

# Emotion and control in the planning of goals

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**Abstract** By planning the what, where, and when of pursuing a goal, people improve the likelihood that they will ultimately attain that goal. Whereas research to date has explored the breadth of this planning effect and its underlying processes, contextual variables that influence the formation and execution of plans have mostly gone unexplored. In light of the central role played by emotional experience in goal pursuit, its impact on planning remains an open question of both theoretical and practical importance. Here, we suggest that anger and sadness—and their corresponding, distinct cognitive appraisal patterns regarding control—differentially impact (1) the tendency to plan and (2) the implementation of plans. Anger (greater control) led to the formation of more plans for goal-directed behavior (Studies 1 and 2) and faster execution of real behavior as prescribed by predetermined plans (Study 3). Broader implications for theories of emotion and goal pursuit are discussed.

**Keywords** Anger · Sadness · Goals · Planning · Action

## Introduction

The fields of motivation and self-regulation have long considered the means by which people can become more likely to attain their goals. In the pursuit of desired outcomes, it is crucial that the individual first selects one such desired outcome among a variety of options (Ajzen 1991; Locke and Latham 1990; Oettingen 2012; Webb and Sheeran 2006). Without denying the importance of selecting appropriate goals, research shows that forming only an intention to achieve a goal may not yet afford the ideal conditions under which to ultimately attain it. Instead, Gollwitzer (1999) suggests that the individual supplement these *goal intentions* with specific if–then plans that link opportune situations with an appropriate goal-directed response. These plans, termed *implementation intentions*, have increased the probability of goal attainment across a wide variety of situations, applications, and populations (for a review, see Gollwitzer and Sheeran 2006). Despite the beneficial effects of implementation intentions for goal striving and attainment, relatively little empirical attention has considered the contextual variables that stimulate their formation and enhance their execution (but see Gollwitzer et al. 2010; Oettingen et al. 2001), and none considers the role of emotion. The current investigation attempts to fill this gap by exploring how the experience of discrete anger and sadness may affect such if–then plans.

Goal intentions take the structure “I intend to reach Z” with Z relating to a desired outcome. For example, a student might decide, “I intend to earn an A!” To furnish her goal intention with an implementation intention, she must explicate both an anticipated situational cue that provides the opportunity to work toward the goal and an appropriate goal-directed response. Such planning links the two in the following format: “If situation X arises, then I will perform

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the goal-directed response Y.” For example, “*if my friends invite me out before the exam, then I will say no*” (Gollwitzer 1993, 1999). Nearly two decades of research has shown that implementation intentions provide an added benefit beyond goal intentions (Gollwitzer and Oettingen 2011; Gollwitzer and Sheeran 2006).

Striving for goals is an inherently affective experience. Research to date, however, has focused primarily on the role of emotion in *setting* goals. People pursue objectives that are expected to prove satisfying upon their attainment, and these goals inherently require that individuals strive toward or approach a course of action that changes their current circumstances (Bagozzi et al. 1998; Kahneman and Tversky 1984; Martin and Tesser 1996; Oettingen and Gollwitzer 2001). Comparatively very little is known about the role of emotions—and, specifically, feeling states—in *striving* for goals (cf. Polman and Kim 2013). Accordingly, the present investigation will attempt to better understand the role of anger and sadness in if–then planning, a hallmark of goal striving.

From the perspective of appraisal theory, discrete emotional states are marked by separable patterns of cognition (or appraisals, Smith and Ellsworth 1985). A central component underlying both anger and sadness is the sense of control, but in opposite directions: Whereas sadness is characterized by little control to respond, anger is characterized by a strong sense of control in assigning responsibility to a specific other person and what should be done in response (Lazarus 1991; Ortony et al. 1988). The experience of sadness prompts a desire for better understanding, which gives rise to objective information processing (Bless et al. 1996; Tiedens and Linton 2001). Conversely, anger is associated with heuristic processing and feelings of optimism and control (Carver 2004; Tiedens and Linton 2001).

The appraisal tendency framework offers insight into how these cognitive characteristics of anger and sadness influence forward-looking behaviors in new, unrelated contexts. In one series of studies (Keltner et al. 1993), participants were led to experience either sadness or anger in one context before evaluating a second, novel context. The results revealed that sadness caused people to see situational forces (i.e., determinants outside their control) as exerting a stronger influence on the environment relative to anger. Further, people experiencing anger make relatively optimistic assessments of risk and more readily make risky choices, and appraisal-based feelings of control account for this relationship (Lerner et al. 2003; Lerner and Keltner 2000, 2001).

Given the different appraisal characteristics of anger and sadness, we hypothesize that these emotions should also have divergent effects on goal planning. Because anger is marked by cognitive underpinnings of control whereas

sadness is marked by the opposite, we predict that people experiencing anger should more effectively form and act on implementation intentions relative to people experiencing sadness. This prediction derives from a similar cognitive profile (i.e., strong feelings of control) characteristic of people actively engaged in goal striving (Dholakia et al. 2007; Gollwitzer and Kinney 1989; Taylor and Gollwitzer 1995).

We test these hypotheses in three studies, separately examining the formation of plans (Studies 1 and 2) and the speed of executing planned behavior in response to the critical cue linked to this behavior in an if–then plan (Study 3). We predict that anger (relative to sadness) should cause participants to generate more implementation intentions (Study 1) and that feelings of control account for the tendency of angry (vs. sad) participants to select an implementation intention over a goal intention (Study 2). In Study 3, we predict that a given if–then plan—formulated under neutral affect—should prove more effective for participants experiencing anger than sadness in a reaction time experiment.

## Study 1: Emotion induction and plan formation

In Study 1, we explore whether participants experiencing state anger will form more if–then plans than participants experiencing state sadness. As described above, furnishing one’s goals with implementation intentions requires the individual to consider specific and appropriate goal-relevant behaviors, opportune situations in which to execute them, to create a link between the two, and to commit to both the goal and the plan (Gollwitzer 1999). This process should be promoted by a frame of mind characterized by certain biases that foster belief in the efficaciousness of one’s action control. Therefore, given the cognitive appraisal of control experienced with anger, we predict that participants induced to feel this emotion will more thoroughly supplement their goals with implementation intentions (i.e., create if–then plans for behavior). Conversely, those experiencing sadness, a feeling state characterized as a cognitive opposite of anger, should form fewer implementation intentions. Study 1 will test this prediction.

