

Inclusion–Exclusion of Positive and Negative Past Selves: Mood Congruence as Information

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The current research challenges the widespread truism that recalling a positive self necessarily increases self-esteem, whereas recalling a negative self necessarily decreases self-esteem. Four experiments demonstrate that chronically happy people show a relative increase in self-esteem by recalling either a positive or a negative self. Chronically sad people, however, show a relative decrease in self-esteem by recalling either a positive or a negative self. These effects are due to divergent perceptions of mood congruence between the recalled self and the current self. Specifically, happy people perceive high mood congruence between a recalled positive self and the current self but low mood congruence between a recalled negative self and the current self. In contrast, sad people perceive high mood congruence between a recalled negative self and the current self but low mood congruence between a recalled positive self and the current self. Independent of chronic mood, mood congruence leads to perceptions of temporal recency, whereas mood incongruence leads to perceptions of temporal distance. In line with the inclusion–exclusion model of social judgment, perceived temporal recency elicits assimilation effects on self-esteem, whereas perceived temporal distance elicits contrast effects on self-esteem.

Keywords: mood congruence, temporal distance, past self, chronic mood, self-esteem

According to common wisdom, thinking about personal glories increases self-esteem and subjective well-being, whereas thinking about personal failures decreases self-esteem and subjective well-being. This truism is also evident in psychological research and practice. For example, Wildschut, Sedikides, Arndt, and Routledge (2006) claimed that nostalgia (i.e., the recall of predominantly positively valenced episodes from one's personal past) is a means for self-esteem boost (see also Routledge, Arndt, Sedikides, & Wildschut, 2008; Sedikides, Wildschut, & Baden, 2004). In the clinical realm, reminiscence therapy (Haight, 1988) seeks to increase subjective well-being by asking elderly clients to recall happy times from their past. Furthermore, recalling extremely positive episodes from one's personal past is frequently used to induce happy mood (e.g., see Martin, 1990; Sedikides, 1992, 1995). These findings all suggest that the current self is inevitably *assimilated* toward the recalled self. That is, remembering positive information from one's personal past is assumed to be included in

one's current self-concept, resulting in higher self-esteem and/or subjective well-being. Put simply, thinking about our glorious past is assumed to make us feel like heroes in the present.

We believe this assumption does not apply to everyone. In this article, we report four experiments providing evidence that some people *contrast* their current self away from a recalled positive self. For these people, recalling positive information operates as a standard of comparison against which the current self is judged (cf. Blanton, 2001; Schwarz & Bless, 1992, 2007). Relative to this positive comparison standard, the current self should appear negative, lowering self-esteem and/or subjective well-being. In other words, we suggest that thinking about one's glorious past makes some people feel like losers in the present.

Who are the people who feel like heroes, and who are the people who feel like losers after thinking about glorious past selves? The overarching hypothesis in this research is that recalling a positive past self leads to a relative increase in self-esteem for *chronically happy people* but to a relative decrease in self-esteem for *chronically sad people*. Thus, we hypothesize that, after recalling glorious past selves, chronically happy people feel like heroes, whereas chronically sad people feel like losers. The rationale for this hypothesis is outlined below and illustrated in Figure 1, in what we refer to as the mood congruence model (MCM) of temporal comparison.

According to the MCM, chronically happy people should perceive *mood congruence* between a recalled positive self and their current self. Past research on ease of retrieval effects (Schwarz, Bless, Strack, Klumpp, Rittenauer-Schatka, & Simons, 1991), vividness of recall effects (R. Brown, Rippes, & Shevell, 1985; Hishi-

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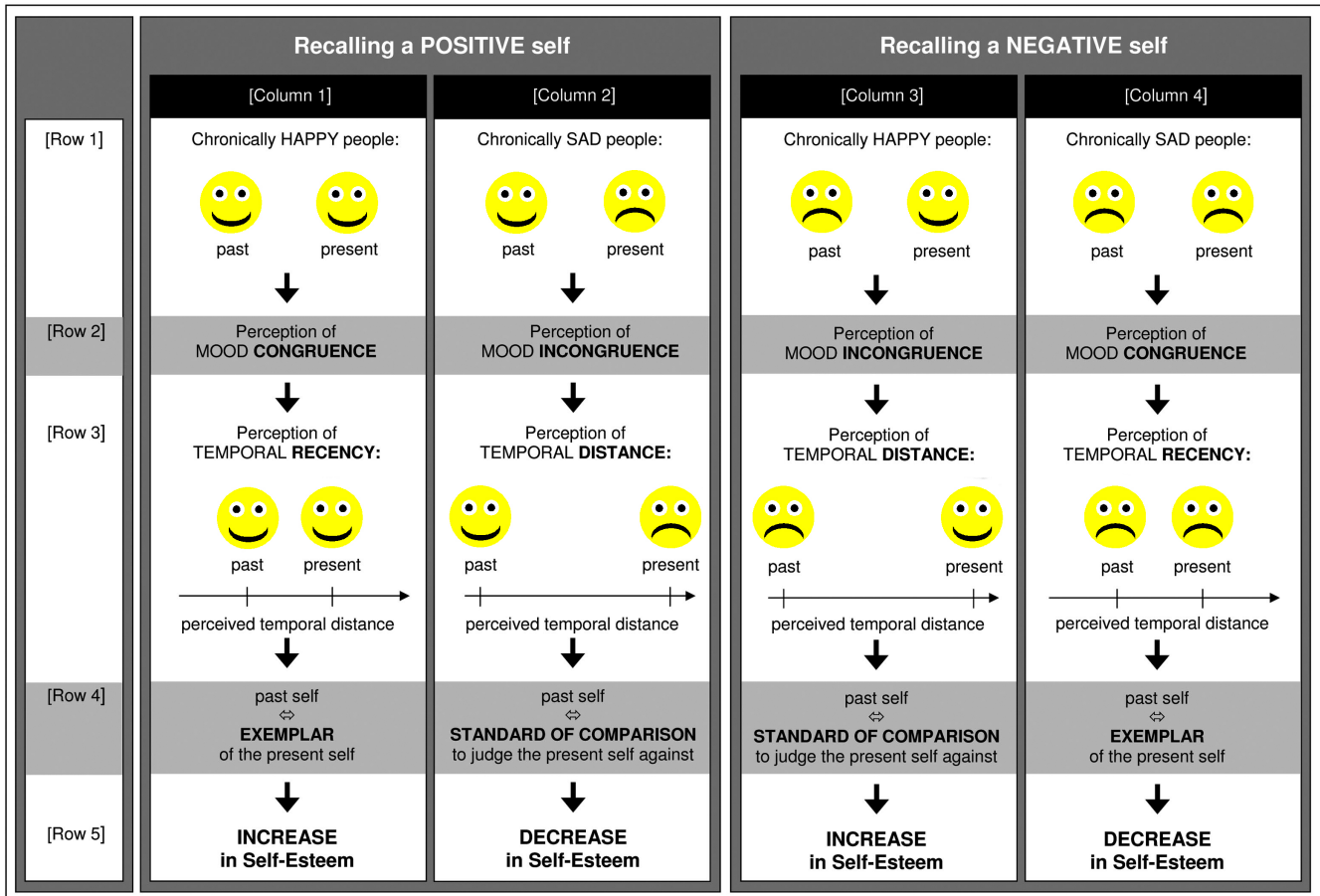


Figure 1. The mood congruence model of temporal comparison.

tani, 1985), and feature overlap effects (J. D. Brown, Novick, Lord, & Richards, 1992; Schwarz & Bless, 2007) all suggest that perceptions of mood congruence should foster the feeling that the recalled positive self is *temporally recent* (i.e., “it feels like yesterday”). Further, past research (Broemer, Grabowski, Gebauer, Ermel, & Diehl, 2008; Strack, Schwarz, & Gschneidinger, 1985; for a review see Schwarz & Strack, 1999) has shown that perceiving a recalled self as temporally recent fosters the impression that this recalled self is still a valid part of the current self. Therefore, the recalled self serves as an exemplar for the current self, resulting in the inclusion of the recalled self in the current self (i.e., assimilation; see Markman & McMullen, 2003; Mussweiler, 2003; Schwarz & Bless, 1992, 2007; Stapel & Koomen, 2000; for a general review, see Stapel & Suls, 2007). In short, when recalling a positive past self, chronically happy people (see Figure 1, column 1, row 1) should perceive mood congruence between the recalled positive self and the current self (see Figure 1, column 1, row 2). The perception of mood congruence should foster feelings of temporal recency between the past and the current self (see Figure 1, column 1, row 3). The perception of temporal recency should elicit the feeling that the recalled positive self is a part of the current self (see Figure 1, column 1, row 4). Hence, chronically happy people should show a relative increase in self-esteem (see Figure 1, column 1, row 5).

Exactly the opposite should be the case for chronically sad people. According to the MCM, chronically sad people should perceive *mood incongruence* between a recalled positive self and their current self. As suggested by past research (see below), perceptions of mood incongruence should foster the feeling that the recalled positive self is *temporally distant* (i.e., “it feels like centuries ago”). Further, past research has shown that perceiving a recalled self as temporally distant fosters the impression that this recalled self is no longer a valid part of the current self. In this case, the recalled self serves as a standard of comparison against which the current self is judged, resulting in the exclusion of the recalled self from the current self (i.e., contrast). In short, when recalling a positive past self, chronically sad people (see Figure 1, column 2, row 1) should perceive mood incongruence between the recalled positive self and the current self (see Figure 1, column 2, row 2). The perception of mood incongruence should foster feelings of temporal distance between the past and the current self (see Figure 1, column 2, row 3). The perception of temporal distance should elicit the feeling that the recalled positive self is no longer a part of the current self. Hence, the current self should be compared with the positive past self (see Figure 1, column 2, row 4), making the current self look inferior in comparison. As such, chronically sad people should show a relative decrease in self-esteem (see Figure 1, column 2, row 5).

