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# Feeling prepared increases confidence in any accessible thoughts affecting evaluation unrelated to the original domain of preparation<sup>☆</sup>

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## A B S T R A C T

The present research shows that preparedness increases reliance on thoughts irrelevant to the domain of preparation. In Study 1, participants wrote positive or negative thoughts about a tuition increase proposal. Next, participants were primed with words related to preparedness or positive control words and reported their evaluations of the initial proposal. Consistent with self-validation theory, results showed that the effect of the direction of thoughts (positive/negative) on attitudes toward tuition was significantly greater when participants were primed with preparedness than control words. A second study replicated and generalized these findings to the domain of social interaction, using a different topic (genetically modified food), and a more natural yet indirect induction of preparedness (expectation to prepare for negative feedback). Study 3 extended these findings by comparing the validating effects of an indirect (expectation) versus a direct (implementation intention) induction of preparedness. Consistent with self-validation theory, moreover, both studies 2 and 3 demonstrated that preparedness and thought confidence mediated the effects of the preparedness manipulations on attitude extremity even though the domain of preparation was unrelated to the domain of evaluation.

## 1. Introduction

Preparedness can automatically activate primitive, inborn, physiologic processes that ready the organism for action (e.g., fight vs. flight response, Cannon, 1929). More specifically, being prepared can give people a momentary confidence that can be misattributed to whatever thoughts people have in mind. Thus, we argue that preparedness in one domain can also lead to psychological changes by increasing the confidence people have in their accessible thoughts, even if those thoughts are unrelated to the domain of preparation. In this research, we rely on self-validation theory (Petty, Briñol, & Tormala, 2002) to test our hypotheses about preparedness.

### 1.1. Self-validation theory

The key notion of self-validation is that generating thoughts is not sufficient for them to have an impact on judgment. Rather, one must also have confidence in them, or feel good about them. The self-validation logic suggests that when people are being deliberative, they look for ways to assess the validity of whatever mental contents they currently have in mind. Research shows that numerous variables can affect the sense of confidence people have in their thoughts including feelings of power (Briñol, Petty, Valle, Rucker, & Becerra, 2007), happiness

(Briñol, Petty, & Barden, 2007), and many others (see Briñol & Petty, 2009, for a review).

Consider relevant work on embodied cognition, which has demonstrated that many different bodily responses can affect perceptions of thought validity under conditions of high thinking and when the behaviors are concurrent with or follow thought-generation (Briñol, Petty, & Wagner, 2011). For example, self-validation theory suggests that, just as vertical head movements from others give people confidence in what they are saying, individuals' own vertical head movements can give them confidence in what they are thinking. In the first studies demonstrating this embodied validation effect, Briñol and Petty (2003) found that when people listened through headphones to strong arguments for campus identification cards, vertical head movements led to more favorable attitudes than horizontal movements, as would be expected if vertical movements increased confidence in the favorable thoughts generated to the strong arguments. However, when people listened to weak arguments in favor of the identification cards, vertical movements led to less favorable attitudes than horizontal movements, as would be expected if vertical movements increased confidence in the negative thoughts generated to the weak arguments.

Thus, regardless of thought valence (favorable or unfavorable), nodding one's head validated and strengthened the impact of those thoughts on attitude judgments relative to shaking. Subsequent

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research replicated these findings using body postures associated with confidence (e.g., pushing the chest out) versus doubt (e.g., slouching forward with one's back curved; Briñol, Petty, & Wagner, 2009). Aggressive facial expressions associated with preparing to attack (raising vs. covering one's upper lip) have also been found to enhance reliance upon both positive and negative thoughts in attitude judgments (Briñol, Petty, & Requero, 2016). Beyond bodily responses, other variables related to confidence have also influenced evaluations by self-validation, ranging from self-affirmation inductions (Briñol, Petty, & Tormala, 2006; Briñol et al., 2007) to informing people that their thoughts stemmed from a message delivered by an expert rather than a non-expert source (Tormala, Briñol, & Petty, 2007). The present research tests whether preparedness can serve as a new validating variable with the potential to enhance reliance on thoughts even if irrelevant to the domain of preparation.

### 1.2. Preparedness reduces doubts and competition of responses

*Preparedness* is an adaptive goal state of readiness to respond. Like other validating variables (e.g., power, happiness, etc.), we argue that preparedness can influence confidence in any thoughts salient at the time (even unrelated to the domain of preparation) and, in turn, modify the impact of those thoughts on attitudes. This view converges with prior work on the point that the ultimate end of preparedness is to drive affective, cognitive, and behavioral processes to reduce response competition and enhance certainty in the domains relevant to preparation. For example, the *New Look Psychology* proposed that stored schematic structures serve to create a state of perceptual preparedness (Bruner, 1957). Moreover, later theorists argued that survival and adaptation demanded the resolution of competing action tendencies into one *unambiguous behavioral orientation* to maximize preparedness for future outcomes (Jones & Gerrard, 1967). This work suggests that preparedness is necessary for organisms to adapt quickly to all kinds of new challenges. Moreover, this work provides early precedence for the claim that preparedness requires response certainty (vs. response competition) and, as such, it is plausible that preparedness will increase reliance upon any thought that people have in mind when forming judgments.

More recently, scholars have suggested that thoughts about the past and present do not exist for their own sake but, instead, serve the adaptive end of preparing for future experiences (Baumeister, Vohs, & Oettingen, 2016). For example, Baumeister, Hoffman, and Vohs (2020) conducted an experience sampling study to investigate the content and time dimensions of everyday thoughts. First, the findings showed that there were far more thoughts about the future than the past. Moreover, when people did report thinking about the past, the most common category they reported was “implications of the past for the future.” These findings suggest that, when people think about the past, it primarily serves to prepare them for the future (Baumeister et al., 2016).

Similarly, prior work suggests that upward mental simulations serve to maximize preparedness (Roese, 1997). Recent work also suggests a motivation to prepare for anticipated social interactions drives the automatic activation and expression of stereotypes in subsequent social behavior (Cesario, Plaks, & Higgins, 2006; Gawronski & Cesario, 2013). Along with functional theories of attitudes and mental simulations (e.g., Maio & Olson, 2000), other work proposes that people are motivated to reduce cognitive dissonance not merely for the sake of maintaining consistency but because dissonant cognitions have the potential to interfere with un-conflicted responses to future outcomes (Harmon-Jones & Harmon-Jones, 2002).

Furthermore, the identity-based model of motivation proposes that cued identities advance states of procedural and action preparedness to think and behave in an identity-congruent manner within a particular context (Oyserman, 2009). That is, preparedness requires that both thought and action maximize ongoing readiness to respond to particular future outcomes (Oyserman & Destin, 2010). Other work suggests

that implementation intentions enhance preparedness by specifying clear “if-then” plans that link anticipated stimuli to prepared responses (Dennehy, Ben-Zeev, & Tanigawa, 2014; Oettingen & Gollwitzer, 2010). Importantly, these frameworks have helped to build the link between preparedness and confidence or a state of certainty.

### 1.3. Preparedness and confidence in abilities

Regarding the link between preparedness and confidence, prior work has also focused on clarifying *how* preparedness influences confidence as well as ultimate judgments in the domain of preparation. Preparedness often involves acquiring more knowledge and experience, facilitating subsequent performance, promoting feelings of self-efficacy, agency, and control in the domains for which one is prepared (Carroll, Sweeny, & Shepperd, 2006). Thus, people associate preparedness with confidence because increased preparation often brings actual knowledge and practice, along with perceptions of efficacy, ease, and control over the task for which one is prepared. Indeed, people can associate preparedness with confidence also because most people actually do perform better and have more control when they are prepared compared to unprepared. As noted earlier, being prepared allows individuals to respond to challenges and opportunities better than when unprepared. Furthermore, because preparation often stems from appraisals that one can overcome threats and challenges, one can expect that preparedness should enhance confidence (Briñol, Petty, & DeMarree, 2015). As such, it makes sense for people to feel confident when prepared. Beyond the objective advantages of preparation and the corresponding confidence that comes with being prepared, people might associate preparedness with confidence because their prior social experiences suggest that people who look prepared also appear confident (Harmon-Jones, Schmeichel, Mennitt, & Harmon-Jones, 2011). Moreover, just as people who look prepared look confident, one's own subjective experience of preparedness might likewise activate confidence.