## Method

### Participants and design

Fifty-seven students (29 females) at the University of Konstanz participated in exchange for 3 Euro (approximately \$5). Their mean age was 22.13 years ( $SD = 2.33$ ), and they were tested 1–5 at a time using a paper-and-pencil

format. Participants were randomly assigned to the sadness, anger, or neutral affect control condition. The cover story described the study as an experiment on how people resume thinking about their goals after thinking about unrelated events and that, in order to achieve this, they would perform a perspective taking exercise amid the primary, goal-related experiment.

### Procedure

Their first task was to name their most important academic goal. Next, participants were asked to set aside their thoughts about the goal in order to perform the perspective-taking task that served as our emotion manipulation. To induce conscious, discrete emotions, participants were instructed to take the perspective of the protagonist in a short vignette designed to elicit sadness, anger, or neutral affect (Hemenover and Zhang 2004). In the anger condition, the protagonist was evicted from an apartment by a landlord without cause (see “Appendix 1”); in the sadness condition, the protagonist experienced the death of a pet (see “Appendix 2”); in the neutral affect condition, the protagonist compiled a grocery list and shopped for the items (see “Appendix 3”). They were encouraged to experience the thoughts and feelings of the protagonist as they would themselves and allowed as much time as necessary to complete the task. Next, all participants rated their present feelings with respect to four anger-related adjectives (angry, annoyed, frustrated, and irritated), three sadness-related adjectives (sad, gloomy, and down), two other negative emotions (fearful, nervous), and two positive emotions (happy, content). Ratings were made on a five-point scale, from 1 (*not at all*) to 5 (*very much*).

Subsequently, participants were asked to recall the academic goal they had named earlier and then to perform a sentence stem completion task with respect to that goal. In order to assess the extent to which they thought about their goal in terms of implementation intentions (i.e., planning), participants completed a planning task developed by Oettingen et al. (2001). The task presented participants with eight different incomplete sentence stems and asked them first to review each of the stems and then to select and complete the four that best matched their thinking about their goal by filling in the corresponding blank lines. Each stem started with a different phrase and ended with a blank space. Four of the stems constituted implementation intentions (e.g., “If — occurs, then I will —”), whereas the other four were phrased as general goal intentions (e.g., “In general, I will —”). Finally, they provided demographic information and were debriefed and dismissed.

## Results

### Manipulation check

Using participants’ emotion ratings, we computed mean indices of the four anger adjectives (Cronbach’s  $\alpha = .82$ ) and three sadness adjectives (Cronbach’s  $\alpha = .91$ ). Emotion ratings differed significantly by condition for both the anger and sadness indices,  $F_s(2, 54) > 5.8$ ,  $ps < .005$ . Participants expressed more anger in the anger condition ( $M = 2.61$ ,  $SD = 1.04$ ) than in the sadness ( $M = 1.72$ ,  $SD = .55$ ) or neutral ( $M = 1.51$ ,  $SD = .60$ ) condition,  $ps < .005$  (LSD); they expressed more sadness in the sadness condition ( $M = 3.00$ ,  $SD = 1.21$ ) than in the anger ( $M = 1.95$ ,  $SD = .94$ ) or neutral ( $M = 1.88$ ,  $SD = 1.22$ ) condition,  $ps < .01$  (LSD). Additionally, participants in the neutral affect condition reported significantly greater happiness and contentment ( $M_{\text{happiness}} = 2.84$ ,  $SD_{\text{happiness}} = 1.02$ ;  $M_{\text{contentment}} = 2.95$ ,  $SD_{\text{contentment}} = .91$ ) than those in the anger ( $M_{\text{happiness}} = 1.68$ ,  $SD_{\text{happiness}} = 1.06$ ;  $M_{\text{contentment}} = 2.00$ ,  $SD_{\text{contentment}} = 1.20$ ) and sadness ( $M_{\text{happiness}} = 1.74$ ,  $SD_{\text{happiness}} = 1.10$ ;  $M_{\text{contentment}} = 1.89$ ,  $SD_{\text{contentment}} = .99$ ) conditions,  $F_s > 5.8$ ,  $ps < .001$  (LSD). Participants in the three emotion conditions did not differ in their ratings of the two other negative emotions (fear:  $M_{\text{anger}} = 1.74$ ,  $SD_{\text{anger}} = 1.24$ ,  $M_{\text{sadness}} = 1.74$ ,  $SD_{\text{sadness}} = .87$ ,  $M_{\text{neutral}} = 1.37$ ,  $SD_{\text{neutral}} = 1.01$ ; nervousness:  $M_{\text{anger}} = 1.79$ ,  $SD_{\text{anger}} = 1.40$ ,  $M_{\text{sadness}} = 1.79$ ,  $SD_{\text{sadness}} = .86$ ,  $M_{\text{neutral}} = 1.58$ ,  $SD_{\text{neutral}} = .96$ ),  $F_s < 1$ .

### Plan formation

Based upon their completion of the sentence stems, each participant received a score on the planning measure that reflected how many chosen sentence stems constituted implementation intentions; scores ranged from 0 to 4, with higher scores indicating more implementation intentions chosen and formed. Content analyses confirmed that participants completed the stems in a manner consistent with their format (i.e., did not use the blank goal intention stems for implementation intentions or vice versa). Scores on this measure were significantly affected by experimental condition,  $F(2, 54) = 3.22$ ,  $p = .048$ ,  $\eta^2 = .11$ . Further, a planned contrast revealed a linear increase in planning across the three conditions,  $F(1, 54) = 6.43$ ,  $p = .014$ . Specifically, participants in the anger condition formed more plans ( $M = 2.26$ ,  $SD = .81$ ) than those in the sadness condition ( $M = 1.68$ ,  $SD = .48$ ),  $t(36) = 2.69$ ,  $p = .011$ ,  $d = .88$ . Planning among those in the neutral affect condition ( $M = 1.95$ ,  $SD = .78$ ) fell between the two emotion conditions and did not differ significantly from either,  $ps > .15$  (LSD).

