processes as well as the basics of transactional management are necessary for an organization to realize the power of transformational factors and enabling them to adapt more quickly and to implement revolutionary change more efficiently. Organizational and transformational leadership needs to address and consider the local context (Cascio, 2007, Rousseau, 2012) formed by these basic transactional elements and transactional leadership to be effective and achieve sustainable change. Without establishing and changing these basics, attempts to quickly adapt and change through organizational transformational leadership might be of limited success.

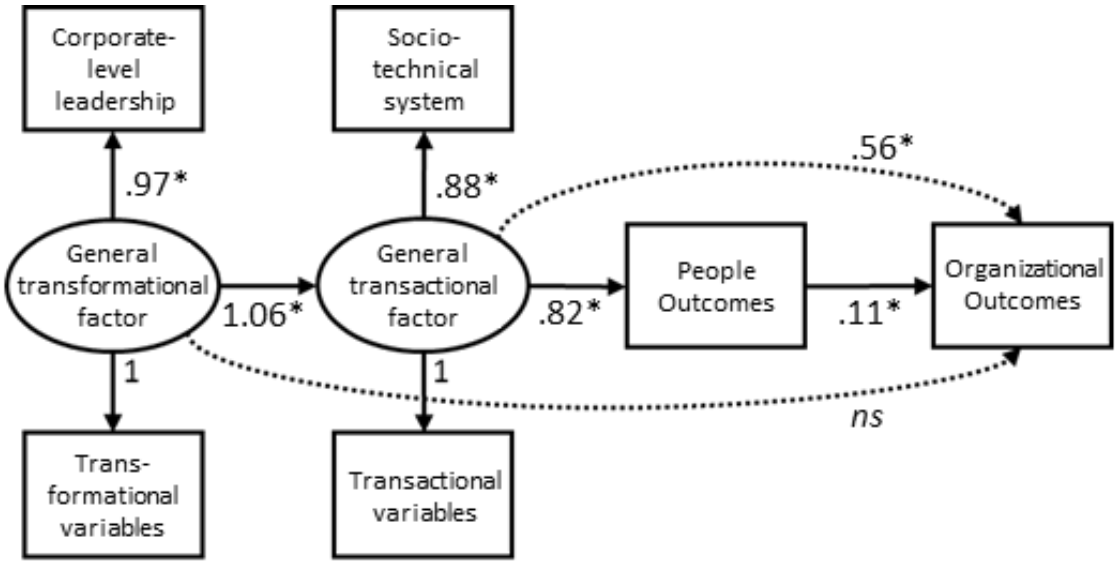



*Figure 2.3.* Path coefficients of Model $B_m$.
*Note.* *p < .001.

Our results also reflect and support the general notion formulated within the Denison Organizational Culture Survey (Denison et al., 2012) and the SFM (Brodbeck, 2013, 2015, Mauersberger, et al., 2017), that organizations need to assure their stability and flexibility at the same time, as the balancing of these seemingly contradictory demands is instrumental for organizational functioning (Denison et al., 2012). This notion rests on a time-honored perception formulated by Simon (1947) of an organization as an adaptive system of physical, personal and social components that not only needs to strive to maximize profit, but also has to find acceptable solutions to acute problems and thus needs to balance seemingly contradictory goals at the same time. In decades of research this approach got reframed and refined (e.g., Holland, 1975; Kuran, 1988; March 1991) and pathed ways to the concept of organizational ambidexterity (Tushman & O'Reilly, 1996), which at its core states, that to stay competitive organizations have to be able to adapt quickly through exploration, while still being able to exploit (March, 1991). Thus, conceptual gut feeling similarities between the concepts of flexibility and stability, which are represented by the transformational and the transactional factor in our model, and the concept of

exploration and exploitation of organizational ambidexterity research are not accidental, but rather represent the same idea in slightly different contexts.

Indeed, our results can be considered in line with the constructs of simultaneous and contextual ambidexterity of organizations (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2013; Raisch & Birkinshaw, 2008). Gibson and Birkinshaw (2004: 214) view, the ability to balance exploration and exploitation requires a "supportive organizational context" and define ambidextrous organizations as "aligned and efficient in their management of today's business demands, while also adaptive enough to changes in the environment that they will still be around tomorrow (p. 209)." However, what the organizational systems and processes are that enable organizations to explore and exploit simultaneously were never concretely specified (O'Reilly & Tushman, 2013). This is exactly where our model can be helpful. Elements of the perceived work environment constituting the general transformational factor and therewith organization flexibility, might be the preconditions for successful exploration, while the elements forming the transactional factor and determining organizational stability might precondition successful exploitation. Expanding this thought even further leads to the interesting idea, that exploitation preconditions and mechanism need to be in place before organizations can effectively explore. And vice versa, the fruits of exploration can only be harvested when transactional factors are shaped and in place, which can transform relevant ideas and inventions into productive innovations.

Thus, the structural Transformation-Transaction Model for employee surveys developed and validated in this paper might not only represent the first employee survey model, that builds on an internationally generalizable model and incorporates validated content and factorial structure with meta-analytically validated structural assumptions regarding its factors and

relevant outcomes. As Burke (2017) has pointed out for the BLOAS, such a sophisticated survey model might also represent a general model of organizational functioning and organizational performance emergence. Drawing from a wide range of meta-analyses of industrial and organizational psychology as well as management and business research the presented model pulls together theories and concepts from both disciplines and forms a high-level representation and unifying theory.

With the presented, practitioners now have a model at their disposal whose structure and content is meta-meta-analytically validated, cross-cultural measurement equivalent and truly enables practitioners to utilize employee survey data for evidence-based management. The models' high-level structure also can provide practitioners with a clear and quick overview of how perceptions of the work environment affect employees and organizational outcomes and allows to identification levers for change.

### 2.7.1 Limitations and Routes for Future Research

When aggregating meta-analytic evidence to perform high-level MMASEM across many research domains of industrial and organizational psychology as well as business research, as conducted in this paper, some compromises, mainly resulting from meta-analyses reporting practice, have to be made: Although independent and dependent variables were coded respectively for each effect size, only a small sample of effect sizes extracted from the meta-analyses included only studies with time-lagged designs. Thus, causality and directionality of relationships cannot be assumed with certainty at the current status. To perform the high-level analysis across many research domains different variables had to be subsumed under the same construct. This assignment of variables to constructs was conducted by well-trained raters and was based on an empirically validated theoretical framework (Mauersberger et al. 2017).

Although we view our aggregation as pretty robust, also considering the amount of data and variables included, potentially important relationships between single variables subsumed to different constructs might have got lost in the process. Thus, future research should attempt to take a detailed look at the variable's assignment to the constructs of the TFTA model to further refine the model. As meta-analyses usually do not report interaction terms for their focus variables moderator variables could not be considered in the MMASEM analysis. Furthermore, as levels of analysis and measurement were also in most cases not reported for the coded effect sizes in the meta-analyses, different levels of analysis and measurement of the same constructs may be confounded in the analysis.

Future theory development and research is asked to establish and test causal relationships of the models' categories. Furthermore, to improve employee survey measurement models, future research should address probable multi-level effects (Klein & Kozlowski, 2000; Hitt, Beamish, Jackson & Mathieu, 2007) within employee survey measurement models – a topic largely unaddressed so far.

In sum, we provide a basis for designing employee surveys based on a cross-culturally validated measurement model that incorporates scientific content and structure. Thus, when building on the model, organizations can directly apply the principles of the "big 'E' evidence" of EbM when gathering their information for the "little 'e' evidence" of EbM via employee surveys (cf. Rousseau, 2006).

## 2.8 Linking Chapter 2 and Chapter 3

In Chapter 2 we reviewed scientific employee survey measurement models to evaluate their suitability for evidence-based management purposes, by combining scientific "big 'E' evidence" (Rousseau, 2006) represented in their components and structure with local context

specific “little ‘e’ evidence” (Rousseau, 2006) generated through conducting employee surveys in practice. As no measurement model combined validated content with a validated model structure we developed and tested seven potential structural survey models meta-meta-analytically synthesizing current scientific evidence. As expected the Transformation-Transaction survey models’ factorial and internal structure proved to fit the data best. It, thus, represents the first theoretically well-grounded and scientifically substantiated structural measurement model for employee surveys and their specific use for evidence-based management.

In Chapter 3 we build on the Transformation-Transaction survey model developed in Chapter 2 and transfer it into practice in three studies. Applying the Transformation-Transaction survey model to conduct employee surveys in practice enables us, first, to validate the model not only with synthesized secondary meta-analytic data, but also with empirical data collected directly in practice. Extending previous research on employee survey models that has focused so far on cross-sectional analyses and validation neglecting the inherent causal nature of their own assumptions (cf. Borg & Mastrangelo, 2008; Burke, 2016; Di Pofi, 2002) we, second, investigate causality of the Transformation-Transaction survey models’ assumptions. Third, as survey data is gathered in very complex and dynamic organizational systems (e.g., Katz & Kahn, 1978), we make a first attempt to include multi-level considerations an employee survey model. The longitudinal and multilevel design of the studies in Chapter 3 combined with the analyses of real-life data from an applied context allows obtaining a clearer picture of the Transformation-Transaction survey model quality and its suitability for evidence-based management.

# 3 Testing Causality and Multilevel Effects in a Sound Structural Employee Survey Measurement Model[3]

## 3.1 Abstract

Organizations more and more utilize employee survey data for evidence-based management and organizational change. However, current employee survey models' usefulness for evidence-based management is limited as they lack adequate validation of causal assumptions underlying their internal structure and impacts on 'hard' business outcome criteria and furthermore neglect potential multilevel effects in the survey data. In two large scale empirical studies we tested several causal assumptions underlying a scientifically sound structural survey model (cf. Matthaei & Brodbeck, 2018). In a third study, we further developed the model to capture multilevel concepts and their effects on people outcomes and also tested its incremental validity against a commensurate single-level survey model with data from over 190.000 employees in over 3000 work-units. Results are discussed in the light of combining people analytics with business analytics by demonstrating causal and multi-level effects of 'soft' survey data on 'hard' business data on the work group level.

## 3.2 Introduction

In the past decades political and market environments have become more and more volatile for organizations. Besides disgruntlement in traditional political alliances, and a revival of market protectionism (e.g., Scherrer & Abernathy, 2017), dramatically innovative ideas, so called "disruptive technologies" (Christensen et al., 2008), transform whole industries within

[3] The studies in this chapter have been presented at the "78the Annual Meeting of the Academy of Management" in August 2018 in Chicago, IL, USA. Professor Felix C. Brodbeck supervised this research and is the second author of this work. When using the term "we", I refer to Felix C. Brodbeck and myself.

years (Finz-enz, 2010). For instance, Amazon reinvented book selling, Spotify revolutionized the music business and Uber is on its way to substitute professional taxi services by private entrepreneurs. These trends let pundits and leaders alike assert that we now live in a 'VUCA world', employing an acronym for volatility, uncertainty, complexity, and ambiguity (Bennett & Lemoine, 2014).

To meet these challenges organizations are required to become more and more adaptive, while retaining a core stability to be able to perform efficiently (cf. Gibson & Birkinshaw, 2004; Matthaei & Brodbeck, 2018), and improve decision making (Rousseau, 2006). Attempting to achieve high adaptability organizations are implementing manifold initiatives revolving around continuous organizational development, feedback systems, reorganization of organizational structure like delayering and reorganization of work and work environments like employee empowerment. To improve decision-making, many organizations introduce the idea of data and evidence-based management (EbM; Bersin, 2015; Rousseau, 2006). EbM tries to make use of available scientific and local evidence (Rousseau, 2006) thereby reducing "eminence-based" or "eloquence-based" (cf. Isaacs & Fitzgerald, 1999) as well as feeling-based management (Brodbeck, 2008; Pfeffer & Sutton, 2006).

A key instrument that can contribute to and drive both organizational adaptability and decision making while bringing them together however is often overlooked – the employee survey. Employee surveys are commonly perceived as instruments of organizational development, fostering organizational adaptability by providing systematic feedback and initiating follow-up change processes (e.g., Burke, 2017; Church et al., 2012; Kraut, 2006). Their potential value for evidence-based management is far less known, though (Matthaei & Brodbeck, 2018; Mauersberger et al., 2017). When based on a sound scientific survey measurement model,

employee surveys enable organizations to integrate generalizable scientific knowledge (big "E" evidence, cf. Rousseau, 2006: 260), represented in the survey model, with locally generated organization-specific data (little "e" evidence, cf. Rousseau, 2006: 260), and thus allows organizations to rely on best available evidence for decision guidance.

To validly derive goal-directed change initiatives from survey results and using survey data to generate evidence for evidence-based management, employee surveys have to be thoughtfully designed. Researchers, however, repeatedly noted, that many of the existing employee survey measurement models lack either a well-grounded theoretical underpinning or a sound empirical foundation (Borg & Mastrangelo, 2008; Burke, 2017; Matthaei & Brodbeck, 2018; Mauersberger et al., 2017). Especially the structure of survey models, meaning the interrelations of its proposed factors with each other and relevant organizational outcomes, is often insufficiently specified and lacks sound validation (Burke, 2017; Di Pofi, 2002; Matthaei & Brodbeck, 2018; Mauersberger et al., 2017). A well specified and validated survey model structure however is essential when applying data generated through employee survey for evidence-based management. To know how the different variables of a model interact and via which process they influence organizational outcomes is essential for drawing valid and generalizable conclusions from the employee surveys results, for example, about linkages and levers for organizational change and development in evidence-based management (Kraut, 2006). Recently, some steps towards solving these problems have been made, by systematically analyzing the scientific survey model literature. With the model, presented by Matthaei and Brodbeck (2018), the first comprehensive survey model for international employee surveys was developed on the basis of meta-analytically validated structural assumptions by integrating components of different scientific survey models. Despite this effort, still two important

traditional shortcomings could not be solved by their work and thus remain to be tackled before employee survey models can be applied for evidence-based management with a clear conscience.

First, structural assumptions specified by theoretically sound survey models (e.g., Burke, 2017; Matthaei & Brodbeck, 2018) imply causality (Borg & Mastrangelo, 2008). If A is changed, B is affected and so forth. However, these structural assumptions are, if at all, so far only validated with cross-sectional analysis and, therefore, allow identifying correlations but no causal relationships. Even though Matthaei and Brodbeck (2018) for example test their models' structure with meta-meta-analytical structural equation modeling, their sample could not be limited to time-lagged meta-analytic designs and thus does not allow for testing the assumed causal relationships. The employee survey model literature so far falls short of adequately validating their causal structural assumptions, leaving survey practitioners in uncertainty, if the relationships specified in their survey model actually allow identification of levers for change or just represent correlations between variables.

Second, employee survey data is gathered in very complex and dynamic systems (e.g., Katz & Kahn, 1978). Commonly employees across a whole organization, from different organizational units, profession, different countries or subsidiaries, are surveyed. Hierarchical organizational structures and affiliation with a specific organizational unit relating thereto, influence employees everyday work experience to a great extent. Employees within the same units probably more resemble one another due to personnel selection processes and make more similar experiences at work, for example due to having the same boss or identical profession, than employees from different organizational units. This implies that employee surveys comprise complex multilevel systems with probable multilevel effects (Hitt, Beamish, Jackson & Mathieu, 2007; Klein & Kozlowski, 2000), that should be accounted for in employee survey models.

Although accounting for and modeling multilevel effects is often demanded and discussed in recent years (Hitt, Beamish, Jackson & Mathieu, 2007; Klein & Kozlowski, 2000) and management research is slowly stepping up to the task (e.g., Aguilera, Rupp, Williams, & Ganapathi, 2005; Beehr, Glazer, Fischer, Linton, & Hansen, 2009; Zohar, & Luria, 2005), there have been no attempts to account for multilevel data and effects in employee survey models so far (Matthaei & Brodbeck, 2018).

The purpose of this paper is to address these shortcomings, by testing the causal relationships proposed in the model presented by Matthaei and Brodbeck (2018) to organizational outcomes (Study 1) as well as its internal causal structural assumptions (Study 2) with large scale time-lagged data. We then attempt to further develop the model to account for multilevel effects in the data and test if the multilevel model fits the data better than the single level model (Study 3).

## 3.3 Theoretical Background

### 3.3.1 State of the Art Employee Survey Models and their Causal Assumptions

Employee surveys describe a "systematic process of data collection designed to quantitatively measure specific aspects of an organizational member's experience as it relates to work" (Church & Waclawski, 1998, p. 4). Conducted regularly by most large companies in Europe and the US (Hossiep & Frieg, 2013; Wiley, 2010), employee surveys are commonly perceived as instruments of organizational development, fostering organizational adaptability by providing systematic feedback and initiating follow-up change processes (e.g., Burke, 2017; Church et al., 2012; Kraut, 2006). Furthermore, they can provide insights extending beyond basic HR data and into the "black box" of employees' work environment perceptions, attitudes and the

emergence of "organizational behavior" as a whole and thus can expose the missing link in the value creation chain between organizational investments constituting the organizational work environment and organizational performance (Burke, 2017; Fitz-enz, 2010; Kraut, 2006; Matthaei & Brodbeck, 2018; Wiley, 2010). Thus, employee surveys provide information for managerial decisions for improving organizational functioning (Kraut, 1996) and therefore represent a tool perfectly suited to help HR departments to prepare their companies for the volatile political and market environments as well as potential future disruptive changes (cf. Fitz-enz, 2010; Kraut, 2006).

Over the last decades employee surveys have evolved from sporadic polls and benchmarking surveys, with just the intent to understand how employees see things to large unfreeze-and-involve management programs with the clear goal to improve satisfaction and performance, involving all employees and management levels in extensive regular follow-up processes (Borg & Mastrangelo, 2008). In the latest development phase, researchers and practitioners increasingly try to develop long-term focused "systemic employee surveys" by embedding the measured soft factors in the management systems (e. g., performance appraisal) and link them with other business data to improve management (Borg & Mastrangelo, 2008; Kraut, 2006; Wiley, 2010). Today there are various theoretical models available serving as a basis for questionnaire design, data analysis, and reporting of employee surveys as well as action planning based on survey results (Borg & Mastrangelo, 2008).

In a recent review Matthaei and Brodbeck (2018) analyze the 11 most renowned and scientifically published employee survey measurement models regarding their (a) relevance for organizational outcomes, (b) their comprehensiveness, (c) their structure and (d) their international measurement equivalence. They find that no model fulfills all the criteria. Most

models were able to predict organizational outcomes and received support for their factorial structure. However, only very few models, Harrison, Newman and Roth´s model, the RACER model (Borg & Mastrangelo, 2008) and the Burke-Litwin Organizational Assessment Survey (BLOAS; Burke & Litwin, 1992; Burke, 2017), explicitly go beyond factorial modeling and propose relationships and interactions between the components of perceived work environment and individual and organizational outcomes. However, these models' structural assumptions lack empirical validation (Matthaei & Brodbeck, 2018). To make things worse, only for a single survey model, the Strategic Fitness Model (Brodbeck, 2015; Mauersberger et al., 2017), international measurement equivalence was proven across the globe.

To tackle these shortcomings Matthaei and Brodbeck (2018) synthesized a new model from the best models' components and validated its structure meta-meta-analytically on the basis of over 120 meta-analyses. The model combines structural assumptions from various survey models like the Burke-Litwin-Organizational Assessment Survey (BLOAS; Burke, 2017; Burke & Litwin, 1992) and the Denison Organizational Culture Survey (Denison & Neale, 1996; Denison, Nieminen, & Kotrba, 2012) with the basic factorial structure of the Strategic Fitness Model (SFM; Brodbeck, 2015; Mauersberger et al., 2017). Center of the model are two higher-order factors of the perceived work environment, a latent transformational factor and a latent transactional factor, that both split up into two lower-level factors, which themselves again consist of multiple dimensions. The model thus might be referred to as Transformation-Transaction Model (TFTA model). The transformational factor, consists of the lower-level factors "transformational variables" and "corporate-level leadership", while the transactional factor, comprising the lower-level factors "transactional variables" and "socio-technical system", mediates the influence of the transformational factor onto relevant people outcomes, like job

satisfaction, commitment or engagement. These people outcomes, then in turn influence organizational outcomes, like organizational performance, profit, turnover or sickness rates (Matthaei & Brodbeck, 2018). The full model is depicted in Figure 3.1 and its dimensions and factors are described in more detail in Appendix A.

