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CHAPTER TWO

Affective Consequences of Intentional Action Control

Peter M. Gollwitzer[*,§,1,a], **Torsten Martiny-Huenger**[§,¶,a] **and Gabriele Oettingen**[*,||,a]
[*]Department of Psychology, New York University, New York, NY, USA
[§]Department of Psychology, University of Konstanz, Konstanz, Germany
[¶]Department of Psychology, UiT The Arctic University of Norway, Tromsø, Norway
[||]Department of Psychology, University of Hamburg, Hamburg, Germany
[1]Corresponding author: E-mail: peter.gollwitzer@nyu.edu

Contents

Abstract

In the current chapter, we focus on evaluative consequences of successfully implementing an intended action. In the first part of the chapter, we review research showing the affective devaluation of objects that are in conflict with intended actions (i.e., the distractor devaluation effect); devaluation here refers to more negative (or less positive) evaluations of distracting stimuli after episodes of intentional selection (i.e., intentionally responding to certain stimuli in a way that requires ignoring distractors).

[a] Authors equally contributed to this article.

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In doing so, we focus on recent evidence supporting the assumption that this devaluation occurs in particular for interference-creating stimuli. In the second part of the chapter, we turn to the potential downstream consequences of distractor devaluation. First, we provide evidence that evaluative consequences of distractor devaluation and mere exposure can systematically influence intergroup bias. Second, we show how prior devaluation processes may bias subsequent selection processes in favor of executing intended actions. Thus, whereas most of the current research on action control focuses on how people best translate their intentions into action, the present chapter addresses the further question of how the execution of behavioral intentions leads to changes in affect that facilitate the maintenance of one's intentions in the long run.

1. INTRODUCTION

When investigating human motivation and action in relation to self-regulation, researchers primarily focus on goal-relevant aspects such as the expected value of the goal and the relevant skills and means to goal attainment (i.e., the goal's desirability and feasibility), the framing of the goal, and the strength of commitment to the goal (see Gollwitzer, 1990, 2012; Gollwitzer & Oettingen, 2012; Oettingen, 2000, 2012; Oettingen, Mayer, & Thorpe, 2010). However, in striving for a focal goal, people commonly encounter various goal-irrelevant objects, and some of these irrelevant objects may come into conflict with effectively attaining the focal goal. Consider the following example: You aim to promote your health by eating more fruits and vegetables. You also know that buying an apple in your workplace's cafeteria is an appropriate action in the service of this goal. On your daily walk to the cafeteria, you encounter many goal-irrelevant "objects" (e.g., strangers, hallways, goal-unrelated thoughts). Some objects, however, are not only goal irrelevant, but they have the potential to interfere with your intended action of buying an apple. For example, in the cafeteria, you pass by the shelf with chocolate muffins. The sight of the muffins may activate your habitual response of selecting and buying one, which is in conflict with your health promotion goal and the intended behavior of selecting an apple (in this chapter, we refer to this kind of conflict as *cognitive interference*). Furthermore, because of the muffin's history of coinciding with delicious taste, the sight of the muffin may activate positive evaluations (e.g., De Houwer, Thomas, & Baeyens, 2001; Martin & Levey, 1978). Such positive evaluations may, in turn, activate a behavioral approach orientation (e.g., Chen & Bargh, 1999), which is also in conflict with your intended behavior of avoiding the muffin and taking an apple instead (in this chapter, we refer to this kind of conflict as *motivational interference*). Besides potential higher-level problems of goal striving (e.g., forgetting the intention; reviewed by Gollwitzer & Oettingen, 2012), the given example highlights various kinds of stimulus-elicited low-level conflicts that need to be solved in the process of implementing intended actions. As we argue later, these conflicts play an important role in shaping a person's affective responses to the objects that are interfering with intentional action control.

There is extensive research investigating how people succeed in implementing intended actions such as selecting and buying healthy food despite interfering factors, for instance, by engaging in if–then planning (Gollwitzer, 1999, 2014; Gollwitzer & Sheeran, 2006; Martiny-Huenger, Martiny, & Gollwitzer, in press) and/or mental contrasting (Oettingen, 2000, 2012; Kappes, Oettingen, & Pak, 2012). In the present chapter, however, we focus on affective consequences that follow the successful implementation of an intended action. Accordingly, in the first part of the chapter, we review research showing the affective devaluation of objects (stimuli) that are in conflict with the execution of intended behaviors (i.e., *distractor devaluation*; Fenske & Raymond, 2006; Martiny-Huenger, Gollwitzer, & Oettingen, 2014a, 2014b; Raymond, Fenske, & Tavassoli, 2003). Devaluation refers to the fact that the evaluation of these objects becomes more negative (or less positive) after a selection episode that forces people to ignore these stimuli either attentionally or behaviorally. We report evidence that this devaluation occurs to a higher degree for objects that create much interference (e.g., a chocolate muffin in the above example) than for irrelevant objects that do not create any interference (e.g., hallways in the above example).

In the second part of the present chapter, we discuss various downstream consequences of distractor devaluation. We first provide evidence that distractor devaluation is a mechanism that needs to be considered when it comes to the formation and maintenance of attitudes toward in-group and out-group members (i.e., intergroup bias). Second, we discuss how devaluation mechanisms may bias the selection of subsequent behavioral intentions and thereby support ongoing goal pursuits. Importantly, whereas most of the research on action control focuses on how people best translate an intention into behavior (i.e., achieve a high rate of goal attainment), we instead focus on mechanisms that may support the maintenance of the behavioral intentions themselves. There is certainly much research (e.g., Brendl, Markman, & Messner, 2003; Hoefling et al., 2009; for a review, see Markman, Brendl, & Kim, 2009) on whether and how motivational factors (e.g., having a certain goal, need states such as being hungry) influence evaluations of objects; the unique contribution of the present chapter pertains to changes in evaluations of objects as a consequence of having acted in a certain way in their presence.

2. SELECTION AND AFFECTIVE DEVALUATION

2.1 Attentional Selection and Devaluation

The influence of affect on top–down control processes has been demonstrated many times in recent decades. For example, the affective significance (e.g., positive or negative valence) of a stimulus is known to influence attentional selection (reviewed in Yiend, 2010). However, effects in the opposite direction seem possible as well. These have not yet received the research interest that they deserve. The initial demonstration that attentional selection processes influence evaluations was provided by Raymond et al. (2003). In their studies, attentional selection was manipulated by a two-item search task in which participants saw abstract patterns and indicated the location of a target (e.g., a pattern consisting of circles) while ignoring a distractor (e.g., a pattern consisting of squares). Affective reactions were assessed by evaluations of the stimuli's valence. After each selection, participants evaluated one of the previously presented stimuli (target or distractor). The important finding was that distractors were evaluated more negatively than targets and control (novel) stimuli. These results imply that perceptually available but ignored stimuli seem to be linked to negative evaluative consequences.

Devaluation effects as a result of attentional selection processes have been replicated with the two-item search task described above (e.g., Goolsby, Shapiro, & Raymond, 2009; Kiss et al., 2007); analogous effects have been found with multiple-distractor search tasks (Raymond, Fenske, & Westoby, 2005; Veling, Holland, & van Knippenberg, 2007) and a flanker-like task (Martiny-Huenger et al., 2014a). In terms of stimuli, distractor devaluation has been shown with Chinese characters (in conditions of high distractor interference; Martiny-Huenger et al., 2014a), Latin letters (Veling et al., 2007), line drawings of objects (Griffiths & Mitchell, 2008), brands displayed on Web page banners (Duff & Faber, 2011), and human faces (e.g., Goolsby et al., 2009, Studies 1 & 2; Kiss et al., 2007; Martiny-Huenger et al., 2014b; Raymond et al., 2005, Study 3). Thus, the effect is not limited to specific paradigms and can affect a wide range of stimuli (see also the following section on response suppression and devaluation effects).

Note that distractor devaluation effects may counteract the evaluative consequences of *mere exposure* (Zajonc, 1968). Several decades of research indicate that making a stimulus accessible to an individual's perception is sufficient to increase liking for the stimulus. In one of the earliest experimental tests of the effect (Zajonc, 1968, Study 2), Chinese(-like) characters were presented at different frequencies (0–25). After exposure to the stimuli, participants indicated on a seven-point scale whether the Chinese characters meant something good or bad. The results showed a clear relationship between the frequency of the presentation of each stimulus and its evaluation. More frequent exposure brought about more positive evaluations. The same results were found with nonsense words (supposedly Turkish) and face stimuli (Zajonc, 1968, Studies 1 & 3, respectively). More than 100 studies investigated the mere exposure effect in the first 20 years after the Zajonc publication. In his meta-analysis, Bornstein (1989) concluded that the mere exposure effect was robust with a moderate effect size of $r = 0.26$ (Cohen, 1977). The minimal prerequisites needed for mere exposure effects to emerge are indicated by research showing that even subliminal exposure (i.e., below the threshold for conscious perception) is sufficient to induce increased liking (Monahan, Murphy, & Zajonc, 2000; reviewed by Zajonc, 2001).

Thus, with regard to our initial example of heading toward the apples in the cafeteria and repeatedly being exposed to the chocolate muffins (i.e., with or without attention, and with or without conscious awareness; Zajonc, 2001), based on decades of mere exposure research the best guess regarding the evaluative consequences for the muffins would be to predict more positive evaluations over time. However, from the distractor devaluation perspective, whether or not a person ignores the muffins should be a moderator (Huang & Hsieh, 2013); in the case of intentionally ignoring the muffins, the evaluation of the muffins should become more negative over time.

2.2 Response Suppression and Devaluation

Besides attentional selection, response selection processes (i.e., response suppression) seem to have similar evaluative consequences. There is evidence that stimuli associated with response suppression are subsequently evaluated more negatively than stimuli not associated with response suppression (e.g., Fenske, Raymond, Kessler, Westoby, & Tipper, 2005). For example, participants in a study by Fenske et al. (2005) had to repeatedly respond to faces in a categorization task but withhold responses if a transparent color patch was superimposed over the faces. Affective evaluations were assessed by the question of which of two presented faces was more trustworthy. Those faces previously associated with response suppression were selected significantly less than those not previously associated with response suppression; the opposite was true when participants were asked which face was less trustworthy. Thus, this pattern of results strongly suggests that the stimuli associated with response suppression became less likable. Various studies have also shown analogous devaluation effects as a result of response suppression (e.g., Buttaccio & Hahn, 2010; Doallo et al., 2012; Frischen, Ferrey, Burt, Pistchik, & Fenske, 2012; Kiss, Raymond, Westoby, Nobre, & Eimer, 2008; Martiny-Huenger et al., 2014a; Veling, Holland, & van Knippenberg, 2008).