## Discussion

Evidence from this study supports our hypothesis for the effect of distinct emotions on plan formation: Angry participants generated more plans for their goals than did sad participants. While we believe these results derive from a shift in feelings of personal control, Study 1 does not speak to this underlying process. Furthermore, Study 1 cannot resolve potential alternative accounts for our effect. For example, as the purpose of the emotion induction was somewhat transparent to participants, demand characteristics may have played a role in how participants responded to both the manipulation check as well as the planning measure. To resolve these issues, Study 2 attempts a conceptual replication of Study 1, taking a different methodological approach to emotion and plan formation.

## Study 2: Control and plan formation

Our theoretical account for the effect of discrete emotion on planning identifies a crucial link connecting two heretofore disparate literatures (appraisal theories and action control theories): personal control. To provide evidence for this proposed underlying process, Study 2 adopts a two-stage experimental-causal-chain design. As outlined by Spencer et al. (2005), this type of design proves most useful when the proposed mediating process (here, personal control) is both easy to measure and easy to manipulate. Whereas Study 1 identified the relationship between the independent variable (discrete emotion) and the dependent variable (planning), Study 2 first establishes a relationship between discrete emotion and the proposed mediator (personal control, Study 2a) and then manipulates the proposed mediator to establish its relationship with our dependent variable (planning, Study 2b).

### Study 2a: Measuring control

While the results of Study 1 support our hypothesized connection between emotion and planning, they do not speak to the role of control in this relationship. Although anger often more strongly evokes this cognitive appraisal than sadness, it is possible to experience anger even in the absence of such appraisal (e.g., Harmon-Jones et al. 2003). To address this issue in the first stage of an experimental-causal-chain design, we measured feelings of control that arose from the same materials used to evoke discrete anger and sadness in Study 1.

## Method

**Participants and design** Sixty-eight students at New York University (from a similar student population as Study 1) participated in exchange for course credit. They were tested individually using a computerized format. The random assignment to one of three emotion conditions was identical to Study 1.

**Procedure** In keeping with the design of Study 1, participants first performed the perspective-taking task that served as our emotion manipulation. Afterward, all participants were asked three questions to assess the impact of the vignettes on their sense of personal control. The first asked how certain they felt about what to do next in the situation, and the second asked how much control they felt they had to respond in the situation. These ratings were made on five-point scales, with the first ranging from 1 (*not at all*) to 5 (*very much*) and the second ranging from 1 (*none*) to 5 (*a lot*). For the third question, participants responded to the dominance dimension of the Self-Assessment Manikin (SAM; Bradley and Lang 1994). It depicts a series of five human-shaped figures increasing in size from very small to very large. We chose this measure because it elegantly captures the sense of personal control to which our theorizing refers. Finally, participants were debriefed and the experimental session was concluded.

## Results

Scores on the SAM were coded numerically (ranging from one for the smallest figure to five for the largest), and our three dependent measures evinced good reliability (Cronbach's  $\alpha = .66$ ). Accordingly, we computed for each participant a mean control index of the three items. These scores yielded a significant difference between emotion condition,  $F(2, 65) = 3.38, p = .040, \eta^2 = .09$ . Specifically, participants in the anger condition scored higher ( $M = 3.48, SD = .80$ ) than those in the sadness condition ( $M = 2.88, SD = .75$ ),  $p = .01$  (LSD), with those in the neutral affect condition falling between the other two ( $M = 3.11, SD = .84$ ) and not differing from either,  $ps > .12$  (LSD). Using the same materials that impacted planning in Study 1, this first finding confirms the existence of a relationship between our independent variable (discrete emotion) and the proposed mediator (feelings of control).

### Study 2b: Manipulating control

In the second stage of our design, Study 2b manipulates personal control to assess its impact on plan formation.

Because our objective was to identify the role of the cognitive components of anger and sadness (i.e., feelings of control) as they relate to planning, we created a new method to prime feelings of (un)controllability in an affective context. We drew on the procedural priming literature to activate not a concept but a style of thinking (Förster et al. 2009; Gollwitzer et al. 1990). All participants read a newspaper article, containing elements of both high and low controllability, and thereafter answered a series of questions related to either the controllable or uncontrollable aspects of it. Afterward, in an ostensibly unrelated task, participants were given the opportunity to engage in planning. We predicted that those answering high controllability questions would prove more likely to structure their goal pursuit using an if-then plan.

### Method

**Participants and design** Fifty-eight students (45 females) at New York University participated in exchange for course credit. Their mean age was 19.30 years ( $SD = 1.00$ ), and they were tested 1–10 at a time using a paper-and-pencil format. Participants were randomly assigned to either the high or low controllability condition ( $ns = 29$ ). The cover story described the study as an experiment on how people resume thinking about their goals after thinking about unrelated events and that, in order to achieve this, they would read a newspaper article and answer questions about it amid the primary, goal-related experiment.

**Procedure** Their first task was to name their most important academic goal. Next, participants were asked to set aside their thoughts about the goal in order to read the newspaper article that served as our controllability priming manipulation. Participants in both conditions read the same newspaper article (adapted from Wegener and Petty 1994) about an earthquake that occurred in Peru on August 15th, 2007<sup>1</sup>. After finishing the article, participants were asked a series of questions related to the aspects of (un)controllability in the article as well as their own reactions to it. In the high controllability condition, the questions related to aspects of the earthquake involving control (see “Appendix 4”). In the low controllability condition, the questions related to the earthquake’s uncontrollability (see “Appendix 5”). As a check for changes in conscious feeling states, all participants were asked to indicate the extent to which the article had made them angry and sad; responses were made on a scale from 1 (*not at all*) to 7 (*very much*).

Subsequently, participants were asked to recall the goal they had named earlier and then to perform a sentence stem completion task with respect to that goal (again, adapted from Oettingen et al. 2001). The task presented them with four different incomplete sentence stems and asked them first to review each of the stems and then to select and complete the one that best matched their thinking about their goal by filling in the corresponding blank lines. Two of the stems were formatted such that they explicitly linked situations to behaviors (e.g., “If — happens, then I will do —”), whereas the other two identified only outcomes and the potential value they offered (e.g., “If — is achieved, it will —”). Thus, the former entailed the construction of implementation intentions, whereas the latter involved the construction of goal intentions. All participants chose only one type of structure to represent their conceptualization of the goal. Finally, they provided demographic information and were debriefed and dismissed.