So far, we have outlined the implications of the MCM for recalling a positive past self. Of course, the recall of past selves is not restricted to remembering past glories. Thus, what does the MCM predict concerning the implications of recalling a negative past self? When asked to recall a negative past self, the MCM suggests that chronically happy people (see Figure 1, column 3, row 1) should perceive *mood incongruence* between a recalled negative self and their current self (see Figure 1, column 3, row 2). Perceptions of mood incongruence should foster the feeling that the recalled negative self is *temporally distant* (see Figure 1, column 3, row 3), giving the impression that this recalled self is no longer a valid part of the current self. Therefore, the recalled self serves as a standard of comparison against which the current self is judged, resulting in the exclusion of the recalled self from the current self (i.e., contrast; see Figure 1, column 3, row 4). Thus, chronically happy people should show a relative increase in self-esteem (see Figure 1, column 3, row 5).

Exactly the opposite should be the case for chronically sad people. When recalling a negative past self, the MCM suggests that chronically sad people (see Figure 1, column 4, row 1) should perceive *mood congruence* between a recalled negative self and their current self (see Figure 1, column 4, row 2). Perceptions of mood congruence should foster the feeling that the recalled negative self is *temporally recent* (see Figure 1, column 4, row 3), giving the impression that this recalled self is still a valid part of the current self. Therefore, the recalled self serves as an exemplar for the current self, resulting in the inclusion of the recalled self in the current self (i.e., assimilation; see Figure 1, column 4, row 4). Thus, chronically sad people should show a relative decrease in self-esteem (see Figure 1, column 4, row 5).

The provocative implication of the MCM is that chronically happy people should show a relative increase in self-esteem when recalling either a positive or a negative past self, whereas chronically sad people should show a relative decrease in self-esteem when recalling either a positive or a negative past self. In other words, the MCM predicts that chronically happy people show a relative increase in self-esteem whatever valenced self they recall, whereas chronically sad people show a relative decrease in self-esteem whatever valenced self they recall.

Processes Underlying the MCM

The processes that underlie the MCM have partly been suggested and supported by other research. First, the prediction that perceived temporal recency between a recalled and the current self evokes assimilation effects, whereas perceived temporal distance evokes contrast effects (see link between rows 3, 4, and 5 in Figure 1), is based on the inclusion–exclusion model of social judgment (Schwarz & Bless, 1992, 2007). In the present context, perceiving temporal recency between a recalled self and the current self leads the recalled self to be included in the representation of the current self, eliciting assimilation. However, perceiving temporal distance between a recalled self and the current self leads the recalled self to be excluded from the representation of the current self, eliciting contrast.

Moreover, the core of MCM—that perceived mood congruence between a recalled self and the current self leads to feelings of temporal recency (see link between rows 2 and 3 in Figure 1)—is in line with research investigating effects of ease of retrieval

(Schwarz et al., 1991), vividness of recall (R. Brown et al., 1985), and feature overlap (Schwarz & Bless, 2007; Stapel, 2007). Interestingly, although these lines of research all suggest that mood congruence between a recalled self and the current self should lead to feelings of temporal recency, they differ in the suggested process underlying this link. Research investigating the effects of ease of retrieval and vividness of recall suggests that mood congruence increases the ease and the vividness with which information is recalled (cf. mood-state-dependent retrieval effect; Blaney, 1986; Bower, 1981; Kenealy, 1997). At the same time, research has shown that ease and vividness of recall are used as heuristics to judge temporal distance, with easily and vividly recalled memories feeling temporally more recent than memories that are difficult to retrieve or feel vague and fuzzy (e.g., R. Brown et al., 1985; Herzog, Hansen, & Wänke, 2007; Sanna & Schwarz, 2003, 2004). Together then, research investigating effects of ease of retrieval and vividness of recall suggests that ease of retrieval and vividness of recall mediate the effect of mood congruence on perceived temporal distance.

On the other hand, research investigating the effects of feature overlap (Schwarz & Bless, 2007; Stapel, 2007) may also explain the effect of mood congruence on perceived temporal distance. Specifically, affect should be an important feature when it comes to valenced selves. This assumption is in line with the central role of the hedonic principle in people's lives (Kahneman, Diener, & Schwarz, 1999; Sedikides & Gregg, 2008). When recalling *valenced* selves, mood should be an especially relevant feature, and hence mood congruence should be an important type of feature overlap. Of importance, overlap between a recalled self and the current self has been assumed to foster feelings of personality continuity, which have been tied to the perception of temporal recency (cf. Beike & Niedenthal, 1998; Broemer et al., 2008). Together then, research investigating effects of feature overlap suggests that mood congruence is a particularly important type of feature overlap when recalling valenced selves, and hence mood congruence should have an effect on perceived temporal distance.

Both possible explanations for our assumption that mood congruence affects perceived temporal distance are theoretically sound and not mutually exclusive. We test which of these explanations applies to our model.

The Temporal Distance Bias

Although the primary aim of the current research is to challenge the widespread truism that recalling a positive self necessarily increases self-esteem and recalling a negative self necessarily decreases self-esteem, we also consider the mechanisms underlying the *temporal distance bias*. The temporal distance bias describes the phenomenon that people perceive positive past selves as temporally more recent than negative past selves. Prior research has suggested that the temporal distance bias is due to the motivation to self-enhance (Ross & Wilson, 2002). According to temporal self-appraisal theory (Ross & Wilson, 2000; Wilson & Ross, 2001), the general finding that a positive past self is perceived as more recent than a negative past self reflects people's attempts to willfully associate the current self with positive past selves and to dissociate it from negative past selves (cf. Ross & Conway, 1986; Ross & Wilson, 2000; Wilson & Ross, 2001, 2003). Ross and Wilson (2002) argued that this *motivational explanation* for the

temporal distance bias is supported by their finding that this bias is stronger for people with high self-esteem (cf. Libby, Eibach, & Gilovich, 2005; McFarland & Alvaro, 2000). According to Ross and Wilson (2002), self-esteem moderates the temporal distance bias because high self-esteem people engage more strongly in self-enhancement (Baumeister, 1998; Sedikides & Gregg, 2003; Sedikides & Strube, 1997). Complementing this research, the MCM suggests that the strength of the temporal distance bias is partly determined by *cognitive factors*. As illustrated in Figure 1, the MCM predicts that chronically happy people perceive a recalled positive self as more recent than a recalled negative self because they perceive similarities in chronic and recalled affective states. Following the same logic, the MCM predicts that chronically sad people perceive a recalled negative self as more recent than a recalled positive self.

Overview

Overall, in this research we pursue two goals. First, we use the MCM to challenge the common belief that people generally assimilate toward a recalled positive self and contrast themselves away from a recalled negative self. Second, we shed more light on the mechanisms underlying the temporal distance bias. We conducted four experimental studies to achieve our two goals. In Study 1, we show that chronic mood affects the direction of the temporal distance bias. Further, we show that perceived mood congruence mediates this effect. In Study 2, we replicate the findings of Study 1 using a different operationalization to test our hypothesis. More important, Study 2 rules out that the moderating effect of chronic mood on the temporal distance bias is spuriously caused by trait self-esteem. In Study 3, we replicate and extend the findings of Studies 1 and 2 by demonstrating that perceiving a recalled self as recent leads to an assimilation effect on self-esteem, whereas perceiving a recalled self as distant leads to a contrast effect on self-esteem. Finally, in Study 4, we replicate the results of the prior studies and show that an experimental manipulation of perceived temporal distance successfully undermines the naturally occurring differences in the temporal distance bias between happy and sad people. This last finding is important because it shows that interventions can be designed to prevent chronically sad people from decreasing their self-esteem by recalling past selves.

Study 1

In Study 1, we tested whether chronically happy people perceive a recalled positive self as temporally more recent than a recalled negative self *and* whether chronically sad people perceive a recalled negative self as temporally more recent than a recalled positive self. Further, we tested whether this effect is due to differences between happy and sad people in the perceived mood congruence between the recalled self and the current self.

Method

Participants

Ninety-five participants (73 women, 20 men, and 2 who did not respond) completed this online study (www.online-studies.org). The study was advertised on John Krantz's Web portal for online studies (<http://psych.hanover.edu/research/exponnet.html>). The

language of the study was English. The mean age of the participants was 27.08 years ($SD = 10.61$). The majority of the participants were from North America (77%). One additional participant was identified as an outlier and was excluded from the analyses. The reaction time of 1 further participant indicated that she took a long break from the study between the completion of the manipulation and the dependent measures, and thus she was also excluded from the analyses.

Materials and Procedure

After consenting to participate, participants completed a series of demographic items. Next, we assessed participants' chronic mood followed by the recall of either positive or negative personal episodes that took place 3–5 years ago. As a manipulation check, participants rated the valence of the recalled episodes. Finally, participants completed the dependent measures, which were perceived mood congruence and perceived temporal distance between the recalled self and the current self. At the end of the study, participants read a feedback page and were thanked for their participation.

Chronic mood. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) consists of a 10-item Positive Affect subscale and a 10-item Negative Affect subscale. Example items for the Positive Affect subscale are "enthusiastic" and "active." Example items for the Negative Affect subscale are "upset" and "ashamed." Participants indicated whether "I generally feel this way . . ." using a 5-point scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). As in previous research (e.g., Schimmack & Diener, 2003), positive and negative (reverse-scored) affect were combined to form one chronic mood score¹ ($\alpha = .89$).

Past self recall. In the positive (negative) past self condition, participants read the following:

We would like you now to think about the successes (failures) you had 3 to 5 years ago. That is, please close your eyes and visualize as many of your own personal successes (failures) as possible that took place 3 to 5 years ago. IN OTHER WORDS, THINK ABOUT ALL PERSONAL SUCCESSES (FAILURES) YOU EXPERIENCED 3 TO 5 YEARS AGO. Think solely about your own personal successes (failures) and disregard any personal failures (successes).

After visualizing as many successes (failures) as possible we would like you to write down the three most positive (negative) personal

¹ By averaging across both subscales, we treated chronic mood as a one-dimensional construct. Some prior research has found that positive and negative affect do not constitute the endpoints of a single dimension but instead constitute two independent dimensions (e.g., Watson et al., 1988). However, this perspective was challenged by Diener, Larsen, Levine, and Emmons (1985), who have argued that the one-dimensional nature of chronic mood was obscured by the failure to distinguish between the intensity and the frequency of affect. To test whether positive and negative (reverse-scored) affect have different moderating effects on the temporal distance bias, we conducted all analyses for positive affect and negative affect separately for all four studies. The results that used positive affect and negative affect independently mirrored each other and were also virtually identical to the results obtained by treating chronic mood as a one-dimensional construct. Therefore, for the sake of brevity, we only report the results obtained by the total chronic mood scale.

successes (failures) you had 3 to 5 years ago. Please describe one success (failure) in each of the three textboxes below.