Returning to our example presented at the outset of the chapter, suppressing the habitual response to select and buy the chocolate muffin in the cafeteria should result in more negative evaluations of the muffins. For the sake of convenience, we adopt the following terms to refer to the stimuli used, the participants' interaction with the stimuli, and the evaluative consequences: Previously ignored stimuli and stimuli associated with response suppression will be referred to as distractors; the process by which the distractor is ignored or responses are suppressed will be referred to as the selection process; and the negative evaluative consequences in both cases will be termed distractor devaluation.

3. UNDERLYING MECHANISMS OF DISTRACTOR DEVALUATION

3.1 Devaluation-by-Inhibition Assumption

The most prominent assumption regarding the underlying mechanisms of distractor devaluation alludes to inhibitory processes and is thus referred to as the devaluation-by-inhibition hypothesis. Raymond and colleagues (Raymond et al., 2003; reviewed in Fenske & Raymond, 2006; Raymond, 2009) proposed that attentional inhibition is applied and encoded with distractors during selection. When a distractor is encountered again, the inhibition is reinstated and negatively affects evaluations. A similar assumption underlies the devaluation effect as a consequence of response suppression, with the only difference that the inhibitory processes relate to suppressing a behavioral response rather than attentional filtering.

Evidence for the devaluation-by-inhibition hypothesis is provided, for example, by neurophysiological studies showing that event-related potentials (ERPs; specific stimulus-driven electrical brain activity) associated with effective attentional inhibition (Kiss et al., 2007) and effective response inhibition (Kiss et al., 2008; see also Doallo et al., 2012) covary with evaluations assessed at a later point in time. Kiss et al. (2007) investigated distractor devaluation effects in a visual attention task in relation to the N2pc ERP. The N2pc component is a lateralized negativity observed on posterior electrodes between 200 and 350 ms after stimulus onset. It is assumed to reflect attentional filtering processes during visual search (e.g., Eimer, 1996; but see Mazza, Turatto, & Caramazza, 2009). Kiss et al. (2007) reported evidence that the onset of the N2pc component covaried with distractor evaluations; an earlier onset (assumed to reflect more efficient selection) was related to more negative distractor evaluations.

In a conceptually similar study, Kiss et al. (2008) investigated distractor devaluation in a response suppression task (Go/No-Go task) and recorded an ERP that is assumed to relate to response suppression (i.e., No-Go N2). The No-Go N2 is a frontocentral ERP negativity at around 300 ms after stimulus onset and is associated with response inhibition processes (e.g., Eimer, 1993; Nieuwenhuis, Yeung, & Cohen, 2004). Paralleling the covariation of the N2pc for attentional distractor devaluation (Kiss et al., 2007), Kiss et al. (2008) reported that the No-Go N2 covaried with distractor devaluation from response suppression. A larger No-Go N2 related to more negative distractor evaluations. To the extent that the ERPs investigated in the Kiss et al. studies (N2pc, Kiss et al., 2007; No-Go N2, Kiss et al., 2008) reflect inhibitory processes in attentional and response selection, these studies indicate that trial-by-trial variations of inhibitory efficiency in the selection process predict subsequent evaluations for the distractor stimuli. More efficient selection relates to more negative evaluations, which supports the devaluation-by-inhibition assumption.

Doallo et al. (2012) provide a more in-depth investigation of how inhibitory processes may actually influence evaluations. The authors show that different brain areas from prefrontal areas and the orbitofrontal cortex (involved in top–down response inhibition) to the amygdala (involved in emotional processing) systematically covary for previously (response) inhibited and devalued stimuli. In general, in line with Raymond (2009), the authors propose that inhibition processes reduce value signals for a given stimulus. This reduced value is translated into a more negative evaluation. However, the proposed devaluation-by-inhibition mechanism has not gone unchallenged, and there is an alternative account for distractor devaluation that does not involve inhibitory processes.

3.2 Evaluative Labels

There are alternative explanations for distractor devaluation that do not allude to inhibitory processes related to attentional or response selection. We go into detail about these alternative accounts not because we think that they are adequate to explain all instances of distractor devaluation, but because of the important implications for the development of appropriate task paradigms for investigating the evaluative consequences of the selection process itself (independent of other evaluative influences that are unrelated to the selection process). One alternative explanation is based on the notion that the labels in a typical selection task (i.e., target and distractor) are already evaluatively charged. Dittrich and Klauer (2012) provide empirical evidence for such an alternative account; they argue that value connotations (i.e., positive vs negative) conveyed through the selection task instructions differentially influence the evaluation of targets and distractors presented in the selection task. They base their assumption on the idea that responses can be affectively coded (Eder & Rothermund, 2008) and argue that selecting a stimulus implies something positive and rejecting a stimulus implies something negative. Thus, the way in which instructions are framed may influence how participants mentally encode the selection process, and therefore certain stimuli may be understood as positive or negative. More specifically, Dittrich and Klauer (2012) asked participants either to select targets (and reject distractors) or to reject the targets (i.e., picking out the bad ones). Whereas the former (typical) way of instructing participants resulted in the usual distractor devaluation effect, the latter reframed instructions resulted in target devaluation. Thus, although the same attentional and behavioral responses were required in both tasks, the reversed value connotation conveyed by the instructions led to the opposite results; distractor devaluation was turned into target devaluation simply by changing the value connotation for targets and distractors in the instructions.

Distractor devaluation research usually shows effects for distractors only (i.e., targets stay unaffected). Accounting for distractor devaluation by referring to evaluatively charged labels cannot easily explain this pattern of results. The latter account would have to predict that targets and distractors are affected to the same extent (albeit in opposite directions). However, the fact that targets stay unaffected whereas distractors do not is in line with the so-called negativity bias: negative information (as well as affect of negative valence) is generally given more weight than the same degree of positive information and affect (e.g., Ito, Larsen, Smith, & Cacioppo, 1998; Rozin & Royzman, 2001). If negative information and affect are given more weight, then distractor devaluation should more readily emerge than enhanced target evaluation. Thus, an account of distractor devaluation based on evaluatively charged labels would not be in conflict with the distractor devaluation evidence.

In conclusion, the discussed alternative account based on the evaluative connotation of labels and the empirical results provided by Dittrich and Klauer (2012) poses a serious challenge to distractor devaluation studies by highlighting an important confounding variable: evaluatively charged labels may be used to mentally represent the selection task, and these mental representations may later become incidentally activated at the time of evaluating the presented stimuli. However, we are suggesting that there are distractor devaluation effects that cannot solely be explained by this alternative account. Besides the neurophysiological studies mentioned above that point to the involvement of attentional and response selection processes in distractor devaluation, there are also findings from behavioral studies that are not easily explained by evaluatively charged labels. We turn to such evidence in the next section by presenting studies that highlight the importance of a selection *conflict* for inducing distractor devaluation (Martiny-Huenger et al., 2014a). This evidence is important because it rules out alternative accounts of distractor devaluation and thus provides evidence that selection processes indeed affect evaluations. Moreover, if it turns out that conflict is an important factor in distractor devaluation, this would provide an easy practical solution to the question of which of the many irrelevant objects that we encounter in everyday life are devalued and which are not.

4. INTERFERENCE AND AFFECTIVE DEVALUATION

4.1 Cognitive Interference

Which of the countless irrelevant objects in our environment are subject to the distractor devaluation effect as we pursue our behavioral goals? Outside the experimental situations with only a limited number of stimuli, it is hard to imagine that all encountered but irrelevant objects are devalued. We already noted in the introductory example of selecting an apple in the cafeteria (over the chocolate muffin) that some objects in our environment are not only irrelevant to a current behavioral goal, but they are explicitly in conflict with it. As already indicated at the end of the last section, we will now turn to evidence that selection conflicts or interference created by a distractor is an important aspect in producing distractor devaluation. The notion of conflict as an important factor in distractor devaluation is important in regard to two issues. First, it can provide information on the underlying mechanism of distractor devaluation. Second, the necessity for a conflict in the selection process may resolve the obvious problem of which objects are actually devalued in everyday life situations: the importance of a selection conflict confines the effect of distractor devaluation to a subset of encountered stimuli—the subset of interference-creating objects.

In an attempt to test the hypothesis that distractor devaluation requires a conflict situation and to avoid the possible influence of evaluative labels, we (Martiny-Huenger et al., 2014a) tested the distractor devaluation effect in the so-called flanker task paradigm (Eriksen, 1995; Eriksen & Eriksen, 1974). Based on the devaluation-by-inhibition hypothesis and evidence that inhibitory processes serve to resolve conflicts depending on the requirements of the immediate situation (De Houwer, Rothermund, & Wentura, 2001; Frings & Wentura, 2006; Tipper, Weaver, & Houghton, 1994), we reasoned that the devaluation effect is a result of a conflict between an intended and a stimulus-driven (distractor) response. If this is the case, then different degrees of conflict (or distractor interference) should influence the devaluation effect. In other words, only distractors in conflict with an intended response should be devalued.

In a typical flanker task, a central target stimulus is flanked by two distractors, mirroring everyday selection processes in which target objects are always surrounded by other objects. For example, in a study by B. Eriksen and C. Eriksen (1974), participants responded to a central letter with a learned response (e.g., either left or right lever press for the letters H or K and S or C, respectively) while ignoring flanking letters. Not surprisingly, in the presence of flankers (i.e., distractors), participants responded slower to the targets compared with a control condition without distractors. Most interestingly, the response times differed in the presence of distractors that had a learned response that was compatible with the required target response (e.g., if both H and K required a left lever press) as compared with distractors that had a learned response that was incompatible with the required target response (e.g., the target H required a left lever press, but the distractor S was associated with a right lever press). In the latter case—in trials with response-incompatible distractors—increased response times were observed. This finding indicates that even stimuli that are not attended to are processed to the extent that learned responses with these distractors can interfere with intended target responses. Since the introduction of the flanker task (B. Eriksen & C. Eriksen, 1974), also referred to as the Eriksen flanker task, it has become an important paradigm for investigating cognitive processes related to distracting stimuli.

The features of the flanker task make it a suitable candidate for investigating the evaluative consequences of ignoring distracting stimuli. Furthermore, distractor devaluation is commonly assumed to be the result of inhibition (or suppression) processes. Although this assumption has some critics (reviewed by MacLeod, Dodd, Sheard, Wilson, & Bibi, 2003), it is a recurring notion that the interference-creating distractors and distractor responses (i.e., in incompatible trials of the flanker task) need to be inhibited in order to execute the intended target response (e.g., Eriksen, 1995; Houghton & Tipper, 1994; Houghton, Tipper, Weaver, & Shore, 1996; Tipper, 2001). Thus, conditions of high distractor interference should result in stronger distractor inhibition compared with conditions of low distractor interference (e.g., Giesen, Frings, & Rothermund, 2012).