### Results

**Initial analysis** Content analyses confirmed that participants completed the stems in a manner consistent with their format (i.e., did not use a blank goal intention stem for an implementation intention or vice versa). Among all participants (across both conditions), there was an uneven distribution of sentence stem selection. Specifically, the goal intention structures were chosen more than the implementation intentions, 81 versus 19 %, respectively.

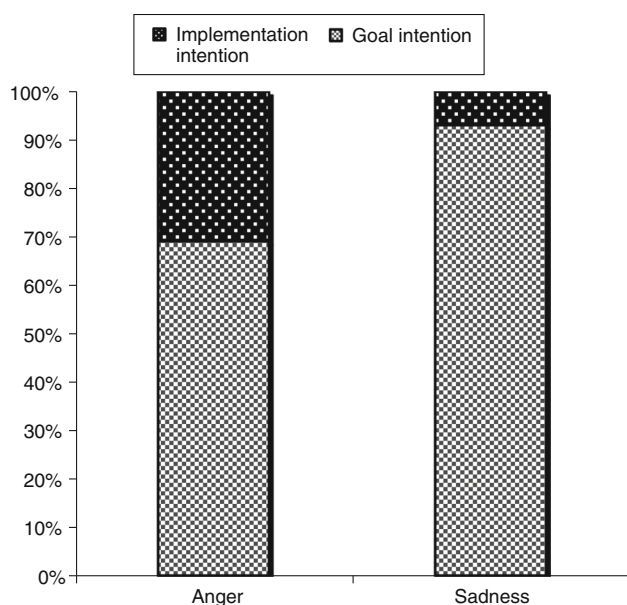
**Discrete feelings** Participants reported comparable anger across the high ( $M = 4.90$ ,  $SD = 1.57$ ) and low controllability conditions ( $M = 4.76$ ,  $SD = 1.12$ ),  $t(56) = .39$ ,  $p > .7$ . Additionally, participants reported comparable sadness across the high ( $M = 5.41$ ,  $SD = 1.62$ ) and low controllability conditions ( $M = 6.00$ ,  $SD = 1.13$ ),  $t(56) = 1.60$ ,  $p > .1$ . Thus, the manipulation did not impact conscious ratings of discrete feeling states.

**Plan formation** Based upon their completion of one of the sentence stems, each participant was categorized as forming an implementation intention or a goal intention. In the high controllability condition, 69 % of participants generated a goal intention and 31 % chose the implementation intention. In the low controllability condition, 93 % of participants chose the goal intention and 7 % chose the implementation intention. This represented a significantly different distribution for type of sentence stem,  $\chi^2(1, N = 58) = 5.50$ ,  $p = .019$ . Figure 1 summarizes these results.

To adjust for the tendency across participants to choose a goal intention, we performed a logistic regression to predict stem type (dummy coded goal

<sup>1</sup> <http://www.nytimes.com/2007/08/25/world/americas/25peru.html>.





**Fig. 1** Distribution of plan type by condition, Study 2b. Numbers indicate percentage of participants in each condition forming either an implementation intention or a goal intention

intention = 0, implementation intention = 1) from controllability condition. By including the constant in the model, we adjust for the overall tendency of individuals to choose the goal intention. The results indicated that after the adjustment, condition still provided a significant predictor for type of stem. Specifically, those in the high controllability condition were significantly more likely than those in the low controllability condition to choose an implementation intention,  $Wald(1) = 4.66, p = .031$ .

## Discussion

The conclusion of Study 2 is largely similar to that of Study 1: Anger, relative to sadness, increases the tendency to form implementation intentions. Importantly, this study lends a number of new insights to the current investigation. Foremost, the two-stage mediation design allowed us to first measure and then manipulate our proposed underlying process: a sense of personal control. Consistent with our prediction, we found that our emotion manipulation from Study 1 did, in fact, change feelings of control (Study 2a) and that a novel procedural priming task activating (un)controllability configured people's tendency to use if-then planning (Study 2b).

Our participants in Study 2b indicated no explicit, conscious difference in their feelings of anger or sadness, providing evidence against any alternative account that differentiates anger from sadness along other dimensions (e.g., physiological arousal). This suggests a unique

contribution of the cognitive markers characteristic of both people feeling anger and people disposed toward planning (i.e., high control). Still, our manipulation was not without affective relevance. We manipulated (un)controllability against the background of an ambiguous emotional state that (in explicit rating terms) combined anger and sadness, as indicated by the high ratings on the manipulation check for both feelings. Thus, Study 2 speaks to the role of control specifically as it is experienced in an affective context.

Additionally, the single-item measure of planning suggests that not only does anger (and control) lead to the formation of more implementation intentions (Study 1), but it also makes individuals more likely to see their goals in distinctly implemental terms when faced with a binary distinction (Study 2). Despite the boost in likelihood to select an implementation intention induced by the high controllability manipulation, participants in general predominantly chose the goal intention stem. Therefore, beyond merely choosing how to *structure* one's goal striving, might anger have a similarly beneficial effect on the *execution* of goal-directed action? We considered this question in Study 3.

## Study 3: Emotion induction and plan execution

A crucial component of the strategic automaticity afforded by implementation intentions is that the person does not have to reflect on whether to act on the respective superordinate goal once the critical situation is encountered (Gollwitzer et al. 2010); she acts on the plan immediately and without conscious involvement. Reduced reflection on whether one should act on one's goal has been found to be associated with feelings of greater optimism with respect to attaining the goal at hand (Taylor and Gollwitzer 1995) as well as subjective control over the goal-relevant situation (Gollwitzer and Kinney 1989). Conversely, automatic action control is hampered by conscious reflection on the purpose of one's actions (Baumeister 1984; Beilock and Carr 2001). Because anger produces (optimistic) feelings of control while sadness reduces them in the interest of deliberate, thoughtful reflection (Bless et al. 1996; Lerner and Keltner 2001; Tiedens and Linton 2001), experiencing anger should benefit the execution of implementation intentions, whereas the careful, analytic processing caused by sadness should undermine it. We test this hypothesis by examining the speed of executing planned behavior as a function of emotional state.