Given these associations, it is not surprising that prior work shows that preparedness can be associated with confidence. For example, one longitudinal study measured students' confidence in their academic abilities both before and after random assignment to an academic preparedness group or a control educational training group. Relative to the control group, students given the preparedness intervention showed greater academic confidence over time (O'Neill & Stephenson, 2012). Conceptually similar, other work shows that occupational health professionals who participated in a terrorism preparedness (vs. control) training program subsequently reported greater confidence in their ability to respond to future terrorist attacks (Gershon, Gemson, Qureshi, & McCollum, 2004). These two examples suggest that the effects of preparedness on subjective confidence hold irrespective of whether the inductions are for positive (academic achievement) or negative (terrorist attack) future outcomes.

Moreover, beyond affecting confidence as an outcome, recent educational research suggests that the confidence evoked by preparedness can mediate the effect of preparedness on subsequent judgment and behavioral outcomes. Specifically, Koivisto, Vuori, and Vinokur (2010) asked students to complete a baseline measure at the beginning of their final academic term. Three months before the end of the term, researchers randomly assigned participants to a 5-day career preparedness intervention or control training group. The preparedness intervention provided students with proactive response strategies for job attainment and performance as well as proactive response strategies for overcoming potential employment obstacles and setbacks. Next, participants completed the time two measure and, finally, the time three measure seven months after graduation. As predicted, participants in the preparedness (vs. control) intervention reported greater time two career confidence and higher time three career commitment and employment status. More importantly, time two career confidence mediated the effect of the career preparedness intervention on time three

career commitment and employment status.

Although promising, the above findings only demonstrated that preparedness inductions influence confidence and career judgments within the same domain. That is, this work shows that *career* preparedness inductions enhanced *career* commitment and outcomes via *career* confidence. By contrast, the separation between primary and secondary levels of representation in self-validation theory enables the novel prediction that the confidence evoked by preparedness in one domain (e.g., *career*) can generalize to strengthen attitudes in an unrelated domain (e.g., *politics*).

#### 1.4. Preparedness increasing thought reliance

Drawing from self-validation theory described earlier, the current hypothesis is that preparedness, like feelings of power or happiness, can validate any primed thoughts by enhancing meta-cognitive confidence, thereby affecting attitudes unrelated to the original domain of preparation. That is, the feeling of confidence from preparedness can be misattributed to any salient thoughts in mind. Thus, preparedness may enhance reliance upon one's thoughts in a wide range of domains. The present work builds on prior meta-cognitive research on self-validation to examine the validating effects of preparedness regarding a diversity of future outcomes (threat, opportunity, or change).

Evidence consistent with a validating role of preparedness can be found in research on relationships. For example, one study showed that relationship commitment, stability, and quality (e.g., relationship satisfaction) was greater among individuals who felt prepared to be in a relationship (Hadden, Agnew, & Tan, 2018). This is plausibly because feeling prepared led people to be more likely to rely on their relationship-relevant thoughts in forming relationship judgments. Importantly, the subjective feeling of preparedness can be *sufficient* on its own to enhance confidence in the domain of preparation, regardless of whether one is actually prepared or not (Carroll, Arkin, & Shade, 2011; Dennehy et al., 2014; Oettingen & Gollwitzer, 2010). Moreover, although prior work shows that confidence mediates the effects of preparedness within the same domain as the initial preparedness induction (Koivisto et al., 2010), as noted earlier, the distinction between primary and secondary thought in self validation theory enables the novel hypotheses that the confidence evoked by preparedness in one domain can generalize to enhance thought reliance in a completely unrelated domain. Thus, we argue that the confidence evoked by a preparedness manipulation in one domain can be misattributed to reflect the validity of attitude-relevant thoughts in a completely unrelated domain, thereby increasing their use in forming judgments.

## 2. Empirical overview

To test our core hypothesis regarding the validating effects of preparedness, the current studies created prepared vs. control conditions, and evaluated the impact of those inductions on thought use in forming attitudes. In studies 1–2, we first varied positive or negative thoughts that were mentally accessible about a persuasive proposal before the preparedness manipulation. Consistent with self-validation theory, we expected that participants who felt prepared following thought generation in any domain would show greater thought reliance than control participants because feeling prepared would create a sense of confidence that would be misattributed to the accessible thoughts. Thus, we predicted that participants in the preparedness (vs. control) condition would show greater attitude polarization following the generation of positive versus negative thoughts due to greater thought-confidence (measured in Study 2). Another way to examine thought use commonly employed in persuasion studies is to examine the correlation between thought valence and attitudes (Briñol & Petty, 2009). Specifically, the more people are relying on their thoughts, the larger the correlation should be between the favorability of thoughts and attitudes. Thus, we examine the thought-attitude relationship across the

predicted validation (preparation) and control conditions.

Furthermore, to minimize any unique limitations of any particular manipulation and rule out the possibility that our effects could stem from a methodological artifact, we employed different empirical manipulations of preparedness in each study to provide convergent evidence to support our conceptual case for the validating effect of preparedness (see the Cook & Campbell, 1979, discussion of multiple operationism). Regardless of whether the empirical manipulation of preparedness was direct or indirect, for positive or negative outcomes, or in social or academic domains, we predicted that the findings across studies would show that preparedness enhances thought reliance in forming attitudes across different domains.

Furthermore, Study 3 aimed to directly compare the effects of different types of preparedness inductions within the same study. We argue that some manipulations represent relatively indirect inductions of preparedness whereas others are more direct. Specifically, some inductions, like creating an expectancy, are indirect because they merely indicate the likely outcome (e.g., this is likely to happen) that the individual must use and subsequently link to prepared responses (e.g., given this is likely to happen, how can I respond to it). In contrast, other inductions of preparedness, like implementation intentions, are more direct because they not only indicate the likely outcome for which one can become prepared (good or bad score), but, in addition, automatically link particular prepared responses (take vs retake exam) to the likely anticipated outcomes.

In light of the foregoing distinction, Study 3 attempted to extend the findings of both Studies 1–2 by retaining the Study 2 manipulation of expectations but also including a manipulation of implementation intentions in order to compare the effects of a direct induction of preparedness (implementation intentions) to the Study 2 indirect induction (expectancy). Although we predicted that the direct induction would be stronger, we also predicted that both types of inductions would have self-validating effects. Finally, we expected that confidence would mediate the effect of both types of preparedness inductions on attitudes (Studies 2–3).

## 3. Experiment 1

The goal of the first study was examining the extent to which preparedness can increase reliance on thoughts polarizing subsequent evaluations. First, participants wrote positive or negative thoughts about a tuition increase proposal. Next, participants completed word fragments related to preparedness or control words. Finally, participants evaluated the tuition proposal. We expected that the effect of the thoughts initially generated on attitudes toward tuition would be greater when participants were primed with preparedness than control words.

### 3.1. Participants and design

Eighty four undergraduate students at Ohio State University were randomly assigned to the cells comprising a 2 (Thought Direction: Positive vs. Negative)  $\times$  2 (Word completion: Preparedness vs. Control) between-subjects factorial design. A power analyses was conducted using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007). To conduct the analyses, we drew from the initial work cited earlier that examined the role of attack preparedness in validating both positive and negative thoughts (i.e., Briñol et al., 2016). Thus, we combined the effect size estimates for the Thought Direction  $\times$  Attack interactions obtained across Study 1 ( $d = 0.64$ ) and Study 2 ( $d = 0.63$ ) in that prior research to arrive at an overall average effect size estimate of  $d = 0.64$ .<sup>1</sup> The results of the power analysis concluded that the desired sample size for

<sup>1</sup> All d-statistic effect sizes were converted to the equivalent  $f$  effect sizes required by G\*Power for the Study 1–3 power analyses.

a two-tailed test ( $\alpha = 0.05$ ) of the predicted two-way interaction with 0.80 power was  $N = 79$  participants. We posted signups week by week until the week where we anticipated reaching the targeted number, ultimately ending up with 84 total participants. No participants were excluded and all measures and manipulations are reported below.