Thus, in our studies (Martiny-Huenger et al., 2014a), we used an accepted task paradigm to investigate processes related to ignoring distractors (i.e., the flanker task); however, we used the kind of stimuli presented in one of the early mere exposure studies (Zajonc, 1968, Study 2). That is, instead of presenting letters that were associated with certain responses, we presented Chinese characters in a flanker task and asked participants to indicate whether the central target character was (vertically) symmetrical or asymmetrical (see Figure 1). We predicted that only incompatible distractors (e.g., a symmetrical distractor displayed with an asymmetrical target) would be devalued, as only they create a conflict that needs to be resolved. In two studies, we manipulated the conflict originating from distractors (i.e., distractor interference). We manipulated response interference (Studies 1 & 2) by presenting stimulus configurations in which distractor stimuli were associated with the same response as the target stimulus (compatible/low interference; e.g., symmetrical target and symmetrical distractors) or by presenting a stimulus configuration in which distractor stimuli were associated with a different response than the target stimulus (incompatible/high interference; e.g., asymmetrical target and symmetrical distractors). Additionally, we varied the degree of visual interference (Study 2) by presenting some distractor stimuli closer (high interference) and others farther away from the target (low interference; e.g., Raymond et al., 2005).

The evaluative consequences of each manipulation resulted in the expected pattern. Figure 2 displays the magnitude of the distractor

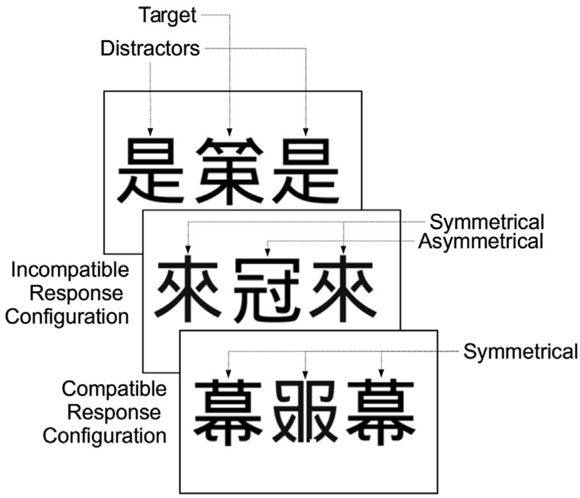

Figure 1 Conceptual illustration of the flanker task used in Martiny-Huenger et al. (2014a).

devaluation effect for the stimulus category (i.e., targets vs distractors) and interference (i.e., low vs high distractor interference) in Studies 1 and 2. Whereas the interference in the upper graph from Study 1 is a result of the response compatibility manipulation alone (i.e., low interference refers to trials with compatible response configurations, and high interference refers to trials with incompatible response configurations), in the lower graph depicting the results of Study 2, low and high interferences refer to the combination of both manipulations (i.e., response compatibility and spatial distance).

Whereas the response compatibility interference manipulation in Study 1 only resulted in a marginally significant interaction effect, combining the visual and response interference conditions (Study 2) and combining the response interference conditions from both Studies 1 and 2 resulted in significant interaction effects between the interference factor and the stimulus category; high-interference distractors were evaluated more negatively than low-interference distractors. Target stimuli were unaffected by the manipulation (or were affected in the opposite direction than the distractors). The fact that high-interference (i.e., conflicting) distractors were evaluated more negatively than low-interference distractors and that only high-interference distractors were devalued below the level of novel control stimuli (Study 2) extends previous research by showing that distractors in general are not

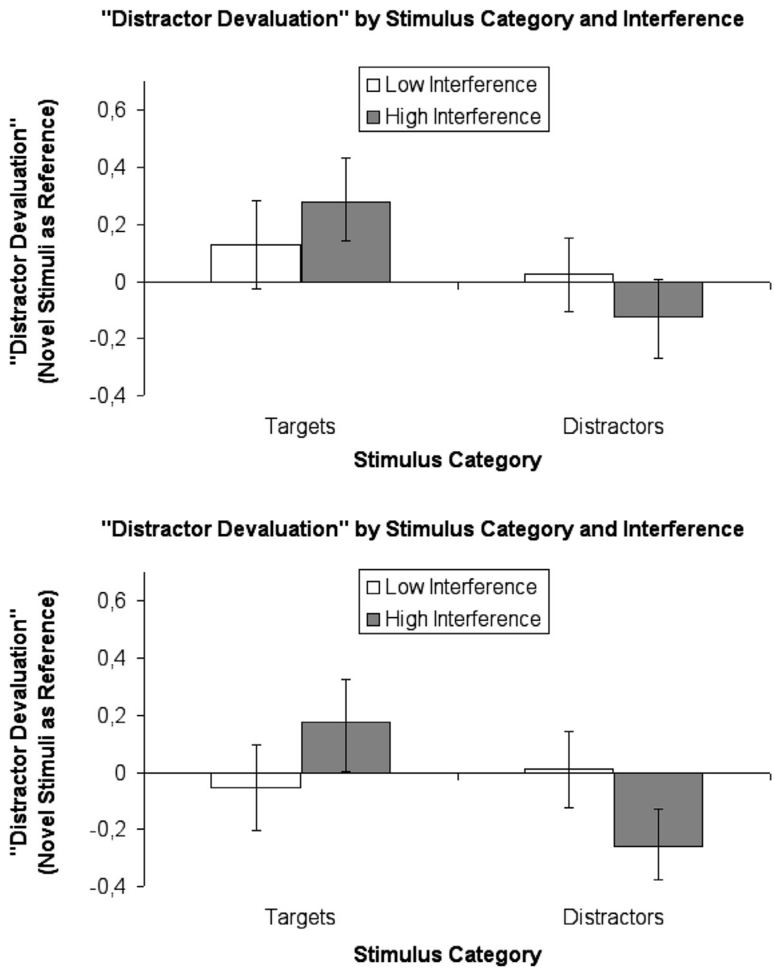

Figure 2 The figure illustrates the results of studies 1 (above) and 2 (below) in Martiny-Huenger et al. (2014a). Evaluations are depicted as difference scores from evaluations of novel stimuli. A negative score represents an actual distractor devaluation effect. Whereas low and high interference refers to response compatibility in Study 1, in Study 2, low and high interference refers to the combination of both response compatibility and target–distractor distance manipulation. Error bars represent ± 1 standard error of the mean.

devalued, but only those distractors that are in conflict with intention-driven responses.

With regard to distractor devaluation research in general, our research provides an important example of distractor devaluation that cannot be attributed to evaluatively charged labels as discussed in the previous section. The important comparison was not made between targets and distractors but between low- and high-interference distractors. The instructions for the task did not differ between the two types of distractors, nor is it likely that the participants explicitly realized that there were subcategories of distractors, which may have allowed them to spontaneously come up with different labels for the low- and high-interference distractors. The only difference between compatible and incompatible target–distractor configurations was the distractor interference. Thus, in the case of our studies (Martiny-Huenger et al., 2014a), it is more likely that processes related to distractor interference (and maybe inhibition to resolve the interference) caused the devaluation effect than processes related to category labels with different value connotations.

In sum, the presented studies provide evidence that distractor devaluation is increased with enhanced conflict between an intended action and the interference from a distractor. We refer to this phenomenon as cognitive interference because of the conflict between different activated responses or visual stimuli. In the following section, we continue to provide evidence for the role of conflict in distractor devaluation, with a focus on conflict of a motivational nature.

4.2 Motivational Interference

Research from other laboratories also suggests that conflicts between intentions and stimulus-driven responses result in a more pronounced devaluation of the conflict-creating stimuli. For instance, Veling et al. (2008) employed a Go/No-Go task in which participants had to respond to certain stimuli and not respond to others. The authors added a valence factor to the design by having participants respond (or not respond) to positive, neutral, and negative stimuli, and they expected a devaluation effect only for positive stimuli. Veling et al. hypothesized that positive stimuli automatically activate an approach orientation (e.g., Chen & Bargh, 1999). This automatic approach orientation can be assumed to be in conflict with the intention-driven response suppression or avoidance orientation. They further assumed that this conflict elicits negative affect, which is tagged to the conflict-eliciting stimulus (Veling et al., 2008). Indeed, the results indicated a devaluation effect only for positive stimuli that required response suppression (i.e., positive No-Go stimuli).

Drawing a parallel to our own research presented above, in the Veling et al. studies, positive stimuli are the high-interference stimuli, and neutral and negative stimuli are the low-interference stimuli. Along the lines of our results (Martiny-Huenger et al., 2014a), only high-interference stimuli were affectively devalued. Thus, Veling et al. (2008) also provide evidence that conflicts between stimulus properties (in this case, positive valence) and intention-driven behaviors lead to a devaluation of the conflict-generating stimulus. Whereas in our case the source of the conflict was a cognitive interference, in the studies by Veling et al. (2008) the interference was of a motivational nature; the evaluative consequences, however, were similar.

In sum, there is a fair amount of empirical evidence showing affective devaluation of distractor stimuli in search tasks (e.g., Raymond et al., 2003), response suppression paradigms (e.g., Fenske et al., 2005; Veling et al., 2008), and interference paradigms such as the flanker task (Martiny-Huenger et al., 2014a). There is also evidence that a conflict between intended and stimulus-elicited processes may be an important part of the distractor devaluation effect. This conflict notion resolves the obvious issue that it is unlikely that all of the unattended objects in our environment are affectively devalued. The devaluation affects only those objects that are explicitly in conflict with one's intentions.

In regard to our initial example, the chocolate muffin is a high-interference-creating snack for a person who intends to buy apples but also has a personal history of habitually selecting chocolate muffins (i.e., cognitive interference) or for whom chocolate muffins elicit a positive evaluation (i.e., motivational interference). Thus, successfully implementing the intended behavior of buying the apple and ignoring the muffin on the nearby shelf may lead to a devaluation of the muffin, but not to a devaluation of other irrelevant objects (e.g., the soup of the day, nearby furniture) with which the person has no noteworthy habitual or affective associations that are in conflict with the focal behavioral goal.

5. CONSEQUENCES OF DISTRACTOR DEVALUATION

In the remainder of this chapter we turn to the question of the consequences of distractor devaluation. First, we present evidence that distractor devaluation can have consequences for social attitudes (e.g., intergroup bias; Martiny-Huenger et al., 2014b), and second, we discuss possible effects of distractor devaluation for subsequent goal pursuits (i.e., what happens if a previously ignored stimulus is encountered again).