Manipulation check. Participants received a list of the three episodes they listed as a part of the manipulation ($\alpha = .86$). Participants rated the valence of each episode on a 9-point rating scale ranging from -4 (*extreme failure*) to $+4$ (*extreme success*).

Perceived mood congruence. For each episode, perceived mood congruence was assessed with a semantic differential ranging from "My current mood is very different from the mood I was in at the time of Episode X" to "My current mood is very similar to the mood I was in at the time of Episode X." Participants responded by ticking on a 420 pixels long line. This line actually consisted of 60 squares. Thus, scores ranged from 1 to 60 ($\alpha = .79$).

Perceived temporal distance. For each episode, perceived temporal distance was assessed with two semantic differentials. Participants used the same response format as used to assess perceived mood congruence. The first semantic differential ranged from "Episode X feels very close" to "Episode X feels very distant." The second semantic differential scale ranged from "Episode X feels very near" to "Episode X feels very far away" ($\alpha = .82$). This measure was virtually identical to that used by Ross and Wilson (2002; Study 1).

To compute the internal consistencies for the perceived mood congruence and the perceived temporal distance measures, we reordered the three episodes for each participant so that Episode 1 was always the episode with the highest perceived mood congruence/temporal distance score, and Episode 3 was always the episode with the lowest perceived mood congruence/temporal distance score. This procedure is necessary to compute Cronbach's alpha because the order of the mood congruence items (i.e., the episodes) was determined by the participants themselves. Note that reordering the items does not affect the mean perceived mood congruence and perceived temporal distance scores.

Results and Discussion

To check whether people in the positive recall condition recalled a more positive self than people in the negative recall condition, we conducted a one-way analysis of variance with the valence manipulation as the sole factor, and the self-rated valence of the recalled self as the dependent variable. This analysis revealed that people in the positive recall condition indeed recalled a more positive self than people in the negative recall condition (see Table 1).

To test our hypothesis that chronic mood moderates the effect of recalling a valenced self on perceived temporal distance, we conducted a multiple regression analysis with valence of the recalled self (dummy coded) as a dichotomous predictor, chronic mood (centered) as a continuous predictor, and the cross-product of valence of the recalled self and chronic mood as a third predictor, with perceived temporal distance as the criterion (Cohen & Cohen, 1983). As illustrated in Figure 2 and Table 2, the results of this analysis support our hypothesis.²

Next, we decomposed this interaction to test the statistical significance of the four simple contrasts (Aiken & West, 1991). First, we tested the relation between chronic mood and perceived

Table 1

Descriptive Statistics and Significance Tests to Check the Effectiveness of the Valenced Recall Manipulation

Study	<i>M</i>		<i>SD</i>		ANOVA	
	Positive recall	Negative recall	Positive recall	Negative recall	<i>F</i>	<i>p</i>
1	2.51	-1.55	1.10	1.59	197.47	.001
2	2.38	-2.06	1.72	1.83	160.98	.001
3	2.71	-1.55	1.22	2.03	253.29	.001
4	2.52	-2.11	1.79	1.83	446.07	.001

Note. Dependent variable = perceived valence of the recalled self; ANOVA = analysis of variance.

temporal distance for participants in the positive recall and the negative recall conditions separately. As can be seen in Figure 2 and Table 2, chronically happy people perceived a recalled negative past self as temporally more distant than chronically sad people (Contrast D), whereas chronically happy people perceived a recalled positive self as marginally more recent than chronically sad people (Contrast B). Second, to test our hypotheses that chronically happy (sad) people perceived a recalled positive (negative) self as temporally more recent than a recalled negative (positive) self, we tested the relation between valence of the past self and perceived temporal distance at values one standard deviation below and above the mean of chronic mood. As can be seen in Figure 2 and Table 2, chronically happy people perceived the recalled positive self as temporally more recent than the recalled negative self (Contrast C), whereas chronically sad people showed a tendency to perceive the recalled negative self as temporally more recent than the recalled positive self (Contrast A), although this effect was not significant.

To test whether perceived mood congruence mediated the Valence of the Recalled Self \times Chronic Mood effect on perceived temporal distance, we followed the recommendations by Baron and Kenny (1986). Specifically, in Step 1, it has to be shown that the independent variable (i.e., the interaction between valence of the recalled self and chronic mood) predicts the dependent variable (i.e., perceived temporal distance). As shown above, this criterion was met. In Step 2, it has to be shown that the independent variable (i.e., the interaction between valence of the recalled self and chronic mood) predicts the mediator (i.e., perceived mood congruence). A regression analysis revealed that this criterion was also met (see Table 3). Finally, in Step 3, it has to be shown that the effect of the independent variable on the dependent variable is reduced when the mediator is controlled for. A regression analysis

² An alternative hypothesis that may explain this result is that happy (sad) people recall episodes that are more (less) positive in the positive recall condition and episodes that are less (more) negative in the negative recall condition. To test this hypothesis, we conducted the same analysis while controlling for perceived positivity of the recalled episodes. The results of this analysis were virtually identical to the results when perceived positivity of the recalled episodes was not controlled. Further, we tested this alternative hypothesis in all subsequent studies and consistently found that differences in perceived positivity cannot explain our effect. Thus, our results render this alternative hypothesis extremely unlikely.

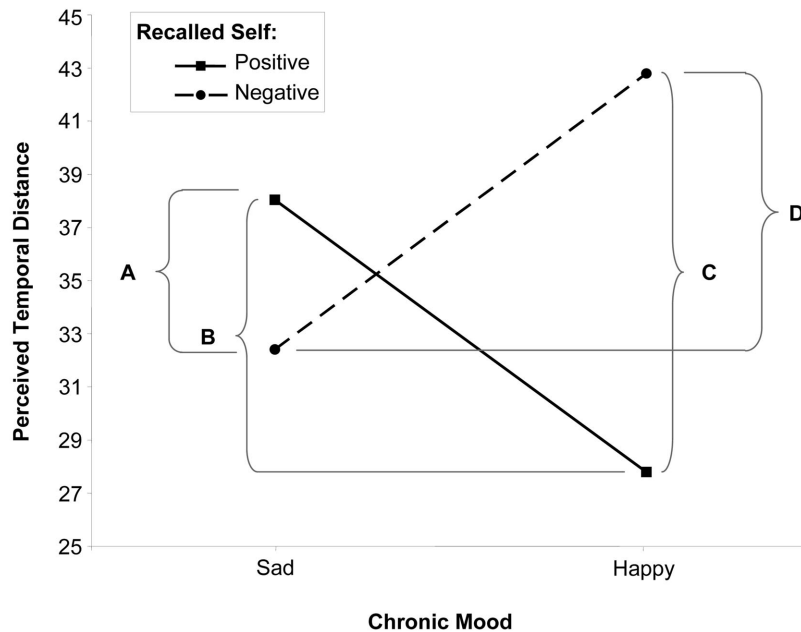


Figure 2. The effect of Valence of the Recalled Self (positive vs. negative) \times Chronic Mood (happy vs. sad) on the perceived temporal distance between the recalled and the current self. The significance tests for Contrasts A–D are presented in Table 2. Sad and happy mood equal one standard deviation below and above the mean of chronic mood, respectively. The graph illustrates the mean temporal distance perceptions for happy versus sad mood people in the positive versus negative recall condition across Studies 1–4 (control).

showed that the former highly significant effect of the interaction between valence of the recalled self and chronic mood on perceived temporal distance (see Step 1) was no longer significant after perceived mood congruence was controlled (see Table 3). Further, a Sobel test (Sobel, 1982) revealed that the path from the Valence of the Recalled Self \times Chronic Mood interaction over perceived mood congruence to perceived temporal distance was significant ($z = 2.33, p = .02$). Thus, these analyses support our hypothesis that the Valence of the Recalled Self \times Chronic Mood interaction affects perceived temporal distance through its effect on perceived mood congruence. The results of the mediation analysis are summarized in Table 3.³

To summarize the results of Study 1, the perception of temporal distance in relation to positive and negative past selves was dependent on chronic mood. Chronically happy people perceived a recalled negative self as temporally more distant than chronically sad people, whereas chronically happy people perceived a recalled positive self as temporally more recent than chronically sad people. Further, chronically happy people perceived a recalled positive self as temporally more recent than a recalled negative self, whereas chronically sad people showed a tendency to perceive a recalled negative self as temporally more recent than a recalled positive self, although this last effect was not significant. Crucially, these differences in perceived temporal distance occurred, although actual temporal distance between the recalled positive and negative selves to the current self was held constant. Moreover, we provided evidence that the determinant for this temporal distance bias was the perceived mood congruence between the recalled self and the current self. This finding supports our hy-

pothesis that the temporal distance bias is not solely due to the motivation to self-enhance (Ross & Wilson, 2002) but that cognitive factors (i.e., perceived mood congruence) can also determine this bias.

³ An alternative hypothesis that may explain our findings is that happy people strategically choose to recall positive episodes that actually occurred relatively recently within the instructed time-frame (e.g., 3 years ago), whereas they choose to recall negative episodes that actually occurred relatively long ago within the instructed time-frame (e.g., 5 years ago). Past research (Ross & Wilson, 2002) suggests that happy people may be motivated to make such strategic choices concerning the episodes they recall to associate themselves with positive episodes (by recalling more recent ones) and to dissociate themselves with negative episodes (by recalling more distant ones). Therefore, at the end of Study 1, we assessed the actual temporal distance for each episode ("Episode 1/2/3 took place in [month], [year]"; $\alpha = .75$). This enabled us to test whether Valence of the Recalled Self \times Chronic Mood predicted actual temporal distance. Speaking against this alternative explanation, the results of a multiple regression analysis with valence of the recalled self (dummy coded), chronic mood (centered), and the cross-product of valence of the recalled self and chronic mood as the predictors, and actual temporal distance as the criterion, revealed no significant interaction effect. Thus, we obtained no evidence that happy (sad) people recalled positive (negative) selves that actually took place more recently than sad (happy) people did. Further evidence against this alternative explanation is that controlling for actual temporal distance did not change the results of our Valence of Recall \times Chronic Mood effect on perceived temporal distance.