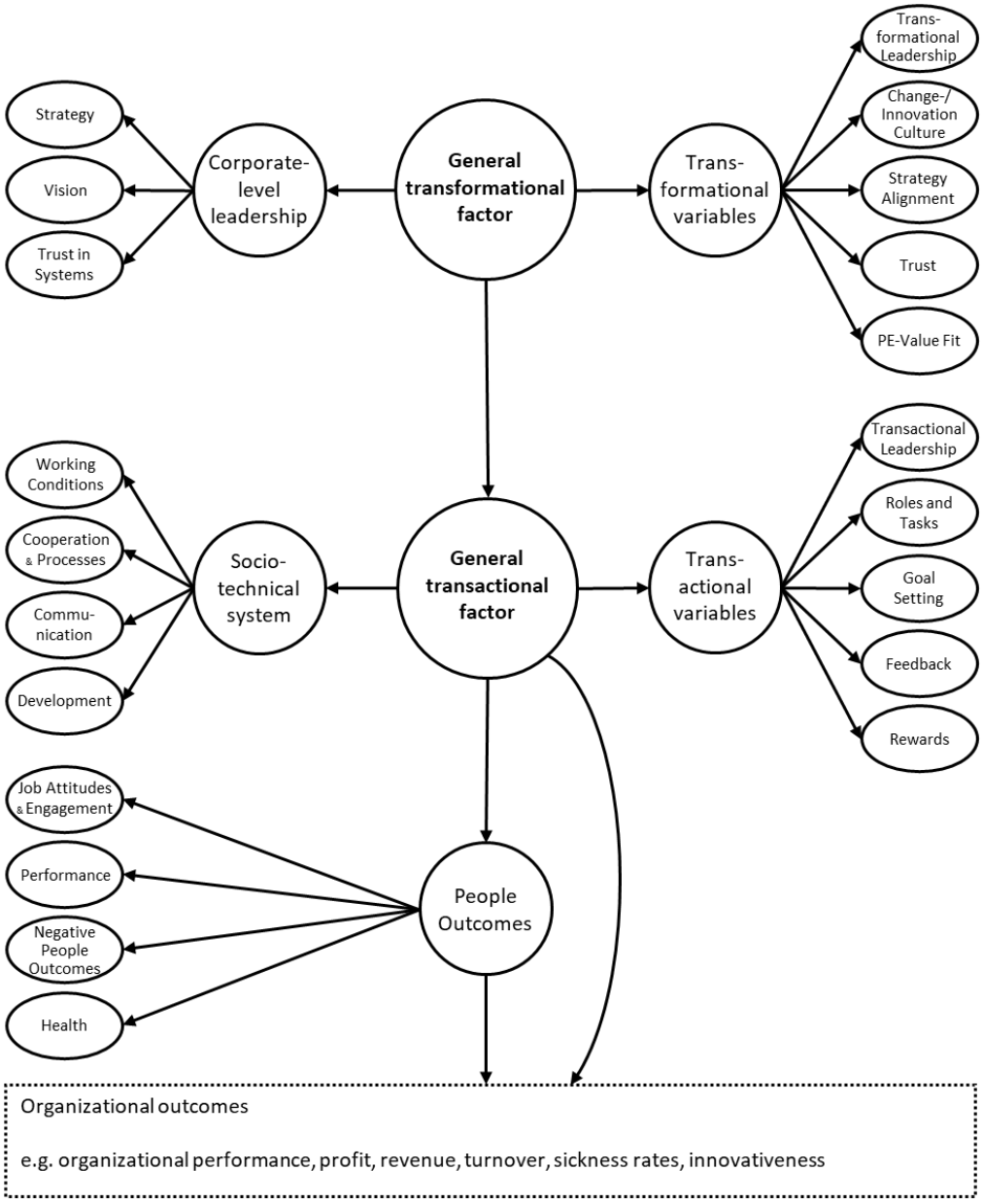



*Figure 3.1.* Transformation-Transaction Model.
*Note.* PE-Value Fit= Person-Environment Value Fit.

As mentioned before their suggested model draws components of its structure from the Burke-Litwin Organizational Assessment Model (e.g., Burke, 2017), which is explicitly stated to be a "causal model" (Burke, 2017, p. 222) that predicts cause, even though in organizational reality probably most variables of the model would correlate with each other (Burke, 2017, p. 228). This intercorrelation of all model variables holds true also for the Strategic Fitness Model (Mauersberger et al., 2017) and for the further developed TFTA model presented by Matthaei and Brodbeck (2018), which we are using as the baseline model in the present study. However, some relationships are weightier than others and some directions are theoretically more reasonable and empirically more important. These considerations are reflected in the model specifications. As can be seen in Figure 3.1, the causal assumptions are the following: the higher order transformational factor influences the higher order transactional factor which affects people outcomes, and together with people outcomes it further affects organizational outcomes.

As mentioned earlier when testing their models' structure with meta-meta-analytical structural equation modeling, Matthaei and Brodbeck (2018) were not able to limit their sample of meta-analyses to time-lagged meta-analytic designs for statistical testing, as there was only a small hand full, and thus, the proposed relationships could not be interpreted as causal relationships. Therefore, an empirical evaluation of the causal nature of the models' structure is still pending. With this paper we use large scale empirical data in two studies to test the causal nature of the models' structure. Study 1 analyzes the internal structure of the model with cross-sectional data and regarding its proposed causal impacts on time-lagged organizational outcomes, while Study 2 tests the causal nature of its internal relationships as described above. Adhering to the formulation of the TFTA model yields in the following hypotheses:

*Hypothesis 1a. The structure of the TFTA model is supported by cross-sectional structural equation modeling and fits the data well.*

*Hypothesis 1b. The transactional factor and the people outcomes of the TFTA model affect time-lagged organizational outcomes.*

*Hypothesis 2a. The transformational factor influences the transactional factor causally.*

*Hypothesis 2b. The transactional factor influences the people outcomes factor causally.*

### 3.3.2 Multilevel Considerations in Employee Surveys

Multilevel scholars have suggested that individual level models are often too simplistic to accurately capture organizational phenomena (e.g., Hitt et al., 2007; Kozlowski & Klein, 2000). Solely focusing on the individual-level may be a cause for concern because it ignores the fact that most contemporary work environments require individuals to align with a work group, team, and/or the organization (Cole et al., 2012; Mathieu, Maynard, Rapp, & Gilson, 2008). Although employee survey results are generally not reported or interpreted in organizations on the individual level, but rather aggregated on team or unit level, the literature on employee survey models has so far circumvented multilevel modeling (Matthaei & Brodbeck, 2018). Findings at one level of analysis, however, cannot be generalized neatly and exactly to other levels of analysis (Klein & Kozlowski, 2000). When micro researchers attempt to generalize findings from individual-level data to higher levels, they commit an atomistic fallacy. Just because a relation holds at the lower level does not mean it will also hold at higher levels. Relationships that hold at one level of analysis may be stronger or weaker at a different level of analysis, or may even reverse direction. We, therefore, need to understand, what exactly might be

represented by employee survey results of the TFTA model aggregated to the team or unit level and how potential "shared team [or unit] properties" (Klein & Kozlowski, 2000) emerge.

Shared team properties originate in same or similar individual "experiences, attitudes, perceptions, values, cognitions, or behaviors" (Klein & Kozlowski, 2000, p. 215), and shared factors or processes constrain variability among members of teams or units. In an employee survey context, with a homogeneous organizational environment, selection, socialization, leadership and social interactions, there are many factors that might have the potential to render a shared team or unit properties (Klein & Kozlowski, 2000). Thus, we want to describe, why and how team members might come to share the different high-level factors of the TFTA model, in the following.

***The Transformational Factor on the Team Level.*** The transformational factor of the TFTA model is associated with leadership in an organizational context (Burke, 2017; Matthaei & Brodbeck, 2018) and captures amongst others the dimensions transformational leadership, strategy, strategy alignment, trust and change and innovation culture. Its characterization as leadership in an organizational context already implies a certain determination through the leaders of teams. Employees of the same workgroup might implicitly or explicitly share consistent perceptions of their leader emerging from similar experiences in treatment from their leader and/or social information processing in interaction among the work group members (Klein & Kozlowski, 2000). The transformational factor on the work group level, thus, might be seen as a representation of change and leadership climate. Looking at the subdimensions of the transformational factor supports this notion.

The dimension “change and innovation culture” which is conceptualized as “climate for innovation” and “change culture” (Mauersberger et al., 2017) directly mirrors the work group-level concept the transformational factor and is implicitly a work group-level dimension. This is supported by the fact, that appropriate change-leadership behaviors in the change literature are mostly assumed to be aimed at the whole work unit (Herold, Fedor, Caldwell, & Liu, 2008). Transformational leadership can, and has been conceptualized as both, an individual-level and as a group or work-unit-level variable (Herold et al., 2008). At the individual level, it would reflect discretionary stimuli differentially aimed by the leader at different followers, whereas at the group level it would reflect ambient stimuli (Hackman, 1992), like leadership style, that are shared or experienced by all group members alike (Herold et al., 2008). Consistent alignment to the strategy within work units of the organization has been conceptualized as structural alignment (Beehr et al., 2009; Semler, 1997). Structural alignment describes the shared alignment to goals in different parts of the organization and can emerge through recruitment and socialization (Kristof, 1996) or leadership as “a major component of leaders’ job responsibilities is to ensure that their units are operating in accordance with the organization’s goals.” (Beehr et al., 2009: 4).

Overall, a work group-level transformational factor might exist and be seen as a representation of change and leadership climate. This work group-level concept captures shared work group properties, that are distinct from individual perceptions and form conceptually different variables.

*Hypothesis 3a. There is significant within-work group consistency to assume a work group-level representation of the transformational factor.*

***The Transactional Factor on the Work Group Level.*** The transactional factor of the TFTA model factor is concerned with management, systems, structures and day-to-day operations (Burke, 2017; Matthaei & Brodbeck, 2018). It comprises amongst others the dimensions transactional leadership, roles and tasks, working conditions, cooperation and communication. As in the case of the transformational factor the dimensions of the transactional factor appear influenced to a large extent by the work-units' leader. This is especially apparent as transactional leadership and assigning roles and tasks is a core task of leaders (e.g., Bass 1999), that due to their leadership style might be handled somewhat consistent by managers towards their work group members (cf. Zohar & Luria, 2005) or might be perceived consistent by work group members due to social information processing in interactions among work group members (Klein & Kozlowski, 2000). Its dimensions, cooperation and communication, are interactive by nature and thus their perception is formed in a social exchange process within the work group (Mauersberger et al. 2017). Aggregating individual-level evaluations of cooperation and communication to the work group-level therefore might yield a shared communication and cooperation climate (cf. Buunk, Zurriaga, Peiro, Nauta, & Gosalvez, 2005). Overall, the transactional factor on the work group-level can be best described as a representation of a working climate, as it captures the perception of the day-to-day working experiences that work group members share.

*Hypothesis 3b. There is significant within-work group consistency to assume a work group-level representation of the transactional factor.*

***People Outcomes on the Work Group Level.*** The people outcomes factor of the TFTA model summarizes all work-related attitudes, states, motivational variables (Mauersberger et al., 2017). These variables are classically assumed to be formed through cognitive evaluative

processes of individuals (e.g., Fishbein & Ajzen, 2010; Mitchell, 1997) and thus should inherently be individual-level constructs. However, a large body of literature has conceptualized these attitudes and motivational states as emergent states on the team-level or work group-level (e.g., Chen & Kanfer, 2006; Cole et al, 2012). At the work group-level, motivational states are assumed to reflect "a shared belief among members regarding various aspects of their capabilities and tasks" (Chen & Kanfer, 2006: 233). One of the most researched work group emergent motivational states is team (or collective) efficacy, which is assumed to be a team-level analogue of self-efficacy (Bandura, 1997) and which captures the shared belief among members of a work group that their work group can accomplish certain tasks (Chen & Kanfer, 2006). High team efficacy should go along with an energetic and engaged team climate (Cole et al., 2012) and with job satisfaction throughout the work group. We thus assume that a shared emergent work group-level perception of people outcomes exists.

*Hypothesis 3c. There is significant within-work group consistency to assume a work group-level representation of the people outcome factor.*

***Relationships between Work Group Level Constructs of the Transformation-Transaction Model.*** It is reasonable to assume, that the work group-level transformational factor, representing change and leadership climate might affect work group-level working climate, represented by the work group-level transactional factor. The shared perception of change climate and leadership of work group members might be seen as an approximation of the real leadership and change management quality experienced in their work group. Leadership and change management quality shapes the working conditions, structures and processes in a work group (e.g., Herold et al. 2008) and therewith their work group-level working climate. We therefore assume:

*Hypothesis 4a. The work group-level representation of the transformational factor is positively related to the work group-level representation of the transactional factor.*

When looking at the work group-level transactional factor, a great working climate might enable work group members to perform better and give them confidence in the work groups' abilities through the day-to-day interactions and shared working experiences and thereby affect the work group members collective efficacy (e.g., Bandura, 1997; Klein & Kozlowski, 2000). Through this process the work group-level transactional factor might positively relate to the work groups' emergent motivational state (Chen & Kanfer, 2006) and thereby also with the work group-level people outcomes.

*Hypothesis 4b. The work group-level representation of the transactional factor positively relates to the work group-level people outcomes.*

Last but not least, the work groups motivational states should impact individual job attitudes, like job satisfaction, motivation or engagement. Members working in highly motivated and engaged work groups, might be infected by these states through emotional, cognitive and social contagion processes (Barsade, 2002; Gibson, 2001). Furthermore, high team efficacy, meaning the confidence in the teams' abilities throughout the team members, might enhance individual self-efficacy. We therefore also assume a positive cross-level relationship of the work group-level people outcomes with the individual-level people outcomes.

*Hypothesis 4c. The work group-level people outcomes relate positively to the individual-level people outcomes.*

The whole purpose of adding multilevel concepts and relationships to the TFTA model is to enable the model to more accurately capture organizational phenomena (e.g., Hitt et al., 2007;

Kozlowski & Klein, 2000), and therewith improve its usefulness and informative value for evidence-based management. Furthermore, a multilevel model would be valuable for in-depth interpretations of employee survey results in practice, as for example, levers for change could be more precisely identified when analyzing differences between individual- and team-level or work group-level results. Individual level factors, such as general life satisfaction or level of competency could be separated from work group level factors, such as group efficacy beliefs. On each level, different means to achieve change would be necessary. As it adds information, we expect the multilevel version of the model to fit employee survey data better than the standard single-level version of it.

*Hypothesis 5. The multilevel version of the TFTA model fits the data better, then the commensurate single-level survey model*

## 3.4 Study 1: Model Structure and Effects on Organizational Outcomes

### 3.4.1 Theoretical Rationale

Study 1 analyzes the internal structure of the TFTA model with cross-sectional data and its dimensions proposed causal impacts on time-lagged organizational outcomes.

### 3.4.2 Sample and Procedures

For the first study employee survey data and HR organizational outcome measures were obtained from a large Germany headquartered manufacturing company. Employee survey data was collected during a span of four weeks in September, 2014. All employees were invited to the survey. White-collar employees with a company e-mail address received an electronic invitation from the board of management providing an internet link to a portal where they could complete

the web-based survey, while blue-collar employees in production areas (52 %) were sent individualized paper questionnaires to participate. In all, 181,103 employees from 3194 work-units and 44 countries chose to voluntarily respond to the 55 items for an overall response rate of 70 per cent. The sample was composed of 2 per cent division-level managers, 8 per cent team leaders, and 90 per cent non-managerial employees. The majority of respondents (83 per cent) were male. One and a half years later, sickness rates, dysfunctional turnover and idea management system data for the year 2015 were retrieved from the companies HR database as organizational outcomes.

### 3.4.3 Measures

***Components of the Transformation-Transaction Model.*** To capture the components of the Transformation-Transaction Model the employee surveys items were matched independently to the dimensions of the model by both authors. This mirrors the procedure by Mauersberger et al. (2017), when they first validated the Strategic Fitness Model. Interrater agreement between both authors was good (Cohens $\kappa = .81$) on dimensional-level and very good on level of the latent (Cohens $\kappa = .95$). The complete set of items and their assignment to the dimensions and lower-level factors of the Transformation-Transaction Model is listed in Appendix A. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and Cronbachs alpha was good to excellent for all five lower-level factor scales ($.85 < \alpha < .92$; DeVellis, 2012).

***Organizational Outcomes.*** As organizational outcomes sickness and turnover rates, as well as idea management system data as indicator for innovativeness were retrieved from the companies HR database. These variables have commonly been used in business research as

indicators for organizational performance outcomes closely linked to employees' job attitudes and perceptions of the work environment (cf. Bowling, Alarcon, Bragg & Hartman, 2015; Hancock, Allen, Bosco, McDaniel, Pierce, 2013; Harter et al., 2002; Park & Shaw, 2013). To assure anonymity, all organizational outcome indicators were collected and matched on work group-level.

As sickness rate, the overall percentage of sick days in a work group across the calendrical year following the employee survey was retrieved. For the turnover rates, with termination by the employee and resignation due to unknown reasons, only dysfunctional turnover (Ton & Huckman, 2008) was considered. Again, the rates were calculated as percentage of workforce turnover per work group across the calendrical year following the employee survey. As indicator for innovativeness the relative number of ideas turned in to the idea management system per employee of a work group across the calendrical year following the employee survey were extracted.

The organizational outcome data were not available for all work groups in the company. The sickness rates as well as the innovativeness indicators could be obtained for 1454 work groups, the turnover rates for 387.

### 3.4.4 Analysis

Our first study aims at testing the structure of the Transformation-Transaction Model with cross-sectional data and time-lagged organizational outcomes. Using the lavaan package (Rosseel, 2012) for R 3.4.3, we apply structural equation modeling (SEM) to test the factorial structure and internal structure of the Transformation-Transaction Model in a first step. In a second step we analyze the models proposed influence on time-lagged sickness and turnover rate

as well as innovativeness indicators each in an individual model. As the independence model is likely wrong in applied research (e.g., Cheung, 2015), RMSEA is the preferable fit index for model testing. For comprehensiveness we also report the standardized root mean square residual (SRMR) as recommended for confirmatory factor analyses by Kline (2010).

### 3.4.5 Results of Study 1

On the basis of SEM, the Transformation-Transaction Model yielded in a good fit to the observed data: RMSEA = 0.085, with a confidence interval (CI, 95 per cent) = 0.085 to 0.085 and a standardized root mean square residual (SRMR) = .080. All items loaded statistically significant on their intended factor with z-values ranging from 144.44 to 285.97. The lower-level factors loaded significantly on the intended second-level factors. On the highest level of the model (second-level) and as expected the transformational factor had a strong significant positive effect on the transactional factor (standardized beta = 1.00), which in turn positively influences the people outcomes factor (standardized beta = .68). Overall, results support the structure of the Transformation-Transaction Model and support Hypothesis 1a.

According to the Transformation-Transaction Model high values in the transactional factor and the people outcomes factor should decrease sickness and turnover rates, but increase innovativeness (e.g., Mauersberger et al., 2017). Our model tests results indicate, that it is not that simple. Standardized beta coefficients of the relationships in Table 3.1 show, sickness rates are significantly predicted by the transactional factor (standardized beta = -.14; $p < .01$), but not by the people outcomes. The turnover rate on the other hand is negatively influenced by the people outcomes (standardized beta = -.06; $p < .01$), but against expectations also positively affected by the transactional factor (standardized beta = .07; $p < .01$). The number of ideas

submitted to the idea management system is positively affected by the people outcomes (standardized beta = .07; $p < .01$), but again against our expectations negatively influenced by the transactional factor (standardized beta = -.18; $p < .01$). Thus, the transactional factor and the people outcomes show predictive validity for some organizational outcome indicators, but not for all. Our results therefore only partially support Hypothesis 1b.

Table 3.1

*Influence of the transactional factor and the people outcome factor on time-lagged organizational outcomes*

| Outcome | Predictor | Standardized beta | SE | z-score | p |
|---|---|---|---|---|---|
| Sickness rate | | | | | |
| | People outcomes | .01 | .01 | 1.73 | .08 |
| | Transactional factor | -.14 | .01 | -17.63 | < .01 |
| Turnover rate | | | | | |
| | People outcomes | -.06 | .02 | - 3.66 | < .01 |
| | Transactional factor | .07 | .02 | 4.47 | < .01 |
| Innovativeness: No. of ideas | | | | | |
| | People outcomes | .07 | .01 | 8.10 | < .01 |
| | Transactional factor | -.18 | .01 | -21.75 | < .01 |

*Note.* SE = Standard error.

## 3.5 Study 2: Causality of Internal Structural Assumptions

### 3.5.1 Theoretical Rationale

As the internal structure of the Transformation-Transaction Model could only be analyzed with cross-sectional data in Study 1, Study 2 is intended to test the causality of the proposed internal relationships with longitudinal data.

### 3.5.2 Sample and Procedures

The sample for Study 2 was provided by the same Germany headquartered company as in study 1, but enriched with data from the subsequent employee survey. This second survey took place two years after the first one. Data collection procedures were identical to those of study 1. All in all, 199,865 employees from 3220 work groups and 44 countries chose to voluntarily respond in the second survey for an overall response rate of 76 per cent. Safeguarding the anonymity of survey participants, we were not able to match individuals between the two surveys, but matched work groups between both surveys and analyzed the structure on work group-level.

### 3.5.3 Analysis

Cross-lagged path analysis is widely used to infer causal associations in data from longitudinal research designs (e.g., Cacioppo, Hawkley, & Thisted, 2010). Causal predominance can be examined by comparing standardized coefficients of the cross-lagged paths (Kearney, 2017; Newsom, 2015). To test the proposed causal relationships in the TFTA model cross-lagged panel analysis was conducted within a structural equation modeling (SEM) framework. The tested cross-lagged panel model is depicted in Figure 3.2.

### 3.5.4 Results of Study 2

The cross-lagged panel specified model fitted the data well (SRMR = .047; Hu & Bentler, 1999) and standardized beta coefficients, that can be seen in Figure 3.2, are all but one significant. The only exception comes as expected. The transformational factor measured in the second survey did not affect the transactional factor captured in the first survey ($\beta$ = -.00; p = .78). Comparing the standardized coefficients across the two cross-lagged pathways indicating the relationship between the transformational factor and the transactional factor, we find a significant positive influence of the transformational factor onto the transactional factor through time ($\beta$ = .09; p < .01), while for the opposed direction no such relationship could be observed. In this model, therefore, the transformational factor seems to causally predict the transactional factor of the TFTA model to a certain extent and the results support Hypothesis 2a. The cross-lagged pathways indicating the relationships between the transactional factor and the people outcomes are both significant and positive. However, the magnitude of the influence from T1 to T2, at $\beta$ = .08 (p < .01) is slightly higher than the influence from T2 to T2 ($\beta$ = .05; p < .01). This result indicates a small positive causal effect of the transactional factor on the people outcomes factor of the TFTA model over a span of two years, and thus support Hypothesis 2b.

