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A Reflection and Evaluation Model of Comparative Thinking

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This article reviews research on counterfactual, social, and temporal comparisons and proposes a Reflection and Evaluation Model (REM) as an organizing framework. At the heart of the model is the assertion that 2 psychologically distinct modes of mental simulation operate during comparative thinking: reflection, an experiential ("as if") mode of thinking characterized by vividly simulating that information about the comparison standard is true of, or part of, the self; and evaluation, an evaluative mode of thinking characterized by the use of information about the standard as a reference point against which to evaluate one's present standing. Reflection occurs when information about the standard is included in one's self-construal, and evaluation occurs when such information is excluded. The result of reflection is that standard–consistent cognitions about the self become highly accessible, thereby yielding affective assimilation; whereas the result of evaluation is that comparison information is used as a standard against which one's present standing is evaluated, thereby yielding affective contrast. The resulting affect leads to either an increase or decrease in behavioral persistence as a function of the type of task with which one is engaged, and a combination of comparison-derived causal inferences and regulatory focus strategies direct one toward adopting specific future action plans.

> "I flew an American Airlines flight from Boston['s] Logan airport, at 8:40 a.m., to Richmond, VA., that dreadful Tuesday. Once off the flight, I saw crowds around a TV screen and began to see what was developing while I was in the air. … I felt totally sick in my stomach knowing I was in the same terminal at Logan airport with these terrorists and feeling how lucky I was to be safely on the ground." Jim Kender, Chelmsford, Mass. ("Where were you?" 2001, p. A3)

Individuals often make comparisons to imagined outcomes, to imagined selves, to past and future selves, and to other people. Why people engage in these comparisons, and what happens when they do, has been the subject of numerous theories in the areas of counterfactual thinking (e.g., Kahneman & Miller, 1986; McMullen, Markman, & Gavanski, 1995; Roese, 1997), social comparison (e.g., Festinger, 1954; Kruglanski & Mayseless, 1990; Taylor & Lobel, 1989), temporal comparison (e.g., Albert, 1977; McFarland & Alvaro, 2000; Ross & Wilson, 2000), and the self (e.g., Higgins, 1987; Markus & Nurius, 1986; Tesser, 1988).

In this article, we describe a model that attempts to organize findings regarding the influence of counterfactual, social, and temporal comparisons on affect and self-evaluations under a single, unifying framework. Our own research program has focused on *mental simulation,* which we define broadly as the consideration of alternatives to present reality (cf. Taylor & Schneider, 1989). Defined as such, mental simulation is common to any type of comparative thinking, including counterfactual thinking, social comparison, temporal comparison, and the like. Although each of these types of comparisons has its own unique characteristics, we believe they share enough in common to justify considering them together. Thus, we would argue that one must engage in mental simulation at some level to consider the implications of counterfactual information (e.g., "If I had taken a different route home, I wouldn't be stuck in this traffic jam"), social comparison information (e.g.," If I were as good looking as John, I would have a more exciting social life;" see also Olson, Buhrmann, & Roese, 2000), and temporal comparison information (e.g., "I used to be dependent on

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drugs, but I'm a different person now. If I hadn't changed my ways, I don't think I'd be alive today"). In this article, we suggest that the same basic processes of mental simulation underlie these various types of comparative thinking.

At the heart of the Reflection and Evaluation Model (REM) is the assertion that two psychologically distinct modes of mental simulation operate in parallel during comparative thinking: *reflection,* an experiential ("as if") mode of thinking characterized by vividly simulating that information about the comparison standard is true of, or part of, the self; and *evaluation,* an evaluative mode of thinking characterized by the use of information about the standard as a reference point against which to evaluate one's present standing. Reflection occurs when information about the standard is included in one's self-construal, and evaluation occurs when such information is excluded (Gardner, Gabriel, & Hochschild, 2002; Schwarz & Bless, 1992; Stapel & Koomen, 2000; Tesser, 1988). The result of reflection is that standard–consistent cognitions about the self become highly accessible, thereby yielding affective assimilation; whereas the result of evaluation is that comparison information is used as a standard against which one's present standing is evaluated, thereby yielding affective contrast (Markman, Elizaga, Ratcliff, & McMullen, 2002; Mussweiler, 2003; Mussweiler & Strack, 2000a, 2000b). In turn, these affective assimilation and contrast effects interact with different task types to influence motivation and behavior (Markman & Tetlock, 2000; McMullen & Eppers, 2001; McMullen & Markman, 2000).

In the next section, we describe research and theory that establish the conceptual underpinnings of the reflection–evaluation distinction. Subsequently, we provide a more formal specification of the model, which includes a description of factors shown to determine whether reflection or evaluation occurs, as well as a discussion of the implications of reflective and evaluative thinking for motivation and behavior.

Theoretical Concepts Underlying the Reflection and Evaluation Distinction

Assimilation–Contrast and Direction of Comparison Effects in Social Judgment

Contrast effects occur when judgments are displaced away from a comparison standard, whereas assimilation effects occur when judgments are pulled toward a comparison standard. To illustrate, consider how a moderately attractive individual might be viewed when surrounded by highly attractive people. A contrast effect occurs if the individual is perceived to be less attractive, and an assimilation effect occurs if the individual is perceived to be more attractive. Early discussions of assimilation and contrast focused on how the distribution of contextual stimuli was responsible for the judgmental effects that were observed (e.g., Helson, 1964; Parducci & Marshall, 1962; Sherif & Hovland, 1961; see also Herr, Sherman, & Fazio, 1983). Helson's adaptation-level theory, focusing exclusively on contrast effects, asserted that the magnitude of any stimulus is judged in a relative way, using the surrounding context stimuli as a comparison standard. Whereas adaptation-level theory focused on the role of context serving as a standard or anchor against which to judge target stimuli, Sherif and Hovland's social judgment theory (SJT) emphasized how people's prior attitudes may serve as a standard against which other attitudinal positions may be judged (cf. Stapel & Koomen, 2001). According to their theory, attitudes close to one's position will be assimilated, whereas attitudes further away will be contrasted. Later, Parducci (1965) criticized the assimilation component of SJT as being an artifactual consequence of memory drift of the remembered value of the standard toward the mean of all stimulus values. Arguing that assimilation occurs under only very restrictive conditions, Parducci instead advocated a range–frequency explanation for contrast effects in social judgment that focused on the relation between the target of judgment and the two endpoints of the context, as well as the target's percentile rank in the context.

Discussions of comparison direction in the social comparison (e.g., Collins, 1996; Festinger, 1954; Taylor & Lobel, 1989; Wills, 1981) and counterfactual thinking literatures (e.g., Markman, Gavanski, Sherman, & McMullen, 1993; McMullen et al., 1995; Roese, 1994; Sanna, 1996) distinguish between comparisons made to better (upward) and worse (downward) standards. Consistent with Parducci's strong stance regarding the ubiquity of contrast effects, early research examining the impact of social comparisons (Festinger, 1954) on self-evaluations also tended to demonstrate contrast effects: Comparisons to relatively better-off standards evoked negative self-evaluations, whereas comparisons to relatively worse-off standards evoked positive self-evaluations (e.g., Morse & Gergen, 1970; Wills, 1981). Likewise, a number of studies examining the consequences of upward and downward counterfactuals found evidence for the operation of an affective contrast mechanism whereby upward comparisons elicit negative affect, and downward comparisons elicit positive affect (e.g., Markman et al., 1993; Medvec, Madey, & Gilovich, 1995; Roese, 1994; Sanna, Turley-Ames, & Meier, 1999).

Research on temporal comparisons has also reported what can be interpreted as contrast effects. For instance, Conway and Ross (1984) found that individuals who had participated in a study skills program designed to improve their academic performance recalled

their past grades as having been lower than they really were in an effort to convince themselves that the program had helped them improve. Thus, much in the same way as people engage in downward contrastive counterfactual thinking or construct downward contrastive social comparisons to enhance their mood and self-esteem, the construction of a negative past self may at times enhance current well-being because it can promote the perception of personal growth (McFarland & Alvaro, 2000; McFarland, Ross, & Giltrow, 1992; Ross, 1989; Taylor, Neter, & Wayment, 1995). On the other hand, negative effects on self-evaluation are also possible to the extent that people believe they have worsened on some dimension over time. For example, Suls, Marco, and Tobin (1991) found that elderly people evaluate their current health more negatively if they first contemplate how healthy they were in the past.

Recently, however, suggestions have been made in the counterfactual, social comparison, and temporal comparison literatures that assimilation effects are also possible. Regarding counterfactuals, McMullen (1997) cited the compelling real-life example of USAir Flight 427, which crashed in Pennsylvania in 1994 and killed all those on board. The media interviewed several individuals who nearly took that flight but canceled at the last minute. Although a contrast effect would exhibit itself as positive affect, these individuals invariably expressed fear and anxiety about what could have happened to them. Jim Kender's ("Where were you?" 2001) quotation from the beginning of this article reflects similar emotions when he states that "I felt totally sick in my stomach knowing I was in the same terminal … with these terrorists."

Wedell and Parducci (2000) suggested that a broader conception of self might lead to assimilative effects in social comparison. More specifically, they noted that upward comparisons may produce more positive self-evaluations if an individual's group identity leads to a different context for evaluation. The operation and impact of this identification process is specified in Tesser's self-evaluation maintenance (SEM) theory (Tesser, 1988; 1991; Tesser, Miller, & Moore, 1988; see also Gardner et al., 2002). The SEM proposes that two processes—reflection and comparison—affect self-evaluation when individuals are outperformed by close others. If a close other performs well on a dimension that is irrelevant to one's self-definition, one benefits by being able to bask in the reflected glory of the other (Cialdini et al., 1976), exemplifying an assimilative response. On the other hand, if a close other performs well on a dimension that is central to the self, social comparison jealousy and depressed self-esteem result instead, exemplifying a contrastive response. Although conceptually related, we should note that the use of the term reflection in our proposed model is somewhat different from Tesser's. In the SEM, reflection refers to enhancing self-esteem by associating with a well-performing other who is included in one's self-construal (Gardner et al., 2002). Thus, one experiences positive affect by basking in the good performance of another. In the REM, on the other hand, reflection refers to a thinking process whereby one vividly simulates that information about the comparison standard is true of, or part of, the self, and affect is subsequently derived from the valence of the accessible cognitions.

Recently, Wilson and Ross (2001; see also Ross & Wilson, 2000; Wilson & Ross, 2000) described a theory that makes predictions conceptually similar to the assimilation and contrast effects reported in the counterfactual thinking and social comparison literatures. According to their temporal self-appraisal theory, the (perceived) temporal distance of a past self can influence retrospective evaluations of the earlier self. Regarding recent past selves, Wilson and Ross (2001) suggested that "If people's appraisal of recent, former selves directly affects their evaluation of their present selves, then they can maintain high levels of current self-regard by emphasizing the worth of recent selves" (p. 573). In our view, this notion is conceptually similar to the idea that recent past selves exert an assimilative effect on evaluations of the present self. With an increase in perceived temporal distance, however, "a favorable evaluation of a former self should be less likely to flatter, and an unfavorable evaluation should be less likely to taint the current self. Instead, individuals may benefit psychologically from criticizing a distant, earlier self" (p. 573). In turn, this notion seems conceptually similar to the possibility that distant past selves exert a contrastive effect on evaluations of the present self. Consistent with their theory, Wilson and Ross found that people tended to disparage their distant past selves (contrast) but compliment their recent past selves (assimilation).

Inclusion–Exclusion

Within the domain of social comparison, the occurrence of assimilation and contrast effects appears to depend on which piece of information the target focuses on (Biernat & Billings, 2001; Buunk, Collins, Taylor, VanYperen, & Dakpf, 1990; Collins, 1996; Pelham & Wachsmuth, 1995; Taylor & Lobel, 1989). Although learning that another is better off than yourself suggests that you are not as well off as everyone else, it also highlights the possibility that you may be better off at some point in the future (Buunk et al., 1990). In support, Major, Testa, and Bylsma (1991) found that the impact of an upward comparison target was positive in studies where participants viewed their own performance as controllable and viewed future success as attainable (see also Markus & Nurius, 1986; Meichenbaum, 1971; Testa & Major, 1990), and Lockwood and Kunda (1997) found that relevant role mod-

els ("superstars") evoked self-enhancement and inspiration when their success seemed attainable but evoked deflation when their success seemed unattainable. Along with these examples of upward assimilative reactions, downward assimilative reactions are also possible if the focus of the comparison is on the negative implications for the self (Smith, 2000). For instance, cancer patients, who compare their physical condition to those whose conditions appear to be worsening (i.e., perceived vulnerability), experience feelings of worry, fear, and anxiety (Wood & VanderZee, 1997; see also Lockwood, 2002; Markus & Nurius, 1986).

In an effort to define a parsimonious set of principles that explains when assimilation and contrast effects occur in social comparison, Stapel and Koomen (2000; see also Blanton, 2001; Wegener & Petty, 1997) recently suggested that comparison information is more likely to lead to assimilation when this information is "included in," or perceived as part of one's self-construal, whereas contrast is more likely when such inclusion processes do not occur (Schwarz & Bless, 1992). Thus, contextual factors, such as closeness–low relevance, controllability, attainability, and similarity (cf. Brown, Novick, Lord, & Richards, 1992), all produce assimilation effects because they instigate the inclusion of social comparison information in self-construals. Conversely, contrast is the likely result when comparison information is excluded from self-construals. In such cases, information about another person will instead be used as a reference point for self-evaluations. According to Stapel and Koomen (2000; see also Stapel & Koomen, 2001; Stapel, Koomen, & Van der Plight, 1996, 1997), comparison information is more likely to be excluded from the self to the extent that the information is perceived to be distinct, and the self is perceived to be immutable. In describing distinctness, Stapel and Koomen (2000) noted that

> Distinct person information (e.g., "information about Leon") constitutes a separate entity with clear object boundaries and is therefore more likely to be used as a comparison standard in the construction of self-judgments than indistinct, abstract information (e.g., "intelligent") that can be less easily used as a clear and specific anchor point. (p. 1069)

Mutability of self, on the other hand, refers to whether one's self-image is unclear and can be influenced relatively easily. Overall, Stapel and Koomen (2000) suggested that contrast effects in social comparison are more likely to occur when social comparison information is distinct, whereas assimilation effects will occur when this information is less distinct and self-views are perceived to be mutable.