### 3.2. Procedure

Upon entering the laboratory, participants were seated at individual computer stations and carried out the experimental procedures electronically. Next, participants learned that they were taking part in two separate research projects, one organized by the Office of Student Wellness in collaboration with the Vice Provost's office and the other by the cognitive psychology program. According to the cover story, the student wellness center wanted to learn the opinions of the students about future changes in their university. We used the topic of raising student tuition to support new student computer facilities on campus (see Supplementary materials). Given the topic focused on raising the participant's tuition, the topic was of relatively high personal relevance for most students. To vary thought valence, participants engaged in a thought-listing task by generating three positive or negative thoughts about raising tuition. For the next part of the session (i.e., the 'second study'), participants engaged in a semantic priming task. Specifically, as part of an apparently separate language task, we primed participants with the construct of preparedness (vs. control) using a word completion task. Finally, participants completed the dependent measure of attitudes toward the proposal and, then, were debriefed, thanked, and dismissed.

### 3.3. Independent variables

#### 3.3.1. Thought direction

Participants first completed the initial thought-listing task. In this task, we randomly assigned participants to generate either three positive or three negative thoughts related to the new increasing tuition policy. We told all participants that this was an important task and asked all of them to think carefully as they generated their arguments about tuition (see Supplementary materials). Previous research shows that this is an effective way to create different profiles of thoughts (see Briñol, McCaslin, & Petty, 2012; Killeya & Johnson, 1998). This manipulation served to produce one group with favorable thoughts and another with unfavorable thoughts toward the same proposal. The benefit of this procedure is that it holds the number and quality of participants' thoughts constant across preparedness conditions (due to random assignment) and only varies valence. This allows us to test the critical question of whether people use their thoughts more in forming different judgments in the preparedness than the control condition.

#### 3.3.2. Preparedness priming

For the priming manipulation, all participants completed a word-completion task, ostensibly to examine the activation of prototypical emotional experiences. Instructions required participants to determine what word they could create by filling in the 1–2 missing letters for each trial (e.g., Pr\_par\_). In the preparedness prime condition, 8 of the 15 words included in this task were associated with preparedness (i.e., prepare, ready, preparedness, forecast, certain, proactive, readiness, anticipate). In the control condition, the words included in the task were positive in meaning (as were the preparedness words) but unrelated to preparedness (i.e., enjoy, excited, merry, joyful, happiness, jolly, joy, happy). The filler words were the same in both conditions and were neutral words unrelated to either prime (i.e., broom, knife, wood, horse, moon, spoon, grass). Word-completion tasks have been used successfully to prime a variety of psychological constructs in previous research (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; DeMarree, Briñol, & Petty, 2014; Kay & Ross, 2003; Petty, DeMarree, Briñol, Horcajo, & Strathman, 2008; Tobin, Capuozzo, &

Raymundo, 2012).

Importantly, the prime words used in this study were different from those used in past research that has primed constructs such as power (Briñol, Petty, Valle, et al., 2007), confidence (Petty et al., 2002), action (Albarracín, Johnson, Fishbein, & Muellerleile, 2001), and competition (e.g., Bargh et al., 2001; Kay & Ross, 2003). In this study, the order of prime and filler words was random for each participant (see supplementary materials). We placed the preparedness induction after the initial thought listing about tuition to ensure that it did not affect the initial content of thoughts (quantity or quality) but, instead, only the use of whatever thoughts the participants had *already* generated in the initial phase. Following the preparedness prime, all participants completed the attitudes dependent measure.

### 3.4. Dependent measures

#### 3.4.1. Thought favorability

One judge, unaware of the experimental conditions, coded each thought that participants wrote on the initial thought listing task (3 positive or 3 negative) with respect to whether it was positive or negative toward a tuition increase using a 9-point scale, ranging from 1 (Very Unfavorable) to 9 (Very Favorable). The judge also coded each participant's thoughts on 9-point scales with respect to the control variables of thought extremity (1 = Not at all Extreme; 9 = Very Extreme), abstraction (1 = Not at all Abstract; 9 = Very Abstract), and length (1 = Very Short; 9 = Very Long) (see supplementary materials).

#### 3.4.2. Attitudes

The primary dependent measure was attitude toward the proposal of raising tuition. This dependent measure was assessed using two general evaluative items that were averaged to form an index ( $r = 0.45$ ,  $p < .0001$ ). The first item asked participants to rate their attitude toward the university proposal using a 9-point scale, ranging from 1 (Extremely Negative) to 9 (Extremely Positive). The second item asked participants to rate the extent to which they supported the proposal using a 9-point scale, ranging from 1 (Strongly Oppose) to 9 (Strongly Support) (see Supplementary materials).

## 4. Results

### 4.1. Thoughts

A 2 (Thought Direction: Positive vs. Negative)  $\times$  2 (Prime: Preparedness vs. Control) ANOVA revealed the predicted main effect of the thought direction on thought favorability,  $F(1, 82) = 88.78$ ,  $p < .001$ ,  $d = 1.49$ . Indeed participants' thoughts were judged by an external judge to be more favorable in the positive ( $M = 8.19$ ,  $SD = 1.01$ ) than in the negative ( $M = 5.42$ ,  $SD = 1.15$ ) thought condition. Also, there were no differences in the rated length, extremity, or abstractness of participants' thoughts as a function of conditions,  $F_s < 0.05$ ,  $p_s > 0.82$ ,  $d = 0.05$ .

### 4.2. Attitudes

A 2 (Thought Direction: Positive vs. Negative)  $\times$  2 (Prime: Preparedness vs. Control) ANOVA showed a main effect of Thought Direction on attitudes,  $F(1, 82) = 75.39$ ,  $p < .001$ ,  $d = 1.57$ . Specifically, the analyses showed that participants listing positive thoughts reported more favorable attitudes toward the tuition proposal ( $M = 5.83$ ,  $SD = 1.72$ ) than those listing negative thoughts ( $M = 3.71$ ,  $SD = 1.14$ ). Although not predicted, there was also a significant main effect of preparedness on attitudes,  $F(1, 82) = 8.54$ ,  $p = .004$ ,  $d = 0.42$ , suggesting that participants in the preparedness condition ( $M = 5.18$ ;  $SD = 2.25$ ) tended to have more positive evaluations than participants in the control condition ( $M = 4.47$ ;  $SD = 1.17$ ).

Most importantly the predicted two-way interaction between

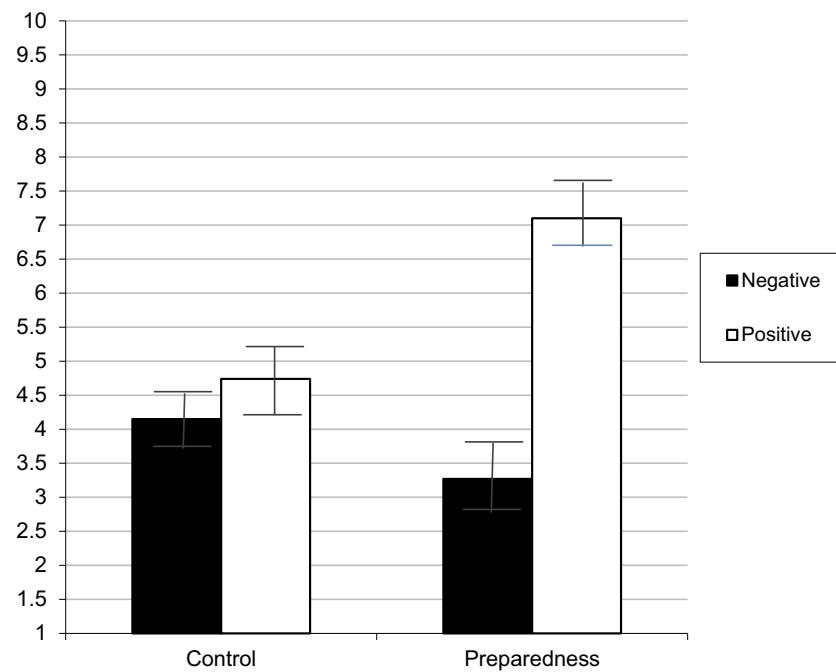


Fig. 1. Study 1 attitudes as a function of preparedness and thought direction (error bars represent 95% confidence intervals).