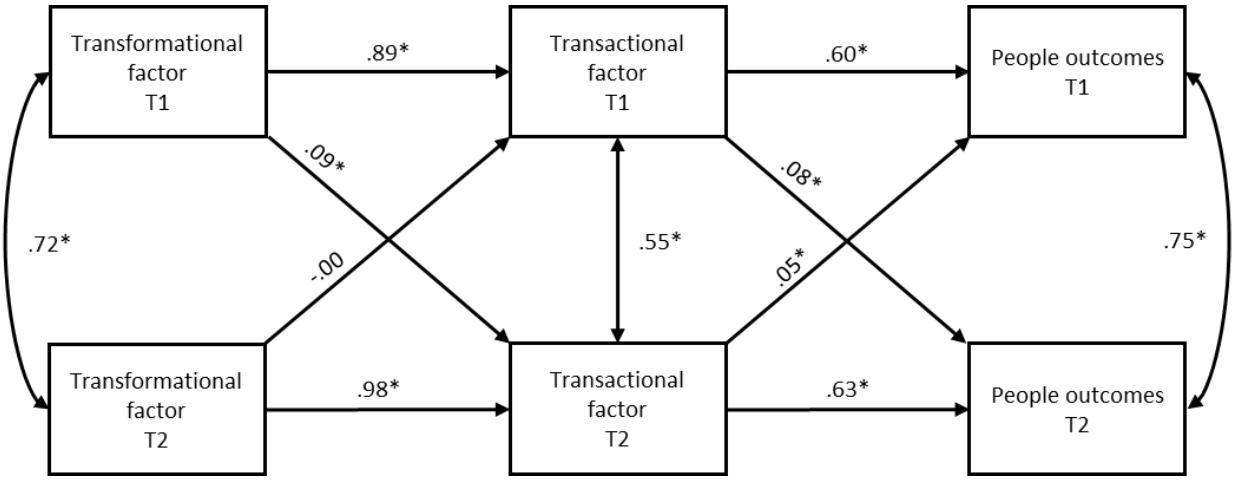



*Figure 3.2.* Structural model for the cross-lagged panel analysis.
*Note. For ease of presentation, covariates and non-significant pathway are not shown. All parameters standardized. *p < .01.*

## 3.6 Study 3: Generalizability across Levels and Multilevel Considerations

### 3.6.1 Theoretical Rationale

Both previous studies did not account for potential multilevel effects in the complex employee survey data (Klein & Kozlowski, 2000; Matthaei & Brodbeck, 2018). Study 3 address this shortcoming, by analyzing the multilevel generalizability and structure of the TFTA model.

### 3.6.2 Sample and Procedures

For Study 3 cross-sectional individual-level data from the second employee survey from the same Germany headquartered company was used. As mentioned earlier in this survey 199,865 employees from 3220 work groups and 44 countries chose to voluntarily respond in the second survey for an overall response rate of 76 per cent.

### 3.6.3 Analysis

To analyze within-work group consistency to assume work unit-level representations of the two higher-order factors the TFTA model, the transformational and the transactional factor, as well as the people outcomes factor, we calculate $r_{wg}$ (James, Demaree, & Wolf, 1984, Le Breton & Senter, 2007), ICC1 (Bliese, 2000) and $a_{wg}$ (Brown & Hauenstein, 2005). For ICC1 values larger than .05 (Van de Vijver & Poortinga, 2002) indicate that aggregation is justified, while for $r_{wg}$ values larger than .70 are normally seen as indicators of acceptable agreement (Beehr et al., 2009). $r_{wg}$ can further be tested for its significance following Dunlap, Burke, and Smith-Crowe (2003). To test the within- and cross-level structural assumptions and model fit, we mean-centered the factor values and apply hierarchical structural equation modeling.

### 3.6.4 Results of Study 3

The average within-subunit inter-rater agreement values were above the recommended .70 criteria. Mean $r_{wg}$ was .81 for the people outcomes ($a_{wg}$ = .74), .77 for the transactional factor ($a_{wg}$ = .71), and .85 ($a_{wg}$ = .79) for the transformational factor respectively. The confidence interval for the $r_{wg}$ coefficients to be significant was .00 to .28, marking all $r_{wg}$ coefficients as highly significant. Additionally, intra-class correlations 1 clearly exceeded the threshold of .05 for all factors. The highest intra-class correlation was observed for the people outcomes (ICC1 = .24, $p < .1$), followed by the transformational factor (ICC1 = .20, $p < .1$). The lowest value was observed for the transactional factor (ICC1 = .15, $p < .1$). These values indicate that the variation between subunits is substantial, the group means are reliable and that the agreement within subunits is acceptable, justifying the aggregation of scores to a subunit level. Hypothesis 3a to 3c

are supported. Thus, for the analyses presented below, the factors have been aggregated to form their counterpart at subunit level.

The tested multilevel version of the TFTA model and the resulting standardized beta coefficients are shown in Figure 3.3. The model fitted the data fairly well (SRMR= .045). As expected the model structure on work group level mirrors its structure on the individual-level. The work group level transformational factor affects the work group level transactional factor (β = .94; p < .01) and the work group level transactional factor in turn affects the work group level people outcomes (β = .73; p < .01). We also find the expected cross-level effect of the work group level people outcomes on the individual-level people outcomes (β = .32; p < .01). Therefore, hypotheses 4a to 4c are supported.

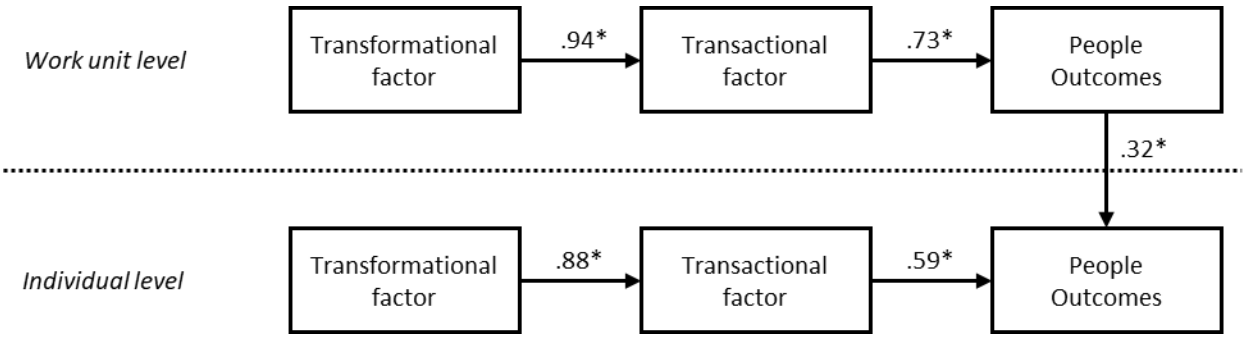



*Figure 3.3.* Multilevel model of the Transformation-Transaction Model.
*Note. All parameters standardized. *p < .01.*

To assure incremental validity of the multilevel model, we tested it against a model only containing its individual-level components. The multilevel version of the TFTA model fitted the data significantly better than the single-level model ($\Delta\chi^2$ = 74115, df = 8, p < .01). Thus, taking multilevel concepts and effects into account adds informative value to the model and Hypothesis 5 is supported.

## 3.7 Discussion

Current employee survey models lack adequate validation of their internal causal assumptions and impacts on 'hard' business outcome criteria underlying them and further neglect potential multilevel effects in the survey data. Both of these shortcomings limit employee surveys usefulness for evidence-based management. With this paper we sought to address these issues, by testing the causal assumptions of the Transaction-Transformation survey model (Matthaei & Brodbeck, 2018) and formulating and testing a potential multilevel version of the model.

In Studies 1 and 2 we found support for the TFTA models' internal structure and its causal nature in cross-sectional as well as longitudinal data and tested its influence on time-lagged sickness and turnover rates as well as an innovativeness indicator. The transactional factor of the TFTA model significantly influenced the work group sickness rates in the following year. For turnover rates and innovativeness findings were mixed. The people outcomes influenced innovativeness positively and turnover rates negatively, as expected. Contrary to our expectation the transactional factor influenced both factors the other way around. Taking a closer look, however, these unexpected results might be very well explainable. Dysfunctional turnover prevalence overall was very low for the studied company (0.83 %), with more than half of it stemming from the "resignation for unknown reasons" category. It might be possible, that these cases include resignations where good internal personnel development – a core element of the transactional factor – yielded in labor piracy. Innovativeness was operationalized as the relative number of ideas submitted to the idea management system from a unit. It makes perfectly sense, that employees in units with good working conditions, a core element of the transactional factor, may not feel the need to submit a suggestion for improvement that often. Our study thus shows,

that the TFTA model significantly predicts hard business outcomes. Although the impact of its individual factors on specific outcome variables might need to be specified and analyzed in more detail in the future.

Employee survey data is collected in the very complex systems of (often hierarchically structured) organizations. Single-level survey models, thus, might be too simplistic to accurately capture organizational phenomena (e.g., Hitt et al., 2007; Kozlowski & Klein, 2000) and guide practitioners, when applying survey data for evidence-based management. In Study 3 we formulated and tested a multilevel version of the TFTA model and find support for a superior informative value over the single-level model. The multilevel model shows, that there are work-unit level perceptions of the TFTA models core elements, that are shared between work group members and might form higher-level concepts as they are least partially distinct from their individual level counterparts. The work group level transformational factor might be understood as representation of change and leadership climate (cf. Herold et al., 2008), the transactional factor might represent work group level working climate as it captures the perception of the day-to-day working experiences that work group members share and the work group people outcomes might be seen as a work groups emergent motivational state (Chen & Kanfer, 2006) and collective efficacy (e.g., Bandura, 1997).

This multilevel perspective on employee survey results has far reaching implications for researchers and practitioners concerned with employee surveys. It shows, that multilevel effects are relevant within employee survey data, their modelling in employee survey models has been neglected in research far too long and should be a focal point of future research (Matthaei & Brodbeck, 2018). This becomes especially apparent when looking at typical analysis of survey results in practice. In practice survey results are usually analyzed aggregated on work group level

and regularly interpreted by comparison with other work groups aggregated results. It is assumed, that this aggregated data still represents the same concepts as the initially collected individual-level data. Conclusion derived from such between groups comparison however might especially emerge from the work group level concepts that seem to conceptually differ from the measured individual-level concepts and thus have to be interpreted and addressed differently when working with the survey results in common subsequent change programs. Our multilevel version of the TFTA model offers a framework for interpreting employee survey data on different aggregated levels and thus allows goal-directedly deriving levers for change.

In business-analytics, 'soft' people factors are often hardly incorporated (e.g., Finz-enz, 2010). Approaches trying to close this gap, like "evidence-based management" and "people analytics" have become huge trends in HR. While evidence-based management integrates scientific generalizable knowledge and local evidence from data analytics as basis for management decision-making (Rousseau, 2006), people analytics is a non-theory-driven approach, focusing solely on local people-related data. People analytics therefore may be seen as a subfield of evidence-based management. The TFTA model represents a scientific, causal and internationally generalizable (Mauersberger et al., 2017) multilevel model, that links 'soft' people factors measured with an employee survey to 'hard' business outcomes and thus might serve as a scientific but understandable template to integrate 'soft' people factors in business-analytics.

Although this study has added multilevel concepts to the TFTA model and validated its causal assumptions, addressing key shortcomings of the survey model literature and thus yielded in maybe the most advanced survey model for evidence-based management to date, the studies presented are by far not without flaws. All the data for this paper originated from one large

company, limiting the generalizability of the results. Also, as survey data could not be linked on the individual-level for data protection reasons, the causality for the internal model structure can only be assumed for aggregated survey data and the proposed multilevel version of the model could only be tested with cross-sectional data. Future research might attempt to address these issues, by surveying multiple smaller organizations and further develop the multilevel version of the model, which so far is limited to the highest-level of the TFTA model (see Figure 3.1).

## 3.8 Conclusion

Our research validated the causal assumptions of the Transformation-Transaction survey model (TFTA, Matthaei & Brodbeck, 2018) and enriched it with multilevel modeling to provide a precise, practical and valid survey model, especially for practitioners, that intend to harness the potential of employee survey results for evidence-based management and business analytics. Although the TFTA model must still gradually further develop from an accumulating body of evidence, we hope it proves useful to employee survey practitioners and evidence-based management.

## 3.9 Linking Chapter 3 and Chapter 4

In Chapter 2, we reviewed scientific employee survey measurement models and, with the Transformation-Transaction survey model, meta-meta-analytically developed a theoretically well-grounded and scientifically substantiated structural measurement model for employee surveys and their specific use for evidence-based management. In Chapter 3, we then build on this scientifically developed model and described three field studies empirically validating it with large-scale data from an applied context. Combining these two steps, theoretical measurement model development and meta-meta-analytic validation on the one hand and empirical validation

with data from practice on the other, yields a survey model, that can represent scientific (big ”E”) evidence (Rousseau, 2006) and serve as a template to generate local organization-specific (little “e”) evidence (Rousseau, 2006), when using employee surveys’ results for evidence based management in practice.

Now, the subsequent study in Chapter 4 presents a short exemplary case of applied research in an organization, where employee survey data generated based on the Transformation-Transaction survey model is applied for evidence-based management by answering a specific management question and providing guidance for decision-making and planning of a change process.

# 4 EbM in Practice: The Loss and Gains from Increased Span of Control. An Empirical Analysis of its Effects on Subordinates´ Perceived Supervisor Support and Overall Job Attitude[4]

## 4.1 Abstract

With the advances in digital communication consulting firms more and more argue towards "delayering" organizations through increasing spans of control. However little to none empirical research has analyzed the effects of spans of control onto leadership effectiveness. We conduct this study in response to two requests from large multinational manufacturing companies that considered increasing the span of control of their managers and potential consequences for leader-member relationships and employees' job attitudes. We argue that a larger span of control makes it harder for leaders to provide adequate support for their subordinates, what again reduces the subordinates overall job attitude. This effect can at least be partially compensated by efficiently structured team processes and mutual support within the team. To test these assumptions, we apply conditional process analysis using cross-sectional employee survey data from 1516 management teams from lower to top management in a large multinational company. Finally, we discuss theoretical and practical implications of the results obtained with special regard to optimizing span of control in organizations and designing accompanying change programs.

[4] This chapters' study has been presented at the "50th Congress of the German Society of Psychology" in September 2016 in Leipzig, Germany. Professor Felix C. Brodbeck supervised this research and is the second author of this work. When using the term "we", I refer to Felix C. Brodbeck and myself.

## 4.2 Introduction

In recent years a trend towards reducing hierarchical levels in organizations and flattening firms can be observed. In an attempt to save costs and enhance speed of communication and agility, span of control is more and more increased (Bandiera, Prat, Sadun, & Wulf, 2014; Schyns, Maslyn, & Weibler, 2010).

Pushed by consulting firms making these arguments, two companies approached us for advice on the potential consequences for leader-member relationships and employees' job attitudes that increasing span of control might have. While one of the companies, a Germany-based automotive company, was still planning the increase, the other, a US-headquartered multi-branch company, had already implemented a program to attain a higher span of control in all management teams. Its managers, however, criticized that increasing their span of control reduces the time they have available for their employees, which they felt would impair engagement in and performance of their teams. Experience reports from the US-headquartered company sensitized HR representatives from the automotive company to commission us to analyze possible consequences an increase in the span of control in their company might have and consider the results when implementing their change program.

In the following, we will present the study conducted, with results and a discussion of practical implications, and thereafter a short description of how the automotive company implemented the evidence obtained into their change program for increasing the span of control.

## 4.3 Theory Development

Although it is reasonable to assume, that increasing spans of control reduces time available from managers to interact with and provide support to subordinates and therefore

enlarges leadership distance (Schyns et al., 2010; Antonakis & Atwater, 2002), no empirical research has yet analyzed the effects of span of control onto supervisor support and the consequences thereof.

Decreased perceived supervisor support by subordinates however could have detrimental effects on their job attitudes. Perceived supervisor support is a key element of transformational leaderships individualized consideration component (e. g. Bass, Avolio, Jung, & Berson, 2003) and was shown to have a strong influence on subordinates' job satisfaction, organizational commitment and engagement (Wang, Oh, Courtright, & Colbert, 2011; Lowe, Kroek, & Sivasubramaniam, 1996), which constitute employees overall job attitudes (Harrison, Newman, & Roth, 2006; Harter & Schmidt, 2008). We therefore assume that:

*H1: Span of control has a negative effect on supervisor support as perceived by subordinates.*

*H2: Span of control has a negative indirect effect on subordinates' overall job attitude, which is mediated by supervisor support as perceived by subordinates.*

Since flattening organizations is associated with above mentioned benefits, finding compensators for a possible detrimental effect of span of control on subordinates' job attitudes becomes highly relevant for HR and OD practitioners. Sherony and Green (2002) suggested, that a few positive and intensive leader-member-relationships within a large team might have a positive contagion effect, if team members trust and support each other (see also Liden et al., 2006), which finally leads to more shared leadership (Pearce & Conger, 2003) among employees. Furthermore, team members' mutual trust and support was found to be strongly related to their job satisfaction and organizational commitment (Costa, 2003). Therefore, team

members' mutual trust and support might serve as a compensator for detrimental span of control effects.

The quality of team processes might act as another possible compensator. Defined by Hackman (1987) as interpersonal transactions that take place within the work group and relate to the quality of how groups' work on their tasks, high quality team processes have been shown to substitute leadership and enhance team members job attitudes (Konradt, Andreßen & Ellwart, 2009; Antoni & Hertel, 2009). We, therefore, further hypothesize:

*H3a: Quality of team processes moderates the relationship between supervisor support on job satisfaction, in the following manner: High quality team processes decrease positive effect of supervisor support, as perceived by subordinates, on overall job attitude, as perceived by subordinates.*

*H3b: Mutual trust and support between team members moderates the relationship between supervisor support on job satisfaction, in the following manner: High levels mutual trust and support between team members decrease the positive effect of supervisor support, as perceived by subordinates, on overall job attitude, as perceived by subordinates.*

## 4.4 Method

### 4.4.1 Sample and Procedure

The present sample is derived from 2014 employee survey data of a large multinational company based in Germany. It consists of 1.516 management teams with an average team size of 8.34 team members (ranging from N = 6 to N = 25 per team)[5] from lower to top management.

[5] For data protection reasons, only teams with six or more team members could be included.

The 12.476 individuals comprised in total worked in 40 different countries and in manufacturing, banking and administrative professions.

### 4.4.2 Measures

All measures besides span of control were extracted from a larger survey questionnaire, the items of which were aligned to the Transformation-Transaction survey model (Matthaei & Brodbeck, 2018). The questionnaire was translated into 17 languages and back-translated following Brislins recommendations (1980). To justify data aggregation for data analysis on team level, $r_{wg}$ indices for all measures were calculated (LeBreton & Senter, 2008).

**Independent variable.** Span of Control was defined as the total number of team members directly reporting to the same manager and derived from organizational data.

**Mediator**. Perceived supervisor support was measured as a 5-item-scale constructed from existing employee survey items. The choice, which items to include, was made following Kottke and Sharafinskis (1988) approach to consider measures of employees' perception of supervisory support and their Survey of Perceived Supervisory Support. The final selection consisted of the facet's information, communication, feedback, support regarding work-life-balance and support for personal and professional growth. As an example, the item capturing support for personal and professional growth was: "I receive the support from my direct supervisor that I need to learn and grow professionally and personally." On this scale we found a strong mean interrater agreement of $r_{wg(j)} = .705$ between team members.

**Moderators.** Both moderators we surveyed with one-item-measures. The item to measure quality of team processes was: "All work processes within my team are well

organized." ($r_{wg}$ = .657). While the item for mutual trust and support within the team was: "People in my team trust and support each other." ($r_{wg}$ = .690).

**Dependent variable.** To capture overall job attitude, we used the people outcomes dimension of the Transformation-Transaction survey model, that strongly overlaps with conventional job attitude measures and, in this employee survey, consists of three items measuring job satisfaction, organizational commitment and work engagement. These items were collapsed into one scale. Interrater agreement of team members on this scale was again strong ($r_{wg(j)}$ = .826).

### 4.4.3 Analysis

To test our hypotheses, we calculated conditional process analysis with PROCESS macro for SPSS as described by Hayes (2017). PROCESS is an observed variable OLS and logistic regression path analysis modeling tool for SPSS, which is widely used through the social and business sciences for estimating direct and conditional indirect effects in moderated mediator models. To calculate the analyses, we z-standardized the all study variables.

To identify and isolate factors that explain and predict the phenomena of interest makes it necessary to control other relevant variables that may extraneously affect the relationships being investigated (Berneth & Aguinis, 2016). In our analyses we, thus, controlled for the teams working country, as this variable has scientifically been shown to have a significant impact on survey results (Brodbeck, 2016; Hanges, 2004). Further, with the teams' working background (manufacturing or banking / administrative) and the hierarchical level of the teams we controlled for two additional variables which we often observed to have an effect on survey results in practice.