Table 2

Interaction Effects and Contrasts of the Valence of Recall \times Chronic Mood/Trait Self-Esteem Effect on Perceived Temporal Distance

Study	Valence of Recall \times Chronic Mood									
	Interaction		Contrast A		Contrast B		Contrast C		Contrast D	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
1	-.46	.006	.17	.24	-.23	.10	-.42	.006	.38	.03
2	-.53	.001	.18	.16	-.38	.008	-.65	.001	.45	.001
3	-.57	.001	.08	.44	-.52	.001	-.66	.001	.22	.05
4 (control)	-.68	.001	.41	.009	-.34	.006	-.38	.008	.48	.01
Valence of Recall \times Trait Self-Esteem										
2	-.42	.002	.07	.58	-.26	.06	-.53	.001	.35	.009
3	-.43	.001	-.03	.79	-.50	.001	-.57	.001	.05	.70
4 (control)	-.44	.01	.28	.06	-.08	.59	-.27	.09	.49	.005

Note. Dependent variable = perceived temporal distance; Contrasts A–D correspond to the contrasts as indicated in Figures 2 and 3.

Study 2

In Study 2, we sought to further attest that the temporal distance bias does not solely reflect self-enhancement motivation. Ross and Wilson (2002) argue that the temporal distance bias is due to the motivation to self-enhance. They base this argument on their finding that high self-esteem people are more prone than low self-esteem people to perceive a positive past self as temporally recent, and a negative past self as temporally distant. Because self-esteem and chronic mood are highly correlated with each other (Diener & Diener, 1995; Myers & Diener, 1995), the moderating effect of chronic mood obtained in Study 1 may be spuriously caused by the moderating effect of self-esteem.

In Study 2, we sought to replicate Study 1 while additionally testing whether the effects of chronic mood are spuriously caused by trait self-esteem. Given our finding that perceived mood congruence mediated the interaction effect of valence of

the recalled self and chronic mood on perceived temporal distance, it is implausible that the effect of chronic mood is a completely spurious one.

Another goal of Study 2 was to use different methods than those used in Study 1. Specifically, we used different measures of perceived mood congruence and perceived temporal distance. Most important, we asked participants to recall past traits rather than past episodes. The literature on past selves almost exclusively focuses on the recall of past episodes. We posit that a person's positive and negative traits constitute a more adequate operationalization of a person's valenced self than personal positive and negative episodes. In line with this argument, the Twenty Statements Task (Kuhn & McPartland, 1954) asks participants to provide 20 self-descriptions as a measure of the self-concept. In this open-ended task, participants frequently report traits and personal attributes but very rarely report per-

Table 3

Perceived Mood Congruence as a Mediator of the Valence of Recall \times Chronic Mood/Trait Self-Esteem Effect on Perceived Temporal Distance

Study	Valence of Recall \times Chronic Mood \rightarrow Perceived Mood Congruence \rightarrow Perceived Temporal Distance							
	Baron and Kenny (1986)							
	Step 1		Step 2		Step 3		Sobel (1982)	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	<i>z</i>	<i>p</i>
1	-.46	.006	.48	.003	-.27	.10	2.33	.02
2	-.53	.001	.48	.001	-.34	.004	2.95	.003
3	-.57	.001	.63	.001	-.23	.03	4.57	.001
4 (control)	-.68	.001	.66	.001	-.39	.04	2.81	.005
Valence of Recall \times Trait Self-Esteem \rightarrow Perceived Mood Congruence \rightarrow Perceived Temporal Distance								
2	-.42	.002	.55	.001	-.18	.18	16.56	.001
3	-.43	.001	.46	.001	-.18	.09	3.50	.001
4 (control)	-.44	.01	.35	.03	-.25	.11	2.00	.05

Note. Step 1 = effect of Valence of Recall \times Chronic Mood/Trait Self-Esteem on Perceived Temporal Distance; Step 2 = effect of Valence of Recall \times Chronic Mood/Trait Self-Esteem on Perceived Mood Congruence; Step 3 = identical to Step 1, while controlling for Perceived Mood Congruence.

sonal episodes. Moreover, with increasing temporal distance, past episodes have been found to be recalled in more dispositional terms (e.g., Semin & Smith, 1999; Trope & Liberman, 2003). Thus, asking people to recall traits associated with a past self denotes a comprehensive and a representative way to operationalize past selves. Therefore, successful replication of Study 1 with this different methodology would provide strong support for the generalizability of our findings to different types of recall.

Method

Participants

A total of 103 participants (81 women, 22 men) completed this study. Again, the study was advertised on Krantz's Web portal. The mean age of the participants was 24.07 years ($SD = 9.10$). The majority of the participants were from North America (83%). Eleven additional participants failed to complete the task and were excluded from the analyses.

Materials and Procedure

After consenting to participate, participants completed a series of demographic items. Next, we assessed participants' chronic mood and trait self-esteem (in randomized order), followed by the recall of either their positive or negative self. As a manipulation check, participants rated the valence of the recalled attributes. Finally, participants completed the dependent measures, which were perceived mood congruence and perceived temporal distance between the past self and the current self. The order of the items assessing the dependent variables was randomized and placed among several filler items. At the end of the study, participants read a feedback page and were thanked for their participation. The measure of chronic mood was identical to that used in Study 1 ($\alpha = .91$), whereas the manipulation and all other measures used were different from those used in Study 1.

Trait self-esteem. The Rosenberg Self-Esteem Scale (Rosenberg, 1965; $\alpha = .91$) consists of 10 items, such as "On the whole, I am satisfied with myself" and "At times, I think I am no good at all" (reverse-scored). Participants responded to each item using a 7-point rating scale ranging from 1 (*does not apply at all*) to 7 (*applies completely*).

Past self recall. In the positive (negative) past self condition, participants read the following:

We would like you now to think about positive (negative) attributes you had 5 years ago. That is, please close your eyes and visualize the person you were 5 years ago by thinking about solely positive (negative) attributes and disregarding any negative (positive) attributes.

After visualizing your former self we would like you to write down the 5 most positive (negative) attributes you had 5 years ago. Please write one attribute (in one word) in each of the five textboxes below.

Manipulation check. Participants received a list of the five attributes they noted down as a part of the manipulation ($\alpha = .95$). Participants rated the valence of each attribute on a 9-point rating scale ranging from -4 (*very negative*) to $+4$ (*very positive*).

Perceived mood congruence. Perceived mood congruence was assessed with the following two items: "My current mood is very

different from the mood at the time of my recalled self" (reverse-scored), and "My general mood at the recalled time was similar to my mood nowadays" ($r = .28, p = .005$). As in Study 1, participants completed these items by ticking on a 420 pixels long line ranging from 1 (*does not apply at all*) to 60 (*applies completely*).

Perceived temporal distance. The measure of perceived temporal distance was closely modeled after the measure used by Broemer et al. (2008). In particular, perceived temporal distance was assessed with the following two items: "The recalled self felt very far away" (reverse-scored), and "The recalled self felt very recent" ($r = .40, p = .001$). Participants completed these items using the same response format as used to assess perceived mood congruence.

Results and Discussion

Employing the same procedure as in Study 1, we initially sought to replicate our previous findings. First, as shown in Table 1, our manipulation was successful. Second, as shown in Figure 2 and Table 2, chronic mood moderated the effect of recalling a valenced self on perceived temporal distance. Also, simple comparisons revealed that all contrasts of the interaction were significant except of Contrast A, which (similar to Study 1) showed a trend in the expected direction (see Table 2). Finally, as shown in Table 3, the effect of recalling a valenced self on perceived temporal distance was mediated by perceived mood congruence. Thus, the pattern of findings mirrored those obtained in Study 1.

Next, we tested the unique hypotheses of Study 2. To replicate Ross and Wilson's (2002) finding that trait self-esteem determines the perception of temporal distance in respect to recalled positive and negative selves, we repeated the moderation analyses described in Study 1 using trait self-esteem instead of chronic mood as the continuous predictor. The interaction effect of Valence of the Recalled Self \times Trait Self-Esteem on perceived temporal distance was significant. The effect is illustrated in Figure 3 (see also Table 2).

Furthermore, as shown in Table 3, the obtained interaction effect on perceived temporal distance was mediated by perceived mood congruence. The finding that perceived mood congruence mediated the effect of Valence of Recalled Self \times Trait Self-Esteem on perceived temporal distance provides initial support for our hypothesis that over and above self-enhancement, cognitive factors account for the temporal distance bias. To further test this hypothesis, we conducted a multiple regression analysis with valence of the recalled self (dummy coded), chronic mood (centered), trait self-esteem (centered), the cross-product of valence of the recalled self and chronic mood, and the cross-product of valence of the recalled self and trait self-esteem as simultaneous predictors, with perceived temporal distance as the criterion. The results of this analysis can be found in Table 4. As can be seen, trait self-esteem did not account for the moderating effect of chronic mood on perceived temporal distance. Even after controlling for trait self-esteem, the moderating effect of chronic mood on the temporal distance bias remained highly significant. If anything, our results suggest that chronic mood accounts for the moderating effect of trait self-esteem on the temporal distance bias. After controlling for chronic mood, the moderating effect of trait self-esteem on the temporal distance bias was no longer significant.