Thought Direction and Prime was significant,  $F(1, 82) = 40.52$ ,  $p < .001$ ,  $d = 1.00$ . As illustrated in Fig. 1, this interaction indicated that attitudes toward the proposal were more consistent with the direction of thoughts in the preparedness than in the control prime conditions. That is, for the preparedness conditions, participants' attitudes toward raising tuition were more positive when they had previously generated positive thoughts ( $M = 7.10$ ,  $SD = 1.08$ ) than when they generated negative thoughts ( $M = 3.27$ ,  $SD = 1.24$ ),  $F(1, 82) = 109.53$ ,  $p < .001$ ,  $d = 2.20$ . In contrast, for the control conditions, there was a smaller effect of thought direction,  $F(1, 82) = 2.78$ ,  $p = .099$ ,  $d = 0.20$ . Described differently, this interaction revealed that participants with positive thoughts rated the proposal more favorably when completing preparedness words ( $M = 7.10$ ,  $SD = 1.08$ ) than neutral words ( $M = 4.74$ ,  $SD = 1.37$ ),  $F(1, 83) = 44.64$ ,  $p < .001$ ,  $d = 1.07$ . Among participants with negative thoughts, preparation led to less favorable attitudes ( $M = 3.27$ ,  $SD = 1.24$ ) than the neutral prime ( $M = 4.15$ ,  $SD = 0.86$ ),  $F(1, 82) = 5.73$ ,  $p = .019$ ,  $d = 0.35$ .

#### 4.2.1. Thought-attitude linkage

Finally, we predicted that participants in the preparedness (validation) condition would rely more on their thoughts in expressing their attitudes than participants in the control condition. Regressing attitudes onto the relevant variables, a significant interaction emerged between the thought favorability index and the prime condition,  $B = 0.375$ ,  $t(79) = 2.53$ ,  $p = .01$ . Consistent with the self-validation prediction, this interaction revealed that participants' thoughts were more closely associated with attitudes when participants were in the preparedness condition ( $B = 0.86$ ,  $t(40) = 6.96$ ,  $p < .001$ ) than when they were in the control condition ( $B = -0.25$ ,  $t(43) = -1.13$ ,  $p = .26$ ).

## 5. Discussion

In line with the self-validation hypothesis, we found that the effect of thought direction on attitudes was greater when participants were primed with preparedness (vs. control) words. Thus, with a preparedness mindset, participants seemed to rely on their thoughts in forming their attitudes more so than did participants in a more neutral mindset. Importantly, the priming manipulation did not affect the valence, or number, of participants' thoughts because it came after participants

generated their thoughts.

Notably, Study 1 examined thoughts about a topic (increase in tuition) that was highly relevant for undergraduate students and for which the concept of preparation can be naturally associated. When thinking about topics less relevant than the academic context, people might be less likely to use signs of preparedness to assess whether or not to rely on their own thoughts. Therefore, to enhance the generality of findings, Study 2 attempted to generalize to a different topic by having people make judgments about funding for genetically modified food research rather than a tuition increase.

More importantly, Experiment 1 used a relatively subtle word completion task introduced after the thought direction induction in order to prime the concept of preparedness. In contrast, Experiment 2 used a preparedness induction in which participants were told to expect evaluative feedback from a partner. Some participants were explicitly led to expect negative feedback. Although we did not explicitly tell them to prepare, prior work on bracing for the worst led us to anticipate that participants would spontaneously use the expectation to prepare themselves for the feedback (Carroll et al., 2006). This approach should assuage concerns about whether the more abstract, object-free induction used in Experiment 1 would produce the same results as a more object-specific induction. To the extent that the results mirror those obtained in Study 1 even when participants were expecting negative feedback, it would provide convergent evidence that it is the preparation per se that accounts for the validation effects and not any positivity associated with the preparedness prime words used in Study 1.

## 6. Experiment 2

Study 2 was designed to replicate and extend the Study 1 findings in several ways. First, Study 2 used a new proposal topic (funding for genetically modified food research) to further disconnect our attitude object and the preparedness manipulation from the achievement-related context of university academics. Second, Study 2 introduced a different manipulation of preparedness. Instead of a word-completion task, this study gave participants an expectation of receiving evaluative feedback. Although Study 3 will revisit this issue, the Study 2 manipulation of preparedness was indirect in that it provided the expected outcome but did not tell them to prepare let alone provide any

information on *how* to prepare. Importantly, we used a scenario of potential negative feedback in order to generalize our results by focusing participants on preparedness for a negative prospect rather than priming the potentially positive experience of preparedness for good prospects (academic success), which could plausibly have made participants happy and/or affirmed. Moreover, the new induction relied on a social scenario, thereby increasing the potential to generalize across domains. Third, Study 2 included a measure of feelings of preparedness as a manipulation check following the preparedness induction. Finally, this study included a measure of thought-confidence in order to assess the extent to which the preparedness manipulation influences evaluation by the proposed self-validation mechanism. Despite all these changes, we again expected the impact of the direction of thoughts (positive/negative) on attitudes toward the new proposal to be significantly greater when participants were assigned to the new induction of preparedness (expectation for negative feedback). Furthermore, we predicted the effect of preparedness on attitudes would be mediated by thought confidence.

### 6.1. Participants and design

Eighty undergraduate students participated in a 2-part study that would examine their thoughts on a new university proposal as well as the role of self-presentation in interpersonal attraction. Participants were randomly assigned to cells within a 2 (Thought Direction: Negative vs. Positive)  $\times$  2 (Preparedness: Control vs. Preparedness) factorial design. A power analysis was conducted using G\*Power (Faul et al., 2007). After obtaining the predicted interaction effect in study one, we planned for a similar effect size in this second study ( $d = 0.80$ ). The desired sample size for a two-tailed test ( $\alpha = 0.05$ ) of the predicted 2-way interaction with 0.80 power was a total of  $N = 73$ . In order to achieve that number, we decided to post signups week by week until the week where we anticipated reaching the targeted number, ultimately ending up with 80 total participants. No participants were excluded and all measures and manipulations are reported below.

### 6.2. Procedure

Participants first listed three positive or negative thoughts about a new university proposal. Next, we manipulated preparedness for the prospect of social rejection. Preparedness was manipulated by providing participants with no expectation or a negative expectation to anticipate and, in turn, prepare for the imminent prospect of social rejection. We placed the preparedness induction after the initial thought listing to ensure that it did not affect the initial *content* of thoughts but, instead, only the extent to which participants relied on those thoughts that they had *already* generated. Finally, participants rated their feelings of preparedness, thought-confidence, and attitudes toward the proposal before being debriefed and dismissed.

### 6.3. Independent variables

#### 6.3.1. Thought direction

As part of the first apparent study, participants learned about a new university proposal for funding research on genetically modified foods (GMF). The proposal listed four major benefits of GMF: crop growth, economic gains, environmental protection, and global nutrition (see supplementary materials). As noted, we selected this topic rather than the Study 1 topic of student tuition increases to further disconnect our attitude object (as well as our preparedness manipulation) from the positive achievement-related context of university academics. To manipulate thought direction, participants were randomly assigned to complete a thought listing entering either three positive or three negative thoughts about increasing funding for research on GMF.

#### 6.3.2. Induction of preparedness

All participants learned that they would now take part in the second study on the role of self-presentation in interpersonal attraction. They would complete a self-description task in which they would identify and describe their greatest strength, weakness, and most important life goal. All participants learned that their self-description profile would be transferred to another (fictitious) opposite sex participant supposedly situated in the next room. Participants learned that the partner would then evaluate their personal profile and provide feedback to indicate how much they would like to meet the partner in person later. Participants then completed the self-description exercise.