Participants performed a Go/No-Go task that asked them to respond as quickly as possible to numbers but not letters. For half of the participants, this goal intention was supplemented with an implementation intention to respond especially fast to a specific target (the number 3); the other half

received only the goal intention. These instructions were provided prior to an emotion manipulation designed to elicit anger, sadness, or neutral affect. In comparing reaction times to the critical number, we predicted that an induction of anger (vs. sadness), when coupled with an implementation intention, would expedite responding.

## Method

### Participants and design

One hundred and thirty-two students (75 females) at the University of Konstanz participated in exchange for 3 Euro (approximately \$5). Their mean age was 22.21 years ( $SD = 2.52$ ), and they were tested 1–5 at a time using a computerized format. Participants performed a Go/No-Go task in a manner consistent with past research (Brandstätter et al. 2001). A computer screen presented, at random, either a letter (A, E, N, V, X) or a number (1, 3, 5, 7, 9), and participants were instructed to press the ‘x’ key as quickly as possible when numbers (but not letters) were presented. The stimulus for each trial was present on the screen for a maximum of 1,000 ms, and the interval between stimuli ranged from 2 to 6 s.

### Procedure

Participants were met by the experimenter, seated at a computer, and completed an informed consent agreement. They then read instructions for the Go/No-Go task and familiarized themselves with it in 20 practice trials. Next, ostensibly to help their performance during a later session of the task (the main block of trials), participants were provided with one of two sets of instructions to facilitate their responding to numbers. This constituted the intention manipulation. All participants first said to themselves, “I want to react to numbers as quickly as possible.” Then, half of the participants were instructed to repeat the following phrase to themselves three times using inner speech: “I will particularly think of the number 3” (goal intention). The other half of the participants were asked to also repeat this same phrase three times but added to it: “And if the number 3 appears, then I will press the ‘x’ key particularly fast” (implementation intention).

Participants subsequently performed the same perspective-taking task from Study 1 that served as our emotion manipulation, randomly assigned to take the perspective of the protagonist in a short vignette designed to elicit anger, sadness, or neutral affect. As in Study 1, they rated their present feelings on five-point scales, from 1 (*not at all*) to 5 (*very much*). Following the emotion manipulation, the main block of Go/No-Go task trials was presented. Participants were reminded of the task instructions they had

received. The main block of 160 trials lasted 7 min. Finally, they provided demographic information and were debriefed and dismissed.

## Results

### Manipulation check

We computed mean indices of the four anger adjectives (Cronbach’s  $\alpha = .79$ ) and three sadness adjectives (Cronbach’s  $\alpha = .81$ ). Emotion ratings differed significantly by condition for both the anger and sadness indices,  $F_s > 9$ ,  $ps < .005$ . Participants expressed more anger in the anger condition ( $M = 2.49$ ,  $SD = .85$ ) than in the sadness ( $M = 1.83$ ,  $SD = .64$ ) or neutral ( $M = 1.60$ ,  $SD = .47$ ) condition,  $ps < .001$  (LSD); they expressed more sadness in the sadness condition ( $M = 2.80$ ,  $SD = .72$ ) than in the anger ( $M = 2.20$ ,  $SD = .48$ ) or neutral ( $M = 2.12$ ,  $SD = 1.07$ ) condition,  $ps < .001$  (LSD). Participants in the neutral affect condition reported significantly greater happiness and contentment ( $M_{\text{happiness}} = 2.67$ ,  $SD_{\text{happiness}} = .97$ ;  $M_{\text{contentment}} = 2.79$ ,  $SD_{\text{contentment}} = .77$ ) than those in the anger ( $M_{\text{happiness}} = 2.00$ ,  $SD_{\text{happiness}} = 1.14$ ;  $M_{\text{contentment}} = 1.89$ ,  $SD_{\text{contentment}} = .95$ ) and sadness ( $M_{\text{happiness}} = 1.93$ ,  $SD_{\text{happiness}} = 1.03$ ;  $M_{\text{contentment}} = 1.69$ ,  $SD_{\text{contentment}} = .79$ ) conditions,  $F_s > 6.6$ ,  $ps < .005$  (LSD). Participants in the three emotion conditions did not differ in their ratings of the two other negative emotions (fear:  $M_{\text{anger}} = 1.75$ ,  $SD_{\text{anger}} = 1.24$ ,  $M_{\text{sadness}} = 1.80$ ,  $SD_{\text{sadness}} = .79$ ,  $M_{\text{neutral}} = 1.63$ ,  $SD_{\text{neutral}} = 1.05$ ; nervousness:  $M_{\text{anger}} = 1.84$ ,  $SD_{\text{anger}} = 1.01$ ,  $M_{\text{sadness}} = 1.89$ ,  $SD_{\text{sadness}} = .78$ ,  $M_{\text{neutral}} = 1.65$ ,  $SD_{\text{neutral}} = .92$ ),  $F_s < 1$ .

### Reaction time

First, we performed a data reduction to eliminate reaction time latencies  $< 250$  ms and greater than three standard deviations above the mean, which came to 715.98 ms (cf. Bargh and Chartrand 2000; Mendoza et al. 2010). This accounted for  $< 3\%$  of the data. We next calculated, for each participant, the mean reaction times to both neutral numbers and the critical number 3. Using these values, we performed the following analysis of variance: 3 (sadness, anger, or neutral affect)  $\times$  2 (goal intention or implementation intention)  $\times$  2 (neutral numbers or critical number)<sup>2</sup>.