5.1 Distractor Devaluation and Social Attitudes

As selection is such a basic requirement of purposefully getting around in our everyday life, we wondered whether distractor devaluation (in combination with mere exposure) might influence evaluations of the most important "objects" in our environment: other people. Previous research has established that distractor devaluation can also be found for previously ignored faces. For example, Raymond et al. (2005, Study 3) presented grayscale faces in a search task with multiple distractor faces in each trial. Evaluations were assessed by asking participants to judge the presented person's trustworthiness. Similar to the abstract patterns used in Raymond et al.'s studies 1 and 2, previously ignored faces were evaluated more negatively (i.e., less trustworthy) compared with the search task targets. Also in line with other studies (e.g., Martiny-Huenger et al., 2014a; Raymond et al., 2005, Studies 1 & 2), this devaluation was especially pronounced for faces presented closer to the targets.

The face stimuli used in previous distractor devaluation research (e.g., Goolsby et al., 2009; Kiss et al., 2008) were rather plain and neutral faces. They lacked most context information with which people are usually encountered in our everyday life such as different facial expressions, environmental context, or signs of social group memberships. The last aspect is especially interesting in regard to an important social-evaluative phenomenon called intergroup bias. Intergroup bias refers to the finding that people evaluate in-group members (i.e., people belonging to a group the evaluating person also belongs to or identifies with) more favorably compared with out-group members (i.e., people belonging to a group the evaluating person does not belong to or identifies with; reviewed by Hewstone, Rubin, and Willis (2002). Thus, visible markers like skin color, clothing style, or signs that identify a person as a fan of a certain sports team lead to a relatively spontaneous categorization into in- and out-groups (Macrae & Bodenhausen, 2000). Our interest in investigating the possible evaluative consequences of distractor devaluation and mere exposure regarding facial stimuli was driven by the question of whether people relate in the same way or in a different way to in-group versus out-group members. We speculated that group membership may lead to a systematic bias in the sense that we are more likely to attend to in-group members compared with out-group members and to interact more with in-group members compared to out-group members.

For example, some groups are defined by our interactions with the respective group members. We are members of certain work groups or teams exactly because we are working together with the other team members, that is, we are attending to and responding to them more often than to members of other teams we are not part of. Thus, to the extent that we encounter out-group members in workplace settings, under common circumstances, we are probably more likely to ignore them compared to the members of our in-group. Even if group membership is not defined by the specific interactions with other group members, if we are around strangers, it is more likely that we approach people who appear to belong to groups we affiliate with (e.g., regarding helping behavior; Levine, Prosser, Evans, & Reicher, 2005). If in everyday situations we are more likely to attend to in-group members compared to out-group members, basic attitudinal effects of mere exposure and distractor devaluation may in the long run render evaluations of in-group members more positive (as they are more often attended to) and evaluations of out-group members more negative (as they are more often ignored). Indeed, these presumed evaluative consequences are in line with the intergroup bias effect. Whereas we do not claim that intergroup bias is solely a result of the evaluative consequences of selection processes, the evaluative consequences of selection processes may nonetheless reinforce it.

It is complicated to investigate selective attention processes in everyday interactions between people. Therefore, we recently tested the basic assumption that intergroup bias is systematically modulated by selection processes in a lab setting (Martiny-Huenger et al., 2014b). From a mere exposure perspective, it has been suggested that simply increasing exposure to out-group members may ultimately reduce the intergroup bias (e.g., Bornstein, 1993). However, in everyday situations, we are not merely exposed to other people the way that participants in Zajonc's experiments were exposed to the critical stimuli (e.g., Chinese letters). When traversing through everyday life, we almost always pursue one goal or another or even multiple goals at the same time. Such everyday goal striving implies that we are often attending to goal-relevant aspects in our environment and ignoring goal-irrelevant aspects, including our interactions with other people. Furthermore, as argued above, such attention allocation may be biased, such that we are more likely to attend to in-group members and ignore out-group members. Thus, we wondered whether distractor devaluation research may contribute to an understanding of intergroup bias.

Mere exposure research would lead us to predict that attending to in-group and ignoring out-group members should not affect the magnitude of intergroup bias, as both targets and distractors (i.e., in-group and out-group members) are equally (positively) affected by exposure. However, from a distractor devaluation perspective, the positive effects of mere exposure should be confined to the targets only (e.g., to attended in-group members). Ignored out-group members, on the other side, should be subject to the negative evaluative consequences of distractor devaluation. Thus, the difference between in-group and out-group evaluations should become wider (i.e., intergroup bias should increase) when the in-group is attended to and the out-group is ignored. In the opposite case of attending to out-group members while ignoring in-group members, the reverse consequences can be expected. Whereas attending to the target out-group members can be expected to increase liking for the out-group members (as a result of mere exposure), the distractor devaluation associated with ignoring in-group members should induce a reduced liking for in-group members; as a consequence, intergroup bias should become smaller.

We (Martiny-Huenger et al., 2014b) tested these predictions in a task similar to the above-mentioned two-item search tasks reported by Raymond et al. (2003). In two studies, we asked participants to count the number of in-group faces (or out-group faces) in the presence of to-be-ignored out-group faces (or in-group faces). The stimulus faces were of college-aged males and females. The group membership was made visible by university emblems displayed together with the faces. Study 1 was conducted with students from New York University (NYU), and the stimulus faces were wearing baseball caps displaying the emblem of either NYU (in-group) or Columbia University (out-group). Study 2 was conducted with students from the University of Konstanz and the emblem of the University of Konstanz (in-group) or the Applied University of Konstanz (out-group) was displayed on the forehead of the faces. Participants were told that the study was investigating social perception processes, thus accounting for the group categorization. We assessed liking ratings of the in-group and out-group faces prior to and during the search task. As expected, participants showed intergroup bias in the baseline liking ratings (see baseline bars in Figure 3): evaluations of in-group faces were more positive compared to evaluations of out-group faces. Importantly, however, in both studies we found a significant interaction effect for baseline versus experimental ratings and the target group category (in-group vs out-group). As expected, the interaction effect indicated that attending to in-group faces while ignoring out-group faces increased intergroup bias (i.e., widening the gap between the evaluations), whereas attending to out-group faces while ignoring in-group faces resulted in a decreased intergroup bias (see Figure 3). Thus, we provided evidence that immediate goal-directed processing of

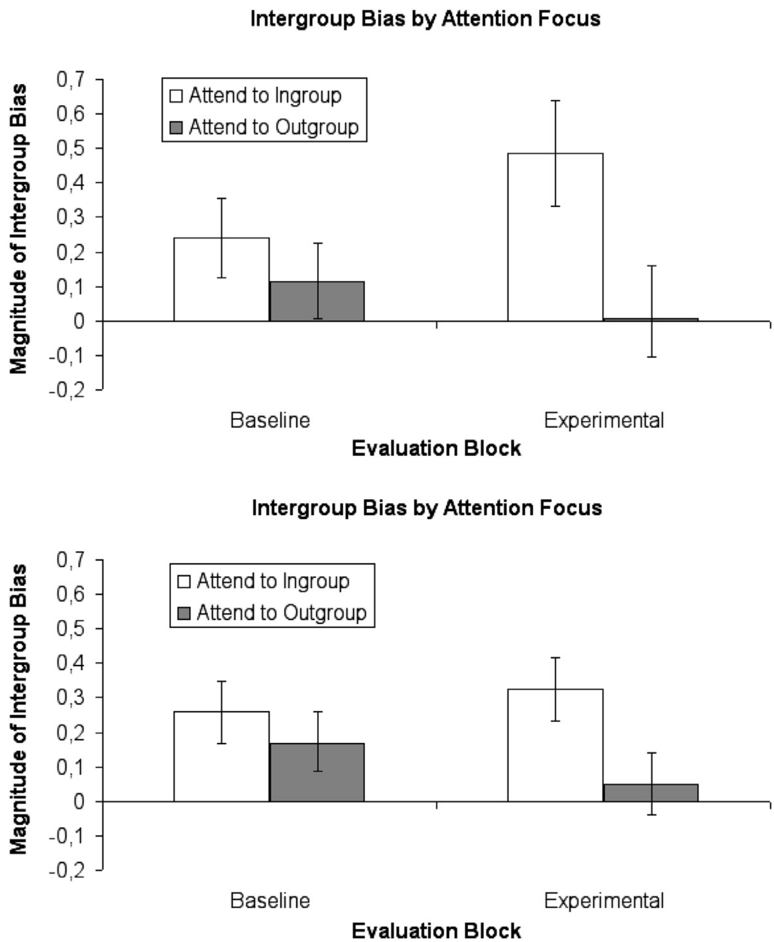

Figure 3 The figure illustrates the results of Studies 1 (above) and 2 (below) in Martiny-Huenger et al. (2014b). Intergroup bias is depicted as the difference between in-group and out-group evaluations (i.e., in-group minus out-group evaluation). A positive value represents more positive evaluations of in-group members compared to out-group members. Error bars represent ±1 standard error of the mean.

in-group versus out-group stimuli (i.e., mere exposure and distractor devaluation) systematically influences intergroup bias.

Thus far, theories explaining intergroup bias have mostly focused on social-motivational factors. That is, certain desires or needs are assumed to be fulfilled by the evaluative difference between in-group and out-group members (Brewer, 1991; Hogg, 2000; Sidanius & Pratto, 1999; Tajfel & Turner, 1979). These motivational explanations are not rooted in actual actions (as they reflect an internal process based only on one's perception), but they are assumed to influence subsequent actions. Our approach, in contrast, presents a cognitive/affective mechanism that influences inter-group bias: exposure and selection processes as a consequence of goal-directed interactions with in-group versus out-group members. It remains to be investigated to what extent these evaluative consequences of mere exposure and distractor devaluation for in-group and out-group members actually influence subsequent social interactions with members of the respective groups. Will changes in evaluation from these selection processes influence actual behaviors? This is the aspect that we focus on in the last part of the chapter, although this discussion is not confined to social interactions. On a more basic level, is distractor devaluation beneficial for subsequent goal striving?

5.2 Benefits of Distractor Devaluation for Action Control

The notion of negative distractors seems intuitive, as we usually ignore or try to ignore disliked stimuli. But how might our action control actually *benefit* from distractors becoming increasingly more negative through distractor devaluation? Two potential mechanisms are explored here: distractor devaluation may reduce the distractor's potential for cognitive processing (e.g., attention, encoding) or from a behavioral perspective, distractor devaluation may make the distractor less likely to be selected in subsequent encounters. Through these mechanisms, distractor devaluation can provide a benefit to goal pursuit: the distractor becomes less distracting.