### 4.5 Results

To test our hypotheses, we calculated conditional process analysis with PROCESS macro for SPSS as described by Hayes (2017). Means, standard deviations and intercorrelations among study variables are displayed in Table 4.1.

Supporting Hypothesis 1, this analysis revealed a significant negative first stage effect (β_first stage = -.07; $p < .001$) of span of control onto subordinates perceived supervisor support. Furthermore, and in line with Hypothesis 2 the results show a significant negative indirect effect of span of control onto subordinates' overall job attitude, that is mediated by their perceived supervisor support (β_indirect effect = -.03; LLCI = -.046; ULCI = -.016). Besides this negative effect, however, results also indicate a significant positive direct effect of span of control onto subordinates' overall job attitude (β_direct effect=.04; $p = .005$).

Table 4.1

*Means, standard deviations and intercorrelations among study variables*

| Construct | *M* | *SD* | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. Span of Control | 8.34 | 2.95 | | | | |
| 2. Perceived Supervisor Support | 4.01 | 0.44 | -.09 * | | | |
| 3. Cooperation with the Team | 4.36 | 0.39 | -.15 * | .61 * | | |
| 4. Quality of Team Processes | 4.03 | 0.44 | -.12 * | .62 * | .61 * | |
| 5. Job Attitudes | 4.10 | 0.32 | -.02 | .60 * | .44 * | .48 * |

*Note. * $p < .001$*

Regarding the hypothesized moderation effects, the results largely differed from our expectations. We expected that high levels of mutual trust and support between team members

would decrease the positive effect of supervisor support on job satisfaction and thus substitute leadership support to a certain extent. However, we could not find a significant interaction effect of mutual trust and support within the team and perceived supervisor support on job attitudes remained nonsignificant (β_(trust*PSS) = -.03; p = .550). Further, we expected that high quality team processes would also decrease the positive effect of supervisor support on job satisfaction and substitute supervisor support. Even contrary to our expectations the interaction effect of the quality of team processes and perceived supervisor support on the team members' job attitudes turned out to be significantly positive (β_ (team processes*PSS) = .17; p < .001). Summaries of the results are displayed Figure 4.1 and Table 4.2.

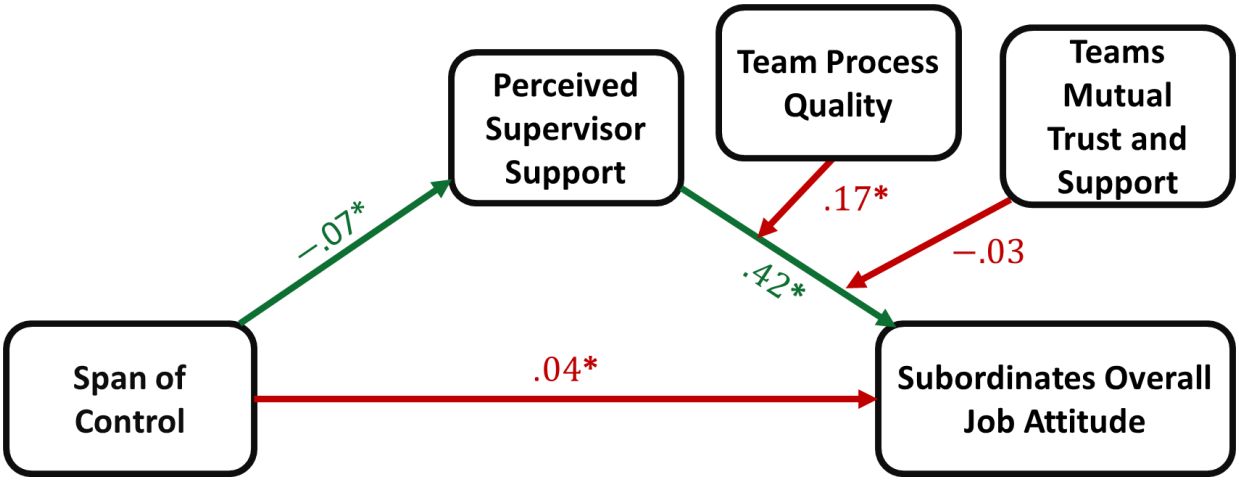



*Figure 4.1.* Results of conditional process analysis. *Note:* $*p < .01$.

Table 4.2

*Standardized effects of conditional process analysis*

| Variable | Standardized Effects | p |
|---|---|---|
| Constant | 0.230 (SE=.062) | < .001 |
| Mediation | | |
| Total effect | -.02 | .401 |
| Indirect effect ($b_1$) | -.03 | LLCI: -.046 |
| | | ULCI: -.016 |
| First stage effect | -.07 | < .001 |
| Second stage effect | .42 | < .001 |
| Direct effect ($b_2$) | .04 | .005 |
| Moderation | | |
| Quality of team processes ($b_3$) | .18 | < .001 |
| Mutual trust and support ($b_4$) | .08 | .008 |
| $b_1$*$b_3$ | .17 | < .001 |
| $b_1$*$b_4$ | -.03 | .550 |
| $R^2$ | .427 | < .001 |

*Note.* SE = standard error.

## 4.6 Discussion

As far as we know, our study represents the first large scale empirical research on the social effects of spans of control in organizations. It shows that increasing spans of control might have detrimental effects on how well subordinates perceive their supervisors support and subsequently change their overall job attitude for worse. On the other side our results indicate no significant total effect of span of control on subordinates' job attitudes. This pattern is due to a positive direct effect of span of control on job attitudes that can be observed, when the indirect

effect is considered. To find an explanation for this effect, we post hoc analyzed, if the two moderators mutual trust and support within the team and quality of work processes might serve as additional mediators between span of control and job attitudes causing a compensatory positive effect. However, results remained not significant. Another explanation for this observed effect might be a mediating role of autonomy on the job or psychological empowerment. Larger spans of control and thereby increased leadership distance (Schyns et al., 2010) may force supervisors to provide more autonomy to subordinates and thereby foster their psychological empowerment (Zhang, & Bartol, 2010). This increase in psychological empowerment then could lead to a more positive job attitude (Seibert, Wang, & Courtright, 2011). Abducting from this finding, future research should analyze the role of psychological empowerment or other variables on the effect span of control on job attitudes.

Our results did not support the proposed moderator effects. It might be possible, that team process quality and mutual trust and support within the team cannot compensate the support a supervisor can offer an employee or at least can only compensate supervisor support under certain conditions. It seems, that while high team process quality overall has a positive effect on team members job attitudes, and together with good supervisor support forms an especially engaging atmosphere for team members, it does not especially compensate the effect low supervisor support has on job attitudes.

Summarized our research indicates, that organizations increasing spans of control have to be aware of the consequences this implies. Even though the observed direct and indirect effects of span of control on job attitudes are not very strong, when increasing the span of control in thousands of teams in large companies, they however become very relevant. Careful implementation programs of larger spans of control, thus, should aim towards counterbalancing

detrimental effects of reduced supervisor support and foster benefits that might result from increased autonomy and psychological empowerment of subordinates.

Overall, however more research is needed on how the relationship between span of control and subordinates job attitudes unfolds and can be influenced.

### 4.7 Management decisions made as consequences of the presented evidence

After the results of the study were presented to the HR management team, it was acknowledged, that increasing the span of control in management teams throughout the company has to be accompanied by a well-designed change program.

The program then developed by a team of HR change experts tapped into an existing program to foster employees' empowerment and further developed it to be applied in the specific change context of increasing spans of control. The program aimed at giving lower level managers more decision-making power to simplify and speed up decision-making processes and increase managers and employees' empowerment in the end. As subordinates in management teams are managers themselves, the program thereby also was indented to enable managers to better support their subordinates, as simplified decision-making processes give them the freedom to allocate more time to their subordinates if necessary.

Since the program to increase the span of control is still running, drawing a conclusion on the change programs effectiveness is not yet possible. Anecdotal evidence gathered in discussions with managers seems, however, to support the notion, that the accompanying empowerment focused change program improved transition to a larger span of control in most units. Compared to the US-headquartered company, especially reduced tensions in management and disgruntlement of managers could be observed when and after increasing the span of control.

Even though this might be caused by other factors differing between the companies, like structural or working climate differences, the pure fact, that the company supports its managers in the change process to a larger span of control with a change program, that focusses on their potential need to reorganize work and decision-making in their teams, should already address some of the managers worries and reservations.

## 4.8 Conclusion

Chapter 4 presented a short exemplary case of applied evidence-based management in an organization, where employee survey data was analyzed to generate local (little “e”, Rousseau, 2006) evidence on the basis of the Transformation-Transaction survey model. The study addressed a company’s HR managements question, what consequences need to be expected when increasing the span of control in their management teams. Following the evidence-based management approach, we incorporated scientific concepts and general evidence presented in scientific literature for formulating hypotheses and tested these with data locally generated with an employee survey based on the scientifically validated Transformation-Transaction employee survey model. The study, that way, was able present evidence that guided management decision-making and planning of an evidence-based change process.

# 5 General Discussion

The general purpose of my PhD thesis was to develop the first integrative science-based employee survey process model that can harness the potential informative power of employees' perceptions of their work environment and job attitudes for evidence-based management in practice. Specifically, my goal was to review the current employee survey measurement model landscape, synthesize a model that fulfills the requirements that usage of its data for evidence-based management brings with it and empirically validate the model. In the three previous chapters (i.e., Chapter 2 - 4), three papers comprising five studies were presented contributing to this purpose. The aim of the general discussion is to offer a general overview of these five studies and their results as well as their contribution as a whole to employee survey theory, research, and practice. Firstly, I will summarize the main results of the three previous chapters addressing the main research questions of this thesis. Secondly, I will emphasize the contributions of my work to employee survey measurement model theory and research. Thirdly, I will discuss the limitations of the present thesis and the implications for future research and practice[6].

## 5.1 Summary of Research

Most large companies worldwide nowadays conduct employee surveys regularly (cf. Hossiep, & Frieg, 2013; Wiley, 2010). By measuring employees' perceptions of the work environment and job attitudes, employee surveys can expose the missing link in the value creation chain between organizational investments constituting the organizational work environment and organizational performance (Burke, 2017; Fitz-enz, 2010; Kraut, 2006; Wiley,

[6] In the general discussion, I will generally use the term „I". However, when talking about a specific study, I will switch to the term "we", which refers to the respective co-authors as provided in the previous chapters' footnotes.

2010). If based on a scientifically substantiated measurement model, employee surveys can close that gap combining generalizable scientific evidence ("big 'E' evidence"; Rousseau, 2006), with locally generated organization or context specific evidence ("little 'e' evidence"; Rousseau, 2006). This synthesis of evidence allows researchers and practitioners to put the local survey results in perspective to scientific evidence and, thereby, identify relevant general and organization-specific cause-effect relationships in organizational performance emergence. The data gathered in such surveys, thus, can be exploited systematically to initiate and implement goal directed change programs as well as support evidence-based management by providing evidence for potential consequences of management decisions. Precondition, however, to enable the use of employee survey data for evidence-based management and identification of change levers, is a scientifically substantiated and well-validated survey measurement model - an aspiration most employee survey measurement models in the observation of many researchers hitherto fail to meet (e.g., Borg & Mastrangelo, 2008, Mauersberger et al., 2017). The studies presented in this thesis sought to review the current state of employee survey models systematically to then develop and validate a sound structural survey measurement model that suits the demands of evidence-based management.

In Chapter 2, we reviewed scientifically published employee survey measurement models and found, that in line with observations of other researchers (Burke, 2017; Di Pofi, 2002; Mauersberger et al., 2017) overall quality is very mixed and especially structural assumptions of the models are often insufficiently specified or lack sound validation. We, thus, built on the existing models to develop seven potential structural employee survey models and tested these by synthesizing meta-analytic evidence with meta-meta-analytic structural equation modeling (MMASEM). As expected we found support for a model, that combines the Strategic Fitness

Models$^{TM}$ factors (Brodbeck, 2015, Mauersberger et al., 2017) with the Burke-Litwin model of organizational performance and change's structure (1992; Burke, 2017), and partitions employees' perceived work environment into two higher order factors. They are a general transformational factor and a general transactional factor that mediates the transformational factor's influence on relevant individual and organizational outcomes. The transformational factor is associated with leadership in an organization context bringing about the change, which is "discontinuous and revolutionary" in nature (Burke, 2017, p. 229), affects the deep structure of the organizational systems, and requires significantly new behavior of the organization's members. The transactional factor on the other side, is more concerned with management, systems maintenance, structures and day-to-day operations (Burke, 2017, p. 230). Following its two higher order factors' reputes and their specific concurrence, we called the model "Transformation-Transaction (TFTA) model". The models meta-meta-analytically proven characteristics can be considered in line with (and also extending) the classical notion of organizations needing to assure stability and flexibility at the same time (cf. Simon, 1947), which is also reflected in the contemporary concept of organizational ambidexterity (e.g., Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2013; Raisch & Birkinshaw, 2008).

In the first study of Chapter 3, we apply the newly developed TFTA measurement model in practice to conduct employee surveys in the real world of a large multinational organization and empirically validate the model's structure and predictive validity for 'soft' people outcomes and 'hard' organizational outcomes. In Study 2 of Chapter 3, we then address another shortcoming of the previous employee survey model literature with testing causality of the Transformation-Transaction model's assumptions with longitudinal data. As another first for employee survey models, Study 3 of the chapter recognizes the complex and dynamic multi-level

nature of organizations (e.g., Katz & Kahn, 1978; Klein & Kozlowski, 2000) and enriches the TFTA model with, to our knowledge, first multilevel-considerations in the research field of employee surveys. It shows empirical support for work-unit level representations of the individual level model components that can be considered, when analyzing employee survey data in practice, for improving the predictive power for people and organizational outcomes of various action variables in employee surveys.

In Chapter 4, a case example of using employee survey data for evidence-based management in a natural organizational context is described. Data gathered with an employee survey based on the Transformation-Transaction model was analyzed, to provide evidence for a specific management question: how increasing the span of control in management teams might affect managers' job attitudes. Results of the study indicate, that increasing the span of control decreases team members' job attitudes mediated via their perceived supervisor support. However, when taking perceived supervisor support into account a significant positive effect of span of control on team members' job attitudes emerges. This finding might hint at another mediation effect with another construct that compensates the negative effect the span of control has on job attitudes via supervisor support. In the chapter we, further, argue theoretically that the team members' empowerment might be this compensatory construct and elaborate exemplarily how the evidence presented in the study was translated into a tailor-made change program of the investigated organization accompanying the increase of span of control.

Overall, in this thesis with the Transformation-Transaction survey model the first employee survey measurement model with a well-validated model structure has been developed through meta-meta-analytical synthesis and four empirical field studies. The systematic review of existing employee survey models and the synthesis of meta-analytical knowledge allowed us

to develop a holistic structural survey model that nearly exhaustively captures elements of the work environment that are relevant for employees and their job attitudes (‘soft’ outcomes), on the one side, and for work unit and organizational outcomes (‘hard’ outcomes), on the other side. The longitudinal field study design enabled us to validate and support the causal nature of the models proposed internal relationships as well as external relationships to organizational outcomes. Furthermore, adding first multi-level considerations to the model we found support for the generalizability of the model when working with survey results on the individual level or with data aggregated on the work-unit level. Finally, a short case example provided evidence for the applicability of the Transformation-Transaction survey model for evidence-based management in practice.

## 5.2 Contributions

### 5.2.1 Review of Employee Survey Measurement Models

The employee survey measurement model landscape is dominated by a flood of non-scientific practice models and almost impossible to oversee. To add to that, the scientific employee survey measurement model literature is disparate, as approaches to construct employee survey models as measurement instruments emerge from very different research streams like organizational culture, alignment, employee satisfaction and engagement, or organizational diagnosis. We present the first general overview and review of scientifically published employee survey measurement models overarching hitherto disparate research streams. With our review we, thus, provide a first systematic and comparative evaluation of scientific employee survey models, explicating strengths, concordance and particular shortcomings of these models in general.

Overall, authors and researchers were able to present good evidence for the predictive validity and factorial structure of most survey models. However, as suspected by some employee survey scholars before (e.g., Borg & Mastrangelo, 2008; Burke, 2017; Mauersberger et al., 2017), survey model quality was found to be mixed. In a glaring omission, most employee survey models circumvented specifying interactions and relationships between the elements of the perceived work environment, employees' job attitudes and organizational outcomes so far. Only very few models specified a model structure, meaning interactions and relationships between their model's components, and none of them consistently validated these assumptions. Furthermore, in the context of international application of most employee surveys, only for one model, the SFM (e.g., Brodbeck, 2013; Mauersberger et al., 2017) international measurement equivalence was analyzed and supported.

With bringing together and categorizing employee survey models from disparate research streams the review contributes long needed structure to the scientific discourse that provides researchers a starting point for the development, validation and improvement of employee survey models in the future. This starting point formed the basis for the consecutive research program presented in this thesis.

### 5.2.2 Development of a Sound Structural Employee Survey Model and Contribution to Organizational Ambidexterity Research

In this thesis, we developed the first comprehensive internationally measurement equivalent employee survey model with a specified and empirically as well as meta-analytically validated model structure. Synthesizing elements of the SFM (e.g., Brodbeck, 2013) and the Burke-Litwin-Organizational Assessment Survey (BLOAS; e.g. Burke, 2017), the model

represents the first employee survey measurement model truly suitable for combining scientific evidence ("big 'E' evidence; Rousseau, 2006) with locally generated "little 'e' evidence" (Rousseau, 2006) in evidence-based management.

The model partitions employees' perceptions of elements of the work environment into two higher order factors, a general transformational and a general transactional factor. As the transformational factor is associated with leadership in an organization context bringing about the change and is "discontinuous and revolutionary" in nature (Burke, 2017, p. 229), this factor seems to represent employees' overall perceptions of organizational adaptability and flexibility. On the other hand, the transactional factor is more concerned with management, systems, structures and day-to-day operations (Burke, 2017, p. 230) and, thus, seems to represent employees' overall perceptions of organizational stability as well as stability and efficiency of the daily working processes. Therewith, the two higher order factors seem to mirror the time-honored notion of stability and flexibility organizations need to assure at the same time (cf. Simon, 1947) as their representation in employees' perceptions. With this said, the two higher order factors of the Transformation-Transaction model might even contribute to the more contemporary concept of organizational ambidexterity (Tushman & O'Reilly, 1996), which was formed through decades of research reframing and refining Simons (1947) initial ideas (e.g., Holland, 1975; Kuran, 1988; March 1991). According to Gibson and Birkinshaw (2004, p. 214), the ability to balance exploration and exploitation requires a "supportive organizational context" and define ambidextrous organizations as "aligned and efficient in their management of today's business demands, while also adaptive enough to changes in the environment that they will still be around tomorrow (p. 209)." It appears that the two higher order factors of the Transformation-

Transaction model truly depict this concurrency in the shared perceptions of an organization's employees.

What the organizational systems and processes are that enable organizations to explore and exploit simultaneously were never concretely specified (O'Reilly & Tushman, 2013). Here our TFTA model can also contribute. Elements of the perceived work environment constituting the general transformational factor and therewith organizational flexibility, can be seen as preconditions for successful exploration, while the elements forming the transactional factor and determining organizational stability can be seen as precondition for successful exploitation.

With the Transformation-Transaction model, we, however, not only identify the two higher order factors of the perceived work environment, that align with the two previously theoretically postulated core dimensions of organization, but also find a mediation of the transformational factors influence onto employees' people outcomes via the transactional factor. This particular relationship between the two factors implies that employees' will only perceive organizational flexibility when they already perceive the basic transactional elements of effective management, systems, structures and day-to-day operations as functioning well. Expanding this thought even further leads to the interesting idea, that exploitation preconditions and mechanism need to be in place *before* organizations can effectively explore. And, vice versa, the fruits of exploration can only be harvested when transactional factors are shaped and in place, which can transform relevant ideas and inventions into productive innovations. From this perspective, our research goes in line with research on organizational ambidexterity and organizational flexibility and stability, and it enriches the knowledge we have on the emergence of these concepts.

Overall, as Burke (2017) has pointed out for the BLOAS, such a sophisticated survey model might also represent a general model of organizational functioning and organizational performance emergence. Drawing from a wide range of meta-analyses of industrial and organizational psychology as well as management and business research the presented TFTA model pulls together theories and concepts from both disciplines and forms not only a high-level representation and unifying theory about organization, but also a measurable model, which validly draws on the shared perceptions and cognitions of an organization's members.

### 5.2.3 Capturing Causality and Multilevel Effects

Causality of employee survey models' structural assumptions is usually assumed (e.g., Burke & Litwin, 1992; Borg & Mastrangelo, 2008), but seldom tested. In fact, hitherto we found only one doctoral thesis by Anderson-Rudolf (1996) dealing with causality of internal structural assumption of employee survey models. In a small-scale longitudinal study of a simplified version of the BLOAS with under 500 participants, Anderson-Rudolf (1996) finds some support for causality of internal model structure and mixed results for its assumed relationships to organizational outcomes. The large-scale analysis of the causal nature of the Transformation-Transaction models' internal relationships on the models highest factor level, presented in this thesis, thus, significantly contributes to a better understanding of the processes by which employees' perceptions of elements of the work environment causally influence their job attitudes.