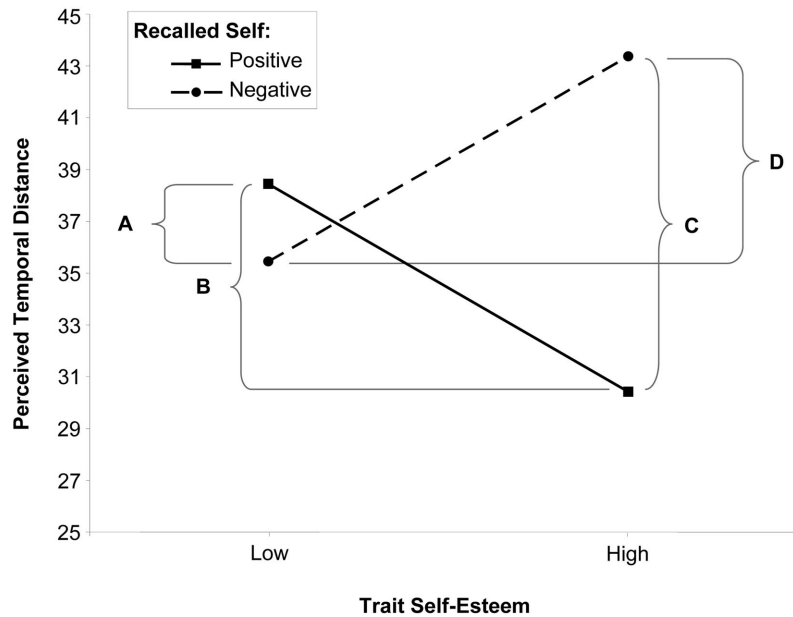


Figure 3. The effect of Valence of the Recalled Self (positive vs. negative) \times Trait Self-Esteem (high vs. low) on the perceived temporal distance between the recalled and the current self. The significance tests for Contrasts A–D are presented in Table 2. Low and high self-esteem equal one standard deviation below and above the mean of trait self-esteem, respectively. The graph illustrates the mean temporal distance perceptions for low versus high self-esteem people in the positive versus negative recall condition across Studies 2–4.

Despite using a different methodology, in Study 2 we replicated all the results obtained in Study 1. Further, we extended the findings of Study 1 by providing evidence that our effect cannot be explained by self-enhancement. Taken together, there is strong support for our hypothesis that the temporal distance bias is not solely due to the motivation to self-enhance. Instead, our results suggest that the temporal distance bias is at least partially determined by cognitive factors: mood congruent past selves are perceived as temporally closer than mood incongruent past selves.

Study 3

As outlined in the introduction, perceived temporal distance has been found to be a crucial determinant of assimilation and contrast

effects concerning past selves (for a review, see Schwarz & Strack, 1999). Thus, in Study 3, besides seeking to replicate our earlier findings, we tested whether perceived temporal distance indeed determines assimilation and contrast effects on self-esteem. Consistent with the MCM, we expected that perceiving a positive past self as temporally recent (as chronically happy people do) should lead to an assimilation effect of this positive past self and thus should relatively increase self-esteem. Similarly, perceiving a negative past self as temporally recent (as chronically sad people do) should lead to an assimilation effect of this negative past self and thus should relatively decrease self-esteem. On the contrary, perceiving a negative past self as temporally distant (as chronically happy people do) should lead to a contrast effect concerning this negative past self and thus should relatively increase self-esteem. Similarly, perceiving a positive past self as temporally distant (as chronically sad people do) should lead to a contrast effect concerning this positive past self and thus should relatively decrease self-esteem.

Table 4

Direct Comparison Between the Effects of Chronic Mood and Trait Self-Esteem on the Temporal Distance Bias

Variable	Study 2		Study 3		Study 4 (control)	
	β	p	β	p	β	p
Valence of recall	-.24	.01	-.30	.001	.05	.60
Chronic mood	.51	.01	.24	.05	.25	.25
Trait self-esteem	-.08	.71	-.07	.61	.37	.06
Valence of Recall \times Chronic Mood	-.59	.003	-.45	.001	-.65	.005
Valence of Recall \times Trait Self-Esteem	.08	.70	-.20	.11	-.04	.83

Note. Dependent variable = perceived temporal distance.

Method

Participants

A total of 153 participants (114 women, 37 men, and 2 who did not respond) completed this study. Again, the study was advertised on Krantz's Web portal. The mean age of the participants was 22.73 years ($SD = 7.52$). The majority of participants were from North America (86%). Thirteen additional participants failed to complete the task and were excluded from the analyses.

Materials and Procedure

The study was identical to Study 2 except that (a) participants completed a measure of trait self-esteem directly after completing the demographic questions (i.e., premanipulation self-esteem) and (b) participants completed the same self-esteem measure again at the very end of the study (i.e., postmanipulation self-esteem). Therefore, only the self-esteem measure is described below. Internal consistencies of the chronic mood measure ($\alpha = .90$), the valence of the recalled self measure ($\alpha = .95$), the measure of perceived mood congruence ($r = .53, p = .001$), and perceived temporal distance ($r = .51, p = .001$) were good.

Trait self-esteem. The Single-Item Self-Esteem Scale (Robins, Hendin, & Trzesniewski, 2001) consists of the item "I have high self-esteem." We chose this scale because Ross and Wilson (2002) used the same measure to provide evidence that the temporal distance bias is moderated by trait self-esteem. Participants responded to this measure using the same response format used to assess perceived mood congruence.

Results and Discussion

Employing the same procedure as in Studies 1 and 2, we initially sought to replicate our previous findings. First, Table 1 shows that our manipulation was successful. Second, Figure 2 and Table 2 show that chronic mood moderated the effect of recalling a valenced self on perceived temporal distance. Also, all the contrasts showed the same effects as in Studies 1 and 2. Third, Table 3 shows that the effect of recalling a valenced self on perceived temporal distance was mediated by perceived mood congruence. Fourth, the moderating effect of chronic mood on the temporal dis-

tance bias was not spuriously caused by trait self-esteem. Figure 3 and Table 2 show that trait self-esteem moderated the temporal distance bias, whereas Table 3 shows that the effect of Valence of Recall \times Trait Self-Esteem was mediated by perceived mood congruence. Finally, Table 4 shows that the moderating effect of chronic mood on the temporal distance bias remained significant even after controlling for the moderating effect of trait self-esteem. Taken together, the findings of Study 3 completely replicate the findings of Studies 1 and 2.

Next, we tested the unique hypotheses of Study 3. We tested whether perceived temporal distance actually determined the occurrence of assimilation and contrast effects in respect to recalled positive and negative selves. This was done by conducting a multiple regression analysis with valence of the recalled self (dummy coded) as a dichotomous predictor, perceived temporal distance (centered) as a continuous predictor, the cross-product of valence of the recalled self and perceived temporal distance as a third predictor, *premanipulation* self-esteem as a fourth predictor, and *postmanipulation* self-esteem as the criterion. As illustrated in Figure 4 and Table 5, the results reveal a significant interaction between valence of the recalled self and perceived temporal distance on postmanipulation self-esteem. Furthermore, Table 5 shows that all four contrasts of this interaction were significant.

To supplement our results, we also tested whether (a) self-esteem is more strongly affected by recalling a positive past self, (b) self-esteem is more strongly affected by recalling a negative past self, or (c) self-esteem is similarly strongly affected by recalling a positive and a negative past self. We do not see any reason for assuming that one effect should be stronger than the other. To test this idea, we conducted a multiple regression

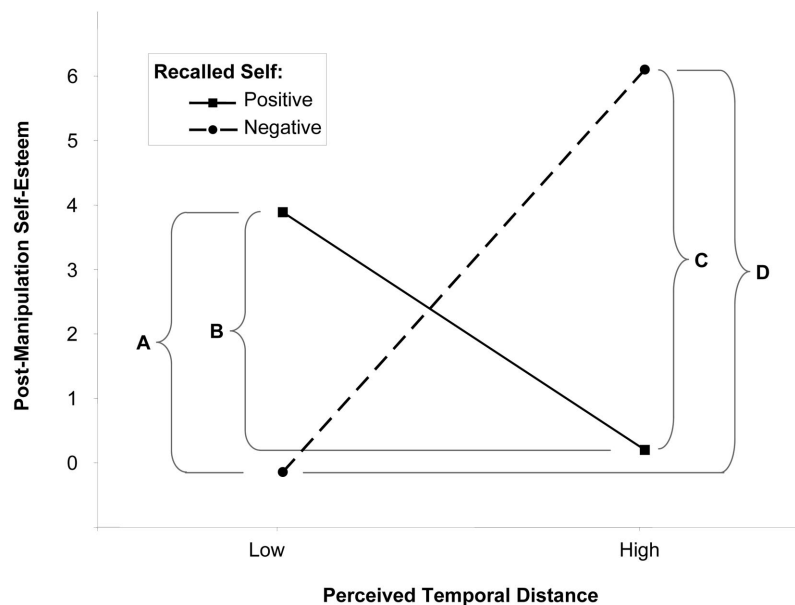


Figure 4. The effect of Valence of the Recalled Self (positive vs. negative) \times Perceived Temporal Distance (low vs. high) on postmanipulation self-esteem (while controlling for premanipulation self-esteem). The significance tests for Contrasts A–D are presented in Table 5. Low and high perceived temporal distance equal one standard deviation below and above the mean of perceived temporal distance, respectively. The graph illustrates the mean postmanipulation self-esteem for low versus high perceived temporal distance perceivers in the positive versus negative recall condition across Studies 3 and 4.

Table 5

Interaction Effects and Contrasts of the Valence of Recall \times Perceived Temporal Distance Effect on Postmanipulational Self-Esteem (While Controlling for Premanipulational Self-Esteem)

Study	Interaction		Contrast A		Contrast B		Contrast C		Contrast D	
	β	p	β	p	β	p	β	p	β	p
3	-.35	.001	.18	.04	-.15	.04	-.25	.002	.28	.001
4	-.15	.003	.08	.10	-.08	.05	-.13	.007	.12	.02

Note. Dependent variable = postmanipulational self-esteem; Contrasts A–D correspond to the contrasts as indicated in Figure 4.

analysis with chronic mood (centered) as a continuous predictor, valence of the recalled self (dummy coded) as a dichotomous predictor, the cross-product of chronic mood and valence of the recalled self as a third predictor, *premanipulation* self-esteem as a fourth predictor, and *postmanipulation* self-esteem as the criterion. The results reveal a significant effect of premanipulation self-esteem on postmanipulation self-esteem ($\beta = .60, p = .001$), a significant effect of chronic mood on postmanipulation self-esteem ($\beta = .36, p = .001$), no significant effect of valence of the recalled self on postmanipulation self-esteem ($\beta = -.05, p = .31$), and no significant interaction between chronic mood and valence of the recalled self on postmanipulation self-esteem ($\beta = -.07, p = .35$). Thus, as expected, the effects of recalling a valenced self on self-esteem are not stronger for a specific type of recall. This analysis is important because the significant relationship between chronic mood and postmanipulation self-esteem, after controlling for premanipulation self-esteem, directly shows that the recall of valenced past selves increases the self-esteem of happy people relative to sad people.