5.2.1 Potential Consequences for Cognitive Processing

Regarding the first mechanism: Can more negative valence reduce a distractor's potential for cognitive processing? Actually, there is a substantial amount of research showing the opposite. Affectively significant stimuli receive preferential processing (reviewed by Lang, Bradley, & Cuthbert, 1997; Pessoa, 2009; Vuilleumier, 2005; Yiend, 2010). Much of this research is concerned with stimuli with negative affective significance. For example, attention is drawn to and kept by threatening or fear-inducing stimuli (e.g., Armony, 2002; Fox, Russo, & Dutton, 2002). Stimuli with negative affective significance are more easily detected than neutral and positive stimuli (e.g., Eastwood, Smilek, & Merikle, 2001). Furthermore, aversively conditioned stimuli are encoded more strongly even when presented as distractors (Lim, Padmala, & Pessoa, 2008). In sum, negative affective significance seems to enhance the chances of a stimulus being cognitively processed.

Such processes are probably beneficial when it comes to life-threatening stimuli (e.g., dangerous animals, angry facial expressions). However, for distractions from our behavioral intentions (e.g., chocolate muffins when wanting to eat more healthy food), an increase in the chances of being cognitively processed is the opposite of being less distracting; we want to pass by them smoothly and not have "arrows" pointing at them.

In light of this evidence, the question arises of whether distractor devaluation actually results in more negative valence or the observed distractor devaluation effects are a consequence of a simple affective neutralization (i.e., removed affective significance). Affective neutralization could indeed have the beneficial effect that previous distractors would receive less preferential processing in future encounters, as affectively driven preferential encoding would be reduced. Frischen, Ferrey, Burt, Pistchik, and Fenske (2012) investigated this possibility by testing whether ignoring distractors actually leads to more negative valence or to affective neutralization (which could be misinterpreted as devaluation when dealing with initially positive stimuli). They argued that affective neutralization should result in more negative evaluations for initially positive stimuli, but more positive evaluations for initially negative stimuli. However, this is not what they found: They consistently observed devaluation effects for positive and negative stimuli. Thus, their studies provide evidence that previously ignored stimuli become more negative no matter whether they were positive or negative initially. A preliminary conclusion would thus be that from a cognitive-processing perspective, distractor devaluation may not be considered beneficial for behavioral intentions that require one to ignore the distractors (i.e., engage in less cognitive processing of stimuli that interfere with one's goal).

However, this conclusion must take into account the small evaluative changes observed in experimental distractor devaluation research (e.g., the small decreases in evaluation of 0.2–0.5 on three- to seven-point scales). Distractors cannot be expected to become negative enough to automatically capture attentional resources. So let us return to the opening example of pursuing a health promotion goal: If the very positive affective significance of a chocolate muffin hampers one's goal pursuit, even small decreases in this positivity should facilitate the goal pursuit. The positive affective significance of a stimulus (e.g., a chocolate muffin) may interfere with a focal goal (e.g., healthy eating) that involves not approaching the positive stimulus. An affective devaluation of such stimuli may reduce the potential for cognitive processing (as a consequence of the positive affective significance) and thus make these stimuli less distracting to the focal goal. Indeed, there are various intervention studies designed to reduce the hedonic value of high-caloric food products (Houben, 2011) and alcohol (Houben, Havermans, Nederkoorn, & Jansen, 2012; Houben, Nederkoorn, Wiers, & Jansen, 2011; Jones & Field, 2013; Wiers, Rinck, Kordts, Houben, & Strack, 2010) by training participants to suppress responses to these stimuli. These studies found evidence for the effectiveness of such training to reduce the actual consumption of the critical stimuli (Houben, 2011; Jones & Field, 2013) and to decrease their positive evaluations (Houben et al., 2012, 2011).

Such intervention studies can thus be considered as preliminary evidence that successful attentional and response selection in line with current behavioral goals may change some characteristics of the distracting stimuli in a way that facilitates subsequent goal-directed avoidance of these stimuli. Still, whether these beneficial effects for subsequent goal pursuit in the presence of distractors with very positive affective significance are due to a decrease in their potential for cognitive processing needs further testing. Besides the potential for cognitive processing, in the next and final section we consider a behavioral perspective and present some initial evidence that distractor devaluation may increase a behavioral avoidance orientation.

5.2.2 Potential Consequences for Behavioral Avoidance

From an action control perspective, it would be beneficial if prior distractors would acquire an increased potential to be behaviorally avoided (i.e., less likely selected) in subsequent encounters. It is commonly assumed that evaluative processes guide behavior (Fazio & Towles-Schwen, 1999; Strack & Deutsch, 2004; Winkielman & Berridge, 2004). More specifically, Chen and Bargh (1999) showed that whereas positive stimuli automatically activate an approach orientation, negative stimuli automatically activate an avoidance orientation (see also Eder & Rothermund, 2008). Thus, from an action control perspective, distractor devaluation may indeed be beneficial for goal-directed behavioral control through a behavioral-avoidance orientation (see also Doallo et al., 2012). Successfully avoiding a stimulus (i.e., attentionally ignoring or behaviorally withholding a response) may, by affective devaluation, make it easier to behaviorally avoid the stimulus in subsequent encounters. Before presenting recent evidence from our own lab in support of this idea, we will shortly review two areas of research in which similar ideas have been proposed. These areas pertain to research as different as the investigation of the so-called *negative priming* effect in cognitive psychology and the question of how people maintain romantic relationships in social psychology.

5.2.2.1 Negative Priming

A well-known effect in cognitive- and memory-oriented psychological research can be seen as evidence that there are processes that impair selection if the selected object was previously encountered as a distractor: the negative priming effect (e.g., Neill & Valdes, 1992; Tipper, 1985, 2001). With paradigms conceptually not unlike the experimental paradigms used to investigate distractor devaluation (e.g., Raymond et al., 2003) but with a focus on response times rather than affective evaluations, researchers have investigated the fate of unattended distractors. For example, in a study by Tipper (1985), participants had to repeatedly respond to a red line drawing (target) that was superimposed over a green line drawing (distractor). In some instances, the distractor drawing appeared as the target in the subsequent trial of the task (ignored repetition condition). Response times to the previously ignored drawing were longer compared to response times in trials without a stimulus repetition. In contrast to the excitatory processes operating on target stimuli, the initial explanation for these results was that inhibitory processes are applied to distractors when selecting the target. These inhibition processes then impair the necessary activation of the stimulus' representation when a response is required on the (previously or still) inhibited distractor.

Whereas the negative priming effect itself has been replicated many times (reviewed by Fox, 1995), there is still an ongoing debate regarding two different mechanism accounts: One is the already mentioned inhibition account related to attentional mechanisms (Tipper, 1985) and the second is a memory-based account called episodic retrieval (e.g., Neill & Valdes, 1992). In recent years, there have been attempts to combine both the accounts (e.g., Tipper, 2001; see also Mayr & Buchner, 2007) with the notion that negative priming may simply have several different causes. More important for our current argument is the question of how persistent such negative priming effects are. If the mechanisms leading to the negative priming effect are to operate in the service of goal-directed behavioral intentions, it seems necessary to assume that the negative priming effect is not only obtained with very short intervals (milliseconds) between the ignoring episode and the subsequent selection episode. Whereas negative priming was initially assessed and found only with intervals of maximally a few seconds (e.g., Neill, Valdes, Terry, & Gorfein, 1992; Tipper, Weaver, Cameron, Brehaut,

& Bastedo, 1991), more recent studies indicate that negative priming effects can be found as well with more extended time intervals (e.g., up to 30 days) between the ignoring episode and the subsequent selection episode (e.g., DeSchepper & Treisman, 1996; Grison, Tipper, & Hewitt, 2005).

In sum, the assumption we derive from research on the distractor devaluation effect (e.g. Raymond et al., 2003) and the evidence that valence can trigger approach and avoidance tendencies (e.g., Chen & Bargh, 1999) has an equivalent in cognitive- and memory-oriented research: Processes associated with ignoring distractors may facilitate goal-directed behavioral intentions by decreasing the likelihood of selecting previously ignored stimuli in the future (e.g., Tipper, 1992). We will now turn to an additional source of empirical evidence for the assumption that it might be beneficial to devalue distractors in order to maintain one's goal-directed behavior.

5.2.2.2 Dealing with Attractive Alternative Partners

If one's goal is the maintenance of a current romantic relationship, an attractive alternative partner can be considered a distractor to that goal. In the context of the investigation of romantic relationships, the idea that the devaluation of attractive alternative partners (i.e., distractors) is a strategy to maintain a current romantic relationship has been around for quite some time (e.g., Thibaut & Kelley, 1959, p. 175), and different researchers have tested this idea experimentally (i.e., the derogation effect; Johnson & Rusbult, 1989; Lydon, Fitzsimons, & Naidoo, 2003; Simpson, Gangestad, & Lerma, 1990). In these studies, participants (in a romantic relationship or not) were asked to rate different people of the opposite gender. Cover stories are used to make participants believe that the rated people are available (or not available) as potential partners. Under certain conditions, potential alternative partners are affectively devalued. The conditions under which such devaluations occur are noteworthy, as they relate to the previously summarized evidence that a conflict is necessary for distractor devaluation to emerge. Regarding the devaluation of attractive alternative partners, it was found that devaluation only occurred when there was a real threat to the individuals' goal of maintaining the current relationship—that is, the alternative partner had to cause some kind of conflict with that goal. For example, no devaluation was found for individuals who were not strongly committed to their current relationship and devaluation occurred only for *attractive* alternatives (Johnson & Rusbult, 1989). Thus, if the alternative partner did not induce a conflict because of a lack of commitment to the current relationship or a lack of attractiveness of the available alternative partner, no devaluation occurred.

Arguments used in a recent article by Ritter, Karremans, and van Schie (2010) locate the devaluation of attractive alternative partners even closer to our notion of distractor devaluation as a consequence of selection processes. These authors argue that people seem to be pulled rather automatically toward encountered attractive others (e.g., Van Leeuwen & Macrae, 2004). This is in line with the automatic activation of an approach orientation induced by positive valence (e.g., Chen & Bargh, 1999). Furthermore, Ritter et al. (2010) argue that individuals confronted with an attractive alternative partner have to self-regulate their responses toward the attractive alternative. They define self-regulation as the capacity to override one's desires, thoughts, and habitual behaviors (e.g., Baumeister, Schmeichel, & Vohs, 2007), in other words, suppressing habitually activated responses. As we have reviewed above, response suppression can lead to the devaluation of the object associated with the suppressed response. In line with this reasoning, when self-regulatory processes were depleted (Baumeister, Bratslavsky, Muraven, & Tice, 1998) and thus no attempts at response suppressing can be expected, the devaluation of attractive alternatives was no longer observed (Ritter et al., 2010, Study 1). Thus, in line with the distractor devaluation perspective, if the depletion of self-regulatory resources reduced the efforts of overriding (i.e., suppressing) the habitual responses associated with the attractive alternative partner, no devaluation occurred.