The inclusion–exclusion mechanism can also be used to understand how assimilation and contrast effects arise in temporal and counterfactual comparisons. Regarding the former, Strack, Schwarz, and Gschneidinger (1985) found that recalling long-past events elicited a contrast effect on judgments of well-being, and recalling very recent events elicited an assimilation effect. Schwarz and Bless (1992) later argued that long-past events are excluded from one's construal of *my life* now, and thus exert contrast effects on judgments about one's present standing, whereas recent events are included in one's construal of *my life* now and, thus, exert assimilation effects. Likewise, McMullen (1997) suggested that the inclusion of information about the counterfactual standard in self-construals should produce assimilation effects (e.g., "To think, I could have been on that plane"), whereas the exclusion of such information should produce contrast effects (e.g., "If I had been on that plane [but I was not], I would have been killed").

Accessibility Mechanism

Whereas the work of Stapel and his associates (e.g., Stapel & Koomen, 2000; Stapel et al., 1996, 1997) has focused on factors that predict when assimilation versus contrast effects in social judgment are more likely to occur, Mussweiler (2003; Mussweiler & Bodenhausen, 2002; Mussweiler & Strack, 2000a, 2000b) suggested that assimilation and contrast effects can both occur following a given social comparison. According to the selective accessibility model, engaging in comparative self-evaluation produces two distinct informational consequences. First, comparing oneself to a given standard may selectively increase the accessibility of standard–consistent knowledge about the self. Thus, upward comparisons render knowledge indicating a high standard of the self more accessible, whereas downward comparisons render knowledge indicating a low standard of the self more accessible. To use Mussweiler and Strack's (2000b) example, comparing one's athletic abilities to those of Bill Clinton (i.e., a low standard) should render knowledge suggesting a low level of athletic ability for the self more accessible, thereby engendering less flattering evaluations of one's own athletic abilities and negative affect (i.e., an assimilation effect). The second informational consequence of comparative self-evaluation is that it provides a reference point against which the implications of this knowledge can be evaluated. In this case, using Bill Clinton as a reference point for the evaluation of one's athletic abilities may lead to more flattering evaluations of one's own athletic abilities and positive affect (i.e., a contrast effect). In general, then, the affective consequences of focusing on self-related knowledge are likely to be assimilative in nature, whereas the affective consequences of assessing one's position along the judgmental dimension relative to the standard are likely to be contrastive in nature.

We propose that counterfactual and temporal comparisons also yield two informational consequences. First, making counterfactual comparisons should enhance the accessibility of cognitions about the self that are evaluatively consistent with the *counterfactual standard,* and making temporal comparisons should enhance the accessibility of cognitions about the self that are evaluatively consistent with the *temporal standard* (i.e., a past or future self). In turn, affect will be derived from thoughts about the standard that implicate the self, thereby yielding affective assimilation (cf. Schwarz, 1990; Schwarz & Clore, 1983; Strack et al., 1985). To illustrate with an example of counterfactual thinking, consider again the individuals who learn that the aircraft they had originally planned to take crashed with everyone on board killed. Simulating the counterfactual possibility, "I could have been on that plane" renders standard–consistent cognitions about the self more accessible (e.g., "I could be dead," "I would never have been able to see my family again," "I would never have been able to accomplish what I wanted to in life," etc.), and reflecting on these accessible cognitions produces counterfactual–congruent (in this case, negative) affect. Second, comparison standards may also serve as evaluative reference points. Regarding the airplane crash example, employing the counterfactual as a standard against which to evaluate one's present standing should result in positive affect via a contrast effect: "I'm lucky to be alive." Likewise, comparing one's present self to what one perceives to be a worse-off past self should also engender positive affect via a contrast mechanism: "I'm much better off now than I was before" (cf. Wilson & Ross, 2001).

Reflection and Evaluation

According to our model, two psychologically distinct modes of mental simulation operate during comparative thinking. The first of these is reflection, an experiential ("as if") mode of thinking characterized by vividly simulating that information about the comparison standard is true of, or part of, the self, and the second of these is evaluation, an evaluative mode of thinking characterized by the use of information about the standard as a reference point against which to evaluate reality (see Epstein, Lipson, Holstein, & Huh, 1992; Oettingen, 1996; and Strack, 1992, for related conceptualizations). Reflective thinking is encouraged when the contextual features surrounding an event instigate the inclusion of information about the standard in self-construals, whereas evaluative thinking is encouraged when contextual features instigate the exclusion of information about the standard from self-construals and, instead, enhance the relevance of employing information about the standard as a reference point against which to evaluate one's present standing (Gardner et al., 2002; Schwarz & Bless, 1992; Stapel & Koomen, 2000; Tesser, 1988). For example, reflective thinking is likely to be prompted by the presence of clear future possibilities, as when one imagines winning a game that is about to be played. On the other hand, evaluative thinking is likely when future possibilities are absent, as when the game is completed (McMullen & Markman, 2002).

One clear difference between our notion of reflection and Mussweiler's (2003) selective accessibility mechanism is that standard–consistent cognitions need not be based in fact. Instead, they may be imagined. To illustrate, consider an average golfer making a comparison to Tiger Woods. Even average golfers can remember a few good shots that they made in the past, and according to Mussweiler, it is these aspects of self-knowledge that become *selectively* accessible, producing assimilation. According to our conceptualization, however, reflection does not merely enhance the accessibility in memory of those few good shots one has made in the past. Rather, reflection in this case involves actually imagining that one is as good as Tiger Woods (i.e., "as if" one were Tiger Woods), thereby enhancing the accessibility of standard–consistent (imagined) cognitions that implicate the self. In a sense, then, reflection actually renders accessibility less selective. This difference is crucial, because it is unclear how a selective accessibility mechanism can account for the feelings of those who almost boarded the doomed plane. No factual knowledge about the self becomes more accessible in this case; rather, it is the reflection on one's imagined death that produces negative affect.

A theoretical basis for how reflection enhances accessibility appears in the imagination–explanation literature. In this work, a particular future is specified, and participants are asked to imagine and explain how and why such a future might come about (e.g., Ross, Lepper, Strack, & Steinmetz, 1977). These studies have asked participants to imagine and explain a variety of future occurrences, including the outcomes of political elections (Carroll, 1978), sporting events (Hirt & Markman, 1995; Sherman, Zehner, Johnson, & Hirt, 1983), and the impact on people of watching televised aggression (Anderson & Sechler, 1986). In all cases, engaging in the imagination–explanation task increased subjective likelihood estimates for the target outcome relative to participants not given the imagination–explanation task. The prevailing explanation for this effect is that the explanation task enhances the accessibility of information consistent with the future event explained at the time of judgment (Koehler, 1991), whereupon people then judge the likelihood of the future event on the basis of the ease with which instances and examples can be brought to mind (Tversky & Kahneman, 1974). In a similar manner, reflecting on the comparison standard enhances the accessibility of self-related cognitions that are consistent with the standard.

Furthermore, we suggest that reflective and evaluative processing can often occur in parallel. Recent work demonstrating parallel assimilation and contrast effects in social judgment (e.g., Biernat & Manis, 1994; Biernat, Manis, & Kobrynowicz, 1997; Mussweiler & Strack, 2000a, 2000b) has noted distinctions between making judgments along either subjective or objective response scales. On subjective scales, judges are likely to use salient standards to anchor the response scale, typically leading to contrast effects; whereas on objective scales, conversely, the underlying response scale requires no interpretation by the judge, and thus judgments are likely to be based on the implications of accessible self-knowledge, typically producing assimilation effects (Mussweiler & Strack, 2000b). More important, however, although reflection and evaluation processes often work in parallel, they are nonetheless independent processes, and thus, the net outcome of any comparison necessarily depends on the relative strength and intensity of the two types of processing (see Mussweiler, 2003, for a related point). In our conceptualization, relative strength is determined by the extent to which contextual features encourage one to think about the self and the standard together, as a single unit or entity (i.e., inclusion), or the extent to which one thinks about the self and the standard separately, as two distinct entities (i.e., exclusion). Thinking about the self and the standard together enhances the relative strength of reflective processing because information about the standard is being construed, at least temporarily, as being true of, or part of, the self. On the other hand, thinking about the self and the standard separately leads to a switching of attentional focus back and forth between the self and the standard. In our view, such "attentional switching" encourages the use of the standard as a reference point and thereby enhances the relative strength of evaluative processing. In sum, then, although both processes may operate in parallel, if the tendency to consider the self and the standard together is stronger than the countervailing tendency to consider them separately, then reflection and assimilation are likely to ensue. If, however, the tendency to consider self and standard separately is stronger, then evaluation and contrast are likely to ensue.

More generally, the fact that the very same comparison can produce both assimilative and contrastive reactions has intriguing implications for the experience of affect, as it may be that the mixed emotions (cf. Larsen, McGraw, & Cacioppo, 2001) felt after experiencing such events as switching from the doomed plane flight are the result of reflective and evaluative modes of mental simulation operating in parallel. In this way, one can feel both happy and fortunate to be alive, and yet deeply troubled by thoughts of "what might have been."

The Reflection and Evaluation Model of Comparative Thinking

Antecedents to Affective Assimilation and Contrast

Figure 1 depicts the stages that yield either affective assimilation or affective contrast following the generation of upward and downward comparisons. We propose that affective assimilation occurs as a direct consequence of reflection, whereas affective contrast occurs as a direct consequence of evaluation. If the context engenders reflection and subsequent assimilation to an upward comparison, then positive affect will be experienced as a consequence of reflecting on ac-

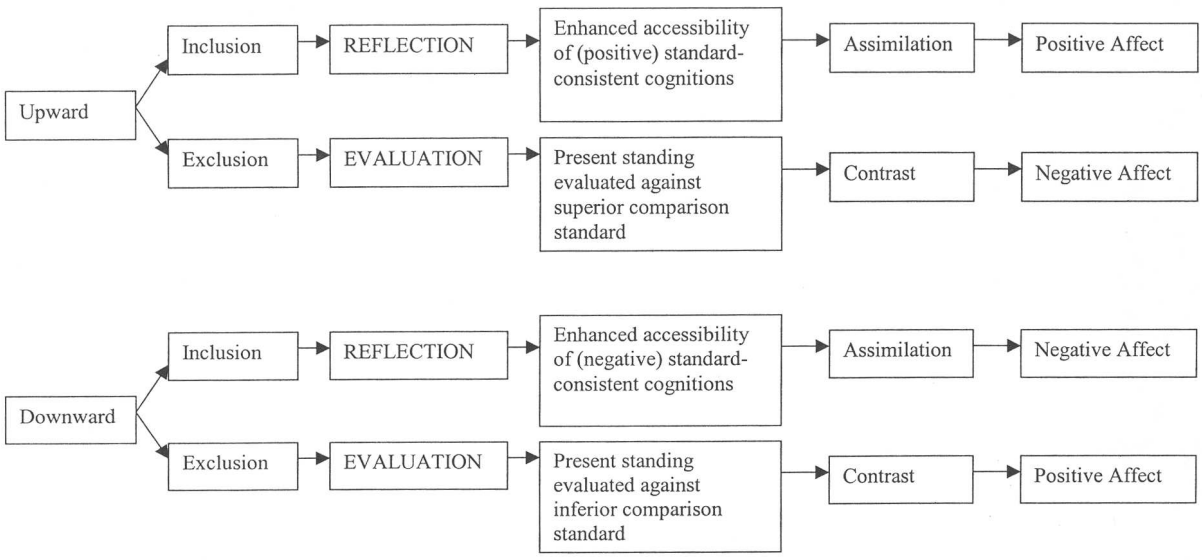

Figure 1. Antecedents to Affective Assimilation and Contrast.

cessible positive cognitions. Conversely, if the context engenders evaluation and subsequent contrast to an upward comparison, then negative affect will be experienced as a consequence of evaluating one's present standing with reference to a superior comparison standard. These affective consequences are reversed for downward comparisons, with negative affect accruing from assimilation as a consequence of reflecting on accessible negative cognitions, and positive affect accruing from contrast as a consequence of evaluating one's present standing with reference to an inferior comparison standard.

Consequences of Comparative Thinking

In addition to specifying the mechanisms that produce assimilation and contrast effects in counterfactual, social, and temporal comparisons, the REM proposes that the reflective and evaluative processes involved in comparative thinking also have important implications for motivation and behavior. The motivational and behavioral consequences of upward and downward comparisons have received the most theoretical attention in the counterfactual thinking literature, and thus we summarize and expand on existing theory in the paragraphs following. More important, however, we suggest that the motivational and behavioral effects that have been described for counterfactual thinking can also be readily generalized to social and temporal comparisons.

A number of researchers have adopted a functional approach toward understanding the determinants and consequences of counterfactual thinking (e.g., Markman et al., 1993; McMullen et. al., 1995; Roese, 1994, 1997; Roese & Olson, 1995b, 1997; Sanna, 2000), and this conceptualization highlights two possible functions that counterfactual thoughts may serve. The first of these is the contrast-based affective function. Essentially, a given outcome will be judged more favorably to the extent that a less desirable alternative is salient, thereby leading to positive emotions, such as relief or joy (Dermer, Cohen, Jacobson, & Anderson, 1979). Thus, the strategic generation of downward counterfactuals may serve the function of enhancing coping and feelings of relative well-being by highlighting how the situation or outcome could easily have been worse. The second of these is the preparative function, and upward counterfactuals have been most closely linked in this regard. Although upward counterfactuals may devalue the actual outcome and make us feel worse (i.e., through affective contrast; see Mellers, Schwartz, Ho, & Ritov, 1997; Shepperd & McNulty, 2002), by simulating routes to imagined better realities we may learn to improve on our outcomes in the future (Johnson & Sherman, 1990; Karniol & Ross, 1996; Taylor & Schneider, 1989). For example, the car owner who thinks "If only I had bought a Honda, I wouldn't be at the service station every other week," may benefit from this counterfactual in that he or she learns to buy a Honda (or a car of similar quality) the next time (Markman et al., 1993).