To summarize the results of Study 3, we replicated the findings of Study 1 that the direction of the temporal distance bias is determined by chronic mood. Further, we replicated the findings of Study 2 that the moderating effect of chronic mood on the temporal distance bias is not spurious because of an effect of trait self-esteem on (a) the temporal distance bias and (b) chronic mood. Extending the findings of Studies 1 and 2, Study 3 provided evidence that the occurrence of assimilation and contrast effects in respect to recalled positive and negative selves is indeed determined by perceived temporal distance. Specifically, we found that an assimilation effect (indicated by a relative change of self-esteem) toward a recalled self occurs when this recalled self is perceived as temporally recent and that a contrast effect away from a recalled self (indicated by a relative change of self-esteem) occurs when this recalled self is perceived as temporally distant. That is, perceiving a positive past self as recent and perceiving a negative past self as distant led to a relative increase in self-esteem. However, perceiving a positive past self as distant and perceiving a negative past self as recent led to a relative decrease in self-esteem. Thus, thinking about either a positive past or a negative past relatively increases self-esteem for chronically happy people but relatively decreases self-esteem for chronically sad people.

Study 4

So far, our findings have shown that chronically sad people perceive a recalled negative self as temporally recent and thus assimilate their current self toward the recalled self. Conversely,

chronically sad people perceive a positive recalled self as temporally distant and thus contrast themselves away from it. These findings suggest that it is important to recognize the central role of perceived temporal distance when attempting to increase self-esteem by asking chronically sad people to recall positive past selves (cf. nostalgia, reminiscence therapy, and experimental mood manipulations). Specifically, it may be desirable to correct chronically sad people's naturally occurring temporal distance bias by manipulating their perception of temporal distance. Because temporal distance determines assimilation and contrast, undermining the temporal distance bias should prevent sad people from assimilating toward a recalled negative self and contrasting themselves away from a recalled positive self. Accordingly, such a temporal distance intervention should prevent a decrease in self-esteem for sad people.

To test this reasoning, in Study 4 we aimed to show that the naturally occurring temporal distance bias can be eliminated by making sad (happy) people believe that a recalled positive (negative) self is not as temporally distant as they are naturally inclined to think and that a recalled negative (positive) self is not as temporally recent as they are naturally inclined to think. To manipulate the perception of temporal distance, we combined manipulations used by Broemer et al. (2008) and by Wilson and Ross (2001). Broemer et al. showed that asking participants to think about the time between the recalled self and the current self from a perspective that is far in the future makes the time between the recalled and current selves appear relatively short. Thus, to decrease perceived temporal distance, we asked participants to take the perspective of their future self in 25 years, to look back at their current self from this perspective, and to mentally travel back to their past self 5 years ago, where they should think about the positive or negative attributes they possessed at that time. To increase temporal distance, we asked participants to mentally travel "all the way" back to their past self 5 years ago. Wilson and Ross (2001) showed that emphasizing the distance between a recalled and a current self increases the perception of temporal distance. A control condition did not attempt to influence perceived temporal distance and simply repeated the procedure of Study 3.

Method

Participants

A total of 270 participants (208 women, 59 men, and 3 who did not respond) completed this study. Again, this study was advertised on Krantz's Web portal for online studies. The mean age of the participants was 26.23 years ($SD = 9.65$). The majority of the

participants were from North America (83%). Eleven additional participants failed to complete the task and thus were excluded from the analyses. The reaction time of 1 additional participant indicated that she took a long break from the study between the completion of the manipulation and the dependent measures, and thus she was also excluded from the analyses.

Materials and Procedure

The control condition of this study was identical to Study 3. The only difference between the short and long temporal distance conditions and the control condition was that the past self recall task was modified to manipulate temporal distance perceptions. Therefore, only the past self recall task for the short and long temporal distance conditions are described below. Internal consistencies of the chronic mood measure ($\alpha = .91$), the valence of the recalled self measure ($\alpha = .96$), the measure of perceived mood congruence ($r = .56, p = .001$), and perceived temporal distance ($r = .48, p = .001$) were good.

Past self recall: Short temporal distance. In the positive (negative) past self condition, participants read the following instructions:

We would like you now to think about positive (negative) attributes you had 5 years ago. We would like you to do this by taking the perspective of your future self in 25 years. That is, *please visualize yourself 25 years from now and then look back to your current self*. Keeping the perspective of your future self in 25 years, **please close**

your eyes and visualize yourself as you “travel” back from your *current self* to your *positive (negative) former self 5 years ago*. When you reach that point, visualize the person you were 5 years ago by thinking about solely positive (negative) attributes and disregarding any negative (positive) attributes. This imagination task is illustrated by the figure below [see Figure 5, Panel A].

After visualizing the time travel, starting with your current self and ending at your positive (negative) former self 5 years ago, we would like you to write down the 5 most positive (negative) attributes you had 5 years ago. Please write one attribute (in one word) in each of the five textboxes below. Please *don't forget to stick to the perspective of your future self in 25 years during the whole task!*

Past self recall: Long temporal distance. In the positive (negative) past self condition, participants read the following instructions:

We would like you now to think about positive (negative) attributes you had 5 years ago. We would like you to do this by taking the perspective of your current self. That is, *please visualize your current self and then look all the way back to your positive (negative) former self 5 years ago*. Keeping the perspective of your current self, **please close your eyes and visualize yourself as you “travel” all the way back** from your *current self* to your *positive (negative) former self 5 years ago*. When you reach that point, visualize the person you were 5 years ago by thinking about solely positive (negative) attributes and disregarding any negative (positive) attributes. This imagination task is illustrated by the figure below [see Figure 5, Panel B].

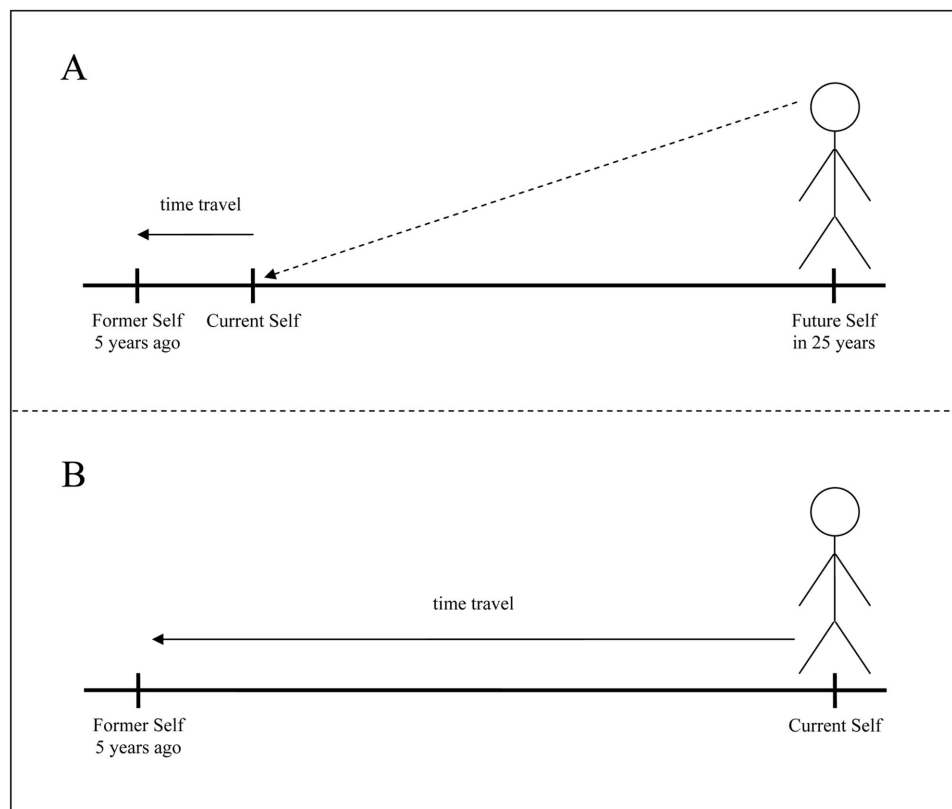


Figure 5. Participants in the short temporal distance condition saw the upper part of this figure (A), and participants in the long temporal distance condition saw the lower part of this figure (B).

After visualizing the time travel, starting with your current self and ending all the way back at your positive (negative) former self 5 years ago, we would like you to write down the 5 most positive (negative) attributes you had 5 years ago. Please write one attribute (in one word) in each of the five textboxes below. Please *don't forget to stick to the perspective of your current self* during the whole task!

Results and Discussion

Employing the same procedure as in previous studies, we initially sought to replicate our previous findings. First, Table 1 shows that our manipulation was successful. Second, Figure 2 and Table 2 show that chronic mood moderated the effect of recalling a valenced self on perceived temporal distance in the control condition of this study. Also, simple comparisons revealed that all contrasts of the interaction were significant. Third, Table 3 shows that the effect of recalling a valenced self on perceived temporal distance was mediated by perceived mood congruence. Fourth, the moderating effect on chronic mood on the temporal distance bias was not spuriously caused by trait self-esteem. Figure 3 and Table 2 show that trait self-esteem moderated the temporal distance bias, whereas Table 3 shows that the effect of Valence of Recall \times Trait Self-Esteem was mediated by perceived mood congruence. Fifth, Table 4 shows that the moderating effect of chronic mood on the temporal distance bias remained significant even after controlling for the moderating effect of trait self-esteem.

We also sought to replicate the unique findings of Study 3. First, we tested whether perceived temporal distance determines the occurrence of assimilation and contrast effects in respect to recalled positive and negative selves. As shown in Figure 4 and Table 5, this was indeed the case. Second, as shown in Table 5, three of the contrasts of this interaction were significant, whereas the fourth was marginally significant (the latter is appropriate given that this is a replication of our prior findings). Finally, we tested whether (a) self-esteem was more strongly affected by recalling a positive past self, (b) self-esteem was more strongly affected by recalling a negative past self, or (c) self-esteem was similarly strongly affected by recalling a positive and a negative past self. Following the procedure described in Study 3, the results of this analysis mirror the results obtained in Study 3, such that there was no significant interaction between chronic mood and valence of the recalled self on postmanipulation self-esteem in the replication condition ($\beta = -.06, p = .53$). Furthermore, this analysis revealed a significant relationship between chronic mood and postmanipulation self-esteem after controlling for premanipulation self-esteem ($\beta = .35, p = .001$). This is direct support that the recall of valenced past selves increases the self-esteem of happy people relative to sad people and that self-esteem is similarly strongly affected by recalling a positive and a negative past self. As such, Study 4 completely replicated the findings of Studies 1–3.