Employee survey data usually is collected in the very complex systems of hierarchically structured organizations. However, all employee survey models hitherto were single-level survey models and, thus, potentially too simplistic to accurately capture organizational phenomena on

multiple levels (e.g., Hitt et al., 2007; Kozlowski & Klein, 2000) and guiding practitioners, when applying survey data for evidence-based management. With the third field study presented in this thesis, we address this issue by formulating and testing a multilevel version of the Transformation-Transaction model. Our results indicate that the Transformation-Transaction model's higher order factors and structural assumptions are indeed generalizable from the individual level into the work-unit level. As we, further, find a superior informative value of the multilevel model (work unit plus individual level) over the single (individual) level model, the results support the notion that multilevel considerations in employee survey models improve their ability to capture organizational phenomena that relate to relevant outcome variables. The work-unit level transformational factor might be understood as representation of change and leadership climate (cf. Herold et al., 2008), while the transactional factor might represent work group level working climate as it captures the perception of the day-to-day working experiences that work group members share and the work group people outcomes might be seen as a work groups emergent motivational state (Chen & Kanfer, 2006) and as collective efficacy (e.g., Bandura, 1997). Even though our analysis is just a first small step in the direction of modeling complex multilevel variables in organizations and effects in employee survey models, it shows that their modelling in employee survey models has been neglected in research far too long and should be a focal point of future research (Matthaei & Brodbeck, 2018). Until more research in this regard is conducted, the multilevel version of the Transformation-Transaction model offers a first framework for interpreting employee survey data on different aggregation levels. Overall, these insights allow practitioners and researchers to easier identify levers for goal-directed change and to derive hypotheses for data analysis according to the principles of evidence-based management.

## 5.3 Limitations and Implications for Future Research

The studies presented in this thesis found some promising results and made important theoretical and methodological contributions to employee survey model research. However, the work conducted in total has still some limitations that should be considered and hence should be addressed by future research.

To develop and test a parsimonious but still comprehensive employee survey measurement model, like the Transformation-Transaction model, many different variables from many research domains had to be subsumed under the same constructs. This assignment of variables to constructs was conducted by well-trained raters and was based on an empirically validated theoretical framework (Mauersberger et al., 2017). Although we view our aggregation as pretty robust, also considering the amount of data and variables included, potentially important relationships between single variables subsumed to different constructs might have escaped notice in the process. Thus, future research should attempt to take a more detailed look at the variable's assignment to the constructs of the Transformation-Transaction model to refine the model further.

In line with this issue, our empirical analysis of the proposed relationships of the Transformation-Transaction models higher order factors with organizational outcomes shows, that the factors significantly predict 'hard' business outcomes, however different performance indicators are influenced by differing configurations of the Transformation-Transaction model's factors. It appears plausible to assume, that the innovativeness of employees, for example, is affected by other elements of the perceived work environment than sickness rates or performance ratings. However, as most employee survey models, the Transformation-Transaction model

conceptualize people outcomes or employees' job attitudes as central best predictors of performance and organizational outcomes in general. This oversimplification should be addressed in future research to be better able to predict focal performance indicators separately and to find specific levers to improve these in practice if necessary.

Another limitation of the work presented is, that even though we were able to analyze large-scale empirical data, all data analyzed (except the data from the meta-meta-analysis) originated from just one company. Although the company consist of over 250 subsidiaries in over 40 countries ranging in their operations from IT, finance and banking to manufacturing branches, common leadership and main strategy still limits generalizability of the results presented. As the Transformation-Transaction models' basic structure was also supported by our meta-meta-analysis' results, this mainly affects the generalizability of the causal nature of the Transformation-Transaction models' internal structural assumptions as well as its multilevel version. Future research should try to replicate our analyses in other and maybe also smaller companies to provide a more robust view on causality and multilevel modelling in the Transformation-Transaction model.

When planning future research on multilevel effects in employee survey models and especially the Transformation-Transaction model, it needs to be stated, that the multilevel considerations we specified and tested in the Transformation-Transaction model should only be seen as a first step into this direction. Countless cross-level effects, including emergence effects from lower to higher levels (e.g., Corning, 2002; Kozlowski, Chao, Grand, Braun, & Kuljanin, 2013) are imaginable and extremely thorough and precise theoretical argumentation and reasoning is necessary to extract the meaningful effects and model them.

## 5.4. Implications for Practice

In this section, I will discuss the research program's implications for practice. The following implications are primarily drawn from the findings of the thesis presented. Some aspects may also derive from further empirical evidence that was not explicitly addressed in our studies.

Nowadays, nearly each and every consulting firm promotes their own employee survey model, leading to a survey model landscape that is dominated by a flood of non-scientific practice models and almost impossible to oversee and evaluate for practitioners. This thesis presents the first overview and review of scientific employee survey measurement models. Identifying the few scientific survey models and evaluating these based on criteria for sound measurement and their applicability for practice our review provides practitioners with a quick and comprehensive overview and with comprehensive information for decision support when looking for a scientifically sound model to build around their survey.

Building on this review, with the Transformation-Transaction model, we developed the first comprehensive, scientifically sound and internationally measurement equivalent employee survey model that specifies the process of how employees' perceptions of the elements of their work environments influence people and organizational outcomes. Based on a synthesis of meta-analytical research the model allows a comprehensive organizational diagnosis, with as few as the 22 items (e.g., Brodbeck, 2013; Mauersberger et al. 2017). The supported causality of the models' assumptions, further, allows practitioners to assume the effective direction of the constructs measured and, thus, to easily identify levers for improving specific topics and to set up goal-directed change programs.

In practice, employee survey results and data are commonly presented and evaluated after aggregation to the work-unit or even higher levels (e.g., Harter et al., 2002). This procedure, however, implies that the usual single-level survey models' structural assumptions and concepts are generalizable to higher levels of aggregation without committing atomistic fallacy (e.g., Hitt et al., 2007; Kozlowski & Klein, 2000). As work-unit level aggregation represents work group members' shared perceptions and not their individual's, this assumption cannot be made without multi-level validation of the survey model's structure across the respectively specified levels. Change programs derived from statistically unverified aggregated survey results are likely to miss the mark. Our research shows, at least by having taken some first multilevel verification steps, that the Transformation-Transaction model is generalizable onto the work-unit level of analysis and, thus, offers a framework for deriving from and distinguishing between goal-directed levers for change on multilevel survey results.

Overall, a short and quickly filled-out employee survey based on the Transformation-Transaction model can provide practitioners with comprehensive data about employees' perceptions of their work environment and job attitudes. Due to the model's scientifically sound constructs and structure, this data can give valuable information for evidence-based management in practice. The models validated constructs and structure, further, offer valid reference points for formulating hypothesis in evidence-based management ("big 'E' evidence"; Rousseau, 2006) and Transformation-Transaction model surveys can collect local data ("little 'e' evidence"; Rousseau, 2006) that can be analyzed to generate evidence to predict consequences of management decisions and, therewith ultimately improve managerial decision making in organizations. Through an improvement of decision making as well as the direct measurement of organizational flexibility and stability as main factors of the Transformation-Transaction model,

the employee survey can help HR departments across the world to make their companies more adaptable and enable them to cope better with ever faster changing political and market environments (e.g., Christensen et al., 2008; Scherrer & Abernathy, 2017).

## 5.5 Conclusion

With this thesis, we contributed to closing the gap between usually practice oriented employee survey measurement models and scientific knowledge. In sum, with the Transformation-Transaction employee survey model, the presented work provides a foundation for designing employee surveys based on a cross-culturally validated measurement model that incorporates scientific content and structure. Our research validated the causal assumptions of the Transformation-Transaction survey model and found support for its generalizability of work-unit level.

Dividing employees' perception of the work environment into two higher order factors, the transformational and the transactional factor of the Transformation-Transaction model, might represent the first list of preconditions in the work environment relevant for employees' successful exploration and exploitation or organizational ambidexterity in general (e.g., O'Reilly & Tushman, 2013). Our finding that the transactional factor mediates the influence of the transformational factor onto people outcomes and organizational outcomes sheds new light on organizational ambidexterity, implying that preconditions for exploitation need to be in place before exploration can have a positive impact on employees' job attitudes and performance.

Thus, my thesis contributed (1) on a methodological level, by developing a first all-around scientifically sound employee survey model measurement model, (2) on a theoretical level by contributing to the understanding of the emergence of people outcomes from

employees' work environment perception and organizational ambidexterity theory and (3) on an empirical level by validating the presented models' causal structure and offering first evidence for the relevance of multi-level modeling in employee survey models.

Although the Transformation-Transaction model still needs to develop further gradually from an accumulating body of evidence, I strongly believe, when building on the model, organizations can directly apply the principles of evidence-based management and improve organizational development, change management and managerial decision making.

*"It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change."* – Charles Darwin

## References

Aguilera, R. V., Rupp, D. E., Williams, C. A., & Ganapathi, J. (2007). Putting the S back in corporate social responsibility: A multilevel theory of social change in organizations. *Academy of Management Review*, 32, 836-863.

* Ahmed, I., & Nawaz, M. M. (2015). Antecedents and outcomes of perceived organizational support: a literature survey approach. *Journal of Management Development*, 34(7), 867-880.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.

* Alarcon, G. M. (2011). A meta-analysis of burnout with job demands, resources, and attitudes. *Journal of Vocational Behavior*, 79(2), 549-562. doi:10.1016/j.jvb.2011.03.007

* Allen, T. D., Herst, D. E. L., Bruck, C. S., & Sutton, M. (2000). Consequences associated with work-to-family conflict: a review and agenda for future research. *Journal of Occupational Health Psychology*, 5(2), 278-308.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing.* Washington, DC: American Educational Research Association.

Anderson-Rudolf, M. K. (1996). *A longitudinal study of organizational change: How change in individual perceptions of transformational and transactional constructs predicts change in organizational performance*. Published doctoral dissertation. Available from ProQuest Dissertations and Theses database. (UMI No. 9631657)

Antonakis, J., & Atwater, L. (2002). Leader distance: A review and a proposed theory. *The Leadership Quarterly*, 13(6), 673-704.

Antoni, C., & Hertel, G. (2009). Team processes, their antecedents and consequences: Implications for different types of teamwork. *European Journal of Work and Organizational Psychology*, 18(3), 253-266.

Arthur, W., Jr., Bennett, W., Jr., Edens, P. S., & Bell, S. T. (2003). Effectiveness of training in organizations: A meta-analysis of design and evaluation features. *Journal of Applied Psychology,* 88, 234–245. doi:10.1037/0021-9010.88.2.234

Ashkanasy, N.M., Broadfoot, L. E. and Falkus, S. A. (2000). Questionnaire Measures of Organizational Culture. In N. Ashkanasy, C. Wilderom and M. Peterson (Ed.), *Handbook of Organizational Culture and Climate* (pp. 131-145). Thousand Oaks, California: Sage Publications.

* Bal, P. M., De Lange, A. H., Jansen, P. G., & Van Der Velde, M. E. (2008). Psychological contract breach and job attitudes: A meta-analysis of age as a moderator. *Journal of Vocational Behavior*, 72, 143-158. doi: 10.1016/j.jvb.2007.10.005

Baldwin, T. T. & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology,* 41, 63–107. doi:10.1111/j.1744-6570.1988.tb00632.x

Bandiera, O., Prat, A., Sadun, R. & Wulf, J. (2014). Span of Control and Span of Attention. *Harvard Business School Strategy Unit Working Paper*, (12-053), 14-22.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

* Banks, G. C., Batchelor, J. H., Seers, A., O'Boyle, E. J., Pollack, J. M., & Gower, K. (2014). What does team–member exchange bring to the party? A meta-analytic review of team and leader social exchange. *Journal of Organizational Behavior*, 35(2), 273-295. doi:10.1002/job.1885

* Banks, G. C., McCauley, K. D., Gardner, W. L., & Guler, C. E. (2016). A meta-analytic review of authentic and transformational leadership: A test for redundancy. *The Leadership Quarterly*, 27(4), 634-652.

Barnard, C. I. (1938). *The Functions of the Executive*. Cambridge: Harvard University Press.

Barsade, S. G. (2002). The ripple effect: Emotional contagion and its influence on group behavior. *Administrative Science Quarterly*, 47, 644-675.

* Barsky, A., & Kaplan, S. A. (2007). If you feel bad, it's unfair: a quantitative synthesis of affect and organizational justice perceptions. *Journal of Applied Psychology*, 92(1), 286-295.

Bartels, J., Pruyn, A., De Jong, M., & Joustra, I. (2007). Multiple organizational identification levels and the impact of perceived external prestige and communication climate. *Journal of Organizational Behavior,* 28, 173–190. doi:10.1002/job.420

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, NY: Free Press.

Bass, B. M. (1999). Two decades of research and development in transformational leadership. *European Journal of Work and Organizational Psychology*, 8, 9–32. doi:10.1080/135943299398410

Bass, B. M., Avolio, B. J., Jung, D. I., & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology*, 88(2), 207-218.

Baum, J. R., Locke, E. A., & Kirkpatrick, S. A. (1998). A longitudinal study of the relation of vision and vision communication to venture growth in entrepreneurial firms. *Journal of Applied Psychology,* 83, 43–54. doi:10.1037/0021-9010.83.1.43

Baum, J. R., Locke, E. A., & Smith, G. G. (2001). A multidimensional model of venture growth. *Academy of Management Journal*, 44, 292–303. doi:10.2307/3069456

Beehr, T. A., Glazer, S., Fischer, R., Linton, L. L., & Hansen, C. P. (2009). Antecedents for achievement of alignment in organizations. *Journal of Occupational and Organizational Psychology,* 82, 1–20. doi:10.1348/096317908X310247

* Bell, S. T., Villado, A. J., Lukasik, M. A., Belau, L., & Briggs, A. L. (2011). Getting specific about demographic diversity variable and team performance relationships: A meta-analysis. *Journal of Management*, 37(3), 709-743.

Bennett, N., & Lemoine, G. J. (2014). What a difference a word makes: Understanding threats to performance in a VUCA world. *Business Horizons*, 57, 311-317.

Bentler, P. M. (1990). Comparative fit indexes in structural modeling. *Psychological Bulletin,* 107, 238–246.

Bernerth, J. B., & Aguinis, H. (2016). A critical review and best-practice recommendations for control variable usage. *Personnel Psychology*, 69(1), 229-283.

* Berry, C. M., Lelchook, A. M., & Clark, M. A. (2012). A meta-analysis of the interrelationships between employee lateness, absenteeism, and turnover: Implications for models of withdrawal behavior. *Journal of Organizational Behavior*, 33(5), 678-699. doi:10.1002/job.778

Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, organizational deviance, and their common correlates: A review and meta-analysis. *Journal of Applied Psychology,* 92, 410–424. doi:10.1037/0021-9010.92.2.410

Bersin, J. (2015, February 1). *The geeks arrive in HR: People analytics is here.* Retrieved from: https://www.forbes.com/sites/joshbersin/2015/02/01/geeks-arrive-in-hr-people-analytics-is-here/#64644a2373b4

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 349-381). San Francisco: Jossey-Bass.

* Boer, D., Deinert, A., Homan, A. C., & Voelpel, S. C. (2016). Revisiting the mediating role of leader–member exchange in transformational leadership: the differential impact model. *European Journal of Work and Organizational Psychology*, 25(6), 883-899.

Boesche A., Bruch, H., & Kunz, J. (2008). Die Kraft positiver Energien [The power of positive energy]. *Personalwirtschaft,* 12, 54–56.

Bolino, M. C., & Turnley, W. H. (2008). Old faces, new places: Equity theory in cross-cultural contexts. *Journal of Organizational Behavior*, *29*, 29–50. doi:10.1002/job.454

Bonavia, T., Gasco, V. J., & Tomás, D. B. (2009). Spanish adaptation and factor structure of the Denison Organizational Culture Survey. *Psicothema, 21*, 633-638.

Borg, I. (2003a). *Führungsinstrument Mitarbeiterbefragung* [Management instrument employee survey] (Third ed.). Göttingen: Hogrefe.

Borg, I. (2003b). Affektiver Halo in Mitarbeiterbefragungen [Affective Halo in Employee Surveys]. *Zeitschrift für Arbeits- und Organisationspsychologie*, 47(1), 1–11.

Borg, I. (2014). Mitarbeiterbefragungen [Employee survey]. In N. Baur & J. Blasius (Eds.) *Handbuch Methoden der empirischen Sozialforschung* [Handbook methods of social research] (pp. 767-774). Wiesbaden, Germany: Springer.

Borg, I., & Mastrangelo, P. M. (2008). *Employee surveys in management: Theories, tools, and practical applications*. Göttingen, Germany: Hogrefe.

Borg, I., & Zimmermann, M. (2006). How to create presentations that spark action. In A. I. Kraut (Ed.), *Getting action from organizational surveys* (pp. 401-423). San Francisco, CA: Jossey-Bass.

* Bowen, F. E., Rostami, M., & Steel, P. (2010). Timing is everything: A meta-analysis of the relationships between organizational performance and innovation. *Journal of Business Research*, 63(11), 1179-1185. doi:10.1016/j.jbusres.2009.10.014

Bowers, C. A. Pharmer, J. A., & Salas, E. (2000). When member homogeneity is needed in work teams: A meta-analysis. *Small Group Research,* 31, 305–329. doi:10.1177/104649640003100303

Bowling, N. A., & Beehr, T. A. (2006). Workplace harassment from the victim's perspective: A theoretical model and meta-analysis. *Journal of Applied Psychology,* 91, 998–1012. doi:10.1037/0021-9010.91.5.998

* Bowling, N. A., Alarcon, G. M., Bragg, C. B., & Hartman, M. J. (2015). A meta-analytic examination of the potential correlates and consequences of workload. *Work & Stress,* 29, 95-113. doi:10.1080/02678373.2015.1033037

* Bowling, N. A., Eschleman, K. J., Wang, Q., Kirkendall, C., & Alarcon, G. (2010). A meta-analysis of the predictors and consequences of organization-based self-esteem. *Journal of Occupational and Organizational Psychology,* 83(3), 601-626.

Boyce, A. S. (2010). *Organizational climate and performance: An examination of causal priority.* Unpublished doctoral dissertation. Michigan State University, Lansing, MI.

Brislin, R. W. (1980). Cross-cultural research methods. In I. Altman, A. Rapoport and J. F. Wohlwill (Eds.) *Environment and culture* (pp. 47-82). Boston, MA: Springer.

Brodbeck, F. C. (2008). Evidenzbasiertes (Veränderungs-) Management: Einführung und Überblick [Evidence based (change-) management: An introduction and overview]. *Zeitschrift für Organisationsentwicklung,* 1(8), 4–9.

Brodbeck, F. C. (2013, June 18). *Leadership meets University. Wandel in internationalen Gefilden: Chancen und Risiken* [Change in international realm: Prospects and risks]. Television broadcast. Munich: ARD-alpha. (Available from http://www.br.de/fernsehen/ard-alpha/sendungen/alpha-campus/auditorium/ leadership-meets-university-wandel-100.html; last retrieved, 10th Sept. 2017).

Brodbeck, F. C. (2015). *Strategic Fitness Model.* LMU Munich and LOGIT Management Consulting GmbH, Munich.

Brodbeck, F. C. (2016). Internationale Mitarbeiterbefragung [International Employee Survey]. In F. C. Brodbeck, E. Kirchler and R. Woschee (Eds.), *Internationale Führung [International Leadership]*, 207-222. Berlin: Springer.

Brodbeck, F. C., Chhokar, J. S., & House, R. J. (2007). Culture and Leadership in 25 Societies: Integration, Conclusions and Future Direction. In J. S. Chhokar, F. C. Brodbeck & R. J. House (Eds.), *Culture and Leadership Across the World: The GLOBE Book of In-Depth Studies of 25 Societies* (pp. 1023-1084). London: Lawrence Erlbaum Associates.

Brown, R. D., & Hauenstein, N. M. (2005). Interrater agreement reconsidered: An alternative to the rwg indices. *Organizational Research Methods*, 8, 165-184.

* Brown, S. P., & Lam, S. K. (2008). A Meta-Analysis of Relationships Linking Employee Satisfaction to Customer Responses. *Journal of Retailing*, 84(3), 243–255.

Bruch, H., & Vogel, B. (2009). *Organisationale Energie – Wie Sie das Potenzial Ihres Unternehmens ausschöpfen* [Organizational energy – How to capitalize on its potential for your company] (2nd ed.). Wiesbaden, Germany: Gabler.

Bungard, W. & Jöns, I. (1997). *Mitarbeiterbefragung. Ein Instrument des Innovations- und Qualitätsmanagements* [Employee survey. An instrument of innovation and quality management]. Weinheim, Germany: Psychologie Verlags Union.

Bungard, W., Müller, K., & Niethammer, C. (2007). *Mitarbeiterbefragung - was dann ...? MAB und Folgeprozesse erfolgreich gestalten* [Employee survey – and what‘s next? Designing employee survey and follow-up processes]. Heidelberg, Germany: Springer.

Burke, W. W. (2017). *Organization change. Theory & practice*. Thousand Oaks, CA: Sage Publications.

Burke, W. W., & Litwin, G. H. (1992). A causal model of organizational performance and change. *Journal of Management,* 18, 523-545.

Burns, J. M. (1978). *Leadership*. New York: Harper & Row.

Büschgens, T., Bausch, A., & Balkin, D. B. (2013). Organizational Culture and Innovation: A Meta-Analytic Review. *Journal of Product Innovation Management*, 30(4), 763-781.

* Butts, M. M., Casper, W. J., & Yang, T. S. (2013). How important are work–family support policies? A meta-analytic investigation of their effects on employee outcomes. *Journal of Applied Psychology*, 98(1), 1-25. doi:10.1037/a0030389

Buunk, B. P., Zurriaga, R., Peíró, J. M., Nauta, A., & Gosalvez, I. (2005). Social comparisons at work as related to a cooperative social climate and to individual differences in social comparison orientation. *Applied Psychology,* 54, 61-80.