Roese and his colleagues (e.g., Roese, 1994, 1997; Roese & Olson, 1995b, 1997) have been particularly explicit regarding specifying the mechanisms underlying the preparative function. According to Roese, counterfactual thoughts may lead to causal inferences. For example, if Jim fails an exam, and then realizes that he would have passed if he had read the textbook chapters more carefully, he has identified a causally potent antecedent action that may trigger an expectancy regarding the consequences of taking that action in the future. This realization should then heighten intentions to perform that action and thereby influence the manifestation of that action. Subsequent performance will be enhanced to the extent that the original causal inference was at least partly correct (Roese, 1997; Roese & Olson, 1995b; Wells & Gavanski, 1989; but see also Sherman & McConnell, 1995).

According to the present conceptualization, the consequences of comparison direction (upward vs. downward) can be moderated by relatively stronger tendencies to engage in reflective versus evaluative processing. By specifying how comparison direction interacts with simulation mode to yield unique predictions for affect, motivation, and behavior, the REM advances previous functional approaches. The right half of Figure 2 depicts the consequences of evaluative processing. Upward evaluation (UE) yields negative affect, as well as causal inferences (e.g., "I should have read the textbook chapters more carefully"). Causal inferences help identify antecedent actions that may trigger expectancies regarding the consequences of taking such actions in the future. These expectancies, in turn, allow the individual to develop specific behavioral intentions and strategies regarding what actions should or should not be taken. A crucial aspect of the REM, however, is that the motivation to act, or not to act, is *affectively driven* and also necessarily depends on the type of task with which one is engaged. Consistent with both Schwarz's (1990) feelings-as-information hypothesis (see also Taylor, 1991) and the mood-as-input perspective of Martin and his colleagues (e.g., Martin, Ward, Achee, & Wyer, 1993), negative affect should engender more persistence for achievement tasks (i.e., "Have I reached my goal?") but lead to less persistence on tasks pursued merely for enjoyment (i.e., "Am I enjoying myself?"), whereas positive affect should engender more persistence for enjoyment tasks but lead to less persistence for achievement tasks. Moreover, although the causal inference derived from the comparison may suggest specific behaviors that one might perform in the future, in our view it is not the causal inference, per se, directing the individual to

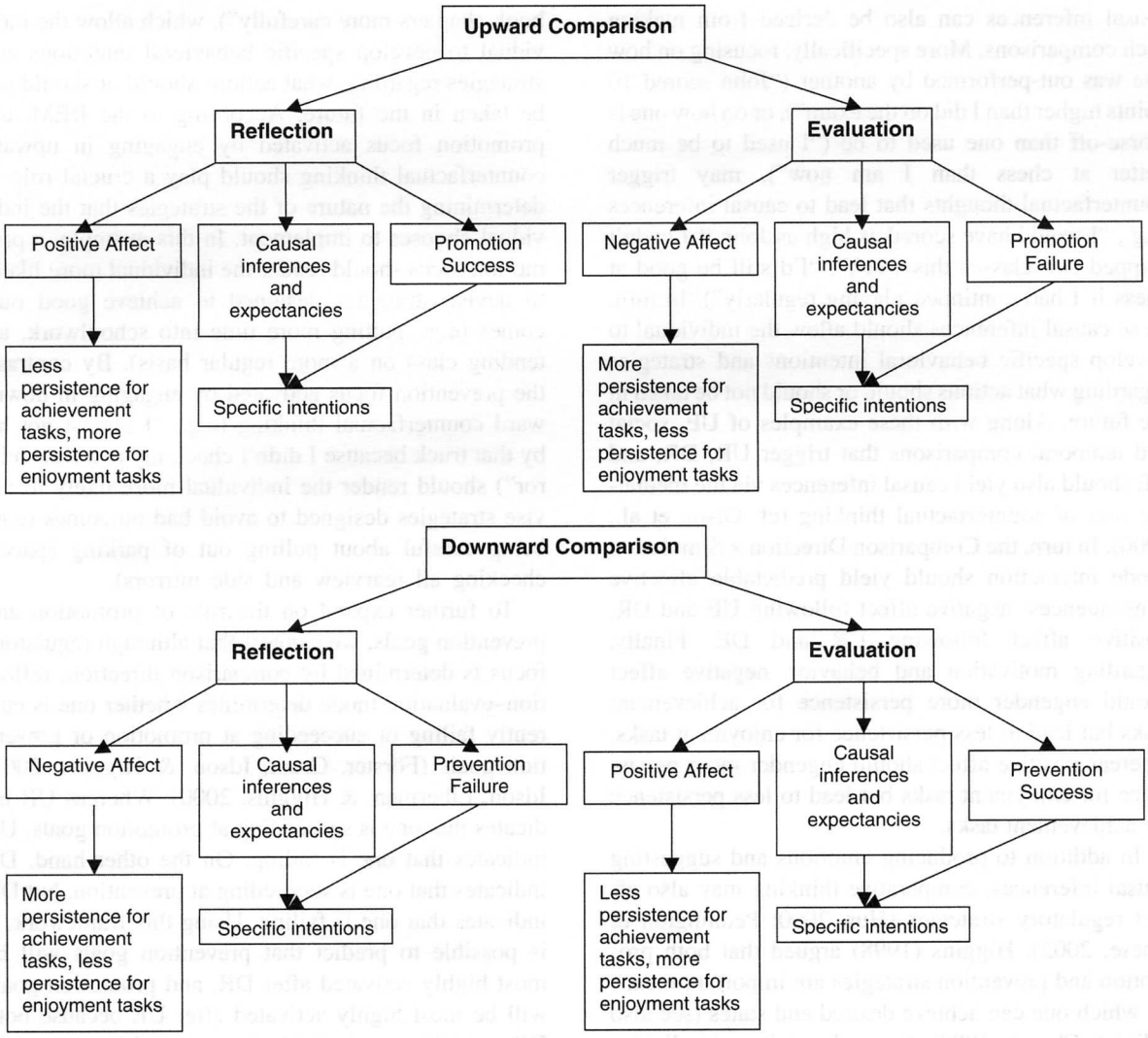

Figure 2. Consequences of Comparative Thinking.

change or act. Rather, we believe that the impetus to either change or stay the course is mediated by one's affective state (cf. Roese & Olson, 1997). Overall, the REM posits a true interaction between affect and cognition: Affect motivates the individual to either change or maintain the status quo, whereas cognition shapes the specific strategies whereby one will either change or keep things the way they are.

Downward evaluation (DE), on the other hand, produces positive affect but can also yield causal inferences. For example, the student who receives a B– might think, "It's a good thing I studied as much as I did. If I had completely blown off my studying, I would have done much worse." The causal inference derived here—that "some studying" is the cause of receiving a decent grade—indicates that a moderate amount of studying in the future will allow the student to maintain the status quo. Moreover, the model predicts that positive affect will lead to less persistence and engender complacency for achievement tasks but will stimulate greater persistence for enjoyment tasks.

The left half of Figure 2 depicts the consequences of reflective processing. Upward reflection (UR) yields positive affect, as well as causal inferences (e.g., "I almost sunk that 30-foot putt because I accounted for the upward slope of the green"). The positive affect derived from UR should engender less persistence for achievement tasks but should stimulate greater persistence for enjoyment tasks (see also Oettingen, 2000; Oettingen & Mayer, 2002). Finally, downward reflection (DR) yields negative affect but also produces causal inferences (e.g., "I almost got hit by that truck because I didn't check my rearview mirror"). The resulting negative affect should stimulate greater persistence and motivate behavioral change for achievement tasks, but lead to less persistence on enjoyment tasks.

To the extent that mental simulation plays a role in the generation of social and temporal comparisons,

causal inferences can also be derived from making such comparisons. More specifically, focusing on how one was out-performed by another ("John scored 10 points higher than I did on the exam"), or on how one is worse-off than one used to be ("I used to be much better at chess than I am now"), may trigger counterfactual thoughts that lead to causal inferences (e.g., "I would have scored as high as John if I hadn't skipped two classes this week"; "I'd still be good at chess if I had continued playing regularly"). In turn, these causal inferences should allow the individual to develop specific behavioral intentions and strategies regarding what actions should or should not be taken in the future. Along with these examples of UE, social and temporal comparisons that trigger UR, DR, and DE should also yield causal inferences via the mediating role of counterfactual thinking (cf. Olson et al., 2000). In turn, the Comparison Direction × Simulation Mode interaction should yield predictable affective consequences: negative affect following UE and DR, positive affect following UR and DE. Finally, regarding motivation and behavior, negative affect should engender more persistence for achievement tasks but lead to less persistence for enjoyment tasks, whereas positive affect should engender more persistence for enjoyment tasks but lead to less persistence for achievement tasks.

In addition to producing emotions and suggesting causal inferences, comparative thinking may also affect regulatory strategies (Hur, 2000; Pennington & Roese, 2002). Higgins (1998) argued that both promotion and prevention strategies are important means by which one can achieve desired end states (see also Elliot & Church, 1997). Promotion-oriented individuals, who are focused on growth, advancement, and accomplishment, tend to pursue strategies aimed at approaching desirable outcomes, whereas prevention-oriented individuals, who are focused on protection, safety, and responsibility, tend to pursue strategies aimed at avoiding undesirable outcomes. Although regulatory focus can be measured as a chronically accessible personality trait (e.g., Shah & Higgins, 2001; Shah, Higgins, & Friedman, 1998), it can also be temporarily induced by cues in the environment (e.g., Förster, Higgins, & Idson, 1998; Higgins, Shah, & Friedman, 1997), and the salience of comparison standards may be one such situational cue.

In this regard, an upward comparison represents a desirable outcome and thus may activate promotion goals to obtain that outcome, whereas a downward comparison represents an undesirable outcome and thus may activate prevention goals so that the outcome does not occur (Hur, 2000; Lockwood, 2002; Lockwood, Jordan, & Kunda, 2002). Returning to a previous example, upward counterfactuals yield causal inferences (e.g., "I should have read the textbook chapters more carefully"), which allow the individual to develop specific behavioral intentions and strategies regarding what actions should or should not be taken in the future. According to the REM, the promotion focus activated by engaging in upward counterfactual thinking should play a crucial role in determining the nature of the strategies that the individual chooses to implement. In this example, a promotion focus should render the individual more likely to devise strategies designed to achieve good outcomes (e.g., putting more time into schoolwork, attending class on a more regular basis). By contrast, the prevention focus activated by engaging in downward counterfactual thinking (e.g., "I almost got hit by that truck because I didn't check my rearview mirror") should render the individual more likely to devise strategies designed to avoid bad outcomes (e.g., being careful about pulling out of parking spaces, checking all rearview and side mirrors).

To further expand on the role of promotion and prevention goals, we suggest that although regulatory focus is determined by comparison direction, reflection–evaluation mode determines whether one is currently failing or succeeding at promotion or prevention goals (Förster, Grant, Idson, & Higgins, 2001; Idson, Liberman, & Higgins, 2000). Whereas UR indicates that one is succeeding at promotion goals, UE indicates that one is failing. On the other hand, DE indicates that one is succeeding at prevention, but DR indicates that one is failing. Using this framework, it is possible to predict that prevention goals will be most highly activated after DR, and promotion goals will be most highly activated after UE because both DR and UE focus individuals on their failure to attain a desired end state. Specific emotional responses should follow as well (see Figure 2). DR indicates prevention failure, thereby engendering emotions such as anxiety and nervousness, whereas UE indicates promotion failure, thereby engendering feelings of sadness and disappointment (Higgins, 1998; Lockwood, 2002; Lockwood et al., 2002; Roese, Hur, & Pennington, 1999). In general, the Direction × Mode interaction specified by the REM maps directly onto the regulatory focus framework, and it should therefore provide a fruitful avenue for examining the interplay between comparisons and motivation.[1]

[1]Recent work conducted by Roese, Hur, and Pennington (1999; see also Pennington & Roese, 2002) examined relations between regulatory focus and counterfactual thinking. These researchers found that additive counterfactuals (i.e., those that add antecedents to a simulation, such as "If only I had studied harder … "), activated a promotion focus, whereas subtractive counterfactuals (i.e., those that remove antecedents from a simulation, such as "If only I had not taken this route home … "), activated a prevention focus. However, these researchers did not examine relative differences in the activation of promotion versus prevention focus as a function of upward versus downward counterfactual thinking.

Reflection–Evaluation and the Intensity of Affective Experience

This conceptualization affords great importance to affect as a determinant of one's subsequent motivational states and corresponding behavior. To understand how affective experience is shaped in the first place, however, we need to stress the crucial role that reflective and evaluative modes of mental simulation play in imbuing counterfactual, social, and temporal comparisons with their emotional power and intensity. Once again, we ask the reader to consider the example of switching at the last minute from the doomed plane flight (i.e., DR). In this case, contextual factors might instigate the inclusion of information about the counterfactual standard in one's self-construal (e.g., "To think I could have been on that plane"; "I could be dead now"; "I should be dead now"). According to the REM, the individual now engages in a reflective mode of mental simulation whereby one vividly imagines the counterfactual and experiences the simulation as if it were real. The more vivid the simulation (Strack et al., 1985), and the easier it is to engage in the simulation (Sherman, Cialdini, Schwartzman, & Reynolds, 1985), the greater will be the enhancement of standard–consistent cognitions regarding the self (e.g., "What would it be like to be on a plane moments before it crashed?"; "How would I feel knowing I would never see my family and friends again?"), and thus, the stronger will be the emotional experience derived from reflecting on the standard. More important, then, reflection both activates and enhances the operation of the accessibility mechanism.[2] In turn, stronger emotional experiences should engender more powerful motivational and behavioral effects than weaker emotional experiences. Conversely, consider what happens when contextual features instigate the exclusion of information about the standard from one's self-construal (e.g., "I could be dead now, but thankfully I am not"). According to the REM, an evaluative mode of mental simulation is engaged whereby the individual employs the counterfactual as a reference point against which to evaluate the present. Once again, it is this processing step that grants counterfactual, social, and temporal comparisons their emotional power and intensity. In this case, the more vivid the simulation, and the greater the effort expended on evaluating one's present standing relative to the standard (i.e., switching attention back and forth between the self and the standard), the stronger should be the emotional experience derived from making the comparison (e.g., "I am incredibly fortunate to be alive"; "From now on, I will approach each day as if it were my last one on earth").