Once participants completed the self-description task, a screen appeared for all participants indicating that the computer transferred his/her responses to the other participant to evaluate and respond to them. After 3 min, participants viewed a screen indicating that the other participant had returned their evaluation early. Based upon pre-determined random assignment, the computer then manipulated expectations by presenting participants with the no expectation (control) or negative expectation (preparedness) condition screen.

In the control condition, participants read that past sessions showed no correlation between return times and the favorability of personal profile evaluations, with shorter return times sometimes predicting positive and sometimes predicting negative evaluations. Thus, the early return time meant that their evaluation was just as likely to be negative as it was to be positive. In contrast, in the negative expectation condition, participants read that past sessions showed a strong correlation between return times and the favorability of personal profile evaluations, with shorter times indicating worse evaluations. Thus, the early return time meant that their profile evaluation was likely to be negative. This warning of a likely negative evaluation allowed participants some time to prepare for it. Thus, although both groups were told that the evaluation was returned early, the manipulation varied whether the early return time did (negative expectation) or did not (no expectation) indicate that a negative evaluation was likely.

### 6.4. Dependent variables

#### 6.4.1. Feelings of preparedness

Before proceeding to the critical dependent measures, all participants completed a manipulation check of preparedness in which they rated how prepared they felt for their partner's feedback (see supplementary materials), using a 9 point Likert scale ranging from 1 (Not at All Prepared) to 9 (Very Prepared).

#### 6.4.2. Thought favorability

As in the first study, one independent judge, unaware of the experimental conditions, coded each thought participants wrote with respect to favorability, extremity, abstraction, and length, using the same 9-point scales described for Study 1.

#### 6.4.3. Thought confidence

Following the preparedness manipulation check, participants were asked to think back to the thoughts they listed toward the proposal and to rate their overall confidence in the thoughts they had listed (see Supplementary materials). We measured thought confidence by asking the participants to rate their confidence in their thoughts, using a 9-point scale ranging from 1 (Not at all Confident) to 9 (Extremely Confident).

#### 6.4.4. Attitudes

Finally, participants completed the primary dependent measure of attitude toward the proposal. Once again, we averaged the same two general evaluative items used in Study 1 to form an index of attitudes ( $r = 0.43, p = .05$ ).

## 7. Results

### 7.1. Feelings of preparedness

A 2 (Thought Direction: Negative vs. Positive)  $\times$  2 (Preparedness: Control vs. Preparedness) ANOVA only showed a main effect of the preparedness manipulation on preparedness feelings,  $t(78) = 21.53$ ,  $p < .001$ ,  $d = 1.04$ . Specifically, participants in the preparedness condition ( $M = 4.80$ ;  $SD = 1.72$ ) reported higher feelings of preparedness for feedback on our manipulation check than control participants ( $M = 2.94$ ;  $SD = 1.84$ ).

### 7.2. Thoughts

The analyses on thoughts revealed a main effect of the thought direction manipulation on thought favorability,  $F(1, 79) = 69.80$ ,  $p < .001$ ,  $d = 1.87$ . As predicted, independent judges rated participants' thoughts as more favorable in the positive ( $M = 6.31$ ,  $SD = 0.47$ ) than in the negative ( $M = 3.89$ ,  $SD = 0.31$ ) thought-listing condition. Also, results showed no differences in the length, extremity, or abstractness of participants' thoughts as a function of preparedness,  $F_s < 1.28$ ,  $p_s > 0.24$ ,  $d = 0.35$ .

### 7.3. Thought confidence

As predicted by the self-validation approach, participants expressed greater confidence in their thoughts in the preparedness ( $M = 6.84$ ,  $SD = 2.19$ ) than in the control ( $M = 4.33$ ,  $SD = 1.93$ ) condition,  $F(1, 79) = 29.15$ ,  $p < .001$ ,  $d = 0.85$ . There were no other significant effects ( $F_s < 1.87$ ,  $p_s > 0.17$ ).

### 7.4. Attitudes

The 2  $\times$  2 ANOVA showed the predicted main effect of thought direction,  $F(1, 79) = 4.99$ ,  $p = .03$ ,  $d = 0.47$ . Specifically, participants who generated positive thoughts ( $M = 4.87$ ;  $SD = 1.65$ ) reported significantly more favorable attitudes than participants who generated negative thoughts ( $M = 4.05$ ;  $SD = 1.35$ ) about the proposal. Preparedness did not have a main effect on attitudes in this study,  $F = 1.35$ ,  $p = .25$ ,  $d = 0.24$ .

Importantly, the predicted two-way interaction was significant,  $F(1, 79) = 10.17$ ,  $p = .002$ ,  $d = 0.70$ , revealing that attitudes toward the proposal were more consistent with thought direction in the preparedness than in the control conditions (see Fig. 2). That is, for the preparedness conditions, participants' attitudes were more positive when they generated positive thoughts ( $M = 5.50$ ,  $SD = 1.54$ ) than when they generated negative thoughts ( $M = 3.76$ ,  $SD = 1.33$ ),  $F(1, 79) = 16.34$ ,  $p < .001$ ,  $d = 0.91$ . In contrast, for the control conditions, participants did not rely on the direction of their thoughts when they evaluated the proposal,  $F(1, 79) = 0.42$ ,  $p = .52$ ,  $d = 0.13$ .

Described differently, this interaction revealed that participants with positive thoughts saw the proposal more favorably in the preparedness condition ( $M = 5.50$ ;  $SD = 1.54$ ) than the control condition ( $M = 4.11$ ;  $SD = 1.46$ ),  $F(1, 79) = 9.97$ ,  $p = .002$ ,  $d = 0.67$ . Although not significant, participants with negative thoughts saw the proposal more unfavorably in the preparedness ( $M = 3.76$ ;  $SD = 1.33$ ) than the control condition ( $M = 4.41$ ,  $SD = 1.31$ ),  $F(1, 79) = 1.96$ ,  $p = .17$ ,  $d = 0.29$ .

### 7.5. Thought-attitude linkage

We predicted that participants in the preparedness condition would rely more on their thoughts in expressing their attitudes than

participants in the control condition. Regressing attitudes onto the relevant variables, a significant interaction emerged between the thought favorability index and the preparedness condition,  $B = 0.65$ ,  $t(80) = 2.72$ ,  $p = .01$ . Consistent with the self-validation prediction, this interaction revealed that participants' thoughts were more closely associated with attitudes when participants were in the preparedness condition ( $B = 0.63$ ,  $t(43) = 3.62$ ,  $p < .001$ ) than when they were in the control condition ( $B = -0.04$ ,  $t(34) = -0.17$ ,  $p = .86$ ).

### 7.6. Mediation analyses

In order to examine whether thought confidence mediated the effect of the thought direction  $\times$  preparedness interaction on attitudes, we followed the recommendations of Muller and colleagues for testing mediated moderation models using bootstrapping methods (Muller, Judd, & Yzerbyt, 2005). In this procedure, we contrast coded thought direction (i.e., negative thoughts =  $-1$ , positive thoughts =  $1$ ) and mean-centered the preparedness and thought confidence measures. From a conceptual standpoint, preparedness represents the IV, thought direction represents the moderator, confidence the mediator, and attitudes the DV. From an analytic standpoint, we followed the recommendations of Muller et al. (2005) to designate the thought direction  $\times$  preparedness interaction as the predictor (X) variable, attitudes as the dependent variable (Y), and the thought direction  $\times$  confidence interaction as the mediator (M). In order to test the hypothesized mediation by thought confidence, we conducted a biased corrected bootstrapping procedure with 10,000 bootstrap re-samples using Hayes process macro (model) (Preacher & Hayes, 2004; Shrout & Bolger, 2002).