Cacioppo, J. T., Hawkley, L. C., & Thisted, R. A. (2010). Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychology and aging*, 25, 453-463.

* Cantarelli, P., Belardinelli, P., & Belle, N. (2015). A Meta-Analysis of Job Satisfaction Correlates in the Public Administration Literature. *Review of Public Personnel Administration*, 36(2), 115–144.

* Cantisano, G. T., Domínguez, J. F. M., & Depolo, M. (2008). Psychological contract breach and outcomes: Combining meta-analysis and structural equation models. *Psicothema*, 20(3), 487-496.

Caroselli, C. (1992). Assessment of Organizational Culture: A Tool for Professional Success. *Orthopaedic Nursing*, 1(3), 57–63.

* Carpenter, N. C., & Berry, C. M. (2017). Are counterproductive work behavior and withdrawal empirically distinct? A meta-analytic investigation. *Journal of Management*, 43(3), 834-863.

Cascio, W. F. (2007). Evidence-based management and the marketplace for ideas. *Academy of Management Journal*, 50, 1009-1012.

* Ceri-Booms, M., Curşeu, P. L., & Oerlemans, L. A. (2017). Task and person-focused leadership behaviors and team performance: A meta-analysis. *Human Resource Management Review*, 27(1), 178-192.

* Chan, D. K. S., Lam, C. B., Chow, S. Y., & Cheung, S. F. (2008). Examining the job-related, psychological, and physical outcomes of workplace sexual harassment: a meta-analytic review. *Psychology of Women Quarterly*, 32(4), 362-376.

Chen, G., & Kanfer, R. (2006). Toward a systems theory of motivated behavior in work teams. *Research in organizational behavior*, 27, 223-267.

* Chen, J., Damanpour, F., & Reilly, R. R. (2007). Understanding antecedents of new product development speed: A meta-analysis. *Journal of Operations Management*, 28, 17–33.

* Cheng, G. H. L., & Chan, D. K. S. (2008). Who suffers more from job insecurity? A meta-analytic review. *Applied Psychology*, 57(2), 272-303.

Cheung, M. W.-L. (2015). *Meta-analysis. A structural equation modeling approach*. Chichester: John Wiley & Sons.

* Chiaburu, D. S., Chakrabarty, S., Wang, J., & Li, N. (2015). Organizational support and citizenship behaviors: A comparative cross-cultural meta-analysis. *Management International Review*, 55(5), 707-736.

* Chiaburu, D. S., & Harrison, D. A. (2008). Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance. *Journal of Applied Psychology*, 93, 1082-1103.

* Chiaburu, D. S., Peng, A. C., Oh, I. S., Banks, G. C., & Lomeli, L. C. (2013). Antecedents and consequences of employee organizational cynicism: A meta-analysis. *Journal of Vocational Behavior*, 83(2), 181–197.

* Chiaburu, D. S., Smith, T. A., Wang, J., & Zimmerman, R. D. (2014). Relative importance of leader influences for subordinates' proactive behaviors, prosocial behaviors, and task performance: A meta-analysis. *Journal of Personnel Psychology*, 13(2), 70-86. doi:10.1027/1866-5888/a000105

* Chiocchio, F., & Essiembre, H. (2009). Cohesion and performance: A meta-analytic review of disparities between project teams, production teams, and service teams. *Small group research*, 40, 382-420.

Christensen, C. M., Johnson, C. W., & Horn, M. B. (2008). *Disrupting class*. New York, NY: McGraw-Hill Professional Publishing.

Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology*, 94, 1103–1127. doi:10.1037/a0016172

* Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work Engagement: A Quantitative Review and Test of its Relations with Task and Contextual Performance. *Personnel Psychology*, 64, 89–136.

Church, A. H., Golay, L. M., Rotolo, C. T., Tuller, M. D., Shull A. C., & Desrosiers, E. I. (2012). Without effort there can be no change: Reexamining the impact of survey feedback and action planning on employee attitudes. *Research in Organizational Change and Development*, 20, 223-264.

Church, A. H., & Oliver, D. H. (2006). The importance of taking action, not just sharing survey feedback. In A. I. Kraut (Ed.), *Getting Action from Organizational Surveys: New Concepts, Technologies, and Applications* (pp. 102-130). San Francisco, CA: Jossey-Bass.

Church, A. H., & Waclawski, J. (1998). *Designing and using organizational surveys.* Brookfield, VT: Gower.

Church, A. H., Waclawski, J., & Burke, W. W. (2001). Multisource feedback for organization development and change. In D. W. Bracken, C. W. Timmreck and A. H. Church (Eds.) *The handbook of multisource feedback: The comprehensive resource for designing and implementing MSF processes* (pp. 301-317). San Francisco, CA: John Wiley & Sons.

* Clark, M. A., Michel, J. S., Zhdanova, L., Pui, S. Y., & Baltes, B. B. (2016). All Work and No Play? A Meta-Analytic Examination of the Correlates and Outcomes of Workaholism. *Journal of Management*, 42(7), 1836–1873.

* Clarke, S. (2013). Safety leadership: A meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. *Journal of Occupational and Organizational Psychology*, 86(1), 22-49. doi:10.1111/j.2044-8325.2012.02064.x

Clarke, S., & Robertson, I. (2008). An Examination of the role of personality in work accidents using meta-analysis. *Applied Psychology*, 57, 94–108. doi:10.1111/j.1464-0597.2007.00267.x

Cleophas, T. J., & Zwinderman, A. H. (2017). Meta-Meta-analysis. In Cleophas, T. J., & Zwinderman, A. H. (Eds.) *Modern Meta-Analysis: Review and Update of Methodologies*, (pp. 135-143). Cham: Springer International Publishing.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20, 37–46.

Cohen-Charash, Y., & Spector, P. E. (2001). The role of justice in organizations. *Organizational Behavior and Human Decision Processes*, 86, 278–321. doi:10.1006/obhd.2001.2958

Cole, M. S., Bruch, H., & Vogel, B. (2012). Energy at work: A measurement validation and linkage to unit effectiveness. *Journal of Organizational Behavior,* 33, 445-467.

Colquitt, J. A., Scott, B. A., & LePine, J. A. (2007). Trust, trustworthiness, and trust propensity: A meta-analytic test of their unique relationships with risk taking and job performance. *Journal of Applied Psychology*, 92, 909-927.

* Colquitt, J. A., Scott, B. A., Rodell, J. B., Long, D. M., Zapata, C. P., Conlon, D. E., & Wesson, M. J. (2013). Justice at the millennium, a decade later: A meta-analytic test of social exchange and affect-based perspectives. *Journal of Applied Psychology*, 98, 199-236.

Combs, J. G., & Ketchen, D. J., Jr. (2002). Why do firms use franchising as an entrepreneurial strategy? A meta-analysis. *Journal of Management*, 29, 443–465. doi:10.1016/S0149-2063_03_00019-9

* Combs, J., Liu, Y., Hall, A., & Ketchen, D. (2006). How much do high-performance work practices matter? A meta-analysis of their effects on organizational performance. *Personnel Psychology*, 59(3), 501-528.

Cooper, H., & Koenka, A. C. (2012). The overview of reviews: Unique challenges and opportunities when research syntheses are the principal elements of new integrative scholarship. *American Psychologist,* 67, 446-462.

* Cooper-Hakim, A., & Viswesvaran, C. (2005). The Construct of Work Commitment: Testing an Integrative Framework. *Psychological Bulletin*, 131(2), 241–259.

Corning, P. A. (2002). The Re-emergence of "Emergence": A Venerable Concept in Search of a Theory. *Complexity*, 7(6), 18-30.

Costa, A. C. (2003). Work team trust and effectiveness. *Personnel Review*, 32(5), 605-622.

* Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology*, 95(5), 834-848. doi:10.1037/a0019364

* Darr, W., & Johns, G. (2008). Work strain, health, and absenteeism: A meta-analysis. *Journal of Occupational Health Psychology*, 13(4), 293-318.

* DeChurch, L. A., & Mesmer-Magnus, J. R. (2010). The cognitive underpinnings of effective teamwork: a meta-analysis. *Journal of Applied Psychology*, 95(1), 32-53. doi: 10.1037/a0017328

De Dreu, C. K. W., & Weingart, L. R. (2003). Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. *Journal of Applied Psychology*, 88, 741–749. doi:10.1037/0021-9010.88.4.741

* Deinert, A., Homan, A. C., Boer, D., Voelpel, S. C., & Gutermann, D. (2015). Transformational leadership sub-dimensions and their link to leaders' personality and performance. *The Leadership Quarterly*, 26(6), 1095-1120.

Deitering, F. G. (2006). *Folgeprozesse bei Mitarbeiterbefragungen* [Follow-up processes of employee surveys]. München, Germany: Rainer Hampp.

* De Jong, B. A., Dirks, K. T., & Gillespie, N. (2016). Trust and team performance: A meta-analysis of main effects, moderators, and covariates. *Journal of Applied Psychology*, 101(8), 1134-1150.

Denison, D. R., Haaland, S., & Goelzer, P. (2003). Corporate culture and organizational effectiveness: Is there a similar pattern around this world? *Advances in Global Leadership*, 3, 205-227.

Denison, D. R., & Neale, W. S. (1996). *Denison organizational culture survey*. Ann Arbor, MI: Aviat.

Denison, D. R., Nieminen, L., & Kotrba, L. (2003). Diagnosing organizational cultures: A conceptual and empirical review of culture effectiveness surveys. *European Journal of Work and Organizational Psychology*, 23, 1-17.

* Derue, D. S., Nahrgang, J. D., Wellman, N., & Humphrey, S. E. (2011). Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Personnel Psychology*, 64(1), 7–52.

* Desmidt, S., Prinzie, A., & Decramer, A. (2011). Looking for the value of mission statements: a meta-analysis of 20 years of research. *Management Decision*, 49(3), 468-483.

* De Wit, F. R., Greer, L. L., & Jehn, K. A. (2012). The paradox of intragroup conflict: a meta-analysis. *Journal of Applied Psychology*, 97(2), 360-390.

DeVellis, R. F. (1991). *Applied social research methods series, Vol. 26. Scale development: Theory and applications.* Thousand Oaks, CA, US: Sage Publications, Inc.

Di Pofi, J. A. (2002). Organizational diagnostics: integrating qualitative and quantitative methodology. *Journal of Organizational Change Management,* 15, 156-168.

* Dirks, K. T., & Ferrin, D. L. (2002). Trust in leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology*, 87, 611–628. doi:10.1037/0021-9010.87.4.611

Domsch, M. E. & Ladwig, D. (2013). *Handbuch Mitarbeiterbefragung* [Handbook employee survey]. Berlin, German: Springer Gabler.

Doppler, K., & Lauterburg, C. (2008). *Change Management: Den Unternehmenswandel gestalten (12th ed.)*. Frankfurt am Main, Germany: Campus Verlag.

* Dulebohn, J. H., Bommer, W. H., Liden, R. C., Brouer, R. L., & Ferris, G. R. (2012). A meta-analysis of antecedents and consequences of leader-member exchange integrating the past with an eye toward the future. *Journal of Management*, 38(6), 1715-1759.

Dunlap, W. P., Burke, M. J., & Smith-Crowe, K. (2003). Accurate tests of statistical significance for rwg and average deviation interrater agreement indexes. *Journal of Applied Psychology*, 88, 356-362.

* Eatough, E. M., Chang, C., Miloslavic, S. A., & Johnson, R. E. (2011). Relationships of role stressors with organizational citizenship behavior: A meta-analysis. *Journal of Applied Psychology*, 96(3), 619-632. doi:10.1037/a0021887

Eisenbeiss, S. A., van Knippenberg, D., & Boerner, S. (2008). Transformational leadership and team innovation: integrating team climate principles. *Journal of Applied Psychology*, 93(6), 1438-1446.

* Evanschitzky, H., Eisend, M., Calantone, R. J., & Jiang, Y. (2012). Success factors of product innovation: An updated meta-analysis. *Journal of Product Innovation Management*, 29, 21-37. doi: 10.1111/j.1540-5885.2012.00964.x

Falletta, S. V. (1999). *Assessing the statistical conclusion and predictive validity of a diagnostic model and survey of organizational performance and change*. Published doctoral dissertation. Available from ProQuest Dissertations and Theses database. (UMI No. 9946410)

* Faragher, E. B., Cass, M., & Cooper, C. L. (2005). The relationship between job satisfaction and health: a meta-analysis. *Occupational and environmental medicine,* 62(2), 105-112.

Fey, C., & Denison, D. R. (2003). Organizational culture and effectiveness: Can an American theory be applied in Russia? *Organization Science,* 14, 686-706.

* Fila, M. J., Purl, J., & Griffeth, R. W. (2017). Job demands, control and support: Meta-analyzing moderator effects of gender, nationality, and occupation. *Human Resource Management Review,* 27(1), 39-60.

Fitz-enz, J. (2010). *The new HR analytics. Predicting the economic value of your company's human capital investments*. New York, NY: AMACOM.

Fishbein, M. & Ajzen, I. (2010). *Predicting and changing behavior. The reasoned action approach*. New York, NY: Psychology Press.

Fleiss, J. L. (1981). *Statistical methods for rates and proportions*. 2nd ed. New York: John Wiley.

* Ford, M. T., Heinen, B. A., & Langkamer, K. L. (2007). Work and family satisfaction and conflict: A meta-analysis of cross-domain relations. *Journal of Applied Psychology*, 92(1), 57-80.

Fox, J. (2006). Structural equation modeling with the sem package in R. *Structural Equation Modeling*, 13;465-486.

* Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V. (2017). Psychological safety: A meta-analytic review and extension. *Personnel Psychology*, 70(1), 113-165.

* Gaertner, S. (1999). Structural determinants of job satisfaction and organizational commitment in turnover models. *Human Resource Management Review*, 9(4), 479-493.

Galbraith, J. R. (2014). Organization design challenges resulting from big data. *Journal of Organizational Design*, 3(1), 2-13.

* Gerstner, C. R., & Day, D. V. (1997). Meta-Analytic Review of Leader-Member Exchange Theory: Correlates and Construct Issues. *Journal of Applied Psychology*, 82(6), 827-844.

Gibson, C. B. (2001). From accumulation to accommodation: The chemistry of collective cognition in work groups. *Journal of Organizational Behavior*, 22, 121–134.

Gibson, C. B. & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal,* 47, 209-226.

Gilboa, S., Shirom, A., Fried, Y., & Cooper, C. (2008). A meta-analysis of work demand stressors and job performance: examining main and moderating effects. *Personnel Psychology*, 61, 227–271. doi:10.1111/j.1744-6570.2008.00113.x

Gillespie, M. A., Denison, D. R., Haaland, S., Smerek, R., & Neale, W. S. (2008). Linking organizational culture and customer satisfaction: Results from two companies in different industries. *European Journal of Work and Organizational Psychology,* 17, 112-132.

Ginevičius, R., & Vaitkūnaitė, V. (2006). Analysis of organizational culture dimensions impacting performance. *Journal of Business Economics and Management,* 7, 201-211.

Gliner, J. A., Morgan, G. A., & Leech, N. L. (2009*). Research methods in applied settings: An Integrated approach to design and analysis (2nd ed.)*. New York: Routledge.

Gupta, V., Hanges, P. J., & Dorfman, P. (2002). Cultural clusters: Methodology and findings. *Journal of world business*, 37(1), 11-15.

Hackman, J. R. (1987). The design of work teams. In J. W. Lorsch (Ed.), *Handbook of organizational behavior* (pp. 315–342). Englewood Cliffs, NJ: Prentice Hall.

Hackman, J. R. (1992). Group influences on individuals in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 199-267). Palo Alto, CA: Consulting Psychologists Press.

* Halbesleben, J. R. (2006). Sources of social support and burnout: a meta-analytic test of the conservation of resources model. *Journal of Applied Psychology*, 91(5), 1134-1145.

* Hameed, M. A., Counsell, S., & Swift, S. (2012). A meta-analysis of relationships between organizational characteristics and IT innovation adoption in organizations. *Information & Management,* 49(5), 218-232.

* Hammond, M. M., Neff, N. L., Farr, J. L., Schwall, A. R., & Zhao, X. (2011). Predictors of individual-level innovation at work: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts,* 5, 90-105. doi:10.1037/a0018556

Hancock, J. I., Allen, D. G., Bosco, F. A., McDaniel, K. R., & Pierce, C. A. (2013). Meta-analytic review of employee turnover as a predictor of firm performance. *Journal of Management,* 39, 573-603.

* Hancock, J. I., Allen, D. G., & Soelberg, C. (2017). Collective turnover: An expanded meta-analytic exploration and comparison. *Human Resource Management Review*, 27(1), 61–86.

Hanges, P. J. (2004). Response bias correction procedure used in GLOBE. In R. J. House, P. J. Hanges, M. Javidan, P. W. Dorfman, & V. Gupta (Eds.), *Culture, Leadership and Organizations. The GLOBE Study of 62 Societies* (pp. 737-751). Thousand Oaks, CA: Sage Publications.

* Harari, M. B., Reaves, A. C., & Viswesvaran, C. (2016). Creative and innovative performance: a meta-analysis of relationships with task, citizenship, and counterproductive job performance dimensions. *European Journal of Work and Organizational Psychology*, 25(4), 495-511.

* Harms, P. D., Credé, M., Tynan, M., Leon, M., & Jeung, W. (2017). Leadership and stress: A meta-analytic review. *The Leadership Quarterly*, 28(1), 178-194.

Harrison, D. A., Newman, D. A., & Roth, P. L. (2006). How important are job attitudes? Meta-analytic comparisons of integrative behavioral outcomes and time sequences. *Academy of Management Journal*, 49, 305-325.

Harter, J. K., & Agrawal, S. (2011). *Cross-cultural analysis of Gallup's Q12 employee engagement instrument*. Omaha, NE: Gallup.

Harter, J. K., & Schmidt, F. L. (2008). Conceptual versus empirical distinctions among constructs: Implications for discriminant validity. *Industrial and Organizational Psychology*, 1, 36-39.

Harter, J. K., Schmidt, F. L., Agrawal, S., Plowman, S. K., & Blue, A. (2016). *The relationship between engagement at work and organizational outcomes. 2016 Q12® meta-analysis: Ninth edition.* Washington, D. C.: Gallup Inc.

Harter, J. K, Schmidt, F. L., Asplund, W. A., Killham, E. A. & Agrawal, S. (2010). Causal impact of employee work perceptions on the bottom line of organizations. *Perspectives on Psychological Science,* 5, 378-389.

* Harter, J. K, Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A Meta-Analysis. *Journal of Applied Psychology*, 87, 268-279.

Hartnell, C. A., Ou, A. Y., & Kinicki, A. (2011). Organizational culture and organizational effectiveness: a meta-analytic investigation of the competing values framework's theoretical suppositions. *Journal of Applied Psychology*, 96, 677-694.

Hattrup, K., Mueller, K., & Aguirre, P. (2008). An evaluation of the cross-national generalizability of organizational commitment. *Journal of Occupational and Organizational Psychology*, 81(2), 219-240.

Hayes, A. F. (2017). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. New York, NY: Guilford Publications.

* Heavey, A. L., Holwerda, J. A., & Hausknecht, J. P. (2013). Causes and Consequences of Collective Turnover: A Meta-Analytic Review. *Journal of Applied Psychology*, 98(3), 412-453.

* Henard, D. H., & Szymanski, D. M. (2001). Why some new products are more successful than others.*Journal of Marketing Research*, 38(3), 362-375.

Herold, D. M., Fedor, D. B., Caldwell, S., & Liu, Y. (2008). The effects of transformational and change leadership on employees' commitment to a change: A multilevel study. *Journal of Applied Psychology*, 93, 346-357.

Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of Management Journal*, 50, 1385-1399.

* 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.

Holland, J. H. (1975). *Adaptation in natural and artificial systems*. Ann Arbor, MI: University of Michigan Press.

* Horstmeier, C. A. L., Boer, D., Homan, A. C., & Voelpel, S. C. (2017). The Differential Effects of Transformational Leadership on Multiple Identifications at Work: A Meta-analytic Model. *British Journal of Management*, 28(2), 280–298.

* Horwitz, S. K., & Horwitz, I. B. (2007). The effects of team diversity on team outcomes: A meta-analytic review of team demography. *Journal of Management,* 33, 987–1013. doi:10.1177/0149206307308587

Hossiep, R., & Frieg, P. (2008). Der Einsatz von Mitarbeiterbefragungen in Deutschland, Österreich und der Schweiz [Th Use of Employee Survey in Germany, Austria and Switzerland]. *Planung & Analyse*, 6, 55-59.

Hossiep, R. & Frieg, P. (2013). Mitarbeiterbefragungen in den 2000er Jahren: Eine Bestandsaufnahme [Employee surveys in the 2000s: A review]. In M. E. Domsch & D. H. Ladwig (Eds.), *Handbuch Mitarbeiterbefragung [Handbook employee survey]* (pp. 57-94). Berlin: Springer Gabler.

House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Thousand Oaks, CA: Sage publications.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal,* 6, 1-55. doi:10.1080/10705519909540118

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology,* 92, 1332–1356. doi:10.1037/0021-9010.92.5.1332

Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings.* Thousand Oaks, CA: Sage Publications.