[2]An example of UR would be the recent advertising campaign to "Be Like Mike" (i.e., NBA star Michael Jordan). Reflecting on what it would be like to experience the success that the standard (Jordan) is enjoying (e.g., money, fame, attention, feelings of invincibility) enhances the accessibility of standard–consistent thoughts about the self, thereby enhancing self-evaluations and engendering positive affect.

Inclusion–Exclusion Features

The next section of the article examines contextual features that promote inclusion and exclusion and thereby instigate reflection and evaluation. The variables described in the following sections are not meant to be an exhaustive list of all potential features. Rather, we discuss empirical evidence that has accumulated thus far within the domains of counterfactual thinking (i.e., attentional focus, process and outcome accountability [OA], temporal perspective), social comparison (i.e., similarity, self-mutability, independent vs. interdependent self-construal), and temporal comparison (i.e., temporal distance), suggesting the operation of reflective and evaluative modes of mental simulation.

Attentional Focus

According to the REM, affective assimilation occurs as a direct consequence of reflection processes that are encouraged when the contextual features surrounding an event instigate the inclusion of information about the comparison standard in self-construals; affective contrast occurs as a direct consequence of evaluation processes that are encouraged when contextual features instigate the exclusion of information about the standard in self-construals and, instead, enhance the relevance of employing the standard as a reference point against which to evaluate one's present standing. The first and most straightforward contextual feature we identify is attentional focus: Focusing attention on the comparison standard itself should instigate reflective processing, whereas focusing attention on the explicit comparison between one's present standing and the comparison standard should instigate evaluative processing.

Empirical evidence. McMullen (1997, Study 2) asked participants to recall a somewhat negative event in their own lives and imagine how things could have turned out better (upward counterfactual) or worse (downward counterfactual) than they actually did. Participants in the reflection condition were instructed to "vividly imagine what might have happened instead," whereas those in the evaluation condition were instructed to "vividly imagine the event and what might have happened instead." Participants in both conditions then described their thoughts in writing and responded to a set of affect adjectives. Content analyses were subsequently performed on the extent to which participants' written responses contained evidence of evaluative comparison or re-

flective experiencing. As expected, participants in the evaluation condition showed more evidence of evaluative comparison in their responses, whereas participants in the reflection condition showed more evidence of reflective experiencing.

The McMullen (1997) study was also designed to test the notion that relative tendencies to reflect versus evaluate might depend on the type of dependent measure employed. For instance, Dermer et al. (1979) and Aspinwall and Taylor (1993) found assimilation effects on mood immediately after participants engaged in mental simulation, but they found contrast effects when subsequent self-evaluations were made. In this context, mood measures may tend to pick up on affect that derives from the enhanced accessibility of standard–consistent cognitions implicating the self—a result of the inclusion of the counterfactual in one's self-construal—thereby yielding affective assimilation effects. Thus, upward counterfactuals should elicit positive affect, whereas downward counterfactuals should elicit negative affect (cf. Schwarz & Clore, 1983). When an explicit self-evaluation is called for, however, one's attention must be turned back to the factual event for evaluation, thereby highlighting the exclusion of the counterfactual from one's current self-construal and leading to affective contrast. In the McMullen (1997) study, participants were asked to report their subjective mood state following the reflection–evaluation manipulation and were then asked to evaluate their factual events (e.g., "How satisfied are you with what happened?").

Consistent with predictions, participants in the reflection condition reported positive affect after making upward counterfactuals and negative affect after making downward counterfactuals, but this pattern was reversed in the evaluation condition. Furthermore, however, it was hypothesized that although evaluating would produce affective contrast regardless of the dependent measure employed, reflecting and reporting mood would lead to affective assimilation. For the mood-state-dependent measure, the expected assimilation effect occurred in the reflection condition, but neither assimilation nor contrast emerged in the evaluation condition. For the evaluation-dependent measure, on the other hand, the only significant effect was a main effect of direction, which took the form of a contrast effect. Regardless of whether the counterfactual was initially considered alone or along with the factual event, the contrast effect occurred when participants evaluated the factual event. Thus, an evaluation-dependent measure was, in and of itself, sufficient to produce affective contrast. Considered together, the overall pattern for the two dependent measures suggests that attentional focus can successfully enhance the relative strength of reflective versus evaluative processing.

Beyond attentional focus manipulations that encourage participants to reflect on comparison standards or evaluate their present standing, other contextual features should more naturally encourage reflection or evaluation. The perceptual salience of "close" comparisons (Kahneman & Varey, 1990) is one such feature, in that being able to see that one almost attained an outcome should lead to the inclusion of the standard and thereby encourage reflection. The casino game of keno, for example, takes advantage of this phenomenon in a clever way: The numbers that surround the winning number are lit up in addition to the number that won, thereby enhancing the salience of "nearly winning" (cf. Landman & Petty, 2000; Sherman & McConnell, 1995). In an empirical demonstration of such a perceptual salience effect, Markman, Gavanski, Sherman, and McMullen (1995) had participants observe the spin of a wheel of fortune. In one condition, the wheel slowed down and narrowly missed landing on a $75 jackpot before settling on a section labeled "$10," whereas in another condition, the wheel slowed down and nearly landed on "bankrupt" before settling on the "$10" section. Participants in the "near-$75" condition expressed more positive affect about the result of the spin than did those in the "near-bankrupt" condition, suggesting that in both cases the counterfactual had been included in participants' construal of their actual outcomes.

Process and Outcome Accountability

We suggest that the social context in which judgments and decisions are made can enhance the relative strength of reflection or evaluation processes and thereby moderate assimilative and contrastive reactions to comparisons. When people make decisions in social settings where they have to justify themselves to others, accountability pressures put constraints on what they do, and knowing that they will be held accountable for their actions and decisions, people seek approval and respect (e.g., Jones & Wortman, 1973; Schlenker, 1982; Sherif & Cantril, 1947). Recently, distinctions have been drawn between two types of accountability: process accountability (PA) and OA (Siegel-Jacobs & Yates, 1996; Simonson & Staw, 1992). In PA, the decision maker knows that an evaluation will be based solely on the quality of the process used in arriving at a response, regardless of the outcome of that response. In the medical domain, for instance, PA might require a physician to justify how a particular treatment was chosen, regardless of whether the patient ultimately got better. Conversely, in OA, the decision maker knows that an evaluation depends solely on the outcome of a response, without regard to the nature of the process used to arrive at that response. Thus, the physician would only be concerned with how the patient fared under the chosen course of treatment.

In an effort to justify a particular historical perspective, historians will often claim that a prediction of theirs regarding how a certain historical event would turn out was "almost right" (Tetlock, 1998). More generally, people who are under pressure to justify the process by which they made a prediction or decision (PA) know that the implications of what nearly happened may be as important determinants of how others evaluate them as what actually happened. According to this framework, those under PA may be more likely to reflect on comparison information (e.g., "I was almost right;" "I almost won;" "I nearly beat Susan at tennis), thereby engendering affective assimilation. Thus, PA is a contextual feature that emphasizes the implications of close comparisons for evaluating decision making: focusing on a near win provides information that one has performed relatively well, whereas focusing on a near loss provides information that one's performance could stand some improvement. Conversely, because OA enhances the importance of evaluating factual outcomes, those under OA may be more likely to exclude information about the comparison standard and instead employ such standards as evaluative reference points (e.g., "I could have won, but I didn't win"), thereby engendering affective contrast. More important, the effects of PA and OA should also be partially determined by the relative strength of reflective versus evaluative processes. If other contextual features instigate the inclusion of information about the standard, thereby encouraging reflection, then PA should exacerbate and OA should mitigate assimilative reactions. Conversely, if the context instigates the exclusion of standard information and instead enhances the relevance of evaluating one's present standing against the standard, then OA should exacerbate and PA should mitigate contrastive reactions.

Empirical evidence. In a study designed to test whether accountability moderates default assimilative reactions to counterfactuals, Markman and Tetlock (2000) had participants engage in a simulated stock investment competition. Participants chose between investing in one of two different companies and were told that they would win a trial if the stock they chose outperformed the stock they did not choose across a 1-year span. After each decision, participants viewed a simulation that corresponded to one of four outcome conditions. In the clear-win condition, the participant's chosen stock clearly outperformed the unchosen stock, whereas in the clear-loss condition, the chosen stock was clearly outperformed by the unchosen stock. In the near-win condition, the chosen stock was just barely outperformed by the unchosen stock, whereas in the near-loss condition, the chosen stock just barely outperformed the unchosen stock. Participants were also assigned either to a PA (expected that their decision processes would be evaluated), OA (expected that their decision outcomes would be evaluated), or not accountable (NA) condition, where they reacted to the results of each stock competition in the absence of any accountability pressure. After each simulation, participants provided a written response to the question, "Now that you have viewed the results of this last stock simulation, what are you thinking?" after which they responded to a series of dependent measures, including a set of mood-state adjectives and a request to apportion $1,000 of hypothetical money into each of the two companies they had chosen between.

Content analyses were performed on the extent to which participants' counterfactuals exhibited evaluative versus reflective qualities (McMullen, 1997). PAs engaged in more reflective counterfactual thinking than did NAs, who in turn engaged in more reflection than did OAs. In addition, the near-win and near-loss conditions engendered more reflection than did the clear-loss and clear-win conditions. The emotion data produced two relevant findings. First, PAs were sadder when they nearly lost than when they clearly won, but they were happier when they nearly won than when they clearly lost, whereas OAs did not differ in either case. Second, PAs were sadder when they nearly lost than were OAs, but they were happier when they nearly won than were OAs. Moreover, PAs were less willing to reinvest money in their chosen stock when they nearly lost than were OAs, but they were more willing to reinvest when they nearly won than were OAs, suggesting that PAs were especially troubled by the implications of the close-call counterfactual in the near-loss condition, but they were relatively inspired by the implications of the close-call counterfactual in the near-win condition. Subsequent analyses provided some support for this explanation, as higher reflective ratings were found to positively correlate with a willingness to reinvest in the near-win condition but were found to negatively correlate with a willingness to reinvest in the near-loss condition. In general, then, it appears that PA and OA amplify and attenuate assimilative reactions to close-call outcomes.

At first glance, the results of the Markman et al. (1995) and Markman and Tetlock (2000) studies contrast sharply with results that have been reported by Medvec and her colleagues (Medvec et al., 1995; Medvec & Savitsky, 1997). Medvec et al., for instance, found that Olympic silver medalists experienced less satisfaction from their performance than did bronze medalists (i.e., affective contrast). Why was there more evidence of contrast in the Medvec et al. studies but more evidence of assimilation in the Markman and Tetlock study? In Markman and Tetlock, the performance of the stocks dramatically unfolded on the computer screen, rendering the counterfactuals in the near-win and near-loss conditions perceptually salient—participants could literally see that the counterfactual alternative to reality nearly occurred,

thereby eliciting affective assimilation effects via the inclusion of the close counterfactual. The experimental contexts investigated by Medvec and her colleagues, on the other hand, may tend to encourage contrast effects. For instance, silver medalists may be particularly focused on their present standing and how they compare to an imagined better outcome—Olympic gold. Thus, when the context enhances the relevance of employing the counterfactual as an evaluative reference point, affective contrast is more likely. Moreover, OA would likely exacerbate such reactions, whereas PA would likely have a mitigating effect.

Temporal Perspective

Another variable that should influence the relative strength of reflective and evaluative processing tendencies is temporal perspective: whether an event is perceived as a final and completed event or as part of a series of events that will continue into the future. Several studies have examined the effects of temporal perspective on counterfactual generation. For instance, Gilovich and Medvec (1994) found that actions evoke more regret in the short term, but inactions evoke more regret in the long run, and Markman et al. (1993) found that repeatable events tend to evoke upward counterfactual thinking, whereas nonrepeatable events tend to evoke downward counterfactual thinking (see also Sanna, 1996). More closely related to the notion of reflection, Boninger, Gleicher, and Strathman (1994) found that when people imagined doing poorly in a track meet, the negative affect from thinking that they could have performed better was mitigated when they focused on future races. Thus, temporal perspective can play a role in determining affective reactions to counterfactual thinking.

The temporal perspective factor gains significance in light of the fact that studies demonstrating affective contrast have generally examined final outcomes. For example, Medvec and Savitsky (1997) examined students' perceptions of their final grades of the semester, and Medvec et al. (1995) examined affective reactions to final athletic event outcomes (e.g., the medals awarded to Olympic athletes after a particular event is over). More generally, however, few of the outcomes people experience are final: Students receive individual grades throughout the semester, and athletes spend a great deal of time training in preparation for final events. Close upward counterfactuals suggest that better possibilities are easily attainable (e.g., "I almost did it; I will do it next time"), whereas close downward counterfactuals suggest that worse possibilities may be looming (e.g., "I almost failed; I could fail next time").

Empirical evidence. In a direct empirical test of the impact of temporal perspective, McMullen and Markman (2002) had participants read a play-by-play account of one half of a college basketball game from the perspective of a fan of one of the two teams. Participants either read an account of the first half of the basketball game (future outcome condition) or the second half of the basketball game (final outcome condition). The half then ended with either a 15-point difference (the blowout condition) or a 1-point difference (the close condition). After reading the account, participants reported their affect regarding the outcome of the game. The data revealed affective contrast effects in the final outcome condition: Being a fan of the losing team felt better if the second half was a blowout compared to a close game, and being a fan of the winning team felt better if the second half was close compared to a blowout. On the other hand, the future outcome condition produced an affective assimilation effect: At halftime, fans of the team that was down by 1 point actually felt better than fans of the team that was up by 1 point.

As previously noted, Boninger et al. (1994) found that thinking about the future can mitigate the negative affect that derives from counterfactual thinking. However, McMullen and Markman (2002) demonstrated assimilation effects as opposed to the mere weakening of contrast effects. The close counterfactuals used in the McMullen and Markman (2002) study appear to have evoked the perception of propensity toward an unrealized outcome. According to Kahneman and Varey (1990), propensities "indicate advance toward the focal outcome, or regression away from it" (p. 1105), and it is this perception of dynamic and accelerating movement toward a win or loss that may trigger counterfactuals, such as "We almost won," or "We nearly blew it" (see also Carver & Scheier, 1990; Hsee, Salovey, & Abelson, 1994; Landman, 1993; Roese & Olson, 1995a; Savitsky, Medvec, & Gilovich, 1997; Sheldon & Houser-Marko, 2001; Zeigarnik, 1935). Thus, to the extent that individuals perceive themselves to be on a trajectory toward either a desired or an undesired end state—one that is highly and plausibly attainable—affective assimilation is more likely to occur via the inclusion of the comparison standard (see Markman & Tetlock, 2000). On the other hand, outcomes that are perceived as final and static should encourage evaluation via the exclusion of the standard. Consistent with this reasoning, Sanna (1997) found that participants who were high in self-efficacy experienced more positive affect after generating upward counterfactuals than did participants who were low in self-efficacy, but only when participants perceived the event to be repeatable.