Following the recommendations of Muller and colleagues (Muller et al., 2005), we first regressed attitudes on thought direction, preparedness, and the interaction between the two. As predicted, the interactive effect of thought direction and preparedness on attitudes was significant,  $b = 0.62$ ,  $SE = 0.1615$ ,  $t = 3.81$ ,  $p < .003$ , 95% CI [ $+0.2952, +0.9386$ ], as well as the main effects of thought direction,  $b = -0.82$ ,  $SE = 0.32$ ,  $t = -2.59$ ,  $p = .01$ , 95% CI [ $+0.1908, +1.454$ ], and preparedness,  $b = -0.28$ ,  $SE = 0.12$ ,  $t = -2.31$ ,  $p = .02$ , 95% CI [ $-0.5238, -0.0388$ ]. Second, we regressed confidence (the proposed mediator) on thought direction, preparedness, and the interaction between the two terms. As predicted, only the main effect of preparedness on confidence was significant ( $b = 0.73$ ,  $SE = 0.11$ ,  $t = 6.55$ ,  $p < .001$ ). Third, we regressed attitudes on preparedness, thought direction, the preparedness  $\times$  thought direction interaction, and the key thought direction  $\times$  confidence interaction. As predicted, the thought direction  $\times$  preparedness interaction became non-significant,  $b = 0.332$ ,  $SE = 0.17708$ ,  $t = 1.90$ ,  $p = .06$ , 95% CI [ $-0.0167, +0.6639$ ], once the significant confidence  $\times$  preparedness interaction was included as the mediator,  $b = 0.4034$ ,  $SE = 0.1121$ ,  $t = 3.59$ ,  $p < .001$ , 95% CI [ $+0.180196, +0.6266$ ]. The main effects of preparedness,  $b = -0.28$ ,  $SE = 0.11$ ,  $t = -2.48$ ,  $p = .02$ , 95% CI [ $-0.5038, -0.0559$ ] and thought direction,  $b = +0.62$ ,  $SE = 0.30$ ,  $t = 2.06$ ,  $p = .04$ , 95% CI [ $+0.0215, +1.217$ ], were also significant (see Table 1).

Next, we ran a formal effect analyses to test the relative strength of the indirect versus the direct effect. This approach includes procedures that compute a 95% confidence interval (CI) around the indirect effect and the exclusion of zero from this CI would be consistent with mediation. As predicted, moreover, the formal effect analyses confirmed that the 95% confidence interval of the indirect effect (i.e., the path through the mediator) did not include zero,  $a \times b = 0.2932$ , BootSE = 0.1254, 95% CI [ $+0.0862, +0.5808$ ]. Moreover, after controlling for the indirect effect, the total effect of the preparedness  $\times$  thought direction interaction on attitudes,  $c = 0.6169$ ,

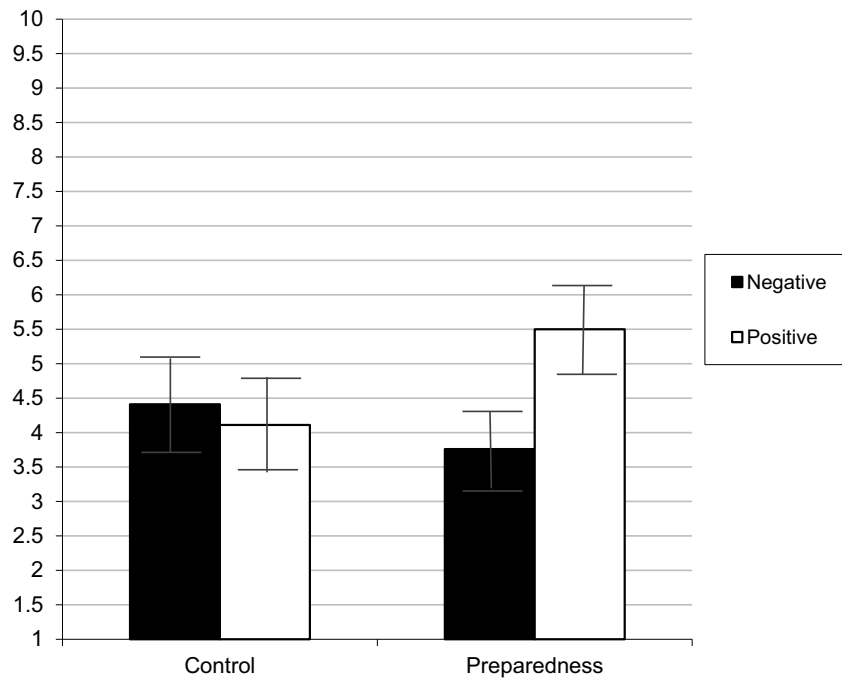


Fig. 2. Study 2 attitudes as a function of preparedness and thought direction (error bars represent 95% confidence intervals).

Table 1

Reduced and full regression model: attitudes (Study 2).

Reduced model: predictors	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	95% CI
1. Preparedness	-0.28	0.12	-2.31	0.02	-0.5238, -0.0388
2. Thought Direction	-0.82	0.32	2.59	0.01	+0.1908, +1.454
3. TD × Preparedness	0.62**	0.16**	3.81	0.003	+0.2952, +0.9386
Full regression model: predictors	<i>B</i>	<i>SE</i>	<i>t</i>	<i>P</i>	95% CI
2. Preparedness	-0.28	0.11	-2.48	0.02	-0.5038, -0.0559
3. Thought Direction	0.62	0.30	2.06	.04	+0.0215, +1.217
4. TD × Preparedness	0.32	0.17*	1.90	0.06	-0.0167, +0.6639
5. TD × Confidence	0.40**	0.11	3.59	0.00	+0.1801, +0.6266

Note: *b* represents unstandardized regression weights; *SE* represents standard error.

\* *p* < .05.

\*\* *p* < .001.

BootSE = 0.1615, 95% CI [+0.2952, +0.9386], dropped below significance, *c'* = -0.3236, BootSE = 0.1708, 95% CI [-0.0167, +0.6639], also consistent with mediation (Shrout & Bolger, 2002) (see Fig. 3).<sup>2</sup>

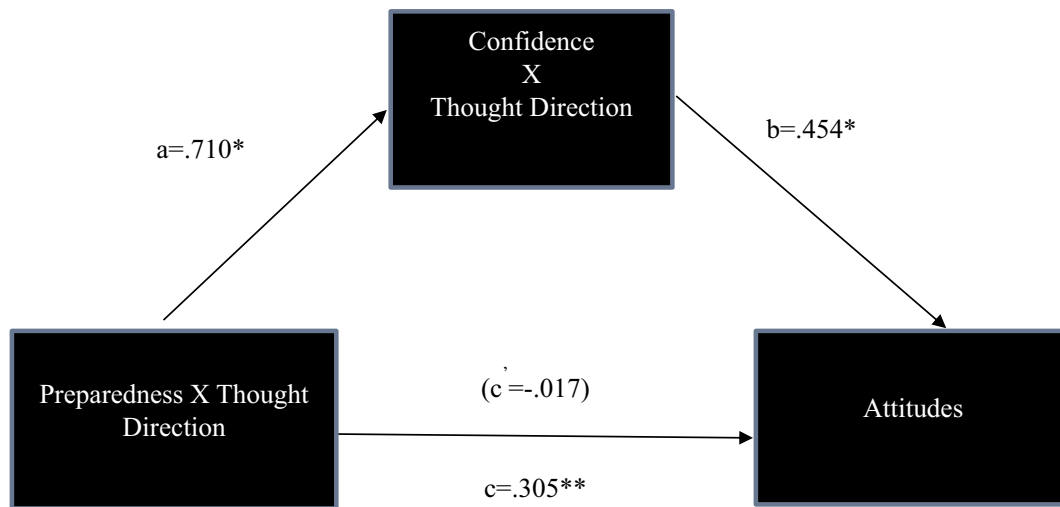
<sup>2</sup>In addition, we used Hayes process macro 15 to test whether confidence mediated the thought direction x preparedness feelings interactive effect on attitudes, based upon on 10,000 bootstraps. First, results showed a significant total effect of the preparedness x thought direction interaction on attitudes, *b* = 0.4251, BootSE = 0.1886, 95% CI [0.0532, 0.6979]. After decomposing the effects, the results showed a significant negative direct effect of preparedness in the negative thought conditions, *b* = -0.3827, BootSE = 0.1364, 95% CI [-0.6546, -0.1109], whereas results showed a non-significant positive direct effect in the positive thought condition, *b* = +0.0424, BootSE = 0.1273, 95% CI [-0.2114, +0.2924]. Moreover, although it was not significant in the negative thought condition, *ab* = 0.1000, BootSE = 0.0860, 95% CI [-0.0379, +0.2555], the predicted indirect path from preparedness feelings to attitudes via confidence was significant in the positive thought condition, *ab* = 0.2786, BootSE = 0.1136, 95% CI [0.0876, 0.5311]. Thus, when taken together, the results of the foregoing analyses provide convergent support for the proposed mediated moderation model.