Overall, participants responded faster to the critical number 3 ( $M = 388.41$  ms,  $SD = 54.21$ ) than to the

<sup>2</sup> The analyses were performed on log-transformed reaction time data to correct for skewness (Bargh and Chartrand 2000) but are reported in milliseconds.

neutral numbers ( $M = 409.69$  ms,  $SD = 48.57$ ),  $F(1, 126) = 30.27$ ,  $p < .001$ , and participants responded faster to all numbers (both critical and non-critical) in the implementation intention condition relative to those in the goal intention condition,  $F(1, 126) = 4.33$ ,  $p = .039$ . These main effects were qualified by an interaction between these two factors,  $F(1, 126) = 6.63$ ,  $p = .011$ , such that responses were fastest to the critical numbers by those in the implementation intention condition. Finally, all of these effects were qualified by the hypothesized three-way interaction between emotion condition, intention, and target type,  $F(2, 126) = 4.49$ ,  $p = .013$ ,  $\eta_p^2 = .07$ .

We decomposed the relationship between emotion, intention, and target in the following analyses. First, we considered only the critical trials and observed a main effect of intention,  $F(1, 126) = 8.82$ ,  $p = .004$ , that was qualified by a significant interaction with emotion condition,  $F(2, 126) = 3.31$ ,  $p = .040$ ,  $\eta_p^2 = .05$ . For those in the goal intention condition, pairwise comparisons revealed no difference in reaction time as a function of emotion condition,  $ps > .35$ . However, for those in the implementation intention condition, pairwise comparisons indicated that participants in the anger condition responded faster than those in the sadness condition,  $t(42) = 3.28$ ,  $p = .002$ , and the neutral affect condition,  $t(42) = 2.02$ ,  $p = .049$ , which did not themselves differ,  $t(42) = 1.32$ ,  $p = .19$ . We computed a planned contrast testing our specific hypothesis (sadness curbs the implementation intention effect, whereas anger intensifies it) by coding the neutral affect condition as 0, the sadness condition as 1, and the anger condition as -1; this contrast was highly significant,  $t(63) = 3.27$ ,  $p = .002$ . Finally, we analyzed the effects of implementation intentions as compared to goal intentions within each emotion condition. Whereas a highly significant implementation intention effect (i.e., faster responding) was observed in the anger condition,  $t(42) = 3.72$ ,  $p = .001$ , this effect was less pronounced in the neutral affect condition,  $t(41) = 1.23$ ,  $p = .23$ , and completely absent from the sadness condition,  $t(43) = .21$ ,  $p = .84$ . In analyzing reaction times for the non-critical trials only, no significant main effects were observed for emotion condition, intention condition, or their interaction,  $Fs < 1.2$ , all  $ps > .3$ . Table 1 provides means and standard deviations of the reaction times to critical and non-critical numbers for each individual experimental condition<sup>3</sup>.

<sup>3</sup> To consider individual-level variability, we conducted a difference score analysis by subtracting for each participant the mean reaction time to critical trials from the mean reaction time to non-critical trials. A nearly identical pattern of results obtained.

**Table 1** Mean reaction times to critical and non-critical numbers by condition, Study 3

Condition	Critical		Non-critical	
	Mean	SD	Mean	SD
Goal intention				
Anger	412.72	71.27	408.31	55.04
Sadness	396.38	56.63	426.78	67.07
Neutral affect	395.62	66.12	401.38	33.30
Implementation intention				
Anger	357.43	26.97	399.11	38.67
Sadness	391.90	43.13	410.23	49.80
Neutral affect	376.40	35.10	411.14	37.80

Reaction times reported in milliseconds

## Discussion

This final study broadens our investigation from plan formation to plan enactment, with anger facilitating the effective execution of planned behavior. As predicted, implementation intentions proved especially beneficial for participants experiencing anger, whereas sadness undermined their effect. This pattern of results was not observed for responses to non-critical trials: Reaction times for people in the anger conditions were similar to those in the sadness and neutral affect conditions. Furthermore, participants experiencing anger while holding only a goal intention did not evince a speeded reaction time to either critical or non-critical trials, arguing against the alternative hypothesis that anger simply provides a generalized enhancement effect for motivation and the initiation of action (cf. Lerner and Tiedens 2006). These results suggest that anger benefits goal striving only when coupled with the appropriate behavioral intention (i.e., an if–then plan).

## General discussion

The present investigation sought to identify the role of distinct feeling states in the self-regulation of goal striving via planning. Across three studies, our evidence suggests that anger—relative to sadness—enhances the planning of goals by giving rise to the formation of more implementation intentions (Studies 1) and more effective execution of plan-prescribed behavior (Study 3) due at least in part to differences in feelings of control (Study 2). Thus, this research makes an important contribution to the literature on emotion and self-regulation, identifying contextual affective variables (discrete anger and sadness) that impact readiness to form implementation intentions and act on them.



To date, research examining context effects on implementation intentions has identified only very few factors that influence plan formation or plan execution. With respect to plan formation (which formed the basis of our Studies 1 and 2), Oettingen et al. (2001) found an interactive effect of self-regulatory mode of thought and expectations for achieving one's goal. Specifically, when participants *mentally contrasted* their fantasies regarding a desired future outcome with the obstacles of present reality precluding its realization, and this mode of thought was coupled with high expectations of success to achieve the desired outcome, they formed more plans. With respect to plan execution, Gollwitzer et al. (2010) point out that implementation intentions prove most effective when their formulation meets certain criteria: selecting easily identifiable situational cues for the if-component; selecting the most instrumental behavior—whether simple or complex—to facilitate goal progress for the then-component; not subjecting the goal to further deliberation (e.g., asking “why” the goal is being pursued; Wieber et al. 2014).

We add to this literature by extending from such cognitive and behavioral aspects to emotional determinants of planning, noting that affective experience is a crucial (yet often overlooked) element of the goal pursuit process. The studies presented here compliment existing lines of research by extending the scope of implementation intention moderators to the emotional states of anger and sadness. Most relevant to the present research, Willis et al. (2010) have observed that a recalled instance of illegitimate (vs. legitimate) powerlessness positively affected the planning of goals as well as persistence in goal striving. These authors propose that the experience of anger in response to illegitimacy might underlie their effects; the current investigation provides support for this claim.