One key feature that may determine the likelihood of inclusion versus exclusion following a temporal comparison is perceived temporal distance—whether one is comparing the present self to a recent or distant past self (Miller & McFarland, 1986; Wilson & Ross,

2001). Wilson and Ross found that people tended to disparage their distant past selves but compliment their recent past selves. According to this framework, perceptions of smaller temporal distance should encourage reflective processing (vividly reliving how things were in the recent past—e.g., "Until very recently, I didn't have a single friend"), enhance the accessibility of standard–consistent cognitions, and yield affective assimilation effects. Conversely, perceptions of greater temporal distance should encourage evaluative processing (evaluating one's present self against the standard—e.g., "I was an outcast in high school, but in college I'm now surrounded by friends") and yield affective contrast effects.

Perceived Mutability of the Self

Another contextual feature with relevance for inclusion–exclusion is the perception that the self is a more or less mutable entity. Recently, Stapel and Koomen (2000) suggested that in order for assimilative social comparisons to occur, individuals must have room in their self-views for inclusion, meaning that the image of who or what one is on a certain dimension is unclear and thus can be influenced relatively easily (cf. Dweck, 2000). After manipulating perceived mutability through experimental instructions and examining individual differences in self-concept clarity (Campbell, 1990), Stapel and Koomen found that assimilation effects on self-evaluations were more likely when perceived mutability was high, whereas contrast effects were more likely when perceived mutability was low.

Perceived mutability is also conceptually related to variables, such as attainability and vulnerability (e.g., Lockwood, 2002; Lockwood et al., 2002; Lockwood & Kunda, 1997). To illustrate, Lockwood and Kunda found that relevant role models ("superstars") evoked self-enhancement and inspiration when their success seemed attainable, but they evoked deflation when their success seemed unattainable. Moreover, Lockwood found that when perceived vulnerability to another's negative fate was low, downward comparisons enhanced self-evaluations, but when vulnerability was high, downward comparisons deflated self-evaluations. To date, no studies have directly examined the impact of perceived mutability of self on counterfactual or temporal comparisons, but we would expect effects similar to those reported for social comparisons—a greater likelihood of affective assimilation (via inclusion and subsequent reflection) when the self is perceived to be more mutable, and a greater likelihood of affective contrast (via exclusion and subsequent evaluation) when the self is perceived to be less mutable. Examining perceptions of self-mutability should be of particular interest to counterfactual researchers in light of the theoretical importance of mutability in determining the content of counterfactual thoughts (e.g., Kahneman & Miller, 1986; Miller & McFarland, 1986; Roese & Olson, 1995a, 1997).[3]

Similarity to the Comparison Standard

Recently, Mussweiler (2001a, 2001b, 2003; Mussweiler & Bodenhausen, 2002) suggested that the nature of the initial hypothesis being tested during a social comparison is an important determinant of how the comparison influences self-evaluations. If perceivers initially seek information indicating that they are similar to the standard, then the accessibility of standard–consistent self-knowledge is increased such that self-evaluations are assimilated toward the standard, whereas if judges seek information indicating that they are dissimilar from the standard, then the accessibility of standard–inconsistent knowledge is increased such that self-evaluations are contrasted away from the standard (see also Brewer & Weber, 1994; Brown et al., 1992; Collins, 1996; Pelham & Wachsmuth, 1995). After hypothesizing that perceivers would be more likely to test for similarity to a standard to the extent that they initially saw themselves as similar rather than dissimilar to it, Mussweiler (2001a) experimentally manipulated similarity by varying whether the self was compared to the standard, or the standard was compared to the self. Consistent with prior research indicating that similarity is perceived to be higher if the standard is compared to the self, rather than the self to the standard (Srull & Gaelick, 1983; Tversky, 1977), Mussweiler (2003) found that assimilation was more likely to occur in the former, and contrast was more likely to occur in the latter.

The effects reported by Mussweiler have intriguing ramifications for counterfactual and temporal comparisons. For instance, testing the hypothesis, "How similar is my past self to my present self?" may instigate the inclusion of the past self and thereby encourage reflective processing, whereas testing the hypothesis, "How dissimilar is my past self from my present self?" may instigate the exclusion of the past self and thereby encourage evaluative processing (see also Beike & Niedenthal, 1998). Manipulating similarity by encouraging a participant to compare the counterfactual or temporal standard to one's present standing (or by priming them to do so—see Mussweiler, 2001b) may encourage reflective processing and engender affective assimilation, whereas encouraging a participant to compare one's present standing to the counterfactual or temporal standard may encourage evaluative processing and engender affective contrast.

[3]In the counterfactual thinking literature, mutability refers to the ease with which one can imagine that some aspect of reality could have been different. Typically, the more unusual or exceptional an event, the more mutable it is. For example, it may be easy for a lottery winner to imagine not winning the lottery.

Independent Versus Interdependent Self-Construals

Cultural researchers (e.g., Markus & Kitayama, 1991; Triandis, 1989) have noted the distinction between the North American view of the self as an independent entity and the collectivist view of the self as one being fundamentally interconnected with others. Recent research, however, has suggested that even in individualistic cultures certain relationships and group memberships may be incorporated into self-views (e.g., Brewer & Gardner, 1996; Smith, Coats, & Walling, 1999; Smith & Henry, 1996; Trafimow, Triandis, & Goto, 1991). For instance, research has demonstrated that in close relationships, the self often includes overlapping connections with close others (e.g., Aron & Aron, 1986; Aron, Aron, Tudor, & Nelson, 1991), and the degree of overlap between self and close other is associated with feelings of closeness and intimacy within the relationship (Aron & Fraley, 1999). Moreover, by manipulating self-construal via priming in a classic SEM paradigm (Tesser & Campbell, 1982), Gardner et al. (2002) found that when the self is expanded to include others as part of the self, the successes of others, even in self-relevant domains, can be experienced as nonthreatening and cause for celebration (see also Beach & Tesser, 1996; Beach et al., 1998; Gardner, Gabriel, & Lee, 1999; Lee, Aaker, & Gardner, 2000). This burgeoning interest in the independent versus interdependent nature of self-construals dovetails nicely with this reflection–evaluation framework. When a social comparison is called for, interdependent (self–other) construals will more likely lead to reflective processing, thereby encouraging affective assimilation, whereas independent (single-entity) construals will more likely lead to evaluative processing, thereby encouraging affective contrast.

Empirical Evidence for the Accessibility Mechanism

A recent study attempted to provide evidence for an accessibility mechanism in counterfactual thinking (Markman et al., 2002). Based on a procedure used by Mussweiler and Strack (2000b), Markman et al. assessed the accessibility of self-related cognitions subsequent to making a counterfactual. Participants were instructed to recall a somewhat negative academic event (e.g., receiving a low grade on a recent exam) and then engage in UR, UE, DR, or DE in the same manner as employed by McMullen (1997, Study 2). After describing their counterfactual, participants engaged in a lexical decision task that included a word associated with high self-efficacy (capable), and a word associated with low self-efficacy (unable). In general, it was expected that lexical decisions for standard–consistent words would be faster than those for standard–inconsistent words. Thus, participants should have been faster to recognize the word "capable" after generating upward counterfactuals than after generating downward counterfactuals, but should have been faster to recognize the word "unable" after generating downward counterfactuals than after generating upward counterfactuals (i.e., a Direction × Target Word interaction). In addition, however, because reflection invokes a narrower focus of attention on the standard itself than does evaluation, it was expected that differences in the speed of lexical decisions would be more pronounced in the reflection than in the evaluation conditions (i.e., a Direction × Mode × Target Word interaction).

It should also be noted that the predicted response latency pattern allowed for a plausible alternative interpretation (Mussweiler & Strack, 2000b): Rather than reflecting differences in the accessibility of self-related cognitions, the effect could well be caused by the activation of general semantic knowledge (i.e., thinking about getting a better grade might increase the accessibility of concepts that are closely associated with it). Thus, to distinguish between the accessibility of self-related cognitions and the accessibility of general semantic knowledge, Markman et al. (2002) followed Dijksterhuis et al.'s (1998) procedure: Half of the lexical decisions were preceded by the subliminal presentation of a word closely associated with the self-concept (*I, my, me*), whereas the other half were preceded by a word unrelated to the self (*and, or, when*). Dijksterhuis et al.'s demonstration that the subliminal presentation of self-related words activates the self-concept suggests that lexical decisions that are preceded by such primes assess the specific accessibility of self-related knowledge. Overall, then, it was proposed that the predicted Direction × Mode × Target Word interaction would primarily occur if the lexical decision trials were preceded by self-primes.

The data for the lexical decision times following self-primes are depicted in Table 1. The predicted Direction × Target Word interaction was obtained, $p < .04$, indicating that participants were faster to respond to "capable" after generating upward counterfactuals than after generating downward counterfactuals, but they were faster to respond to "unable" after generating downward counterfactuals than after generating upward counterfactuals. Furthermore, the predicted Direction × Mode × Target Word interaction was obtained, $p < .04$, indicating that participants were particularly fast to identify "capable" following upward assimilation and were particularly fast to identify "unable" following downward assimilation. The data for lexical decisions following non-self-primes showed a somewhat similar pattern to those presented in Table 1, but neither the Direction × Target Word nor

Table 1. *Response Latencies for High and Low Self-Efficacy Words as a Function of Counterfactual Direction and Mode.*

	Capable		Unable	
Mode	**Assimilation**	**Contrast**	**Assimilation**	**Contrast**
Direction				
Upward	661.40	755.42	812.80	754.58
Downward	834.75	735.69	658.83	738.62

Note: Means reflect raw response latencies.

the Direction × Mode × Target Word interactions were statistically significant.

Motivational and Behavioral Consequences of Comparative Thinking

The next section of the article documents empirical evidence for the motivational and behavioral consequences of reflection and evaluation processes in comparative thinking. Because the motivational and behavioral effects of upward and downward comparisons have received the most theoretical attention in the counterfactual thinking literature, we focus primarily on work in this area.

Comparative Thinking, Motivation, and Behavior: Initial Empirical Evidence

A study conducted by Markman et al. (1993) provided initial empirical support for the motivational functions of counterfactual thinking. In this study, participants played blackjack against a computer-simulated opponent and were led to believe that they would either be playing no additional hands of blackjack or three additional hands of blackjack. Participants who expected to play again demonstrated a greater tendency to generate upward counterfactuals relative to those who did not expect to play again. According to Markman et al., participants who expected to play again tended to generate upward counterfactuals because they needed preparative information to help them perform better. On the other hand, participants who did not expect to play again needed no such information and, instead, only wanted to feel good about their current performance. Thus, the counterfactuals they generated (i.e., downward) served the affective function (see also Sanna, 1996; Sanna et al., 1999). Roese (1994, Study 2) found that participants who had generated upward counterfactuals subsequently indicated greater intentions to perform success-facilitating behaviors for future exams, relative to controls and those who had generated downward counterfactuals. Moreover, Roese (1994, Study 3) demonstrated a link between intentions and behavior. Participants induced to generate upward as opposed to downward counterfactuals later performed better on an anagram task, and subsequent analyses suggested that the improvement in performance was at least partially due to their following through on counterfactual-related intentions. In addition, Nasco and Marsh (1999) found that a greater frequency of upward counterfactual thinking after grade feedback was associated with heightened behavioral intentions and improvement in academic performance (see also Grieve, Houston, Dupuis, & Eddy, 1999).

Evidence for the motivational and behavioral implications of upward and downward comparisons can also be found in the social comparison literature (e.g., Atkinson, 1957; Cervone & Peake, 1986). For instance, Seta (1982) had participants perform a pattern recognition task in the presence of another student whose performance was inferior to, identical to, or superior to the participant's. Those who participated with the better performing other demonstrated superior performance to those performing alone or with an inferior other. Similarly, Wayment, Taylor, and Carillo (1994, as described in Taylor, Wayment, & Carillo, 1996) had participants perform an anagram task either alone or in the presence of a partner who substantially outperformed them (upward comparison condition) or substantially underperformed them (downward comparison condition). Participants in the downward comparison condition solved fewer anagrams but felt good about their performance in comparison to those in the upward comparison condition who solved more anagrams but felt worse about their performance.

New Proposals Regarding Affect and Motivation

The REM proposes that affective experiences derived from counterfactual thinking mediate subsequent changes in motivation. This is consistent with Schwarz's (1990) proposal that affect plays a critical role in regulating motivation. He argued that positive and negative affective states provide different kinds of motivational information—negative affect informs us that we are not achieving our goals and that we should not be satisfied with the status quo, whereas positive affect informs us that all is well and that increased effort is unnecessary (see also Taylor, 1991). Although previous views of the functional value of counterfactual thinking have excluded downward counterfactuals from any preparative function (e.g., Markman et al., 1993; Roese, 1994, 1997), the notion that positive and negative affective states have distinct motivational implications suggests two basic hypotheses regarding downward counterfactuals. The first of these is that when a downward counterfactual evokes

negative affect, it can serve as a "wake-up call" to change one's behavior. To illustrate, if one narrowly avoids a car accident, one may be more motivated to stop drinking and driving. Thus, if one can be made aware of the counterfactual possibility of negative outcomes through DR, one may try harder to avoid them.

The second hypothesis is that downward counterfactuals that provide comfort through affective contrast can actually reduce the motivation to change and improve. The drunk driver who continues to get lucky and avoid accidents may come to believe that there is nothing wrong with drinking and driving, and simply refuse to change. Interestingly, Sanna (1996, 1998, 2000) found that optimists are more likely than pessimists to engage in this type of DE but are less likely to think through future courses of action (cf. Norem & Cantor, 1986; Showers, 1992). Thus, DE may promote complacency (for similar proposals in the social comparison literature, see also Gibbons, Blanton, Gerrard, & Buunk, 2000; Taylor & Lobel, 1989).