## 8. Discussion

The second study conceptually replicated the results obtained in the first study within the domain of social interaction, using a different topic, and a more natural, yet indirect, induction of preparedness. Despite these variations in the procedure and inductions, preparedness validated previously generated positive and negative thoughts, thereby polarizing subsequent evaluative judgments. Furthermore, the present study provided evidence consistent with our hypothesized mediated moderation model that feeling prepared in one domain (social) validates positive or negative thoughts regarding a different topic (GMOs) unrelated to the domain of preparation by increasing thought-confidence. Of course, in line with recent recommendations regarding mediation reports, we acknowledge that it could also be consistent with other plausible alternative models not tested here (Fiedler, Harris, & Schott, 2018).

Although informative, there were some limitations of Study 2 as well. For example, given past work on the validation effects with other variables, Study 2 cannot rule out emotions as a possible alternative explanation for the validating effects obtained for preparedness since it may feel good to be prepared or people may be angry at the prospect of





**Fig. 3.** Study 2 mediated moderation model of the indirect effect of preparedness on attitudes via confidence (mediation effect) across conditions of thought direction (moderation effect). Note: \* indicates  $p < .05$ . Value in the parenthesis (i.e.,  $-0.017$ ) is the direct effect of thought direction  $\times$  preparedness on attitudes while accounting for the effect through the indirect path.

receiving negative feedback. Thus, in Study 3, we incorporated measures of positive and negative emotions to address this limitation. Also, as noted earlier, Study 2 only examined the validating effects of an indirect induction of preparedness. Specifically, providing negative expectations about upcoming feedback allows people to prepare for that feedback but our induction did not actually tell them to prepare nor did it provide any feedback about how to prepare. Thus, Study 3 also aimed to compare the validating effects of a more direct induction and indirect induction of preparedness by incorporating implementation intentions as a direct induction of preparedness that automatically links the anticipated outcomes with prepared responses to those outcomes.

### 9. Experiment 3

Study 3 introduced several important changes. First, we wanted to ensure that the validation effects in this study were due to the effects of our manipulation on preparedness as opposed to confident emotions such as happiness or anger. Therefore, we included control measures of positive and negative emotion (Briñol, Petty, Stavrakı, et al., 2018; Briñol, Petty, Valle, et al., 2007). Second, Study 3 added a different manipulation of preparedness that required participants to actually prepare responses to different possible test outcomes (good or bad). This manipulation provides a more direct operational manipulation of preparedness as an adaptive goal state of *readiness to respond* to future outcomes. Specifically, we have argued that the expectancy manipulation used in Study 2 provided an indirect manipulation of preparedness because it indicated the likely outcome but still required participants to generate their own responses to prepare for that likely outcome (i.e., given this is likely to happen, how should I respond). In contrast, implementation intentions provide a more direct induction of preparedness because they prompt participants to generate intentions in an “if-then” format that automatically link particular prepared responses (e.g., accept score vs. retake test) to particular anticipated outcomes (good or bad score).

Put simply, providing an expectancy is an indirect preparedness induction because it only provides the “if” part of the contingency whereas implementation intentions are direct because they automatically link the “if” with the “then” prepared responses. Thus, whereas Study 2 only assessed the impact of an indirect induction of preparedness, Study 3 went further by incorporating this direct induction to compare the effects of the indirect (negative expectation) and direct (implementation intentions) inductions of preparedness.

Specifically, we adapted the Study 2 paradigm to indirectly manipulate preparedness via the participant's test expectation along with the more direct manipulation of response preparedness via implementation intentions. Given that the thought direction  $\times$  preparedness interaction was significant in Studies 1–2, Study 3 dropped the manipulation of thought direction to test the unique effects of the direct induction of preparedness via implementation intentions and the indirect induction of preparedness in a design in which only positive thoughts were elicited.

With respect to our hypotheses, we predicted that both indirect and direct inductions of preparedness would be effective resulting in two main effects on the attitude outcome measure. That is, those in the implementation intention condition (direct preparedness induction) would show greater feelings of preparedness and confidence and hold more positive attitudes than those in the control conditions, regardless of the level of expectation (indirect preparedness induction). More positive attitudes were predicted as a result of validation because thoughts were held constant at a positive level. Moreover, we predicted that those with negative expectations (indirect preparedness induction) would show greater feelings of preparedness, confidence, and hold more positive attitudes than those in the no expectation control condition, regardless of their level of implementation intentions (direct preparedness induction). We did not expect that either the indirect (expectancy) or direct (implementation intentions) manipulations of preparedness would affect the control measures of emotion.

Although we hypothesized that the two inductions of preparedness would both be effective and have independent effects on our measures (i.e., resulting in two main effects), it was also possible that the indirect manipulation of preparedness via expectations would not have as large of an effect as the direct preparedness manipulation via implementation intentions and thus produce an interaction. For instance, an interaction could occur if either induction was sufficient to make people feel prepared. If this happened, the 3 conditions having at least one induction of preparedness would similarly differ from the pure control condition in which neither preparedness inductions were present. Finally, consistent with our mediation model, we predicted that the preparedness manipulations would affect attitudes through feelings of preparedness and confidence.

#### 9.1. Participants and design

We recruited 96 undergraduate students to participate in a two-part study that would first examine their thoughts on a new university

proposal. Study 3 used the Study 2 topic to increase funding for genetically modified food research. We randomly assigned participants to cells within a 2 (Indirect preparedness: No Expectation vs. Negative Expectation)  $\times$  2 (Direct Preparedness: Control vs. Implementation Intentions) factorial design. Given we are predicting main effects of both preparedness inductions on attitudes and Study 3 only used positive thoughts, we conducted an a priori power analyses using G\*Power (Faul et al., 2007), based upon the Study 2 effect size for the simple main effect of preparedness on attitudes in the positive thought condition ( $d = 0.66$ ; Cohen, 1988). The power analysis revealed that the desired sample size for a two-tailed test ( $\alpha = 0.05$ ) of the predicted main effect with 0.80 power was  $N = 75$  participants (approximately 19 participants/condition). As in the prior studies, we posted signups week by week until the week where we anticipated reaching the targeted number, ultimately ending up with 96 total participants (24 participants/condition). No participants were excluded and all measures and manipulations are reported below.<sup>3</sup>

## 9.2. Procedure

Participants first listed three positive thoughts about the university proposal to increase funding for genetically modified food research. After completing part one, all participants learned that they would now engage in the second study validating a new short version of the Graduate Record Examination (GRE). We told participants that 156 was the average minimum GRE score for admissions into most graduate psychology programs. They learned that they would then take the test and, in exchange for their participation, would have the option of either saving their score with the Educational Testing Service (ETS) or retaking the test to earn a higher score after learning how to solve the items they missed. Participants then proceeded to the next screen to take the test. The test consisted of 10 items from the analytical portion of the Graduate Record Examination (GRE Information Bulletin, Educational Testing Service, 1990).

Next, we directly manipulated preparedness via implementation intentions by having participants generate either implementation intentions (preparedness) or goal intentions (control) in anticipation of their test scores. Prior work has used implementation intention manipulations to induce self-regulatory preparedness (Dennehy et al., 2014). Next, we adapted the Study 2 paradigm to indirectly manipulate preparedness via expectations by telling participants that their score would likely be negative or that their score was just as likely to be positive as negative. As before, we placed the preparedness and expectancy inductions after the initial thought listing to ensure that they did not affect the initial *content* of thoughts but, instead, only the extent to which participants relied on those thoughts that they had *already* generated in the initial phase. Finally, participants reported their preparedness, confidence, and attitudes toward the proposal before being debriefed and dismissed.