Our investigation targeted anger and sadness not only to align with a dominant trend in discrete emotion research (e.g., Polman 2011; Polman and Kim 2013) but also for their theoretical and practical relevance. From a theoretical perspective, the marked differences between the cognitive appraisal styles of anger and sadness (differing in control) led to clear, divergent predictions for their effect on goal planning (e.g., Lerner and Keltner 2000, 2001; Gollwitzer and Kinney 1989). These predictions were supported across three studies, with our controllability-based account supported by the two-stage experimental-causal-chain design in Study 2. This approach first measured and then manipulated the mechanism we identified to link these emotions to existing research on goal planning (control). At a practical level, our experiments manipulated emotional states that were independent of the goal under consideration to provide a more straightforward test of the

hypotheses. It remains important to replicate these effects of anger and sadness as elicited in direct response to the focal goal; this would provide support for a functionalist approach to emotion in goal pursuit.

In considering how our effects might operate outside the research lab, we hasten to add an important caveat. In Studies 1 and 2, participants experiencing anger (or high control) explicitly chose to structure their goal pursuit in more implemental terms. In Study 3, arguably, angered participants in the goal intention condition could have generated spontaneous plans (rather than in response to an experimental prompt), which would have expedited their planned responding. That we observed a boost in planned responding only among angered participants in the implementation intention conditions suggests one of two things. The current data cannot speak to whether such spontaneous planning actually took place; if it did, however, this would suggest that spontaneous implementation intentions prove less effective than those created at the behest of a researcher, underscoring the importance of interventions that explicitly require people to form if–then plans (Gawrilow et al. 2011; Thürmer et al. 2013). On the other hand, perhaps spontaneous planning did not take place. People generally articulate overarching goals before specifying their plans to achieve them, but perhaps the quick succession in our experiment from the first (in the goal intention condition) to the second (opportunities for spontaneous planning) rendered the latter less likely to occur. Thus, might recent goal planning hinder implementation intention formation? If participants had been assigned to neither a goal nor an implementation intention condition beforehand, might angered participants more successfully devise and use if–then plans? These and other open questions await future empirical consideration.

Anger and sadness differ on a wide variety of dimensions. We targeted these emotions because of their opposing cognitive appraisal styles—leading to a divergence in control—and found evidence that this facet of emotion offers one piece of the puzzle in explaining the relationship between emotion and planning. Nevertheless, other frameworks detail other differences between these (and other) emotions, raising the possibility that multiple affective determinants could configure if–then planning. For instance, whereas anger elicits a strong sense of behavioral approach, this motivational drive is much weaker among people experiencing sadness (Carver 2004; Carver and Harmon-Jones 2009; Higgins et al. 1997). Might, therefore, motivational approach intensity offer a unique account for the relationship between emotion and planning? This perspective would open the door to consideration of other discrete feeling states. Fear, for example, shares the high motivational intensity of anger, but with a motivational direction attuned toward behavioral

withdrawal rather than approach (Buss et al. 2003; Carver and Harmon-Jones 2009).

Furthermore, our targeted emotions are differentially arousing: Anger evokes a greater sense of arousal than does sadness (e.g., Lang et al. 1990). Perhaps this heightened arousal—as a separate pathway—attunes individuals to opportunities for action in their environment (i.e., through making plans, Studies 1 and 2, or executing them, Study 3). After all, implementation intentions prescribe behaviors to be executed quickly and without conscious deliberation, and anger can provoke people to make more impulsive decisions (Anderson and Bushman 2002). Though these two variations on snap judgments seem highly related at face value, we distinguish our results from impulsivity insofar as impulsive decisions are made hastily and in the moment. Conversely, implementation intentions are formulated prior to encountering the critical cue. Said differently, anger-evoked impulsivity occurs in the heat of the moment and with little consideration of the past or the future. Implemental planning, however, requires the person to generate a contingency for future action: When the critical cue is encountered in the future, the behavior is executed immediately. Furthermore, acting upon plans is informed by the past decision to make a plan in the first place. Thus, our results suggest that successful planning may harness the potential of anger—inclined toward action—by directing it more productively toward predetermined behavioral scripts. Generally, despite the potential offered by the separate causal pathways proposed, our findings attest to the importance of personal control in making a unique contribution to planning.

Given the present findings, one might be tempted to conclude that only anger is of use to the goal pursuer, whereas sadness is a handicap; “When in doubt, get angry.” However, such a conclusion seems premature. Successful goal attainment requires not only the effective implementation of adopted goals but also the setting of appropriate goals; it is the latter where sadness gains importance. Though less effective for planning how to attain goals, sadness facilitates effective goal selection and goal commitment (Kappes et al. 2011; Oettingen 2012). Across several studies that used a variety of manipulations to elicit sadness, this emotion—compared to a neutral affect control condition—led more participants to mentally contrast their desired future fantasies with obstacles of present reality that stood in the way. Considering the robust effect of this mode of self-regulatory thought in helping people commit themselves to the right kinds of goals (e.g., Oettingen et al. 2001), these results suggest an advantageous role of sadness earlier in the time course of goal pursuit.

Further, such careful consideration associated with sadness should also benefit people who have run into difficulties when acting on their goals (Gollwitzer 1990; Gollwitzer and Bayer 1999). Then, sadness should facilitate mental contrasting leading to engagement if the goal is still achievable, but to disengagement from unreachable goals or switching to more effective means of goal striving. As a result, the individual would be afforded the opportunity to allocate limited resources (e.g., time, energy) elsewhere with greater efficiency (Janoff-Bulman and Brickman 1982). Klinger (1975) has posited an incentive-disengagement cycle by which people respond to obstacles during goal pursuit first with aggressive action and later with depressive disengagement. The cycle suggests a trajectory by which people may respond to goal-relevant challenges, first amplifying their efforts and then reducing them to the point of disengagement (see also Henderson et al. 2007). In tandem with this research, the results from our studies suggest not a value judgment on which emotion is best for goal pursuit, but instead that anger and sadness each have a functional, distinct role in the process.

## Conclusion

In sum, the present research supports the notion that different emotions differentially affect the planning of goals, situated at the intersection of cognition, motivation, and action. As such, it fills an important gap in theorizing to date on the downstream consequences of emotional experience for self-regulation. From one perspective, emotion is posited to have a direct effect on action by activating automatic or reflexive scripts for certain behaviors to be taken (i.e., action tendencies, Frijda 1986). On the other hand, emotion may instead be conceptualized as exerting an indirect force on action (Baumeister et al. 2007), through which people engage in cognitive elaborations in response to emotional experience, which in turn informs potential future behaviors (Kappes et al. 2011). Our studies suggest that emotion may additionally affect the link between cognition and action, as anger and sadness were shown to influence plan formation as well as plan execution. Consequently, the evidence presented here hints at the vast potential of future explorations into the relationship between emotions and the self-regulation of goal pursuit.