Empirical evidence. To examine the motivational implications of DR and DE, McMullen and Markman (2000, Study 3) measured students' responses after receiving their first exam grade in a course. It was hypothesized that students' counterfactual thoughts about their performance on that first exam would influence their affect as well as their motivation toward the rest of the course. Specifically, if students were encouraged to engage in DE, they should have reported lowered motivation toward the rest of the class, but if they were encouraged to engage in DR, they should have reported heightened motivation (cf. Lockwood, 2002; Lockwood et al., 2002).

Participants indicated their grade on their first exam. Next, those in the counterfactual conditions were instructed to make a downward counterfactual (i.e., compare their present grade to an imagined worse grade). In the evaluation condition they were instructed to "evaluate your grade in comparison to the worse grade you imagined," whereas in the reflection condition they were instructed to "vividly imagine receiving that worse grade." Those in the control condition, who had not been instructed to generate any counterfactuals, simply described their thoughts about their actual exam grade. All participants indicated the extent to which they were experiencing various emotions and then answered several questions regarding their motivation to modify their study habits in the future (e.g., "How much do you feel you should change the way you study for the next exam?").

Consistent with McMullen (1997), more negative affect was experienced in the reflection condition, and more positive affect was experienced in the evaluation condition. More important, motivation to modify future study habits was greatest in the reflection condition. Analyses were also conducted to examine whether the influence of the counterfactual manipulation on motivation was mediated by negative affect. The counterfactual manipulation initially predicted motivation, but when affect was also entered into the regression equation, the coefficient for the counterfactual manipulation dropped to nonsignificance, whereas the affect coefficient remained significant. Thus, it appears that affect at least partially mediated the counterfactual's impact on motivation (cf. Baron & Kenny, 1986).

The critical assumption underlying the McMullen and Markman (2000) work is that affective states have motivational implications. Thus, when the students in the study experienced negative affect after thinking about their grades, they reported enhanced motivation to work harder. Roese (1994, 1997) argued that upward counterfactuals prepare for the future by suggesting specific courses of action (e.g., "If I had studied harder, I would have received a better grade; therefore, I will study harder next time"), whereas downward counterfactuals suggest no such specific routes to better performance and thus are not involved in future preparation. The results of McMullen and Markman's grade study, however, provide clear evidence that downward counterfactual thoughts can be motivating, and affect plays a mediating role in this process. Although downward counterfactuals do not envision a route to a positive outcome, per se, they can clearly motivate us to discontinue potentially destructive behaviors.

Affect and Motivation: The Moderating Role of Task Type

Although McMullen and Markman (2000) suggested that negative affect increases motivation, whereas positive affect yields complacency, their study did not examine upward counterfactuals. If the feelings-as-information perspective is correct, UE should enhance motivation (Markman et al., 1993; Roese, 1994), and UR (e.g., feeling good by imagining having won the lottery) should lead to complacency. The prediction of such a complacency effect following UR would be supported by the research of Oettingen and her colleagues (e.g., Oettingen, 1996; Oettingen & Mayer, 2002; Oettingen, Pak, & Schnetter, 2001; see also Klinger, 1990; McGregor, Newby-Clark, & Zanna, 1999; Singer, 1966). In this work, engaging in positive fantasy by itself decreased motivation and inhibited success, whereas explicitly contrasting positive fantasies with reality enhanced motivation and facilitated success. According to Oettingen (1996), positive fantasies can be detrimental because they engender an-

ticipatory consumption of motivation that would otherwise be directed toward achieving a given goal.

On the other hand, positive affect may increase motivation for some tasks, and negative affect may decrease motivation. Martin et al. (1993) argued that the implications of affect vary because different tasks may imply different stop rules. If the rule is to stop when the goal is reached, as it might be in an achievement-oriented task, negative affect should encourage one to continue, whereas positive affect should encourage one to stop. However, if the rule is to stop when one is no longer enjoying the task, then affect should produce the opposite results: Positive affect should encourage one to continue, whereas negative affect should encourage one to stop. Thus, tasks engaged in for enjoyment (cf. Hirt, Melton, McDonald, & Harackiewicz, 1996) may produce very different results than achievement-oriented tasks.

Empirical evidence. McMullen and Eppers (2001) examined the possibility that the influence of counterfactual thinking on motivation might interact with the type of task involved. Participants spent 5 min solving a set of crossword-like puzzles, and were then instructed to generate either a downward or upward counterfactual about their performance. Next, they were instructed to either vividly imagine the counterfactual (reflection) or to compare the counterfactual to their actual performance (evaluation). They then worked on another set of puzzles, but this time they could spend as much or as little time working as they wished. In the enjoy condition, they were told that the point of the word puzzles was simply to have fun with the puzzles, and if they were no longer having fun they could stop. In the achieve condition, on the other hand, they were told to try to perform as best they could, and when they were satisfied with their performance they could stop (cf. Sanna, Meier, & Wegner, 2001). The primary dependent measure was the amount of time they spent on a second set of word problems.

When engaged in the achievement task, UR reduced task persistence relative to UE, whereas DR increased persistence relative to DE. In the enjoyment task, however, that pattern reversed, as UR actually increased task persistence relative to UE, whereas DR decreased persistence relative to DE. More generally, these findings suggest that the relations among comparative thinking, affect, and motivation are more complicated than has been previously described: Motivation and persistence appear to be the result of a complex interaction between the direction of the comparison (upward vs. downward), the mode of mental simulation (reflection vs. evaluation), the affect produced by the comparison (positive vs. negative), and the type of task involved (e.g., achievement vs. enjoyment).

Comparative Thinking and Regulatory Focus

According to the REM, comparative thinking may also activate self-regulatory strategies, with upward comparisons potentially activating promotion goals and downward comparisons potentially activating prevention goals (Hur, 2000). In a recent social comparison study (Lockwood, 2002), 1st-year undergraduates read about either a 1st-year student coping poorly with college adjustment, or a recent graduate coping poorly with the transition to a postcollege career, and were then asked to imagine how they might become like the student in the future. Although participants exposed to the poorly coping graduate subsequently viewed themselves as more vulnerable to having this negative outcome happen to them, and exhibited deflated self-perceptions, they also became more prevention-oriented and, consistent with McMullen and Markman's (2000) findings, more motivated to work hard to avoid such outcomes (see also Lockwood et al., 2002; Oettingen, 2000). Moreover, Lockwood's finding that a prevention focus was only activated *when vulnerability was high* is consistent with our earlier suggestion that DR may activate a prevention failure focus.

Future Directions and Conclusions

One of the theoretical and empirical challenges facing future work in the area of social judgment will be to identify those inclusion–exclusion features that do the best job of instigating reflective and evaluative modes of mental simulation. A potentially fruitful way of doing this would be to start by considering what functions are served by counterfactual, social, and temporal comparisons (Roese, Sanna, & Galinsky, 2003; Sanna, 2000; Sanna, Chang, & Meier, 2001). In light of the suggestion made by some that counterfactual thinking is motivated by a desire to improve one's current standing and to prevent negative outcomes (e.g., Mandel & Lehman, 1996; Markman et al., 1993; Roese, 1994; Roese & Olson, 1997; Sanna, 1996), contextual features, such as perceived mutability and repeatability, may be particularly discerning predictors. A long-standing assumption of social comparison theory, on the other hand, is that people engage in such comparisons to assess their standing on a given dimension (Festinger, 1954; see also Kruglanski & Mayseless, 1990). The self-assessment motive should make perceptions of similarity to the comparison standard (Mussweiler, 2003) a particularly discriminating predictor of affective assimilation versus contrast. Finally, if temporal comparisons are best motivated by a desire to self-enhance (Albert, 1977; McFarland & Alvaro, 2000; Wilson & Ross, 2000, 2001), then perceived temporal distance may ultimately be the best predictor.

Another important challenge will be to more precisely specify the relations among comparison direction, affect, motivation, and behavior. For instance, although the REM posits that upward evaluative comparisons are motivating because they engender negative affect, Taylor and Lobel (1989) argued that to benefit from upward social comparison information (i.e., via self-improvement), people are actually better off avoiding explicit self-evaluations of their merits during the comparison (Blanton, Buunk, Gibbons, & Kuyper, 1999). As a case in point, Gibbons et al., (2000) found that college students were more likely to do well in school if they reported comparing their grades with other students who scored "high" on tests, but they were not helped if they reported comparing to specific students who had done "better" than them, suggesting that students benefited from upward social comparison only when they did not think about others in a way that might make them feel worse by comparison. Although these suggestions may seem at odds with this conceptualization, we believe that they speak rather compellingly to the complexity of the relations among affect, motivation, and behavior. In our view, it is still the negative affect accruing from upward evaluation that signals the need for improvement (cf. Schwarz, 1990). In turn, causal inferences and a promotion (failure) focus are derived from making the comparison. Consistent with the suggestions of Taylor and Lobel, and Blanton et al., however, we believe that the individual at this point benefits from avoiding explicit self-evaluations by reflecting instead on the attainability of better outcomes. Employing a role model here (or, similarly, an idealized counterfactual outcome or future self) may be helpful, as observing such a person may reveal useful information about how to improve (cf. Buunk & Ybema, 1997) or may endow one with a sense of potential, self-confidence, and feelings of self-efficacy (Blanton et al., 1999; Buunk et al., 1990; Lockwood & Kunda, 1997; Major et al., 1991). In so doing, the negative affect initially derived from the comparison will be mitigated, even though the inferential benefits of making the comparison remain (Roese, 1997; Taylor, 1991).

Future research should also address a distinction between temporal comparisons on the one hand, and counterfactual and social comparisons on the other, with regard to how these types of social judgments are thought to affect self-evaluations. Whereas assimilation and contrast effects in the counterfactual and social comparison literature are typically inferred by examining subsequent evaluations of the self (e.g., ratings of satisfaction and mood, self-evaluations on a given dimension), contrast effects in the temporal comparison literature are often inferred by examining subsequent evaluations of the comparison standard (e.g., ratings of recent and distant past selves). For instance, Wilson and Ross (2001) cited the finding that participants rated their distant past selves significantly more negatively than they rated their present selves as evidence for the disparagement of distant past selves, but they cited the finding that participants rated their recent past selves equivalently to their present selves as evidence for the complimenting of recent past selves—no positive or negative effects on evaluations of the present self were reported. It is noteworthy that the procedure employed by Wilson and Ross did not ask participants to explicitly compare their present selves to their past selves. Rather, participants were simply asked to rate their present selves on a given attribute and then rate their (distant or recent) past selves on that same attribute (or vice versa—Wilson and Ross reported that the order of these ratings did not exert any effects). In our view, a procedure that explicitly instructs participants to compare their present and past selves might yield assimilative or contrastive effects on evaluations of the present self relative to a control condition in which participants merely evaluate their present selves (cf. Beike & Niedenthal, 1998). In general, reflection will be encouraged to the extent that contextual features instigate the inclusion of the temporal comparison standard in construals of the present self, whereas evaluation will be encouraged to the extent that contextual features instigate the exclusion of the standard from self-construals and instead enhance the relevance of employing the standard as a reference point against which to evaluate the present self.

To conclude, we believe a strong point of the REM is the degree of specificity it achieves in describing the underlying mechanisms that produce affective assimilation and contrast effects in comparative thinking. In so doing, we have integrated two theoretical frameworks: the inclusion–exclusion model advocated by Schwarz and Bless (1992) and Stapel and Koomen (2000; see also Blanton, 2001; Tesser, 1988; Gardner et al., 2002), and the selective accessibility model described by Mussweiler (2003). In addition to synthesizing these two perspectives into a unifying model of affective assimilation and contrast, we believe that the REM also specifies a link in the chain of mechanisms and processes leading to affective assimilation and contrast that has not been previously considered. The inclusion–exclusion mechanism initiates the chain by specifying which information will be included versus excluded from one's self-construal, whereas the accessibility mechanism appears later in the chain to enhance the accessibility of standard–consistent cognitions implicating the self. More important, however, the REM also specifies two modes of mental simulation that are instigated by the inclusion–exclusion mechanism, activate and enhance the accessibility mechanism, and play a substantial role in shaping the individual's affective experience: reflection and evaluation. In our view, future work should be directed toward understanding the phenomenological experience

of reflecting and evaluating—what do these two modes of mental simulation feel like, and how exactly are they different? We find the recent work of Green and Brock (2000) on the transportive nature of fictional narratives to be particularly intriguing in this regard. Green and Brock described how a compelling narrative can transport individuals into an alternative mode of thinking in which they feel deeply connected to the characters as well as the emotions conveyed in the story. Moreover, highly transported individuals will often experience some of the emotions of the characters themselves. This notion of experiencing the emotions of the characters "as if" they were real seems to capture the essence of reflection—vividly simulating the comparison as if it were true of, or part of, the self.

Human beings have a seemingly boundless capacity for thinking about and simulating possible worlds and possible selves. The work we have described points out some psychological consequences of engaging in comparative thinking. By attending to the various forms of comparative thinking and specifying the mechanisms that underlie such psychological phenomena, we hope to inspire future research that examines the complex interplay between affect, cognition, motivation, and behavior.

References

Albert, S. (1977). Temporal comparison theory. *Psychological Review, 84,* 485–503.

Anderson, C. A., & Sechler, E. S. (1986). Effects of explanation and counterexplanation on the development and use of social theories. *Journal of Personality and Social Psychology, 50,* 24–34.

Aron, A., & Aron, E. A. (1986). *Love and the expansion of the self: Understanding attraction and satisfaction.* Washington, DC: Harper & Row.

Aron, A., Aron, E. A., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology, 60,* 241–253.

Aron, A., & Fraley, B. (1999). Relationship closeness as including others in the self: Cognitive underpinnings and measures. *Social Cognition, 17,* 140–160.

Aspinwall, L. G., & Taylor, S. E. (1993). Effects of social comparison direction, threat, and self-esteem on affect, self-evaluation, and expected success. *Journal of Personality and Social Psychology, 64,* 708–722.