Isaacs, D., & Fitzgerald, D. (1999). Seven alternatives to evidence based medicine. *BMJ,* 319, 1618.

* Ilies, R., Nahrgang, J. D., & Morgeson, F. P. (2007). Leader-member exchange and citizenship behaviors. *Journal of Applied Psychology*, 92(1), 269-277.

* Jackson, T. A., Meyer, J. P., & Wang, X. H. F. (2013). Leadership, Commitment, and Culture A Meta-Analysis. *Journal of Leadership & Organizational Studies*, 20(1), 84-106.

James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of applied psychology*, 69, 85-98.

Jöreskog, K. G., & Sörbom, D. G. (1989). *LISREL 7 user's reference guide*. Chicago: Scientific Software.

* Jiang, K., Liu, D., McKay, P. F., Lee, T. W., & Mitchell, T. R. (2012). When and how is job embeddedness predictive of turnover? A meta-analytic investigation. *Journal of Applied Psychology*, 97(5), 1077-1096. doi:10.1037/a0028610

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology,* 86, 80–92. doi:10.1037/0021-9010.86.1.80

Judge, T. A., & Piccolo, R. F. (2004). Transformational and transactional leadership: A meta-analytic test of their relative validity. *Journal of Applied Psychology,* 89, 755–768. doi:10.1037/0021-9010.89.5.755

Judge, T. A., Piccolo, R. F., Podsakoff, N. P., Shaw, J. C., & Rich, B. L. (2010). The relationship between pay and job satisfaction: A meta-analysis of the literature. *Journal of Vocational Behavior*, 77(2), 157-167. doi:10.1016/j.jvb.2010.04.002

Judge, T. A, Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction-performance overall relationship: A qualitative and quantitative review. *Psychological Bulletin,* 127, 376–407. doi:10.1037/0033-2909.127.3.376

Jung, T., Scott, T., Davies, H. T. O., Bower, P., Whalley, D., McNally, R., & Mannion, R. (2009). Instruments for exploring organizational culture: A review of the literature. *Public Administration Review,* 69, 1087-1096.

Kaplan, R. S., & Norton, D. P. (1996). *The balanced scorecard: translating strategy into action*. Boston: Harvard Business Press.

Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations* (Vol. 2). New York: Wiley.

Kearney, M. W. (2017). Cross Lagged Panel Analysis. In M. R. Allen (Ed.), *The SAGE Encyclopedia of Communication Research Methods*. Thousand Oaks, CA: Sage.

* Keim, A. C., Landis, R. S., Pierce, C. A., & Earnest, D. R. (2014). Why do employees worry about their jobs? A meta-analytic review of predictors of job insecurity. *Journal of Occupational Health Psychology,* 19(3), 269-290.

* Kinicki, A. J., McKee-Ryan, F. M., Schriesheim, C. A., & Carson, K. P. (2002). Assessing the construct validity of the Job Descriptive Index: A review and meta-analysis. *Journal of Applied Psychology*, 87(1), 14–32.

Klein, K. J., & Kozlowski, S. J. (2000). From micro to meso: Critical steps in conceptualizing and conducting multilevel research. *Organizational Research Methods*, 3, 211-236.

* Kleingeld, A., van Mierlo, H., & Arends, L. (2011). The effect of goal setting on group performance: a meta-analysis. *Journal of Applied Psychology*, 96, 1289-1304.

Kline, R.B. (2010). Promise and pitfalls of structural equation modeling in gifted research. In B. Thompson & R. F. Subotnik (Eds.), *Methodologies for conducting research on giftedness* (pp. 147–169). Washington, DC: American Psychological Association.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, 119, 254–284. doi:10.1037/0033-2909.119.2.254

* Knight, A. P., & Eisenkraft, N. (2015). Positive is usually good, negative is not always bad: The effects of group affect on social integration and task performance. *Journal of Applied Psychology*, 100(4): 1214–1227.

Konradt, U., Andreßen, P., & Ellwart, T. (2009). Self-leadership in organizational teams: A multilevel analysis of moderators and mediators. *European Journal of Work and Organizational Psychology*, 18(3), 322-346.

* Kossek, E. E., Pichler, S., Bodner, T., & Hammer, L. B. (2011). Workplace social support and work–family conflict: A meta-analysis clarifying the influence of general and work–

family-specific supervisor and organizational support. *Personnel psychology*, 64(2), 289-313.

Kottke, J. L., & Sharafinski, C. E. (1988). Measuring Perceived Supervisory and Organizational Support. *Educational and Psychological Measurement*, 48, 1075-1079.

Kozlowski, S. W., Chao, G. T., Grand, J. A., Braun, M. T., & Kuljanin, G. (2013). Advancing multilevel research design: Capturing the dynamics of emergence. *Organizational Research Methods*, 16(4), 581-615.

Kozlowski, S., & Klein, K. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 3-90). San Francisco: Jossey-Bass.

* Kraft, P., & Bausch, A. (2016). How Do Transformational Leaders Promote Exploratory and Exploitative Innovation? Examining the Black Box through MASEM. *Journal of Product Innovation Management*, 33(6), 687-707.

Kraut, A. I. (Ed.) (1996). *Organizational surveys: Tools for assessment and change*. San Francisco, CA: Jossey-Bass.

Kraut, A. I. (Ed.) (2006). *Getting action from organizational surveys: New concepts, technologies and applications*. San Francisco, CA: Jossey Bass.

Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel psychology*, 49, 1-49.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology,* 58, 281–342. doi:10.1111/j.1744-6570.2005.00672.x

Kuenzi, M. & Schminke, M. (2009). Assembling fragments into a lens: A review, critique, and proposed research agenda for the organizational climate literature. *Journal of Management,* 35, 634-717.

Kuran, T. (1988). The tenacious past: Theories of personal and collective conservatism. *Journal of Economic Behavior and Organization,* 10, 143-171.

Landis, R. S. (2013). Successfully combining meta-analysis and structural equation modeling: recommendations and strategies. *Journal of Business Psychology,* 28, 251-261.

Langford, P. H. (2009). Measuring organisational climate and employee engagement: Evidence for a 7 Ps model of work practices and outcomes. *Australian Journal of Psychology,* 61, 185–198.

Langford, P. H., & Presbitero, A. (2012). The "7Ps" model of work practices and outcomes: Generalizable or culture-specific? *Philippine Journal of Psychology,* 45 (2).

LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational research methods,* 11, 815-852.

LePine, J. A., Erez, A., & Johnson, D. E. (2002). The nature and dimensionality of organizational citizenship behavior: A critical review and meta-analysis. *Journal of Applied Psychology,* 87, 52–65. doi:10.1037/0021-9010.87.1.52

* LePine, J. A., Piccolo, R. F., Jackson, C. L., Mathieu, J. E., & Saul, J. R. (2008). A meta-analysis of teamwork processes: tests of a multidimensional model and relationships with team effectiveness criteria. *Personnel Psychology*, 61(2), 273-307.

* LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor–hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal*, 48(5), 764-775.

Lewin, K. (1951). *Field theory in social science*. New York: Harper and Row.

* Li, A., & Cropanzano, R. (2009). Do East Asians Respond More/Less Strongly to Organizational Justice Than North Americans? A Meta-Analysis. *Journal of Management Studies*, 46(5), 787-805.

Liden, R. C., Erdogan, B., Wayne, S. J., & Sparrowe, R. T. (2006). Leader-member exchange, differentiation, and task interdependence: Implications for individual and group performance. *Journal of Organizational Behavior*, 27, 723-746.

* Lin, C., Standing, C., & Liu, Y. C. (2008). A model to develop effective virtual teams. *Decision Support Systems*, 45(4), 1031–1045.

Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioral treatment: Confirmation from meta-analysis. *American Psychologist*, 48(12), 1181-1209.

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: SAGE Publications.

* Litano, M. L., Major, D. A., Landers, R. N., Streets, V. N., & Bass, B. I. (2016). A meta-analytic investigation of the relationship between leader-member exchange and work-family experiences. *The Leadership Quarterly,* 27(5), 802-817.

* Liu, D., Jiang, K., Shalley, C. E., Keem, S., & Zhou, J. (2016). Motivational mechanisms of employee creativity: A meta-analytic examination and theoretical extension of the creativity literature. *Organizational Behavior and Human Decision Processes,* 137, 236-263.

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal seting and task motivation. *American Psychologist,* 57, 705–717. doi:10.1037/0003-066X.57.9.705

Locke, E. A., & Latham, G. P. (2007). New developments in and directions for goal-setting research. *European Psychologist,* 12, 290–300. doi:10.1027/1016-9040.12.4.290

Lowe, K. B., Kroek, K. G., & Sivasubramaniam, N. (1996). Effectiveness Correlates of Transformational and Transactional Leadership: A Meta-Analytic Review of the MLQ Literature. *The Leadership Quarterly*, 7, 385-415.

* Luchman, J. N., & González-Morales, M. G. (2013). Demands, control, and support: A meta-analytic review of work characteristics interrelationships. *Journal of Occupational Health Psychology,* 18(1), 37-52. doi:10.1037/a0030541

Macey, W. H., Schneider, B., Barbera, K. M., & Young, S. A. (2009). *Employee engagement: tools for analysis. Practice, and Competitive Advantage*. Oxford, UK: Wiley-Blackwell.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organizational Science,* 2, 71-87.

* Marinova, S. V., Peng, C., Lorinkova, N., Van Dyne, L., & Chiaburu, D. (2015). Change-oriented behavior: A meta-analysis of individual and job design predictors. *Journal of Vocational Behavior*, 88, 104-120.

* Martin, R., Guillaume, Y., Thomas, G., Lee, A., & Epitropaki, O. (2016). Leader–Member Exchange (LMX) and Performance: A Meta-Analytic Review. *Personnel Psychology*, 69(1), 67–121.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. *Journal of management*, 34, 410-476.

Matthaei, B. M., & Brodbeck, F. C. (2018). *Developing a Sound Structural Measurement Model for International Employee Surveys.* Paper to be presented at the Society of Industrial and Organizational Psychology (SIOP) Conference, Chicago, IL.

Mauersberger, S. (2012). *Development of a measurement model for international employee surveys*. Unpublished doctoral dissertation. Ludwig-Maximilians-Universtät, München.

Mauersberger, S., Kugler, K. G., & Brodbeck, F. C. (2017). *Development of a Measurement Model for International Employee Surveys.* Paper presented at the Society of Industrial and Organizational Psychology (SIOP) Conference, Orlando, FL.

* Maynard, M. T., Mathieu, J. E., Gilson, L. L., O'Boyle Jr, E. H., & Cigularov, K. P. (2013). Drivers and outcomes of team psychological empowerment: A meta-analytic review and model test. *Organizational Psychology Review*, 3(2), 101-137.

Mesmer-Magnus, J. R., & DeChurch, L. A. (2009). Information sharing and team performance: A meta-analysis. *Journal of Applied Psychology,* 94, 535–546. doi:10.1037/a0013773

* Mesmer-Magnus, J. R., & Viswesvaran, C. (2006). How family-friendly work environments affect work/family conflict: A meta-analytic examination. *Journal of Labor Research*, 27(4), 555-574.

Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior*, 61, 20–52. doi:10.1006/jvbe.2001.1842

* Michel, J. S., Kotrba, L. M., Mitchelson, J. K., Clark, M. A., & Baltes, B. B. (2011). Antecedents of work–family conflict: A meta-analytic review. *Journal of Organizational Behavior*, 32(5), 689-725. DOI: 10.1002/job.695

* Michel, J. S., Mitchelson, J. K., Pichler, S., & Cullen, K. L. (2010). Clarifying relationships among work and family social support, stressors, and work–family conflict. *Journal of Vocational Behavior*, 76(1), 91-104.

* Miraglia, M., & Johns, G. (2016). Going to work ill: A meta-analysis of the correlates of presenteeism and a dual-path model. *Journal of Occupational Health Psychology*, 21(3), 261-283.

Mitchell, T. R. (1997). Matching motivational strategies with organizational contexts. *Research in Organizational Behavior*, 19, 57–149.

* Montazemi, A. R., Pittaway, J. J., Saremi, H. Q., & Wei, Y. (2012). Factors of stickiness in transfers of know-how between MNC units. *The Journal of Strategic Information Systems*, 21(1), 31-57.

* Nahrgang, J. D., Morgeson, F. P., & Hofmann, D. A. (2011). Safety at work: A meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *Journal of Applied Psychology*, 96(1), 71-94. doi:10.1037/a0021484

Newsom, J. T. (2015). *Longitudinal structural equation modeling: A comprehensive introduction.* Routledge.

* Nixon, A. E., Mazzola, J. J., Bauer, J., Krueger, J. R., & Spector, P. E. (2011). Can work make you sick? A meta-analysis of the relationships between job stressors and physical symptoms. *Work and Stress,* 21, 1-22.

* Ng, T. W. (2015). The incremental validity of organizational commitment, organizational trust, and organizational identification. *Journal of Vocational Behavior*, 88, 154-163. doi: 10.1016/j.jvb.2015.03.003

* Ng, T. W., & Feldman, D. C. (2012). A comparison of self-ratings and non-self-report measures of employee creativity. *Human Relations*, 65(8), 1021-1047.

* Ng, T. W., & Feldman, D. C. (2015). The moderating effects of age in the relationships of job autonomy to work outcomes. *Work, Aging and Retirement*, 1(1), 64-78.

* Oh, I. S., Guay, R. P., Kim, K., Harold, C. M., Lee, J. H., Heo, C. G., & Shin, K. H. (2014). Fit happens globally: A meta-analytic comparison of the relationships of person–environment

fit dimensions with work attitudes and performance across East Asia, Europe, and North America. *Personnel Psychology*, 67(1), 99-152.

* O'Neill, T. A., Allen, N. J., & Hastings, S. E. (2013). Examining the "Pros" and "Cons" of Team Con flict: A Team-Level Meta-Analysis of Task, Relationship, and Process Conflict. *Human Performance*, 26(3), 236-260.

Oreg, S. (2003). Resistance to change: Developing and individual differences measure. *Journal of Applied Psychology,* 88, 680–693. doi:10.1037/0021-9010.88.4.680

Oreg, S. (2006). Personality, context, and resistance to organizational change. *European Journal of Work and Organizational Psychology*, 15, 73–101. doi:10.1080/13594320500451247

Organ, D. W. (1997). Organizational citizenship behavior: It's construct clean-up time. *Human Performance,* 10, 85–97. doi:10.1207/s15327043hup1002_2

O'Reilly, C. A., Cardwell, D. F., Chatman, J. A., Lapiz, M., & Self, W. (2010). How leadership matters: The effects of leader's alignment on strategy implementation. *The Leadership Quarterly*, 21, 104–113. doi:10.1016/j.leaqua.2009.10.008

O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. *The Academy of Management Perspectives*, 27, 324-338.

* Park, H. I., Jacob, A. C., Wagner, S. H., & Baiden, M. (2014). Job control and burnout: a meta-analytic test of the conservation of resources model. *Applied Psychology*, 63(4), 607-642.

Park, T. Y., & Shaw, J. D. (2013). Turnover rates and organizational performance: A meta-analysis. *Journal of Applied Psychology*, 98(2), 268.

Patterson, M. G., West, M. A., Shackleton, V. J., Dawson, J. F., Lawthom, R., Maitlis, S., Robinson, D. L., & Wallace, A. M. (2005). Validating the organizational climate measure: links to managerial practices, productivity and innovation. *Journal of Organizational Behavior,* 26, 379-408.

* Pattikawa, L. H., Verwaal, E., & Commandeur, H. R. (2006). Understanding new product project performance. *European Journal of Marketing*, 40, 1178-1193.

Pearce, C. L., & Conger, J. A. (2003). *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks, CA: Sage.

Pfeffer, J., & Sutton, R. I. (2006). Hard facts, dangerous half-truths, and total nonsense: Profiting from evidence-based management. *Harvard Business Review,* 84, 62-74. doi:10.1037/e635442007-001

* Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: a meta-analysis. *Journal of Applied Psychology*, 92(2), 438-454.

* Podsakoff, N. P., Whiting, S. W., Podsakoff, P. M., & Blume, B. D. (2009). Individual-and organizational-level consequences of organizational citizenship behaviors: A meta-analysis. Journal of Applied Psychology, 94, 122-141.

* Podsakoff, P. M., Bommer, W. H., Podsakoff, N. P., & MacKenzie, S. B. (2006). Relationships between leader reward and punishment behavior and subordinate attitudes, perceptions, and behaviors: A meta-analytic review of existing and new research. *Organizational Behavior and Human Decision Processes,* 99(2), 113–142.

* Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. (1996). Meta-analysis of the relationships between Kerr and Jermier's substitutes for leadership and employee job attitudes, role perceptions, and performance. *Journal of Applied Psychology*, 81(4), 380–399.

Pratt, Z. L. (2004). *An investigation of the relationships between external environment, mission and strategy, leadership, organizational culture, and performance*. Published doctoral dissertation. Available from ProQuest Dissertations and Theses database. (UMI No. 3158993)

Quinn, R., & Rohrbaugh, J. (1981). A competing values approach to organizational effectiveness. *Public Productivity Review*, 5, 122-140.

Raisch, S. & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, 34, 375-409.

* Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: a review of the literature. Journal of Applied Psychology, 87, 698-714.

Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of Management Journal*, 53(3), 617-635.

* Riggle, R. J., Edmondson, D. R., & Hansen, J. D. (2009). A meta-analysis of the relationship between perceived organizational support and job outcomes: 20 years of research. *Journal of Business Research*, 62(10), 1027-1030. doi: 10.1016/j.jbusres.2008.05.003

Riketta, M. (2008). The causal relation between job attitudes and performance: a meta-analysis of panel studies. *Journal of Applied Psychology*, 93, 472–481. doi:10.1037/0021-9010.93.2.472

* Robbins, J. M., Ford, M. T., & Tetrick, L. E. (2012). Perceived unfairness and employee health: A meta-analytic integration. *Journal of Applied Psychology*, 97(2), 235-272. doi:10.1037/a0025408

Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Softwar*e, 48, 1-36. URL http://www.jstatsoft.org/v48/i02/

Rousseau, D. M. (1988). The construction of climate in organizational research. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology 1988* (pp. 139-158). Oxford, England: John Wiley.

Rousseau, D. M. (1995). *Psychological contracts in organizations: Understanding written and unwritten agreements.* Thousand Oaks, CA: Sage.

Rousseau, D. M. (2006). Is there such a thing as "evidence-based management"? *Academy of Management Review,* 31, 256–269. doi:10.5465/AMR.2006.20208679

Rousseau, D. M. (2012). Envisioning evidence-based management. In D. M. Rousseau (Ed.), *The Oxford Handbook of evidence-based management*. New York: Oxford University Press.

Rousseau, D. M., & Gunia, B. C. (2016). Evidence-Based Practice: The Psychology of EBP Implementation. *Annual Review of Psychology,* 67, 667-692.

* Sabherwal, R., Jeyaraj, A., & Chowa, C. (2006). Information system success: individual and organizational determinants. *Management Ccience*, 52(12), 1849-1864.

Sackett, D. L., Straus, S. E., Richardson, W. S., Rosenberg, W., & Haynes, R. B. (2000). *Evidence-based medicine: How to practice and teach EBM*. New York: Churchill Livingstone.

Schaufeli, W. B., & Bakker, A. B. (2010). Defining and measuring work engagement: Bringing clarity to the concept. In A. B. Bakker and M. P. Leiter (Eds.) *Work engagement: A handbook of essential theory and research* (pp. 10-24). Hove, UK: Psychology Press.

Scherrer, C., & Abernathy, E. (2017). Trump's Trade Policy Agenda. *Intereconomics*, 52, 364-369.

Schiemann, W. A. (2007). People Equity: A new paradigm for measuring and managing human capital. *Human Resource Planning*, 29, 34-44.

Schiemann, W. A., & Morgan, B. S. (2006): Strategic surveys- linking people to business strategy. In A. I. Kraut (Ed.), *Getting action from organizational surveys* (pp. 76-101). San Francisco, CA: Jossey-Bass.

Schmidt, F. L., & Hunter, J. E. (2014). *Methods of meta-analysis: Correcting error and bias in research findings*. Thousand Oaks, CA: Sage publications.

* Schmidt, S., Roesler, U., Kusserow, T., & Rau, R. (2014). Uncertainty in the workplace: Examining role ambiguity and role conflict, and their link to depression—a meta-analysis. *European Journal of Work and Organizational Psychology*, 23(1), 91-106.

Schyns, B., Maslyn, J. M., & Weibler, J. (2010). Understanding the relationship between span of control and subordinate consensus in leader–member exchange. *European Journal of Work and Organizational Psycho*logy, 19(3), 388-406.

Schönborn, G. (2010). Value Performance. On the relation between corporate culture and corporate success. *Zeitschrift für Psychologie / Journal of Psychology*, 218, 234-242.

Scott, J. C., & Mastrangelo, P. M. (2006). Driving change around the world. In A. I. Kraut (Ed.), *Getting action from organizational surveys* (pp. 483–511). San Francisco, CA: Jossey Bass.

* Seibert, S. E., Wang, G., & Courtright, S. H. (2011). Antecedents and consequences of psychological and team empowerment in organizations: a meta-analytic review. *Journal of Applied Psychology*, 96, 981-1003.

Semler, S. W. (1997). Systematic agreement: A theory of organizational alignment. *Human Resources Development Quarterly*, 8, 23–40.

Shah, N., Irani, Z., & Sharif, A. M. (2017). Big data in an HR context: Exploring organizational change readiness, employee attitudes and behaviors. *Journal of Business Research*, 70, 366-378.