In sum, theorizing in the domain of romantic relationships in regard to how to deal with attractive alternative partners shows parallels to the more basic distractor devaluation research that is concerned with the evaluative consequences of selection processes. Furthermore, and most important for our current argument, the idea that the devaluation of attractive alternative partners is a mechanism of maintaining a current relationship is in line with our argument that distractor devaluation serves an important function in facilitating and maintaining behavioral goals. We will now return to a more low-level perspective and present initial evidence from our own lab that distractor devaluation relates to response times for stimuli previously encountered as distractors.

5.2.2.3 Distractor Evaluations and Subsequent Selection

Recent studies in our lab provide initial evidence for a relationship between distractor (d)evaluation and selection efficiency. In two studies, participants first performed a flanker task (prime task) adapted from Martiny-Huenger et al. (2014a). In each trial, they had to report the symmetry of a centrally presented Chinese character while ignoring two flanking Chinese characters. After this flanker task, participants evaluated some of the previously presented stimuli. Half were stimuli that had previously appeared exclusively as targets and the other half were stimuli that had previously appeared exclusively as (incompatible) distractors. After the evaluation task, the participants performed a second flanker task (probe task). In both studies, this second flanker task was exactly the same task as the first flanker task. However, in the first study, the critical distractors from the first task were now presented as targets in the second flanker task (distractor-to-target study). Thus, the status of the initial distractor stimuli changed from the first to the second flanker task and participants had to respond to (i.e., select) the previously ignored distractors. In the second study, the prior distractors were again presented as distractors in the probe flanker task (distractor-to-distractor study). Thus, the status of the initial distractors did not change in the second study and participants were never required to respond to (i.e., select) previous distractor stimuli.

In line with our reasoning above, in the distractor-to-distractor study (Study 2), we did not expect a systematic relationship between evaluations of the distractors and response times in the trials in which the stimuli were presented as distractors. We assumed that a decreased likelihood of being selected would not influence the response time to another stimulus in the presence of the distractor. However, if the prior distractors were presented as targets, as was the case in the distractor-to-target study (Study 1), we assumed that a decreased likelihood of being selected should result in delayed response times in trials in which prior distractors required a response.

This is exactly what we found. Predicting the response times of the probe flanker task from the prior status of the critical stimuli (i.e., prior target vs prior distractor) and the evaluations of the stimuli (with the first flanker task response times as covariate), we found a significant effect of the prior status of the critical stimulus and the evaluations as well as a significant interaction effect of both factors. First, we observed that response times in trials with previous distractors as targets were slower compared to response times to prior targets (i.e., a negative priming effect; Tipper, 1985; reviewed by Fox, 1995). Second, and most importantly, deconstructing the interaction effect showed that distractor evaluations predicted the late response times to these distractors when they became targets. More negative distractor evaluations were related to slower response times (i.e., impaired selection). For prior targets, there was no such relationship.

Furthermore, the distractor-to-distractor study served as a control study to test whether this impairment was generally occurring when distractors were encountered again or it was only observed when the prior distractors had to be selected as targets. As expected, the distractor-to-distractor study did not show the same effect.

In sum, in the recent research in our lab, we observed that the selection of prior distractors was significantly impaired and the impairment increased with an increase in distractor devaluation. These results raise interesting questions: How does this relationship between affective distractor evaluations and the negative priming effect relate to the nonaffective mechanisms of negative priming (e.g., Neill & Valdes, 1992; Tipper, 1985; see also Rothermund, Wentura, & De Houwer, 2005)? Is distractor devaluation partly responsible for negative priming effects? Or is the affective devaluation only a co-occurring third variable that is related to the cognitive mechanisms that cause the negative priming effect? No matter which answer will ultimately turn out to be correct, our new line of research indicates that cognitive and affective processes involved in negative priming and distractor devaluation are to be understood as highly interconnected.

On a broader conceptual level, relating our results again to our initial example of intending to select an apple in the presence of a chocolate muffin: Repeatedly selecting the apple may steadily increase the likelihood that previously acquired cognitive or affective mechanisms that work in favor of selecting the chocolate muffin are disrupted, just like the selection and response to a previous distractor was impaired in our distractor-to-target study. In the long run, this may serve as a mechanism that supports the selection of apples in future visits to the cafeteria or other places providing these or similar choices.

6. CONCLUSION

In the present chapter, we propose that the negative evaluative consequences observed after a selection task may constitute a mechanism by which successfully implementing intended actions may change the characteristics of distracting stimuli in order to facilitate subsequent similar actions and making self-regulation progressively easier. We reviewed research demonstrating that selection processes as a consequence of immediate behavioral intentions can have evaluative consequences for distractor stimuli. The evaluative consequences are reflected in an affective devaluation (i.e., more negative/less positive evaluations) for previously ignored or response suppressed stimuli. More specifically, we reported evidence that this devaluation occurs in particular for those stimuli that conflict with intended attentional and behavioral responses. More generally, this line of research complements the broad body of evidence, suggesting complex interactions between cognitive and affective processes (Pessoa, 2009; Vuilleumier & Schwartz, 2001; Yiend, 2010).

There is converging evidence from behavioral and neurophysiological studies supporting the prevalent assumption that inhibitory processes are an important aspect in the distractor devaluation effect (e.g., Doallo et al., 2012; Kiss et al., 2007, 2008; Raymond et al., 2005), but there are also alternative explanations based on the evaluative coding of the selection task (Dittrich & Klauer, 2012). A second concern of the present chapter was to argue that such alternative explanations need not diminish the importance of selection processes (and possibly inhibitory processes as a result of conflicting selections) in distractor devaluation effects. Instead, these alternative explanations can inform us about how to select appropriate paradigms that isolate selection processes from alternative evaluative mechanisms based on evaluatively charged labels.

It is likely that the devaluation of distractors is elicited by different causes across different situations. In previous research, there has been a prevalent use of feature-based selection tasks. In our opinion, these tasks are not the best choice to differentiate between different potential causes for distractor devaluation because the previous category of the to-be-evaluated stimulus can easily be recognized (see Martiny-Huenger et al., 2014a for an in-depth discussion of this issue). Object-based tasks and/or manipulations that allow comparisons between different categories of distractors (e.g., Martiny-Huenger et al., 2014a; Raymond et al., 2005) are better suited to investigating the evaluative consequences of selection processes, as they reduce the plausibility of alternative explanations that are not related to the selection process itself.

In the second part of the chapter, we discussed the downstream consequences of the distractor devaluation effect in regard to social attitudes and its benefits for ongoing goal striving. With regard to attitudes in a social context, we provided evidence that the combination of evaluative consequences of exposure and selection can influence evaluations of attended to and ignored in-group and out-group members, such that intergroup bias can be enhanced or reduced. As selection processes are so pervasive in our everyday life, it may be helpful to consider them in the context of constructing interventions geared at reducing intergroup bias.

With respect to the possible beneficial consequences of distractor devaluation for action control, we considered a mechanism as "beneficial" if it made distractors less distracting when encountered in the future. From the perspective of how much cognitive processing a stimulus receives, we concluded that distractor devaluation may be beneficial for stimuli that interfere with focal goals because of their highly positive affective significance (e.g., alcohol or high-caloric food such as chocolate muffins). Distractor devaluation may reduce this positivity (i.e., making them more neutral) and thereby support goals that require ignoring these stimuli. From a behavioral perspective, negative valence may elicit an avoidance orientation and decreased positive valence may reduce the strength of an approach orientation, and both processes should facilitate ongoing goal striving by decreasing the likelihood of subsequent selection of the previously ignored distractors.

Generally speaking, successfully implementing intended behaviors is especially taxing if the intended behavior must replace an unwanted but habitual response (Gollwitzer, 2014; Oettingen, Wittchen, & Gollwitzer, 2013); this is often the case in efforts to promote one's health (e.g., eating an apple instead of a chocolate muffin or going jogging instead of relaxing on the couch). The habitual, unwanted behavior then coincides with the presence of critical objects (e.g., a chocolate muffin, a relaxing sofa). The processes reviewed in this chapter suggest that successfully implementing intended behaviors (e.g., selecting an apple, going jogging) and ignoring the respective distracting objects reduces the positive valence of these ignored objects (e.g., chocolate muffin, the comfortable sofa) and thus increases the likelihood of ignoring them and implementing the intended behaviors in the future.

REFERENCES

Armony, J. (2002). Modulation of spatial attention by fear-conditioned stimuli: an event-related fMRI study. *Neuropsychologia, 40*, 817–826. http://dx.doi.org/10.1016/S0028-3932(01)00178-6.

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: is the active self a limited resource? *Journal of Personality and Social Psychology, 74*, 1252–1265. http://dx.doi.org/10.1037/0022-3514.74.5.1252.

Baumeister, R. F., Schmeichel, B. J., & Vohs, K. D. (2007). Self-regulation and the executive function: the self as controlling agent. In A. W. Kruglanski, & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed.). New York: Guilford Press.

Bornstein, R. F. (1989). Exposure and affect: overview and meta-analysis of research, 1968–1987. *Psychological Bulletin, 106*, 265–289. http://dx.doi.org/10.1037/0033-2909.106.2.265.

Bornstein, R. F. (1993). Mere exposure effects with outgroup stimuli. In D. M. Mackie, & D. L. Hamilton (Eds.), *Affect, cognition, and stereotyping: Interactive processes in group perception* (pp. 195–211). San Diego, CA, US: Academic Press.

Brendl, C., Markman, A., & Messner, C. (2003). The devaluation effect: activating a need devalues unrelated objects. *Journal of Consumer Research, 29*, 463–473. http://dx.doi.org/10.1086/346243.

Brewer, M. B. (1991). The social self: on being the same and different at the same time. *Personality and Social Psychology Bulletin, 17*, 475–482. http://dx.doi.org/10.1177/0146167291175001.

Buttaccio, D. R., & Hahn, S. (2010). The effect of behavioral response on affective evaluation. *Acta Psychologica, 135*, 343–348. http://dx.doi.org/10.1016/j.actpsy.2010.09.004.

Chen, M., & Bargh, J. A. (1999). Consequences of automatic evaluation: immediate behavioral predispositions to approach or avoid the stimulus. *Personality and Social Psychology Bulletin, 25*, 215–224. http://dx.doi.org/10.1177/0146167299025002007.