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64,* 359–372.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Beach, S. R. H., & Tesser, A. (1996). Self-esteem and the extended self-evaluation model: The self in social context. In M. H. Kernis (Ed.), *Efficacy, agency, and self-esteem* (pp. 145–170). New York: Plenum.

Beach, S. R. H., Tesser, A., Fincham, F. D., Jones, D. J., Johnson, D., & Whitaker, D. J. (1998). Pleasure and pain in doing well, together: An investigation of performance-related affect in close relationships. *Journal of Personality and Social Psychology, 74,* 923–938.

Beike, D. R., & Niedenthal, P. M. (1998). The process of temporal self-comparison in self-evaluation and life satisfaction. In P. T. P. Wong & P. S. Fry (Eds.), *The human quest for meaning: A handbook of psychological research and clinical applications* (pp. 71–89). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Biernat, M., & Billings, L. S. (2001). Standards, expectancies, and social comparison. In A. Tesser & N. Schwarz (Eds.), *Blackwell handbook of social psychology: Intraindividual processes* (pp. 257–283). Malden, MA: Blackwell.

Biernat, M., & Manis, M. (1994). Shifting standards and stereotype-consistent judgments. *Journal of Personality and Social Psychology, 66,* 5–20.

Biernat, M., Manis, M., & Kobrynowicz, D. (1997). Simultaneous assimilation and contrast effects in judgments of self and others. *Journal of Personality and Social Psychology, 73,* 254–269.

Blanton, H. (2001). Evaluating the self in the context of another: The three-selves model of social comparison assimilation and contrast. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton Symposium on the Legacy and Future of Social Cognition* (pp. 75–87). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Blanton, H., Buunk, B. P., Gibbons, F. X., & Kuyper, H. (1999). When better-than-others compare upward: Choice of comparison and comparative evaluation as independent predictors of academic performance. *Journal of Personality and Social Psychology, 76,* 420–430.

Boninger, D. S., Gleicher, F., & Strathman, A. J. (1994). Counterfactual thinking: From what might have been to what may be. *Journal of Personality and Social Psychology, 67,* 297–307.

Brewer, M. B., & Gardner, W. L. (1996). Who is this "we"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology, 71,* 83–93.

Brewer, M. B., & Weber, J. G. (1994). Self-evaluation effects of interpersonal versus intergroup social comparison. *Journal of Personality and Social Psychology, 66,* 268–275.

Brown, J. D., Novick, N. J., Lord, K. A., & Richards, J. M. (1992). When Gulliver travels: Social context, psychological closeness, and self-appraisals. *Journal of Personality and Social Psychology, 62,* 717–727.

Buunk, B. P., Collins, R. L., Taylor, S. E., VanYperen, N. W., & Dakpf, G. A. (1990). The affective consequences of social comparison: Either direction has its ups and downs. *Journal of Personality and Social Psychology, 59,* 1238–1249.

Buunk, B. P., & Ybema, J. F. (1997). Social comparison and occupational stress: The identification-contrast model. In B. P. Buunk & F. X. Gibbons (Eds.), *Health, coping, and well-being: Perspectives from social comparison theory* (pp. 359–388). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology, 59,* 538–549.

Carroll, J. S. (1978). The effect of imagining an event on expectations for the event: An interpretation in terms of the availability heuristic. *Journal of Experimental Social Psychology, 14,* 88–96.

Carver, C. S., & Scheier, M. F. (1990). Origins of positive and negative affect: A control-process view. *Psychological Review, 97,* 19–35.

Cervone, D., & Peake, P. K. (1986). Anchoring, efficacy, and action: The influence of judgmental heuristics on self-efficacy judgments and behavior. *Journal of Personality and Social Psychology, 50,* 492–501.

Cialdini, R. B., Borden, R. J., Thorne, A., Walker, M. R., Freeman, S., & Sloan, L. R. (1976). Basking in reflected glory: Three (football) studies. *Journal of Personality and Social Psychology, 34,* 366–375.

Collins, R. L. (1996). For better or worse: The impact of upward social comparison on self-evaluations. *Psychological Bulletin, 119,* 51–69.

Conway, M., & Ross, M. (1984). Getting what you want by revising what you had. *Journal of Personality and Social Psychology, 47,* 738–748.

Dermer, M., Cohen, S. J., Jacobson, E., & Anderson, E. A. (1979). Evaluative judgments of aspects of life as a function of vicarious exposure to hedonic extremes. *Journal of Personality and Social Psychology, 37,* 247–260.

Dijksterhuis, A., Spears, R., Postmes, T., Stapel, D. A., Koomen, W., van Knippenberg, A., et al. (1998). Seeing one thing and doing another: Contrast effects in automatic behavior. *Journal of Personality and Social Psychology, 75,* 862–871.

Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality and development.* Lillington, NC: Taylor & Francis.

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72,* 218–232.

Epstein, S., Lipson, A., Holstein, C., & Huh, E. (1992). Irrational reactions to negative outcomes: Evidence for two conceptual systems. *Journal of Personality and Social Psychology, 62,* 328–339.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7,* 117–140.

Förster, J., Grant, H., Idson, L. C., & Higgins, E. T. (2001). Success/failure feedback, expectancies, and approach/avoidance motivation: How regulatory focus moderates classic relations. *Journal of Experimental Social Psychology, 37*, 253–260.

Förster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and avoidance strength through goal attainment: Regulatory focus and the "goal looms larger" effect. *Journal of Personality and Social Psychology, 75,* 1115–1131.

Gardner, W. L., Gabriel, S., & Hochschild, L. (2002). When you and I are "we," you are not threatening: The role of self-expansion in social comparison. *Journal of Personality and Social Psychology, 82,* 239–251.

Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999). "I" value freedom, but "we" value relationships: Self-construal priming mirrors cultural differences in judgment. *Psychological Science, 10,* 321–326.

Gibbons, F. X., Blanton, H., Gerrard, M., & Buunk, B. P. (2000). Does social comparison make a difference? Optimism as a moderator of the impact of comparison level on outcome. *Personality and Social Psychology Bulletin, 26,* 637–648.

Gilovich, T., & Medvec, V. H. (1994). The temporal pattern to the experience of regret. *Journal of Personality and Social Psychology, 67,* 357–365.

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79,* 701–721.

Grieve, F. G., Houston, D. A., Dupuis, S. E., & Eddy, D. (1999). Counterfactual production and achievement orientation in competitive athletic settings. *Journal of Applied Social Psychology, 29,* 2177–2202.

Helson, H. (1964). *Adaptation-level theory.* New York: Harper & Row.

Herr, P. M., Sherman, S. J., & Fazio, R. H. (1983). On the consequences of priming: Assimilation and contrast effects. *Journal of Experimental Social Psychology, 19,* 323–340.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*, 319-340.

Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 30, pp. 1–46). San Diego, CA: Academic.

Higgins, E. T., Shah, J., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as a moderator. *Journal of Personality and Social Psychology, 72,* 515–525.

Hirt, E. R., & Markman, K. D. (1995). Multiple explanation: A consider-an-alternative strategy for debiasing judgments. *Journal of Personality and Social Psychology, 69,* 1069–1086.

Hirt, E. R., Melton, R. J., McDonald, H. E., & Harackiewicz, J. M. (1996). Processing goals, task interest, and the mood-performance relationship: A mediational analysis. *Journal of Personality and Social Psychology, 71,* 245–261.

Hsee, C. K., Salovey, P., & Abelson, R. P. (1994). The quasi-acceleration relation: Satisfaction as a function of the change of velocity of outcome over time. *Journal of Experimental Social Psychology, 30,* 96–111.

Hur, T. (2000). Counterfactual thinking and regulatory focus: Upward versus downward counterfactuals and promotion versus prevention. *Dissertation Abstracts International, 60,* 6422B.

Idson, L. C., Liberman, N., & Higgins, E. T. (2000). Distinguishing gains from nonlosses and losses from nongains: A regulatory focus perspective on hedonic intensity. *Journal of Experimental Social Psychology, 36*, 252-274.

Johnson, M. K., & Sherman, S. J. (1990). Constructing and reconstructing the past and the future in the present. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (pp. 482–526). New York: Guilford.

Jones, E. E., & Wortman, C. (1973). *Ingratiation: An attributional approach.* Morristown, NJ: General Learning Press.

Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review, 93,* 136–153.

Kahneman, D., & Varey, C. A. (1990). Propensities and counterfactuals: The loser that almost won. *Journal of Personality and Social Psychology, 59,* 1101–1110.

Karniol, R., & Ross, M. (1996). The motivational impact of temporal focus: Thinking about the future and the past. *Annual Review of Psychology, 47,* 593–620.

Klinger, E. (1990). *Daydreaming: Using waking fantasy and imagery for self-knowledge and creativity.* Los Angeles: Tarcher.

Koehler, D. J. (1991). Explanation, imagination, and confidence in judgment. *Psychological Bulletin, 110,* 499–519.

Kruglanski, A. W., & Mayseless, O. (1990). Classic and current social comparison research: Expanding the perspective. *Psychological Bulletin, 108,* 195–208.

Landman, J. (1987). Regret and elation following action and inaction: Affective responses to positive versus negative outcomes. *Personality and Social Psychology Bulletin, 13,* 524–536.

Landman, J. (1993). *Regret: Persistence of the possible.* New York: Oxford University Press.

Landman, J., & Petty, R. (2000). "It could have been you": How states exploit counterfactual thought to market lotteries. *Psychology and Marketing, 17,* 299–321.

Larsen, J. T., McGraw, A. P., & Cacioppo, J. T. (2001). Can people feel happy and sad at the same time? *Journal of Personality and Social Psychology, 81,* 684–696.

Lee, A. Y., Aaker, J., & Gardner, W. L. (2000). The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus. *Journal of Personality and Social Psychology, 78,* 1122–1134.

Lockwood, P. (2002). Could it happen to you? Predicting the impact of downward comparisons on the self. *Journal of Personality and Social Psychology, 82,* 343–358.

Lockwood, P., Jordan, C. H., & Kunda, Z. (2002). Motivation by positive or negative role models: Regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology, 83,* 854–864.

Lockwood, P., & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology, 73,* 91–103.

Major, B., Testa, M., & Bylsma, W. H. (1991). Responses to upward and downward social comparisons: The impact of esteem-relevance and perceived control. In J. Suls & T. A. Wills (Eds.), *So-*

cial comparison: Contemporary theory and research (pp. 237–260). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Mandel, D. R., & Lehman, D. R. (1996). Counterfactual thinking and ascriptions of cause and preventability. *Journal of Personality and Social Psychology, 71,* 450–463.

Markman, K. D., Elizaga, R., Ratcliff, J. J., & McMullen, M. N. (2002). [Evidence for the operation of an accessibility mechanism in counterfactual thinking]. Unpublished raw data.

Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1993). The mental simulation of better and worse possible worlds. *Journal of Experimental Social Psychology, 29,* 87–109.

Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1995). The impact of perceived control on the imagination of better and worse possible worlds. *Personality and Social Psychology Bulletin, 21,* 588–595.

Markman, K. D., & Tetlock, P. E. (2000). Accountability and close counterfactuals: The loser that almost won and the winner that almost lost. *Personality and Social Psychology Bulletin, 26,* 1213–1224.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98,* 224–253.

Markus, H. R., & Nurius, P. (1986). Possible selves. *American Psychologist, 41,* 954–969.

Martin, L. L., Ward, D. W., Achee, J. W., & Wyer, R. S. (1993). Mood as input: People have to interpret the motivational implications of their moods. *Journal of Personality and Social Psychology, 64,* 317–326.

McFarland, C., & Alvaro, C. (2000). The impact of motivation on temporal comparisons: Coping with traumatic events by perceiving personal growth. *Journal of Personality and Social Psychology, 79,* 327–343.

McFarland, C., Ross, M., & Giltrow, M. (1992). Biased recollections in older adults: The role of implicit theories of aging. *Journal of Personality and Social Psychology, 62,* 837–850.

McGregor, I., Newby-Clark, I. R., & Zanna, M. P. (1999). "Remembering" dissonance: Simultaneous accessibility of inconsistent cognitive elements moderates epistemic discomfort. In E. Harmon-Jones & J. Mills (Eds.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (pp. 325–353). Washington, DC: American Psychological Association.

McMullen, M. N. (1997). Affective contrast and assimilation in counterfactual thinking. *Journal of Experimental Social Psychology, 33,* 77–100.

McMullen, M. N., & Eppers, N. (2001). *The impact of counterfactual thinking on motivation and task persistence.* Paper presented at the American Psychological Association Conference, San Francisco, CA.

McMullen, M. N., & Markman, K. D. (2000). Downward counterfactuals and motivation: The wake-up call and the Pangloss effect. *Personality and Social Psychology Bulletin, 26,* 575–584.

McMullen, M. N., & Markman, K. D. (2002). Affective impact of close counterfactuals: Implications of possible futures for possible pasts. *Journal of Experimental Social Psychology, 38,* 64–70.

McMullen, M. N., Markman, K. D., & Gavanski, I. (1995). Living in neither the best nor worst of all possible worlds: Antecedents and consequences of upward and downward counterfactual thinking. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 133–167). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Medvec, V. H., Madey, S. F., & Gilovich, T. (1995). When less is more: Counterfactual thinking and satisfaction among Olympic athletes. *Journal of Personality and Social Psychology, 69,* 603–610.

Medvec, V. H., & Savitsky, K. K. (1997). When doing better means feeling worse: A model of counterfactual cutoff points. *Journal of Personality and Social Psychology, 72,* 1284–1296.

Meichenbaum, D. H. (1971). Examination of model characteristics in reducing avoidance behavior. *Journal of Personality and Social Psychology, 17,* 298–307.

Mellers, B. A., Schwartz, A., Ho, K., & Ritov, I. (1997). Decision affect theory: Emotional reactions to the outcomes of risky options. *Psychological Science, 8,* 423–429.

Miller, D. T., & McFarland, C. (1986). Counterfactual thinking and victim compensation: A test of norm theory. *Personality and Social Psychology Bulletin, 12,* 513–519.

Morse, S., & Gergen, K. J. (1970). Social comparison, self-consistency, and the concept of self. *Journal of Personality and Social Psychology, 16,* 148–156.