Shea, B. J., Grimshaw, J. M., Wells, G. A., Boers, M., Andersson, N., Hamel, C., … Bouter, L. M. (2007). Development of AMSTAR: A measurement tool to assess the methodological quality of systematic reviews. *BMC Medical Research Methodology*, 7, 1-7.

Sherony, K. M., & Green, S. G. (2002). Coworker exchange: relationships between coworkers, leader-member exchange, and work attitudes. *Journal of Applied Psychology*, 87(3), 542-548.

* Shoji, K., Cieslak, R., Smoktunowicz, E., Rogala, A., Benight, C. C., & Luszczynska, A. (2016). Associations between job burnout and self-efficacy: a meta-analysis. *Anxiety, Stress, & Coping*, 29(4), 367-386.

Simon, H. A. (1947). *Administrative behavior: a study of decision-making processes in administrative organization*. New York: Macmillan.

* Simons, T., Leroy, H., Collewaert, V., & Masschelein, S. (2015). How leader alignment of words and deeds affects followers: A meta-analysis of behavioral integrity research. *Journal of Business Ethics*, 132(4), 831-844.

Smith, F. J. (2003). Organizational Survey. The *Diagnosis and Betterment of Organizations Through Their Members*. London: Lawrence Erlbaum Associates, Inc.

Stadler, P., & Spieß, E. (2002). Mitarbeiterorientiertes Führen und soziale Unterstützung am Arbeitsplatz. *Schriftenreihe der Bundesanstalt für Arbeitsschutz und Arbeitsmedizin.* Dortmund, Germany: Bundesanstalt für Arbeitsschutz und Arbeitsmedizin.

* Stajkovic, A. D., Lee, D., & Nyberg, A. J. (2009). Collective efficacy, group potency, and group performance: meta-analyses of their relationships, and test of a mediation model. *Journal of Applied Psychology*, 94(3), 814-828.

Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin,* 124, 240–261. doi:10.1037/0033-2909.124.2.240

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate behavioral research,* 25, 173-180.

Stone, R. J. (1998). *Human resource management* (3rd ed.). Brisbane: Wiley.

Stone, K. B. (2010). *Relationships between organizational performance and change factors and manufacturing firms' leanness*. Published doctoral dissertation. Available from ProQuest Dissertations and Theses database. (UMI No. 3419114)

Stone, K. B. (2015). Burke-Litwin Organizational Assessment Survey: Reliability and validity. *Organization Development Journal,* 10, 33-50.

Strohmeier, S., & Piazza, F. (2015). *Human Resource Intelligence und Analytics. Grundlagen, Anbieter, Erfahrungen und Trends*. Wiesbaden: Springer Gabler.

* Subramony, M. (2009). A meta-analytic investigation of the relationship between HRM bundles and firm performance. *Human Resource Management*, 48(5), 745-768.

* Sverke, M., Hellgren, J., & Näswall, K. (2002). No security: a meta-analysis and review of job insecurity and its consequences. *Journal of Occupational Health Psychology*, 7(3), 242-264.

* Swider, B. W., & Zimmerman, R. D. (2010). Born to burnout: A meta-analytic path model of personality, job burnout, and work outcomes. *Journal of Vocational Behavior*, 76(3), 487-506.

* Taris, T. W. (2006). Is there a relationship between burnout and objective performance? A critical review of 16 studies. *Work & Stress*, 20(4), 316-334.

Taylor, S., Levy, O., Boyacigiller, N. A., & Beechler, S. (2008). Employee commitment in MNCs: Impacts of organizational culture, HRM and top management orientations. *The International Journal of Human Resource Management,* 14, 501-527.

Ton, Z., & Huckman, R. S. (2008). Managing the impact of employee turnover on performance: The role of process conformance. *Organization Science,* 19, 56-68.

* Tubre, T. C., & Collins, J. M. (2000). Jackson and Schuler (1985) revisited: A meta-analysis of the relationships between role ambiguity, role conflict, and job performance. *Journal of Management*, 26(1), 155-169.

Tushman, M. L. & O'Reilly, C. A. (1996). The ambidextrous organization: managing evolutionary and revolutionary change. *California Management Review,* 38, 1-23.

Van de Vijver, F. J., & Poortinga, Y. H. (2002). Structural equivalence in multilevel research. *Journal of Cross-Cultural Psychology*, 33, 141-156.

van der Post, W. Z., de Coning, T. J., & Smit, E. M. (1997). An instrument to measure organizational culture. *South African Journal of Business Management*, 28, 147-168.

van der Post, W. Z., de Coning, T. J., & Smit, E. M. (1998). The relationship between organizational culture and financial performance: Some South African evidence. *South African Journal of Business Management*, 29, 30-41.

* Van Dijk, H., Van Engen, M. L., & Van Knippenberg, D. (2012). Defying conventional wisdom: A meta-analytical examination of the differences between demographic and job-related diversity relationships with performance. *Organizational Behavior and Human Decision Processes*, 119(1), 38-53.

Van Wijk, R., Jansen, J. J. P., & Lyles, M. A. (2008). Inter- and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies,* 45, 830–853. doi:10.1111/j.1467-6486.2008.00771.x

Viswesvaran, C., & Ones, D. S. (1995). Theory testing: Combining psychometric meta-analysis and structural equations modeling. *Personnel Psychology*, 48, 865-885.

Von Rosenstiel, L. (2000). *Grundlagen der Organisationspsychologie (4th ed.)*. Stuttgart: Schäffer-Poeschel.

* Wang, G., Oh, I., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management*, 36(2), 223-270. doi:10.1177/1059601111401017

* Webber, S. S., & Donahue, L. M. (2001). Impact of highly and less job-related diversity on work group cohesion and performance: A meta-analysis. *Journal of Management*, 27(2), 141-162.

* Whitman, D. S., Caleo, S., Carpenter, N. C., Horner, M. T., & Bernerth, J. B. (2012). Fairness at the collective level: A meta-analytic examination of the consequences and boundary conditions of organizational justice climate. *Journal of Applied Psychology*, 97(4), 776-791. doi:10.1037/a0028021

* Whitman, D. S., Van Rooy, D. L., & Viswesvaran, C. (2010). Satisfaction, Citizenship Behaviors, and Performance in Work Units: A Meta-Analysis of Collective Construct Relations. *Personnel Psychology*, 63, 41–81.

Wiley, J. (2009). The Strategic Employee Survey. In: R. Burke (Ed). *The Human Resources Revolution: Why Putting People First Matter*, Elsevier Science.

Wiley, J. W. (2010). *Strategic employee surveys*. San Francisco, CA: Jossey-Bass.

Wilson, D. B. (2017). *Meta-analysis macros for SAS, SPSS, and Stata.* Retrieved August 5, 2017, from http://mason.gmu.edu/~dwilsonb/ma.html

Winter, S., Feinstein, I., & Müller, K. (2015). The 3D engagement model – a three-dimensional framework for the operationalisation of employee engagement. *Wirtschaftspsychologie*, 12 (2), 36-44.

* Witherspoon, C. L., Bergner, J., Cockrell, C., & Stone, D. N. (2013). Antecedents of organizational knowledge sharing: a meta-analysis and critique. *Journal of Knowledge Management*, 17(2), 250-277. doi: 10.1108/13673271311315204

Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of Management Journal*, 53(1), 107-128.

* Zhao, H. A. O., Wayne, S. J., Glibkowski, B. C., & Bravo, J. (2007). The impact of psychological contract breach on work-related outcomes: A meta-analysis. *Personnel Psychology*, 60, 647–680.

* Zimmerman, R. D. (2008). Understanding the impact pf personality traits om individuals' turnover decisions: A meta-analytic path model. *Personnel Psychology*, 61(2), 309-348.

Zohar, D., & Luria, G. (2005). A multilevel model of safety climate: cross-level relationships between organization and group-level climates. *Journal of Applied Psychology*, 90, 616-628.

Meta-analyses included in the meta-meta-analysis are marked with *.

# APPENDIX

Table A

*First- and second-order categories of the measurement model for employee surveys*

| Category | Description | Exemplary underlying psychological constructs | Exemplary **conceptual** basis and exemplary meta-analyses | Sample item as used in employee surveys |
|---|---|---|---|---|
| *Corporate level leadership* | *This dimension summarizes all variables that directly relate to the top management. From an individual's perspective, top managers must develop a challenging vision, define strategically goals, and build trust. Furthermore, it is the top manager's task to create a socio-technical system and design transactional processes that enable individuals to perform well.* | | | |
| Vision | From an employee's perspective, one of the major tasks of top managers is to develop and communicate an inspiring vision that inspire the staff for the future direction. | Shared vision and systems, vision attributes, vision content | Baum, Locke, & Kirkpatrick, 1998; Van Wijk, Jansen, & Lyles, 2008 | My company has a vision for the future that motivates and inspires me. |
| Strategy | Derived from the vision, a strategy that involves operational goals for the entire organization and its units must develop and communicate with the top management to the staff. At the end, employees must be clear about the contents of the strategy and identify with it. | Strategy clarity, top management support | Beehr Glazer, Fischer, Linton, & Hansen, 2009; Baum, Locke, & Smith, 2001; Combs & Ketchen Jr., 2002 | I am convinced that my company is pursuing the right strategy. |
| Trust in systems | It is important for the functioning of an organization that employees have trust in the overall systems of the organization, particularly perceive their job as secure and trust the top management regarding their decisions and integrity. | Psychological contract, perceived job security, organizational tolerance, organizational support | Rousseau, 1995; Zhao, Wayne, Glibkowski, & Bravo, 2007 | I trust in the management/ the executive management of my company. |

Table A (continued)

| Category | Description | Exemplary underlying psychological constructs | Exemplary conceptual basis and exemplary meta-analyses | Sample item as used in employee surveys |
|---|---|---|---|---|
| *Transactional Variables* | *The dimension of Transactional Variables describes social exchange processes. Organizational behavior concepts that are associated with the principles of transactional leadership such as the structuring of work roles and tasks, setting goals, providing feedback, and rewarding performance are summarized in this dimension.* | | | |
| Trans-actional leadership | In addition to the facets of the transformational leadership, organizational leaders should also behave according to the principles of transactional leadership in order to lead efficiently. | Transactional leadership theory, contingent reward, management by exception | Bass, 1985, 1999; Judge & Piccolo, 2004 | I receive praise and recognition when I do a good job. |
| Roles & tasks | This category provides an overview about how the individual's tasks and the work roles should be structured. Employees must be clear about their unambiguous work roles and self-efficient to master the challenges that come with the work role. Tasks must be structured to have a high motivational potential, e.g. provide a high degree of autonomy and allow the usage of a wide variety of skills. | Job characteristics, work roles, role characteristics, role clarity, role conflict, role overload, task characteristics, workload, work pressure | Bowling & Beehr, 2006; Gilboa, Shirom, Fried, & Cooper, 2008; Humphrey, Nahrgang, & Morgeson, 2007 | In my actual work, I am able to fully deploy my skills and competencies. |
| Goal Setting | Individual's goals should be clear, specific, measurable, challenging but attainable, terminated, and significant. | Goal setting theory | Locke & Latham, 2002, 2007 | I am clear about the demands on the quality for my work. |
| Feedback | Constructive feedback, provided by supervisor, peers, and other persons, helps individuals to distinguish between effective and ineffective behavior. | Feedback interventions | Kluger & DeNisi, 1996; Locke & Latham, 2002, 2007 | I am regularly given feedback on my performance (prompt, understandable, useful). |
| Rewards | Performance leads to both material and non-material rewards. The recipient should be able to evaluate these rewards as fair in terms of distribution, process, and interaction. | Equity theory, organizational justice theory, pay level | Bolino & Turnley, 2008; Cohen-Charash & Spector, 2001 | In my company performance is rewarded. |

Table A (continued)

| Category | Description | Exemplary underlying psychological constructs | Exemplary conceptual basis and exemplary meta-analyses | Sample item as used in employee surveys |
|---|---|---|---|---|
| *Transform-ational variables* | *All variables that relate to transformational processes are summarized in this dimension. Particularly the principles of the transformational leadership and associated concepts have proven to be relevant for various outcome variables.* | | | |
| Trans-formational leadership | Transformational leaders behave according to the four dimensions of the transformational leadership theory, such as lead in an admirable way, articulate an appealing vision, challenge employees, and attend to the follower's needs. | Transformational leadership theory, Charisma, participative leadership, behavioral integrity | Bass, 1985, 1999; Judge & Piccolo, 2004 | Supervisors assume responsibility for change and tackle it with determination. |
| Strategy alignment | To have an effect, the organization's strategy must consequently cascade down by the middle- and shop floor management to each employee. This also helps employees to recognize what are their individual contributions to the overall business goals. | Strategy alignment to individual goals | Beehr et al., 2009; O'Reilly, Cardwell, Chatman, Lapiz, & Self, 2010; Schiemann & Morgan, 2006 | I clearly understand what my personal contribution should be to achieving our goals and targets. |
| Change- & innovation culture | A professionally managed transformation process, including the timely communication about the transformation's selfgoals, the involvement of the staff in the implementation, etc., ensures that employees do not resist to organization's change programs. If the climate for innovations is positive, e.g. with a constructive handling of errors, then employees are likely to be creative and implement new ideas in their working environment. | Change management programs, readiness for change, resistance to change, innovation, climate for innovation | Doppler & Lauterburg, 2008; Hammond et al., 2011; Oreg, 2003, 2006 | In my working environment everyone is willing to learn new things in order to adapt to changing market requirements. |
| Trust | In order to work efficiently and feel comfortable, individuals should trust another in the direct work environment, particularly the next level manager and colleagues. Central is whether all involved people can rely on each other and walk the talk. | Trustworthiness (integrity, benevolence, ability), trust in leadership, leader support | Colquitt, Scott, & LePine, 2007; Dirks & Ferrin, 2002 | In my team / department, colleagues trust, respect and support each other. |
| PE-value fit | Employees must perceive a high level of fit between their personal values and the values and practices of the organization. | Fit between a person and the vocation, job, team, supervisor, or company | Kristof-Brown, Zimmerman, & Johnson, 2005 | My personal values match the values and culture of my company. |

Table A (continued)

| Category | Description | Exemplary underlying psychological constructs | Exemplary conceptual basis and exemplary meta-analyses | Sample item as used in employee surveys |
|---|---|---|---|---|
| *Socio-technical system* | *This dimension comprises all social and technical variables that are needed to provide the basic conditions for the work, such as the provision of tools, venues, teamwork, skill development, communication, etc.* | | | |
| Working conditions | The basic working conditions must ensure that individuals can do their job. This includes the provision of the necessary equipment, suitable venues, and a focus on health and safety. | Suitable venues (e.g., noise), health & safety programs, safety climate, physical comfort | Christian, Bradley, Wallace, & Burke, 2009; Clarke & Robertson, 2008; Humphrey et al., 2007; Stadler & Spieß, 2002 | I have the tools and the equipment (work tools, devices, PC/software etc.) I need to do a good job. |
| Cooperation & processes | To ensure that processes and cooperation run smoothly, work groups must be cohesive, integrate people with diverse backgrounds, solve conflicts constructively, and its members support each other mutually. The processes that occur within a team and between teams and units are perceivable as efficient and useful for the achievement of the goals. | Cohesion, Diversity, social support, inter-personal conflict, working processes, group identification, TMX | Bowers, Pharmer, & Salas, 2000; Bowling & Beehr, 2006; De Dreu & Weingart, 2003; Horwitz & Horwitz, 2007; Humphrey et al., 2007; LePine, Erez, & Johnson, 2002 | Workflows are very well organized in my team / department. |
| Communi-cation | The transparent communication regarding decisions, ongoing changes, business indicators, etc., serves to set individuals performances in the context of the organization. | Communication about goals and objectives, communication quality, information sharing, communication climate | Bartels, Pruyn, De Jong, & Joustra 2007; Baum et al.,1998; Beehr et al., 2009; Mesmer-Magnus & De Church, 2009 | I am informed about the background to important decisions in good time. |
| Develop-ment | This category covers the description of what extent personnel development programs successfully train and develop employees. | Person-job fit, self-efficacy, job training, personnel development | Arthur Jr., Bennet Jr., Edens, & Bell, 2003; Baldwin & Fold, 1988; Judge & Bono, 2001; Stajkovic & Luthans, 1998 | My company provides me with sufficient opportunities and training programs to advance both professionally and personally. |

Table A (continued)

| Category | Description | Exemplary underlying psychological constructs | Exemplary conceptual basis and exemplary meta-analyses | Sample item as used in employee surveys |
|---|---|---|---|---|
| *People Outcomes* | *The dimension of People Outcomes summarizes all work related attitudes, states, motivational variables, and performance criteria on the organization's bottom-line that are relevant for the individual as well as for the organization's functioning* | | | |
| Perfor-mance | Performance behaviors that are independent from formal agreements play an important role in the functioning of an organization. The concepts of OCB and Proactivity were hereby identified as beneficial variables. | OCB, Proactivity, in-role-performance, extra-role-performance, innovative behavior | LePine, Erez, & Johnson, 2002; Organ, 1997 | I go beyond the responsibilities defined in my job role to contribute to the success of my company. |
| Job attitudes & work engagement | This category summarizes work related attitudes, states, and motivational outcome variables. Findings from literature revealed that job satisfaction, combined with commitment to the organization, are positively associated with various performance outcomes. Work engagement and job involvement address motivational aspects of the job that explain additional variance of individual's effectivity. | Job satisfaction, work engagement, commitment, job involvement, organizational identification | Harrison et al., 2006; Judge, Thoresen, Bono, & Patton, 2001; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Riketta, 2008 | I am proud to work for [name of the company]. |
| Negative people outcomes | Negative People Outcomes comprises factors that directly harm the goals of the organization such as counterproductive work behavior, turnover intentions, work stress, and burnout. | Counterproductive work behavior, turnover intentions | Berry, Ones, & Sackett, 2007; Harrison et al., 2006 | As soon as I can find a better job, I'll leave. |
| Health | It has been conclusively shown that subjective statements regarding coping with workload, stress, or work-life-balance correlate moderately to highly with individual health conditions and key operating figures in organizations (e.g. absenteeism, employee turnover, intention to leave, tardiness, disciplinary problems, accidents, increased error rates and labor costs). | Coping with workload, stress, burnout, depression, work-life-balance, well-being | Faragher, Cass, & Cooper, 2005; Nixon, Mazzola, Bauer, Krueger, & Spector, 2011; Bowling, Alarcon, Bragg, & Hartman, 2015 | I have no problem coping with my workload. |

Note. Second-order categories are displayed in italic; first-order categories are displayed in standard letters. PE-value fit = Person-environment-value fit.

Table B

*Extract from the Meta-analyses Database for Meta-meta-analytic Structural Equation Modeling*

| Meta-analysis | ID | Year | Journal | IV Dimension | IV Category 1. Level | IV Construct | DV Dimension | DV Category 1. Level | DV Construct | N participants | N studies | Correlation (*p*) | Correlation (*p*) direction adjusted | CI (95%) | 2nd Rater |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nahrgang, Morgeson, & Hofmann | 1 | 2011 | JAP | Socio-technical system | Working conditions | Perception of risks & hazards | People Outcomes | Negative people outcomes | Accidents and injuries | 28.315 | 21 | 0.13 | | 0.06-0.20 | T. |
| Nahrgang, Morgeson, & Hofmann | 1 | 2011 | JAP | Trans-actional variables | Roles & Tasks | Physical demands, work load, work pressure, work pace | People Outcomes | Negative people outcomes | Accidents and injuries | 24.104 | 18 | 0.09 | | 0.05-0.13 | T. |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | | … |
| Oh, Guay,Kim, Harold, Lee, Heo, & Shin | 27 | 2014 | PP | Transform ational variables | Person-Environ-ment Value Fit | Person-Job fit | People Outcomes | Job attitudes & work en-gagement | Job Satis-faction | 8.837 | 29 | 0.6 | | 0.53-0.67 | A. |
| Oh, Guay,Kim, Harold, Lee, Heo, & Shin | 27 | 2014 | PP | Transform ational variables | Person-Environ-ment Value Fit | Person-Job fit | People Outcomes | Negative people outcomes | Intent to quit | 6.584 | 21 | -0.37 | .37 | -0.43 - -0.30 | A. |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | | … |
| Frazier, Fainshmidt, Kliunger, Pezeshkan, & Vracheva | 76 | 2017 | PP | Corporate level leadership | Trust in Systems | Psycho-logical Safety | Socio-technical system | Communi cation | Informa-tion sharing | 3.427 | 19 | 0.52 | | 0.40-0.63 | A. |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | | … |
| Kinicki, McKee-Ryan, Schriesheim & Carson | 117 | 2002 | JAP | Socio-technical system | Communi cation | Communicat ion quality | People Outcomes | Job attitudes & work en-gagement | Satis-faction with supervisor | 3.816 | 7 | 0.35 | | - | P. |
| Kinicki, McKee-Ryan, Schriesheim & Carson | 117 | 2002 | JAP | Trans-actional variables | Roles & Tasks | Participative involvement | People Outcomes | Job attitudes & work en-gagement | Satis-faction with supervisor | 1.393 | 5 | 0.51 | | - | P. |

*Note.* This table represents just a short extract from the full database and, due to space restrictions, does not offer a full list of the data extracted from the meta-analysis and for each meta-analytic effect size. IV = independent variable, DV = dependent variable, CI = confidence interval.