Next, we tested the unique hypotheses of Study 4. To check whether our manipulation of perceived temporal distance was effective, we conducted an analysis of variance with the temporal distance manipulation (short vs. long) as the independent variable and perceived temporal distance as the dependent variable. As expected, participants in the short temporal distance condition perceived the time between the recalled and the current self as significantly shorter than did participants in the long temporal distance condition, $F(1, 177) = 4.15, p = .04$.⁴ Next, we formed an intervention condition on the basis of chronic mood (above or

below the median) and the temporal distance condition (short or long temporal distance): Sad (happy) participants, who were either in the short (long) temporal distance and positive recall condition or in the long (short) temporal distance and negative recall condition, were treated as a single intervention condition. As shown earlier, the control condition replicated the effect of Valence of Recalled Self \times Chronic Mood on perceived temporal distance. We expected that this effect would not replicate in the intervention condition. Thus, we expected a significant three-way interaction between valence of the recalled self (positive vs. negative; dichotomous), chronic mood (happy vs. sad; continuous), and intervention (intervention vs. control; dichotomous) on perceived temporal distance.

Consistent with predictions, the results of a multiple regression analysis showed a significant three-way interaction among past self, chronic mood, and intervention on perceived temporal distance ($\beta = -.40, p = .009$). This three-way interaction was decomposed. As shown above, chronic mood moderated the temporal distance bias in the control condition. In contrast, in the intervention condition, we obtained no significant interaction between chronic mood and valence of the recalled self on perceived temporal distance ($\beta = -.04, p = .78$). This null finding lends support to our hypothesis that the cognitive intervention undermined naturally occurring differences in perceptions of temporal distance by chronically happy and sad people. In line with this finding, the effect of chronic mood on postmanipulation self-esteem was smaller in the intervention condition than in the control condition, $\beta = -.17, p = .055$.

To summarize the results of Study 4, in the control condition, we replicated the findings of Studies 1–3. Extending the findings of Studies 1–3, we successfully manipulated perceived temporal distance by differentially framing the 5 years of recall (cf. Broemer et al., 2008; Wilson & Ross, 2001). This manipulation undermined the naturally occurring temporal distance bias shown by chronically happy and sad people. The possibility of undermining the temporal distance bias by means of *cognitive* interventions, such as divergent framing of the time between the recalled and the current self, provides further support for the argument that the temporal distance bias is partly caused by cognitive factors.

Analyses Across Studies

In all four studies, we have shown that perceived mood congruence between a recalled self and the current self is a crucial determinant of perceived temporal distance. However, as noted in the introduction, we wished to further consider *why* perceived mood congruence possesses this central role in the temporal distance bias. Specifically, we wanted to compare two possible processes that have been suggested in the literature.

First, mental representations become more abstract with the passage of time (cf. Semin & Smith, 1999; Trope & Liberman, 2003). Thus, one heuristic to judge whether an event is perceived as temporally recent or distant is to rely on the vividness of the

⁴ Note that the effect of the temporal distance manipulation on the items for the manipulation check was smaller than the effect of the manipulation on the dependent variables. This may be due to less than ideal items for the manipulation check.

recalled event and the ease with which the event is retrieved from memory. A memory is perceived as temporally more recent if it is easy to recall (e.g., Sanna & Schwarz, 2003, 2004; for a review, see Schwarz, 2004) or vividly retrieved from memory (e.g., R. Brown et al., 1985). Ease of recall and vividness of retrieval can be influenced by retrieval factors (e.g., R. Brown et al., 1985). The retrieval factor that is relevant for our assumption is the mood-state-dependent retrieval hypothesis. This hypothesis assumes that the vividness of recall and ease of retrieval of positive events should be stronger for happy (vs. sad) people, whereas vividness of recall and ease of retrieval of negative events should be stronger for sad (vs. happy) people (e.g., Blaney, 1986; Bower, 1981; Kenealy, 1997). Therefore, happy people should perceive recalled positive selves as more recent than recalled negative selves, and sad people should perceive recalled negative selves as more recent than recalled positive selves.

Second, affect should be an important feature when it comes to valenced selves. This assumption is in line with the central role of the hedonic principle in people's lives (Freud, 1920; Kahneman et al., 1999; Sedikides & Gregg, 2008). Further, this assumption is in line with Schwarz and Clore's (1983) work on mood-as-information. When recalling *valenced* selves, affective overlap (i.e., mood congruence) may be an especially relevant type of feature overlap (Schwarz & Bless, 2007; Stapel, 2007). Of importance, overlap between a recalled self and the current self has been assumed to foster feelings of personality continuity, which in turn has been hypothesized to increase the perception of temporal recency (cf. Beike & Niedenthal, 1998; Broemer et al., 2008). Thus, this may be a second explanation why affective overlap determined the perception of temporal distance in our studies.

Although both explanations are theoretically sound, there are data suggesting that ease of retrieval and vividness of recall do not explain the role of mood congruence in the temporal distance bias. Specifically, Ross and Wilson (2002) found that ease of retrieval did not account for the interactive effect of valence of the recalled self and self-esteem on perceived temporal distance. Nevertheless, either the ease/vividness of retrieval explanation or the feature overlap explanation may shed more light on the process that underlies the influence of perceived mood congruence on the temporal distance bias. Additionally, evidence for the operation of either one of these processes would further support our claim that the temporal distance bias is partly a cognitive bias, because both ease/vividness of recall as well as feature overlap are cognitive rather than motivational factors.

To investigate these issues, we assessed ease of retrieval, vividness of recall, and feature overlap between the recalled and the current self in Studies 2–4 by using self-report measures of these constructs (see below). Previous studies showed that these constructs can be reliably assessed by means of self-report and that there are moderately strong intercorrelations between these constructs. Consistent with these previous studies, we found moderately strong positive relationships between ease of retrieval and vividness of recall ($.38 < \text{all } rs < .60$; all $ps < .001$) and weak or no relationships between feature overlap and ease of retrieval as well as vividness of recall ($.02 < \text{all } rs < .26$; $ns < \text{all } ps < .001$).

Method

Materials and Procedure

The items assessing vividness of recall, ease of retrieval, and feature overlap between the recalled and the current self were administered together with the items assessing perceived temporal distance and perceived mood congruence in random order. Participants completed all items using the same response format as used to assess perceived mood congruence.

Ease of retrieval. Our measure of ease of retrieval was modeled after the measure used by Schwarz et al. (1991). Ease of retrieval was assessed with two items: "The recall was pretty hard" (reverse-scored), and "It was very easy for me to bring the recalled self to mind" ($r = .51, p = .001$).

Vividness of recall. Vividness of recall was also assessed with two items: "My memories of the recalled self were vague and fuzzy" (reverse-scored), and "My memories of the former self were detailed" ($r = .65, p = .001$).

Feature overlap. Our measure of feature overlap was modeled after the measure used by J. D. Brown et al. (1992). Feature overlap was again assessed with two items: "I do not share a lot of 'features' with the person I was back then" (reverse-scored), and "A lot of things are similar between nowadays and back then" ($r = .48, p = .001$).

Results and Discussion

To test for the unique relation between perceived mood congruence and (a) ease of recall, (b) vividness of recall, and (c) feature overlap, we simultaneously regressed perceived mood congruence on the latter three variables in Studies 2–4 individually. These regressions revealed no significant relations between ease of recall and perceived mood congruence ($-.15 < \beta s < .16$; all ns) and only one significant relation between vividness of recall and perceived mood congruence ($-.04 < \text{all other } \beta s < .19$; all ns). However, this significant relation was negative and thus at odds with the theoretical expectations, indicating that people who recall the past self vividly perceived low mood congruence between the recalled and the current self ($\beta = -.27, p = .005$). On the contrary, we obtained strong relations between perceived feature overlap and perceived mood congruence in all three studies. All of these relations were in the theoretically expected direction, indicating that people who perceive high mood congruence between the recalled and the current self also perceived high feature overlap ($.48 < \text{all } \beta s < .62$; $ps < .001$).

In line with the findings by Ross and Wilson (2002), these results suggest that the central role of perceived mood congruence for the temporal distance bias is unlikely to be due to ease or vividness of retrieval. Indeed, our findings suggest that perceived mood congruence is an especially relevant part of perceived feature overlap. Perceived feature overlap should affect perceived temporal distance because feature overlap fosters the feelings of personality continuity (cf. Beike & Niedenthal, 1998; Broemer et al., 2008). In line with this argument, we found that both perceived mood congruence and perceived feature overlap were strongly and consistently related to perceived temporal distance in all three studies ($-.66 < \text{all } \beta s < -.48$; $ps < .001$; and $-.64 < \text{all } \beta s < -.42$; $ps < .001$; respectively).

It is still an open question whether perceived feature overlap is a stronger or a weaker mediator (in comparison with perceived mood congruence) of the interaction effect of valence of the recalled self and chronic mood on perceived temporal distance. On the one hand, perceived feature overlap is a broader construct than perceived mood congruence, with perceived mood congruence only being one feature of many that may determine assimilation and contrast effects. Thus, one might expect that perceived feature overlap is a stronger mediator than perceived mood congruence. On the other hand, perceived mood congruence might be perceived as the only relevant feature when it comes to valenced selves (cf. Stapel & Marx, 2007). Thus, perceived mood congruence might be the more precise and therefore the stronger moderator of the interaction effect of valence of the recalled self and chronic mood on perceived temporal distance. To test these two possibilities, we compared (a) the decrease of the interaction effect of valence of the recalled self and chronic mood on perceived feature overlap when perceived mood congruence is controlled with (b) the decrease of the interaction effect of valence of the recalled self and chronic mood on perceived mood congruence when perceived feature overlap is controlled. When controlling for mood congruence, the interaction effect of valence of the recalled self and chronic mood on perceived feature overlap was decreased from significance ($.36 < \beta_s < .49$; $ps < .02$) to nonsignificance ($.04 < \beta_s < .19$; $.07 < ps < .80$) in all three cases. When controlling for perceived feature overlap, the interaction effect of valence of the recalled self and chronic mood on perceived mood congruence was only very slightly decreased from very high levels of significance ($.47 < \beta_s < .65$; $ps < .001$) to still high levels of significance ($.29 < \beta_s < .46$; $ps < .01$) in all three cases. In line with this finding, the interaction effect of valence of the recalled self and chronic mood on perceived temporal distance ($-.68 < \beta_s < -.51$; $ps < .001$) was more strongly decreased when controlling for perceived mood congruence ($-.39 < \beta_s < -.27$; $.004 < ps < .10$) than when controlling for perceived feature overlap ($-.49 < \beta_s < -.32$; $ps < .008$).