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (rev. ed.). New York: Academic Press.

De Houwer, J., Rothermund, K., & Wentura, D. (2001). Stimulus-feature specific negative priming. *Memory & Cognition, 29*, 931–939. http://dx.doi.org/10.3758/BF03195755.

De Houwer, J., Thomas, S., & Baeyens, F. (2001). Associative learning of likes and dislikes: a review of 25 years of research on human evaluative conditioning. *Psychological Bulletin, 127*, 853–869. http://dx.doi.org/10.1080/02699930441000265.

DeSchepper, B. G., & Treisman, A. M. (1996). Visual memory for novel shapes: implicit coding without attention. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 22*, 27–47. http://dx.doi.org/10.1037/0278-7393.22.1.27.

Dittrich, K., & Klauer, K. C. (2012). Does ignoring lead to worse evaluations? A new explanation of the stimulus devaluation effect. *Cognition and Emotion, 26*, 193–208. http://dx.doi.org/10.1080/02699931.2011.570313.

Doallo, S., Raymond, J. E., Shapiro, K. L., Kiss, M., Eimer, M., & Nobre, A. C. (2012). Response inhibition results in the emotional devaluation of faces: neural correlates as revealed by fMRI. *Social Cognitive and Affective Neuroscience, 7*, 649–659. http://dx.doi.org/10.1093/scan/nsr031.

Duff, B. R. L., & Faber, R. J. (2011). Missing the mark: advertising avoidance and distractor devaluation. *Journal of Advertising, 40*, 51–62. http://dx.doi.org/10.2753/JOA0091-3367400204.

Eastwood, J. D., Smilek, D., & Merikle, P. M. (2001). Differential attentional guidance by unattended faces expressing positive and negative emotion. *Perception & Psychophysics, 63*, 1004–1013. http://dx.doi.org/10.3758/BF03194519.

Eder, A. B., & Rothermund, K. (2008). When do motor behaviors (mis)match affective stimuli? An evaluative coding view of approach and avoidance reactions. *Journal of Experimental Psychology: General, 137*, 262–281. http://dx.doi.org/10.1037/0096-3445.137.2.262.

Eimer, M. (1993). Effects of attention and stimulus probability on ERPs in a Go/Nogo task. *Biological Psychology, 35*, 123–138. http://dx.doi.org/10.1016/0301-0511(93)90009-W.

Eimer, M. (1996). The N2pc component as an indicator of attentional selectivity. *Electroencephalography and Clinical Neurophysiology, 99*, 225–234. http://dx.doi.org/10.1016/0013-4694(96)95711-9.

Eriksen, C. W. (1995). The flankers task and response competition: a useful tool for investigating a variety of cognitive problems. *Visual Cognition, 2*, 101–118. http://dx.doi.org/10.1080/13506289508401726.

Eriksen, B., & Eriksen, C. (1974). Effects of noise letters upon the identification of a target letter in a nonsearch task. *Perception & Psychophysics, 16*, 143–149. http://dx.doi.org/10.3758/BF03203267.

Fazio, R. H., & Towles-Schwen, T. (1999). The MODE model of attitude-behavior processes. In S. Chaiken, & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 97–116). New York: Guilford.

Fenske, M. J., & Raymond, J. E. (2006). Affective influences of selective attention. *Current Directions in Psychological Science, 15*, 312–316. http://dx.doi.org/10.1111/j.1467-8721.2006.00459.x.

Fenske, M. J., Raymond, J. E., Kessler, K., Westoby, N., & Tipper, S. P. (2005). Attentional inhibition has social-emotional consequences for unfamiliar faces. *Psychological Science, 16*, 753–758. http://dx.doi.org/10.1111/j.1467-9280.2005.01609.x.

Fox, E. (1995). Negative priming from ignored distractors in visual selection: a review. *Psychonomic Bulletin & Review, 2*, 145–173. http://dx.doi.org/10.3758/BF03210958.

Fox, E., Russo, R., & Dutton, K. (2002). Attentional bias for threat: evidence for delayed disengagement from emotional faces. *Cognition & Emotion, 16*, 355–379. http://dx.doi.org/10.1080/02699930143000527.

Frings, C., & Wentura, D. (2006). Negative priming is stronger for task-relevant dimensions: evidence of flexibility in the selective ignoring of distractor information. *The Quarterly Journal of Experimental Psychology, 59*, 683–693. http://dx.doi.org/10.1080/02724980443000872.

Frischen, A., Ferrey, A. E., Burt, D. H. R., Pistchik, M., & Fenske, M. J. (2012). The affective consequences of cognitive inhibition: devaluation or neutralization? *Journal of Experimental Psychology: Human Perception and Performance, 38*, 169–179. http://dx.doi.org/10.1037/a0025981.

Giesen, C., Frings, C., & Rothermund, K. (2012). Differences in the strength of distractor inhibition do not affect distractor-response bindings. *Memory & Cognition, 40*, 373–387. http://dx.doi.org/10.3758/s13421-011-0157-1.

Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins, & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (Vol. 2, pp. 53–92). New York: Guilford.

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist, 54*, 493–503. http://dx.doi.org/10.1037/0003-066X.54.7.493.

Gollwitzer, P. M. (2012). Mindset theory of action phases. In P. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 526–545). London: Sage Publications.

Gollwitzer, P. M. (2014). Weakness of the will: is a quick fix possible? *Motivation and Emotion, 38*, 305–322. http://dx.doi.org/10.1007/s11031-014-9416-3.

Gollwitzer, P. M., & Oettingen, G. (2012). Goal pursuit. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 208–231). New York, NY, US: Oxford University Press.

Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: a metaanalysis of effects and processes. *Advances in Experimental Social Psychology, 38*, 69–119. http://dx.doi.org/10.1007/s11031-014-9416-3.

Goolsby, B. A., Shapiro, K. L., & Raymond, J. E. (2009). Distractor devaluation requires visual working memory. *Psychonomic Bulletin & Review, 16*, 133–138. http://dx.doi.org/10.3758/PBR.16.1.133.

Griffiths, O., & Mitchell, C. J. (2008). Negative priming reduces affective ratings. *Cognition and Emotion, 22*, 1119–1129. http://dx.doi.org/10.1080/02699930701664930.

Grison, S., Tipper, S. P., & Hewitt, O. (2005). Long-term negative priming: support for retrieval of prior attentional processes. *The Quarterly Journal of Experimental Psychology, 58*, 1199–1224. http://dx.doi.org/10.1080/02724980443000557.

Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology, 53*, 575–604. http://dx.doi.org/10.1146/annurev.psych.53.100901.135109.

Hoefling, A., Likowski, K. U., Deutsch, R., Häfner, M., Seibt, B., Mühlberger, A., et al. (2009). When hunger finds no fault with moldy corn: food deprivation reduces food-related disgust. *Emotion, 9*, 50–58. http://dx.doi.org/10.1037/a0014449.

Hogg, M. A. (2000). Subjective uncertainty reduction through self-categorization: a motivational theory of social identity processes. *European Review of Social Psychology, 11*, 223–255. http://dx.doi.org/10.1080/14792772043000040.

Houben, K. (2011). Overcoming the urge to splurge: influencing eating behavior by manipulating inhibitory control. *Journal of Behavior Therapy and Experimental Psychiatry, 42*, 384–388. http://dx.doi.org/10.1016/j.jbtep.2011.02.008.

Houben, K., Havermans, R. C., Nederkoorn, C., & Jansen, A. (2012). Beer no-go: learning to stop responding to alcohol cues reduces alcohol intake via reduced affective associations rather than increased response inhibition. *Addiction, 107*, 1280–1287. http://dx.doi.org/10.1111/j.1360-0443.2012.03827.x.

Houben, K., Nederkoorn, C., Wiers, R. W., & Jansen, A. (2011). Resisting temptation: decreasing alcohol-related affect and drinking behavior by training response inhibition. *Drug and Alcohol Dependence, 116*, 132–136. http://dx.doi.org/10.1016/j.drugalcdep.2010.12.011.

Houghton, G., & Tipper, S. P. (1994). A model of inhibitory mechanisms in selective attention. In D. Dagenbach, & T. H. Carr (Eds.), *Inhibitory processes in attention, memory, and language* (Vol. 30, pp. 20–43). United Kingdom: University College London, San Diego, CA: Academic Press.

Houghton, G., Tipper, S. P., Weaver, B., & Shore, D. I. (1996). Inhibition and interference in selective attention: some tests of a neural network model. *Visual Cognition, 3*, 119–164. http://dx.doi.org/10.1080/713756733.

Huang, Y.-F., & Hsieh, P.-J. (2013). The mere exposure effect is modulated by selective attention but not visual awareness. *Vision Research, 91*, 56–61. http://dx.doi.org/10.1016/j.visres.2013.07.017.

Ito, T. A., Larsen, J. T., Smith, N. K., & Cacioppo, J. T. (1998). Negative information weighs more heavily on the brain: the negativity bias in evaluative categorizations. *Journal of Personality and Social Psychology, 75*, 887–900. http://dx.doi.org/10.1037/0022-3514.75.4.887.

Johnson, D. J., & Rusbult, C. E. (1989). Resisting temptation: devaluation of alternative partners as a means of maintaining commitment in close relationships. *Journal of Personality and Social Psychology, 6*, 967–980. http://dx.doi.org/10.1037/0022-3514.57.6.967.

Jones, A., & Field, M. (2013). The effects of cue-specific inhibition training on alcohol consumption in heavy social drinkers. *Experimental and Clinical Psychopharmacology, 21*, 8–16. http://dx.doi.org/10.1037/a0030683.

Kappes, A., Oettingen, G., & Pak, H. (2012). Mental contrasting and the self-regulation of responding to negative feedback. *Personality and Social Psychology Bulletin, 38*, 845–857. http://dx.doi.org/10.1177/0146167212446833.

Kiss, M., Goolsby, B. A., Raymond, J. E., Shapiro, K. L., Silvert, L., Nobre, A. C., et al. (2007). Efficient attentional selection predicts distractor devaluation: event-related potential evidence for a direct link between attention and emotion. *Journal of Cognitive Neuroscience, 19*, 1316–1322. http://dx.doi.org/10.1162/jocn.2007.19.8.1316.

Kiss, M., Raymond, J. E., Westoby, N., Nobre, A. C., & Eimer, M. (2008). Response inhibition is linked to emotional devaluation: behavioural and electrophysiological evidence. *Frontiers in Human Neuroscience, 2*, 1–9. http://dx.doi.org/10.3389/neuro.09.013.2008.