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## Appendix 1

The landlord in your building doesn't like you, and you are sure it is through no fault of your own. You always pay your rent on time and never have parties in your home. However, when you pass your landlord in the hallway of your building, he glares at you. This has gone on for some time.

You ask your neighbors, two friends, about their interaction with the landlord. They tell you that they are surprised to hear your hot water has gone not been looked at for weeks, as the landlord fixed their broken window within 2 days. They also ask you about the condition of your apartment, saying that the landlord told them you live in unsanitary conditions. You show your neighbors your apartment to show them that in fact your place is very clean.

One day, you arrive home and see a notice posted on your door. Upon closer inspection, you see that it is an eviction notice with your landlord's signature on it. Although you have never received a warning or formal notice, you now have to vacate the apartment within 1 week. The landlord has no right to persecute you like this!

## Appendix 2

Over the past several years, you have developed a strong bond with your pet. It is always there to greet you when you arrive home, and you really value the companionship it provides. It is truly a good friend.

Lately, though, it has been acting different than it used to. It has hardly any energy, stops eating its food, and seems to be sleeping all the time. You try to give it encouragement and support, but your pet doesn't respond. After a few days, you start to become concerned about its

health. That night, you have trouble sleeping for concern over your pet. The next morning, you find your pet has died in its sleep.

You try not to think about the fond memories you have of your pet, but you cannot keep them from creeping up on you. During the next several days, you are reminded of your pet's death every time you see another animal like it. You consider getting a new pet but realize that it will not be the same. You wish your pet were still with you, but you realize that there is nothing you can do to bring it back.

## Appendix 3

On a Saturday afternoon, you realize you need to go grocery shopping. You start to make your list by looking in the refrigerator and decide that you should buy milk, eggs, and orange juice. Next, you go to the cupboard and realize you are low on cereal, so you add that to the list. You put 'paper towels' on the list as well and are now ready to go to the store.

When you get to the store, you take a shopping cart and pull the list from your pocket. First, you pick up the cereal and decide to get some bread as well. You find the paper towels a few aisles over and then you walk with your cart to the refrigerated section. You get the orange juice first, then proceed to the dairy section, where you pick up the milk and the eggs. You proceed to the checkout lane, place your items on the conveyor belt, and pay with cash.

You take your items home with you and unload them. You put away the refrigerated items first. Next, you put the cereal and bread into the cupboard before finally placing the paper towels under the sink.

## Appendix 4

1. Who did the article cite in saying that the government had not mobilized its rescue efforts soon enough?  
a. Mr. Palomino      b. the U.S.      c. the orphan baby's grandparents
2. To what extent do you agree with the following statement?: Making the right decision in an important situation could have made the difference between life and death for many people.  
1. not at all    2. a little      3. somewhat    4. quite a bit    5. very much
3. What was Gerson's aunt Kiara Alviar quoted as saying?  
a. "no help came"    b. "it didn't have to end this way"    c. both a & b
4. To what extent do you agree with the following statement?: It should have been the responsibility of the national government to anticipate and respond to emergencies.  
1. not at all    2. a little      3. somewhat    4. quite a bit    5. very much
5. Who yelled at Mr. Palomino to, "Leave them! Leave them! Get out of [there]!" as he was attempting to rescue his family members?  
a. a trapped person    b. the National Police      c. his family
6. To what extent do you agree with the following statement?: Emergency situations should not mean that people in authority are allowed to abuse their power.  
1. not at all    2. a little      3. somewhat    4. quite a bit    5. very much
7. What is the name of Peru's president?  
a. Pisco      b. Ica      c. García      d. Clemente
8. To what extent do you agree with the following statement?: Using knowledge gained from past problems should have led to making sure that the same mistakes were not made twice.  
1. not at all    2. a little      3. somewhat    4. quite a bit    5. very much
9. Rescue teams arrived at the site of the damage \_\_\_\_ of end of the earthquake.  
a. within 2 hours      b. within 4 hours      c. within 24 hours
10. To what extent do you agree with the following statement?: When faced with tradeoffs between human life and financial cost, all possible resources should have been dedicated to preserving human life.  
1. not at all    2. a little      3. somewhat    4. quite a bit    5. very much

## Appendix 5

1. Baby Gerson Williams Alviar was found where?  
a. beneath his dead father    b. in a ruined church    c. both a & b
2. To what extent do you agree with the following statement?: Despite the best efforts of Luis Palomino, the San Clemente church suffered a great loss.  
1. not at all    2. a little    3. somewhat    4. quite a bit    5. very much
3. Approximately how many people total died as the result of the earthquake?  
a. 25    b. 50    c. 100    d. 500
4. To what extent do you agree with the following statement?: One major tragedy of the earthquake was its unpredictability and inability to be controlled.  
1. not at all    2. a little    3. somewhat    4. quite a bit    5. very much
5. The quote “his body...supported all the weight of the falling stones,” describes what event?  
a. a father dying to save his son    b. how the stones were removed
6. To what extent do you agree with the following statement?: The death of one’s parents at an early age may possibly put the child at a significant disadvantage.  
1. not at all    2. a little    3. somewhat    4. quite a bit    5. very much
7. For what reason were people gathered at the San Clemente church that evening?  
a. a religious holiday    b. a funeral mass    c. town meeting
8. To what extent do you agree with the following statement?: Many of the survivors of the earthquake described in the article may not have had the opportunity to properly mourn their lost family and friends given the chaos in their city.  
1. not at all    2. a little    3. somewhat    4. quite a bit    5. very much
9. What noises were not coming from those trapped in the church wreckage?  
a. loud screaming    b. cellphone sounds    c. faint cries
10. To what extent do you agree with the following statement?: Death by being buried alive would be made worse by having zero control to save oneself.  
1. not at all    2. a little    3. somewhat    4. quite a bit    5. very much

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