The coherent pattern of results across our studies provides strong support for the notion that perceived mood congruence is a *specific and especially relevant type of feature overlap* when it comes to valenced recalled and current selves. Our findings suggest that rather than domain unspecific feature overlap in general, it is feature overlap in the domain of mood (i.e., mood congruence) that determines the temporal distance bias. This finding is consistent with recent research by Stapel and Marx (2007), who advocated the view that some features play a more important role in determining the occurrence of assimilation and contrast effects than other features. At the same time, consistent with evidence reported by Ross and Wilson (2002), our data provide no support for the assumption that perceived mood congruence is central because it relates to ease and vividness of recall. Our finding that perceived mood congruence as a specific feature overlap is a better moderator of the temporal distance bias than domain unspecific perceived feature overlap more generally is consistent with the central role of the hedonic principle in the human psyche (Freud, 1920; Kahneman et al., 1999; Sedikides & Gregg, 2008) and the relevance of mood in guiding more general judgments (Schwarz & Clore, 1983; Sedikides & Green, 2001). Of importance, the current studies are the first to provide empirical evidence that feature

overlap (in the form of perceived mood congruence) is related to perceived temporal distance.

General Discussion

In this article, we proposed and supported the provocative hypothesis that thinking about a positive past self leads to a relative increase in self-esteem for *chronically happy people* but to a relative decrease in self-esteem for *chronically sad people*. Probably even more counterintuitive, we proposed and supported the hypothesis that thinking about a negative past self leads to a relative decrease in self-esteem for *chronically sad people* but to a relative increase in self-esteem for *chronically happy people*. We predicted these results on the basis of our MCM of temporal comparison (see Figure 1). As predicted by the MCM, chronically happy people felt mood congruence (incongruence) between a recalled positive (negative) self and the current self, eliciting feelings of temporal recency (distance), and thus chronically happy people showed an assimilation (contrast) effect in regard to the recalled positive (negative) self, as evidenced by a relative increase in self-esteem. On the other hand, chronically sad people felt mood incongruence (congruence) between a recalled positive (negative) self and the current self, eliciting feelings of temporal distance (recency), and thus chronically sad people showed a contrast (assimilation) effect in regard to the recalled positive (negative) self, as evidenced by a relative decrease in self-esteem.

Across four studies, the data were consistent with predictions in all but one point. With respect to the inconsistent finding, in Studies 1–3, sad people did not significantly differ in their perception of temporal distance when recalling a positive or a negative past self. At first glance, this is at odds with our predictions. The MCM predicts that sad people should perceive a recalled negative self as temporally more recent than a recalled positive self because of the mood congruence (incongruence) between the recalled negative (positive) self and the current self. However, two lines of argument support our rationale. First, the literature on chronic mood provides an explanation for our findings. In non-clinical samples, the mean level of chronic mood is typically positive and not neutral. In fact, the mean mood of participants in Studies 1–3 was almost one standard deviation more positive than neutral mood. Thus, it is not surprising that we found no significant effect when testing this contrast at one standard deviation below the mean of chronic mood, because at one standard deviation below the mean of chronic mood we do not capture really sad mood but neutral mood. In fact, when we test the same contrasts at two standard deviations below the mean, the contrasts are significant in all four studies ($.44 \leq \text{all } \beta_s \leq .82$; all $ps \leq .05$). However, contrasts two standard deviations above or below means must generally be interpreted cautiously, because such an analysis only considers few participants. For example, this small number of participants may cloud the possibility that there could be some curvilinearity underlying this particular contrast. Thus, an important addition to the current research would be to test the MCM using a clinically depressed sample. Second, increasing the power of our analysis by taking the participants of all four studies together was sufficient to show a significant contrast for individuals already at one standard deviation below the mean of chronic mood, $\beta(425) = .18$, $p = .005$. Thus, our data completely support the MCM.

The MCM carries important theoretical and practical implications. First, the assumption that thinking about one's positive past necessarily increases self-esteem, whereas thinking about one's negative past necessarily decreases self-esteem, is inherent in psychological theory (e.g., nostalgia, mood manipulations) and practice (e.g., reminiscence therapy). Our research crucially qualifies this truism. Second, we showed that cognitive factors underlying temporal distance perceptions are not solely contextual in nature (e.g., Broemer et al., 2008; Strack et al., 1985; for a review, see Schwarz & Strack, 1999) but that individual difference variables can also determine temporal distance perceptions through cognitive mechanisms. Third, our research shows that perceiving a positive past self as temporally closer than a negative past self (i.e., the temporal distance bias; Ross & Wilson, 2002) is not solely due to the *motivation* to self-enhance but is also due to the *cognitive* effect that mood congruent selves are perceived as temporally closer than mood incongruent selves.

We have not yet discussed the question of how people arrive at mood congruence judgments. However, this is an important question, because our four studies have shown that perceived mood congruence is central for the temporal distance bias as well as for the occurrence of assimilation and contrast effects in respect to recalled selves. The judgment of congruence (i.e., similarity, overlap) of two entities by definition requires knowledge about both of these entities. Then, in the next step, these two entities are compared, and this finally results in a judgment of congruence. There is little question that people can judge their current mood. However, how do people judge their past mood? It is unlikely that people possess a complete mental record of their mood at all time-points from their personal past. Such knowledge, however, would be necessary to make an error free judgment of mood congruence between a recalled and the current self. Instead, it is more likely to assume that people use self-perception strategies (Bem, 1967, 1972) to infer their past mood from their behavior or from their salient traits at the time of the recalled self. That is, the information that is rendered salient concerning the recalled time should have a strong impact on whether one's past mood is judged as positive or negative. Thus, selectively recalling positive episodes or traits from one's personal past should lead to the conclusion that one's mood at the recalled time was positive, whereas selectively recalling negative episodes or traits from one's personal past should lead to the conclusion that one's mood at the recalled time was negative. Then, the fit between the mood judgment of one's past self and the mood judgment of one's current self should be evaluated. High fit should result in high mood congruence, whereas low fit should result in low mood congruence.

In fact, our results show that this process seems to underlie the perceived mood congruence judgments made by our participants. Specifically, Studies 2–4 show that happy (sad) people indicate higher mood congruence between their current self and their self 5 years ago after they have recalled a positive (negative) past self than after they have recalled a negative (positive) past self. Thus, participants' perception of their past mood varied as a function of recall, and thus participants' perception of their past mood does *not* reflect reality but is *reconstructed on the basis of the valence of the recalled information*. Note that this finding does not question the importance of perceived mood congruence as an influential psychological variable. We have demonstrated the importance of perceived mood congruence not only for the temporal distance bias

but also for the occurrence of assimilation and contrast effects in respect to recalled positive and negative selves.

We believe that our findings can be the basis for a whole host of further empirical work. First, we found that recalling any valenced self increases self-esteem for happy people but decreases self-esteem for sad people. Thus, nostalgia should increase self-esteem of chronically happy people but should decrease self-esteem for sad people. Interestingly, Wildschut et al. (2006; see also Zhou, Sedikides, Wildschut, Lei, & Gao, 2007) did not only find that nostalgia increases self-esteem but also that one trigger of nostalgia is negative affect and loneliness. Thus, these findings suggest that there may be something specific to the recall of past selves in a nostalgic fashion that circumvents contrast effects. Future research should closely examine the difference between the nature of nostalgic and non-nostalgic recalls of past selves. If it is possible to identify features of nostalgia that prevent contrast (e.g., a strong sense of self-continuity; cf. Sedikides, Wildschut, Gaertner, Routledge, & Arndt, 2008), one would possess a powerful tool to strengthen interventions that attempt to increase psychological functioning by recalling positive past selves.

Second, past research has demonstrated that thinking about positive attachment experiences with our parents in childhood (Mikulincer, Gillath, et al., 2001) or thinking about positive past attachment experiences with close people in general (Mikulincer et al., 2003) increases attachment security. Given that attachment experiences are strongly related to affect (Mikulincer, Hirschberger, Nachmias, & Gillath, 2001), the MCM might critically qualify attachment theory, which assumes that asking people to recall secure attachment episodes from their past necessarily increases attachment security (Bowlby, 1969, 1973, 1980). More specifically, it is plausible that chronically sad people contrast themselves away from recalled secure attachment episodes. As such, thinking about positive personal attachment episodes may provide a safe haven (cf. Bowlby, 1969, 1973, 1980) for chronically happy people but a rough sea for those people who are badly in need of security—chronically sad people.

Concluding Remarks

Much research has focused on how the current self shapes perceptions of recalled selves (see Ross, 1989). In our research, we have demonstrated that a recalled self also shapes perceptions of the current self. Together, these results suggest complex and multidirectional effects between a person's past self and present self. These effects may be due to motivational as well as cognitive biases (for a more general discussion between these biases, see Miller & Ross, 1975). In the current research, we have shown that the temporal distance bias (Ross & Wilson, 2002) is not solely due to the motivation to self-enhance. Instead, cognitive factors play an important role in whether a valenced self is perceived as temporally recent or distant. In turn, temporal distance perceptions determined the occurrence of assimilation and contrast effects of the valence of the recalled self on current self-esteem. We developed the MCM of temporal comparison to challenge the widespread assumption that recalling positive selves necessarily increases self-esteem. Using four experimental studies, we believe that we have achieved this goal. We hope that the findings of this research will benefit other researchers, as well as practitioners, who attempt to influence self-esteem by recalling past selves.

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