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1997). Motivated attention: affect, activation, and action. In P. J. Lang, R. F. Simons, & M. Balaban (Eds.), *Attention and orienting: Sensory and motivational processes* (pp. 97–135). Hillsdale, NJ: Erlbaum.

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and emergency intervention: how social group membership and inclusiveness of group boundaries shape helping behavior. *Personality and Social Psychology Bulletin, 31*, 443–453. http://dx.doi.org/10.1177/0146167204271651.

Lim, S.-L., Padmala, S., & Pessoa, L. (2008). Affective learning modulates spatial competition during low-load attentional conditions. *Neuropsychologia, 46*, 1267–1278. http://dx.doi.org/10.1016/j.neuropsychologia.2007.12.003.

Lydon, J. E., Fitzsimons, G. M., & Naidoo, L. (2003). Devaluation versus enhancement of attractive alternatives: a critical test using the calibration paradigm. *Personality and Social Psychology Bulletin, 29*, 349–359. http://dx.doi.org/10.1177/0146167202250202.

MacLeod, C. M., Dodd, M. D., Sheard, E. D., Wilson, D. E., & Bibi, U. (2003). In opposition to inhibition. In B. H. Ross (Ed.), *The psychology of learning and motivation* (vol. 43, pp. 163–214). San Diego, CA: Academic Press.

Macrae, C. N., & Bodenhausen, G. V. (2000). Social Cognition: thinking categorically about others. *Annual Review of Psychology, 51*, 93–120. http://dx.doi.org/10.1146/annurev.psych.51.1.93.

Markman, A. B., Brendl, C. M., & Kim, K. (2009). From goal-activation to action: how does preference and use of knowledge intervene? In E. Morsella, J. A. Bargh, & P. M. Gollwitzer (Eds.), *Oxford handbook of human action* Oxford University Press.

Martin, I., & Levey, A. B. (1978). Evaluative conditioning. *Advances in Behaviour Research and Therapy, 1*, 57–102. http://dx.doi.org/10.1016/0146-6402(78)90013-9.

Martiny-Huenger, T., Gollwitzer, P. M., & Oettingen, G. (2014a). Distractor devaluation in a flanker task: object-specific effects without distractor recognition memory. *Journal of Experimental Psychology: Human Perception and Performance, 40*, 613–625. http://dx.doi.org/10.1037/a0034130.

Martiny-Huenger, T., Gollwitzer, P. M., & Oettingen, G. (2014b). Selective attention to in- and out-group members systematically influences intergroup bias. *Social Psychology and Personality Science*. Advance online publication. http://dx.doi.org/10.1177/1948550614541296.

Martiny-Huenger, T., Martiny, S., & Gollwitzer, P. M. (in press). Action control by if-then planning: explicating the mechanisms of strategic automaticity in regard to objective and subjective agency. In: B. Eitam & P. Haggard (Eds.), *Human agency: Functions and mechanisms*. New York, NY, US: Oxford University Press.

Mayr, S., & Buchner, A. (2007). Negative priming as a memory phenomenon: a review of 20 years of negative priming research. *Zeitschrift für Psychologie: Journal of Psychology, 215*, 35–51. http://dx.doi.org/10.1027/0044-3409.215.1.35.

Mazza, V., Turatto, M., & Caramazza, A. (2009). Attention selection, distractor suppression and N2pc. *Cortex, 45*, 879–890. http://dx.doi.org/10.1016/j.cortex.2008.10.009.

Monahan, J. L., Murphy, S. T., & Zajonc, R. B. (2000). Subliminal mere exposure: specific, general, and diffuse effects. *Psychological Science, 11*, 462–466. http://dx.doi.org/10.1111/1467-9280.00289.

Neill, E. T., & Valdes, L. A. (1992). Persistence of negative priming: steady state or decay? *Journal of Experimental Psychology: Learning, Memory, and Cognition, 18*, 565–576. http://dx.doi.org/10.1037/0278-7393.18.3.565.

Neill, W. T., Valdes, L. A., Terry, K. M., & Gorfein, D. S. (1992). Persistence of negative priming: II. Evidence for episodic retrieval. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 18*, 993–1000. http://dx.doi.org/10.1037/0278-7393.18.5.993.

Nieuwenhuis, S., Yeung, N., & Cohen, J. D. (2004). Stimulus modality, perceptual overlap, and the go/no-go N2. *Psychophysiology, 41*, 157–160. http://dx.doi.org/10.1046/j.1469-8986.2003.00128.x.

Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition, 18*, 101–129. http://dx.doi.org/10.1521/soco.2000.18.2.101.

Oettingen, G. (2012). Future thought and behaviour change. *European Review of Social Psychology, 23*, 1–63. http://dx.doi.org/10.1080/10463283.2011.643698.

Oettingen, G., Mayer, D., & Thorpe, J. (2010). Self-regulation of commitment to reduce cigarette consumption: mental contrasting of future with reality. *Psychology and Health, 25*, 961–977. http://dx.doi.org/10.1080/08870440903079448.

Oettingen, G., Wittchen, M., & Gollwitzer, P. M. (2013). Regulating goal pursuit through mental contrasting with implementation intentions. In E. A. Locke, & G. P. Latham (Eds.), *New developments in goal setting and task performance* (pp. 523–548). New York, NY: Routledge.

Pessoa, L. (2009). How do emotion and motivation direct executive control? *Trends in Cognitive Sciences, 13*, 160–166. http://dx.doi.org/10.1016/j.tics.2009.01.00626.

Raymond, J. (2009). Interactions of attention, emotion and motivation. *Progress in Brain Research, 176*, 293–308. http://dx.doi.org/10.1016/S0079-6123(09)17617-3.

Raymond, J. E., Fenske, M. J., & Tavassoli, N. T. (2003). Selective attention determines emotional responses to novel visual stimuli. *Psychological Science, 14*, 537–542. http://dx.doi.org/10.1046/j.0956-7976.2003.psci 1462.x.

Raymond, J. E., Fenske, M. J., & Westoby, N. (2005). Emotional devaluation of distracting patterns and faces: a consequence of attentional inhibition during visual search? *Journal of Experimental Psychology: Human Perception and Performance, 31*, 1404–1415. http://dx.doi.org/10.1037/0096-1523.31.6.1404.

Ritter, S. M., Karremans, J. C., & van Schie, H. T. (2010). The role of self-regulation in derogating attractive alternatives. *Journal of Experimental Social Psychology, 46*, 631–637. http://dx.doi.org/10.1016/j.jesp.2010.02.010.

Rothermund, K., Wentura, D., & De Houwer, J. (2005). Retrieval of incidental stimulus-response associations as a source of negative priming. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 31*, 482–495. http://dx.doi.org/10.1037/0278-7393.31.3.482.

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review, 5*, 296–320. http://dx.doi.org/10.1207/S15327957PSPR0504.

Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. New York, NY: Cambridge University Press.

Simpson, J. A., Gangestad, S. W., & Lerma, M. (1990). Perception of physical attractiveness: mechanisms involved in the maintenance of romantic relationships. *Journal of Personality and Social Psychology, 59*, 1192–1201. http://dx.doi.org/10.1037/0022-3514.59.6.1192.

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*, 220–247. http://dx.doi.org/10.1207/s15327957pspr0803_1.

Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. In M. A. Hogg, & D. Abrams (Eds.), *Intergroup relations: essential readings* (pp. 94–109). Philadelphia, PA: Psychology Press.

Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. New York: Wiley.

Tipper, S. P. (1985). The negative priming effect: inhibitory priming by ignored objects. *The Quarterly Journal of Experimental Psychology, 37*, 571–590. http://dx.doi.org/10.1080/14640748508400920.

Tipper, S. P. (1992). Selection for action: the role of inhibitory mechanisms. *Current Directions in Psychological Science, 1*, 105–109.

Tipper, S. P. (2001). Does negative priming reflect inhibitory mechanisms? A review and integration of conflicting views. *The Quarterly Journal of Experimental Psychology, 54*, 321–343. http://dx.doi.org/10.1080/713755969.

Tipper, S. P., Weaver, B., Cameron, S., Brehaut, J., & Bastedo, J. (1991). Inhibitory mechanisms of attention in identification and localisation tasks: time course and disruption. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 17*, 681–692. http://dx.doi.org/10.1037/0278-7393.17.4.681.

Tipper, S. P., Weaver, B., & Houghton, G. (1994). Behavioural goals determine inhibitory mechanisms of selective attention. *The Quarterly Journal of Experimental Psychology, 47*, 809–840. http://dx.doi.org/10.1080/14640749408401098.

Van Leeuwen, M. L., & Macrae, C. N. (2004). Is beautiful always good? Implicit benefits of facial attractiveness. *Social Cognition, 22*, 637–649. http://dx.doi.org/10.1521/soco.22.6.637.54819.

Veling, H., Holland, R. W., & van Knippenberg, A. (2007). Devaluation of distracting stimuli. *Cognition and Emotion, 21*, 442–448. http://dx.doi.org/10.1080/02699930600843007.

Veling, H., Holland, R. W., & van Knippenberg, A. (2008). When approach motivation and behavioral inhibition collide: behavior regulation through stimulus devaluation. *Journal of Experimental Social Psychology, 44*, 1013–1019. http://dx.doi.org/10.1016/j.jesp.2008.03.004.

Vuilleumier, P. (2005). How brains beware: neural mechanisms of emotional attention. *Trends in Cognitive Sciences, 9*, 585–594. http://dx.doi.org/10.1016/j.tics.2005.10.01127.

Vuilleumier, P., & Schwartz, S. (2001). Emotional facial expressions capture attention. *Neurology, 56*, 153–158. http://dx.doi.org/10.1212/WNL.56.2.153.

Wiers, R. W., Rinck, M., Kordts, R., Houben, K., & Strack, F. (2010). Retraining automatic action-tendencies to approach alcohol in hazardous drinkers. *Addiction, 105*, 279–287. http://dx.doi.org/10.1111/j.1360-0443.2009.02775.x.

Winkielman, P., & Berridge, K. C. (2004). Unconscious emotion. *Current Directions in Psychological Science, 13*, 120–123. http://dx.doi.org/10.1111/j.0963-7214.2004.00288.x.

Yiend, J. (2010). The effects of emotion on attention: a review of attentional processing of emotional information. *Cognition & Emotion, 24*, 3–47. http://dx.doi.org/10.1080/02699930903205698.

Zajonc, R. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology, 9*, 1–27. http://dx.doi.org/10.1037/h0025848.

Zajonc, R. (2001). Mere exposure: a gateway to the subliminal. *Current Directions in Psychological Science, 10*, 224–228. http://dx.doi.org/10.1111/1467-8721.0015428.