Mussweiler, T. (2001a). Focus of comparison as a determinant of assimilation and contrast in social comparison. *Personality and Social Psychology Bulletin, 27,* 38–47.

Mussweiler, T. (2001b). "Seek and ye shall find": Antecedents of assimilation and contrast in social comparison. *European Journal of Social Psychology, 31,* 499–509.

Mussweiler, T. (2003). Comparison processes in social judgment: Mechanisms and consequences. *Psychological Review, 110.*

Mussweiler, T., & Bodenhausen, G. (2002). I know you are but what am I? Self-evaluative consequences of judging ingroup and outgroup members. *Journal of Personality and Social Psychology, 82,* 19–32.

Mussweiler, T., & Strack, F. (2000a). Consequences of social comparison: Selective accessibility, assimilation, and contrast. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 253–270). New York: Kluwer/Plenum.

Mussweiler, T., & Strack, F. (2000b). The "relative self": Informational and judgmental consequences of comparative self-evaluation. *Journal of Personality and Social Psychology, 79,* 23–38.

Nasco, S. A., & Marsh, K. L. (1999). Gaining control through counterfactual thinking. *Personality and Social Psychology Bulletin, 25,* 556–568.

Norem, J. K., & Cantor, N. (1986). Defensive pessimism: Harnessing anxiety as motivation. *Journal of Personality and Social Psychology, 51,* 1208–1217.

Oettingen, G. (1996). Positive fantasy and motivation. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to action* (pp. 236–259). New York: Guilford.

Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition, 18,* 101–129.

Oettingen, G., & Mayer, D. (2002). The motivating function of thinking about the future: Expectations versus fantasies. *Journal of Personality and Social Psychology, 83,* 1198–1212.

Oettingen, G., Pak, H., & Schnetter, K. (2001). Self-regulation of goal setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology, 80,* 736–753.

Olson, J. M., Buhrmann, O., & Roese, N. J. (2000). Comparing comparisons: An integrative perspective on social comparison and counterfactual thinking. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 379–398). New York: Kluwer/Plenum.

Parducci, A. (1965). Category judgment: A range-frequency model. *Psychological Review, 72,* 407–418.

Parducci, A., & Marshall, L. M. (1962). Assimilation versus contrast in the anchoring of perceptual judgment of weight. *Journal of Experimental Psychology, 63,* 426–437.

Pelham, B. W., & Wachsmuth, J. O. (1995). The waxing and waning of the social self: Assimilation and contrast in social comparison. *Journal of Personality and Social Psychology, 69,* 825–838.

Pennington, G. L., & Roese, N. J. (2002). Regulatory focus and mental simulation. In S. J. Spencer, M. P. Zanna, & J. M. Olson (Eds.), *Motivated social perception: The Ontario Symposium* (Vol. 9, pp. 277–298). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Roese, N. J. (1994). The functional basis of counterfactual thinking. *Journal of Personality and Social Psychology, 66,* 805–818.

Roese, N. J. (1997). Counterfactual thinking. *Psychological Bulletin, 121,* 133–148.

Roese, N. J., Hur, T., & Pennington, G. L. (1999). Counterfactual thinking and regulatory focus: Implications for action versus inaction and sufficiency versus necessity. *Journal of Personality and Social Psychology, 77,* 1109–1120.

Roese, N. J., & Olson, J. M. (1995a). Counterfactual thinking: A critical overview. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 1–59). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Roese, N. J., & Olson, J. M. (1995b). Functions of counterfactual thinking. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 169–197). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Roese, N. J., & Olson, J. M. (1997). Counterfactual thinking: The intersection of affect and function. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 1–59). San Diego, CA: Academic.

Roese, N. J., Sanna, L. J., & Galinsky, A. D. (2003). The mechanics of imagination: Automaticity and counterfactual thinking. In J. A. Bargh, J. Uleman, & R. Hassin (Eds.), *The new unconscious.* New York: Cambridge University Press.

Ross, L., Lepper, M. R., Strack, F., & Steinmetz, J. (1977). Social explanation and social expectation: Effects of real and hypothetical explanations on subjective likelihood. *Journal of Personality and Social Psychology, 35,* 817–829.

Ross, M. (1989). The relation of implicit theories to the construction of personal histories. *Psychological Review, 96,* 341–357.

Ross, M., & Wilson, A. E. (2000). Constructing and appraising past selves. In D. L. Schachter & E. Scarry (Eds.), *Memory, brain, and belief* (pp. 231–258). Cambridge, MA: Harvard University Press.

Sanna, L. J. (1996). Defensive pessimism, optimism, and simulating alternatives: Some ups and downs of prefactual and counterfactual thinking. *Journal of Personality and Social Psychology, 71,* 1020–1036.

Sanna, L. J. (1997). Self-efficacy and counterfactual thinking: Up the creek with and without a paddle. *Personality and Social Psychology Bulletin, 23,* 654–666.

Sanna, L. J. (1998). Defensive pessimism and optimism: The bittersweet influence of mood on performance and prefactual and counterfactual thinking. *Cognition and Emotion, 12,* 635–665.

Sanna, L. J. (2000). Mental simulation, affect, and personality: A conceptual framework. *Current Directions in Psychological Science, 9,* 168–173.

Sanna, L. J., Chang, E. C., & Meier, S. (2001). Counterfactual thinking and self-motives. *Personality and Social Psychology Bulletin, 27,* 1023–1034.

Sanna, L. J., Meier, S., & Wegner, E. A. (2001). Counterfactuals and motivation: Mood as input to affective enjoyment and preparation. *British Journal of Social Psychology, 40,* 235–256.

Sanna, L. J., Turley-Ames, K. J., & Meier, S. (1999). Mood, self-esteem, and simulated alternatives: Thought-provoking affective influences on counterfactual direction. *Journal of Personality and Social Psychology, 76,* 543–558.

Savitsky, K., Medvec, V. H., & Gilovich, T. (1997). Remembering and regretting: The Zeigarnik effect and the cognitive availability of regrettable actions and inactions. *Personality and Social Psychology Bulletin, 23,* 248–257.

Schlenker, B. R. (1982). Translating actions into attitudes: An identity-analytic approach to the explanation of social conduct. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 15, pp. 194–248). New York: Academic.

Schwarz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 527–561). New York: Guilford.

Schwarz, N., & Bless, H. (1992). Constructing reality and its alternatives: An inclusion/exclusion model of assimilation and contrast effects in social judgment. In L. L. Martin & A. Tesser (Eds.), *The construction of social judgments* (pp. 217–245). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology, 45,* 513–523.

Seta, J. (1982). The impact of comparison processes on coactors' task performance. *Journal of Personality and Social Psychology, 42,* 281–291.

Shah, J., & Higgins, E. T. (2001). Regulatory concerns and appraisal efficiency: The general impact of promotion and prevention. *Journal of Personality and Social Psychology, 80,* 693–705.

Shah, J., Higgins, E. T., & Friedman, R. (1998). Performance incentives and means: How regulatory focus influences goal attainment. *Journal of Personality and Social Psychology, 74,* 285–293.

Sheldon, K. M., & Houser-Marko, L. (2001). Self-concordance, goal attainment, and the pursuit of happiness: Can there be an upward spiral? *Journal of Personality and Social Psychology, 80,* 152–165.

Shepperd, J. A., & McNulty, J. K. (2002). The affective consequences of expected and unexpected outcomes. *Psychological Science, 13,* 85–88.

Sherif, M., & Cantril, H. (1947). *The psychology of ego-involvements.* New York: Wiley.

Sherif, M., & Hovland, C. I. (1961). *Social judgment: Assimilation and contrast effects in communication and attitude change.* New Haven, CT: Yale University Press.

Sherman, S. J., Cialdini, R. B., Schwartzman, D. F., & Reynolds, K. D. (1985). Imagining can heighten or lower the perceived likelihood of contracting a disease: The mediating effect of ease of imagery. *Personality and Social Psychology Bulletin, 11,* 118–127.

Sherman, S. J., & McConnell, A. R. (1995). Dysfunctional implications of counterfactual thinking. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 199–231). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Sherman, S. J., Zehner, K. S., Johnson, J., & Hirt, E. R. (1983). Social explanation: The role of timing, set, and recall on subjective likelihood estimates. *Journal of Personality and Social Psychology, 44,* 1127–1143.

Showers, C. (1992). The motivational and emotional consequences of considering positive or negative possibilities for an upcoming event. *Journal of Personality and Social Psychology, 63,* 474–484.

Siegel-Jacobs, K., & Yates, J. F. (1996). Effects of procedural and outcome accountability on judgment quality. *Organizational Behavior and Human Decision Processes, 65,* 1–17.

Simonson, I., & Staw, B. M. (1992). Deescalation strategies: A comparison of techniques for reducing commitment to losing courses of action. *Journal of Applied Psychology, 77,* 419–426.

Singer, J. L. (1966). *Daydreaming.* New York: Random House.

Smith, E. R., Coats, S., & Walling, D. (1999). Overlapping mental representations of self, in-group, and partner: Further response-time evidence and a connectionist model. *Personality and Social Psychology Bulletin, 25,* 873–882.

Smith, E. R., & Henry, S. (1996). An in-group becomes part of the self: Response time evidence. *Personality and Social Psychology Bulletin, 22,* 635–642.

Smith, R. H. (2000). Assimilative and contrastive emotional reactions to upward and downward social comparisons. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 173–200). New York: Kluwer/Plenum.

Srull, T. K., & Gaelick, L. (1983). General principles and individual differences in the self as a habitual reference point: An examination of self-other judgments of similarity. *Social Cognition, 2,* 108–121.

Stapel, D. A., & Koomen, W. (2000). Distinctness of others, mutability of selves: Their impact on self-evaluations. *Journal of Personality and Social Psychology, 79,* 1068–1087.

Stapel, D. A., & Koomen, W. (2001). Let's not forget the past when we go into the future: On our knowledge of knowledge accessibility. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton Symposium on the Legacy and Future of Social Cognition* (pp. 229–246). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Stapel, D. A., Koomen, W., & Van der Plight, J. (1996). The referents of trait inferences: The impact of trait concepts versus actor-trait links on subsequent judgments. *Journal of Personality and Social Psychology, 70,* 437–450.

Stapel, D. A., Koomen, W., & Van der Plight, J. (1997). Categories of category accessibility: The impact of trait versus exemplar priming on person judgments. *Journal of Experimental Social Psychology, 33,* 44–76.

Strack, F. (1992). The different routes to social judgments: Experiential versus informational strategies. In L. L. Martin & A. Tesser (Eds.), *The construction of social judgments* (pp. 249–275). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Strack, F., Schwarz, M., & Gschneidinger, E. (1985). Happiness and reminiscing: The role of time perspective, affect, and mode of thinking. *Journal of Personality and Social Psychology, 49*, 1460–1469.

Suls, J., Marco, C. A., & Tobin, S. (1991). The role of temporal comparison, social comparison and direct appraisal in the elderly's self-evaluations of health. *Journal of Applied Social Psychology, 21,* 1125–1144.

Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization–minimization hypothesis. *Psychological Bulletin, 110,* 67–85.

Taylor, S. E., & Lobel, M. (1989). Social comparison activity under threat: Downward evaluation and upward contacts. *Psychological Review, 96,* 569–575.

Taylor, S. E., Neter, E., & Wayment, H. A. (1995). Self-evaluation processes. *Personality and Social Psychology Bulletin, 21,* 1278–1287.

Taylor, S. E., & Schneider, S. K. (1989). Coping and the simulation of events. *Social Cognition, 7,* 174–194.

Taylor, S. E., Wayment, H. A., & Carillo, M. (1996). Social comparison, self-regulation, and motivation. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (pp. 3–27). New York: Guilford.

Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21, pp. 181–227). New York: Academic.

Tesser, A. (1991). Emotion in social comparison and reflection processes. In J. Suls & T. A. Wills (Eds.), *Social comparison: Contemporary theory and research* (pp. 115–145). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Tesser, A., & Campbell, J. (1982). Self-evaluation and the perception of friends and strangers. *Journal of Personality, 59,* 261–279.

Tesser, A., Miller, M., & Moore, J. (1988). Some affective consequences of social comparison and reflection processes: The pain and pleasure of being close. *Journal of Personality and Social Psychology, 54,* 49–61.

Testa, M., & Major, B. (1990). The impact of social comparison after failure: The moderating effects of perceived control. *Basic and Applied Social Psychology, 11,* 205–218.

Tetlock, P. E. (1998). Close-call counterfactuals and belief-system defenses: I was not almost wrong but I was almost right. *Journal of Personality and Social Psychology, 75,* 639–652.

Trafimow, D., Triandis, H. C., & Goto, S. G. (1991). Some tests of the distinction between the private self and the collective self. *Journal of Personality and Social Psychology, 60,* 649–655.

Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review, 96,* 506–520.

Tversky, A. (1977). Features of similarity. *Psychological Review, 84,* 327–352.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185,* 1124–1130.

Wedell, D. H., & Parducci, A. (2000). Social comparison: Lessons from basic research on judgment. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 223–252). New York: Kluwer/Plenum.

Wegener, D. T., & Petty, R. E. (1997). The flexible correction model: The role of naïve theories of bias in bias correction. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 141–208). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Weiner, B. (1985). "Spontaneous" causal thinking. *Psychological Bulletin, 97,* 74–84.

Wells, G. L., & Gavanski, I. (1989). Mental simulation of causality. *Journal of Personality and Social Psychology, 56,* 161–169.

Where were you? (2001, September 17). *USA Today,* p. A3.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin, 90,* 245–271.

Wilson, A. E., & Ross, M. (2000). The frequency of temporal-self and social comparisons in people's personal appraisals. *Journal of Personality and Social Psychology, 78,* 928–942.

Wilson, A. E., & Ross, M. (2001). From chump to champ: People's appraisals of their earlier and present selves. *Journal of Personality and Social Psychology, 80,* 572–584.

Wood, J. V., & VanderZee, K. (1997). Social comparisons among cancer patients: Under what conditions are comparisons upward and downward? In B. P. Buunk & F. X. Gibbons (Eds.), *Health, coping, and well-being* (pp. 299–328). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Zeigarnik, B. (1935). On finished and unfinished tasks. In K. Lewin (Ed.), *A dynamic theory of personality* (pp. 300–314). New York: McGraw-Hill.