## 9.3. Independent variables

### 9.3.1. Direct induction of preparedness: implementation intentions

Upon completing the GRE test, participants were randomly assigned

<sup>3</sup> This study included an additional ancillary item asking about participants' perceived feelings of power. Although implementation intentions did have a main effect on that item of power,  $F = 4.83, p = .01, d = 0.43$ , there was no main effect of expectancy on the power measure,  $F(1, 81) = 3.76, p < .06, d = 0.43$ . Moreover, when included in regression analyses, the power measure did not significantly predict our measures of preparedness,  $b = -0.21, SE = 0.11, t = -1.81, p = .08$ , confidence,  $b = -0.05, SE = 0.10, t = 0.47, p = .64$ , and attitudes,  $b = -0.04, SE = 0.09, t = -0.50, p = .62$ . Most importantly, the predicted effects of the manipulations on attitudes became even more significant when this power item was entered as a co-variate in the  $2 \times 2$  ANOVA.

to one of two levels of preparedness. To directly manipulate preparedness, we drew from prior studies using implementation intention manipulations to induce self-regulatory preparedness (Dennehy et al., 2014). In the control condition, participants wrote down their intention to earn the best score possible on two consecutive screens. In contrast, those in the preparedness condition were reminded that the average minimum admissions score was 156. They were then asked to write out that the best strategy is to accept the score if it equals or exceeds 156 but retake the test if the first score falls below 156. Next, participants proceeded to a screen where they applied the implementation intention to articulate how they should respond to different test scores. Specifically, participants wrote out that they would accept the score if it equaled 156 but would retake it after learning how to solve the problems they missed the first time if their score fell below 156. In this way, the implementation intention induction included no information on the likelihood of a good or bad score but prepared individuals to effectively respond to either a good score (at or above 156) or a bad score (below 156).

### 9.3.2. Indirect induction of preparedness: expectations

After the direct preparedness manipulation, participants proceeded to a new screen that manipulated expectations. We adapted the Study 2 indirect manipulation of preparedness to vary the participants' performance expectations. Participants were randomly assigned to see 1 of 2 screens that indicated that their test score had been processed early. Drawing from Study 2, the no expectation control condition indicated that past sessions showed no correlation between return times and favorability of exam scores, with shorter return times sometimes predicting positive and sometimes predicting negative exam scores. Thus, the early return time meant that their score was just as likely to be negative as positive. In contrast, the negative expectation condition indicated that past sessions showed a strong correlation between return times and favorability of exam scores, with shorter times predicting worse scores. Thus, the early return time meant that their score was likely to be negative. This warning of a likely negative exam score allowed participants some time to prepare for it. As such, although the expectancy manipulation would indicate the likelihood of the future outcome occurring (bad test score), it did not provide the explicit preparatory information on how to respond to bad versus good scores (see Supplementary materials).

## 9.4. Dependent variables

### 9.4.1. Feelings of preparedness

Before proceeding to the critical dependent measures, all participants completed the same manipulation check of preparedness used in Study 2.

### 9.4.2. Emotion

We included emotion assessment items at the end of the experimental session, after participants had completed all attitude measures. First, we asked participants to think about how they were feeling in anticipation of their test score. Then, we asked participants to report, on 6-point scales (1 = not at all, 6 = very much), the extent to which they felt various positive (e.g., happy, pleased, good, content) and negative (e.g., sad, irritated, negative, angry) emotions in anticipation of their test score.

### 9.4.3. Thought confidence

Following the preparedness manipulation check, we asked participants to think back to the thoughts they listed toward the proposal and rate their overall confidence in the thoughts they had listed using the same measure employed in Study 2 (see Supplementary materials).

### 9.4.4. Attitudes

Finally, participants completed the primary dependent measure of

**Table 2**

Means and standard deviations on feelings of preparedness as a function of the indirect (expectancy clarity) and direct (implementation intentions) inductions of preparedness.

Indirect induction of preparedness	Direct induction of preparedness	
	Goal intention	Implementation intention
Unclear expectancy	3.17 (1.52)	5.84 (1.21)
Clear expectancy	4.04 (1.65)	5.91 (1.78)

attitude toward the proposal. Once again, we averaged the same two general evaluative items used in Studies 1 and 2 to form an index of attitudes. These two items showed high reliability ( $r = 0.89$ ,  $p < .0001$ ).

## 10. Results

### 10.1. Feelings of preparedness

A 2 (Indirect Preparedness Induction: No Expectation vs. Negative Expectation)  $\times$  2 (Direct Preparedness Induction: Control Intention vs. Implementation Intention) ANOVA only showed a main effect of the direct preparedness manipulation via implementation intentions on feelings of preparedness,  $F(1, 95) = 51.43$ ,  $p < .001$ ,  $d = 1.47$ . Specifically, participants in the implementation intention condition ( $M = 5.88$ ;  $SD = 1.50$ ) reported higher feelings of preparedness for test feedback on our manipulation check than control intention participants ( $M = 3.60$ ;  $SD = 1.63$ ).

The main effect of the indirect induction of preparedness,  $F(1, 95) = 2.24$ ,  $p = .13780$ ,  $d = 0.25$ , was not significant. However, a simple main effect of expectancy on preparedness did emerge in the control intention condition,  $F(1, 95) = 3.82$ ,  $p = .05$ ,  $d = 0.32$ . Specifically, in the control condition of implementation intentions, participants in the negative expectation condition ( $M = 4.05$ ;  $SD = 1.65$ ) reported significantly higher feelings of preparedness than participants in the no expectation condition ( $M = 3.17$ ;  $SD = 1.52$ ). This result provides a replication of what was obtained in Study 2 and suggests that the indirect induction of preparedness via an expectation of receiving negative feedback may be sufficient to produce some degree of preparedness. We will return to this point in the discussion. There was no evidence of a simple main effect in the implementation intention condition,  $F(1, 95) = 0.03$ ,  $p = .87$ ,  $d = 0.09$ . Although this pattern of simple main effects implies an interaction between the Indirect and Direct inductions, the interaction test was not significant,  $F(1, 95) = 1.60$ ,  $p = .21$ ,  $d = 0.21$ . For complete set of means, see [Table 2](#).

### 10.2. Emotion measures

As predicted, the analyses revealed no main effects of either Direct or Indirect inductions of preparedness and no interactions on either positive or negative emotions, all  $F$ s  $< 1.53$ , both  $p$ s  $> 0.22$ , both  $d$ s  $< 0.26$ .<sup>3</sup>

### 10.3. Thought confidence

As predicted by the self-validation approach, there was a significant main effect of the direct induction of preparedness via implementation intentions on confidence,  $F(1, 95) = 88.63$ ,  $p < .001$ ,  $d = 1.91$ . Specifically, participants reported greater confidence in their thoughts in the implementation intention condition ( $M = 7.60$ ,  $SD = 1.27$ ) than in the control intention condition ( $M = 5.04$ ,  $SD = 1.46$ ). In addition, consistent with Study 2, there was a significant main effect of the indirect induction via expectancies on confidence,  $F(1, 95) = 5.29$ ,  $p = .02$ ,  $d = 0.34$ . Specifically, participants in the negative expectation

condition ( $M = 6.62$ ;  $SD = 1.82$ ) reported greater confidence than those in the no expectation condition ( $M = 6.04$ ;  $SD = 1.89$ ).

### 10.4. Attitudes

The 2  $\times$  2 ANOVA showed the predicted main effect of the direct preparedness induction via implementation intentions,  $F(1, 95) = 76.36$ ,  $p < .001$ ,  $d = 1.74$ . Specifically, participants in the implementation intention condition ( $M = 7.53$ ;  $SD = 1.37$ ) reported more favorable attitudes than those in the control intention condition ( $M = 5.29$ ;  $SD = 1.24$ ). Moreover, results showed a significant main effect of the indirect preparedness induction via expectancy,  $F(1, 95) = 6.98$ ,  $p = .01$ ,  $d = 0.41$ . Specifically, participants in the negative expectation condition ( $M = 6.73$ ;  $SD = 1.70$ ) reported more favorable attitudes than those in the no expectancy condition ( $M = 6.10$ ;  $SD = 1.70$ ). There was no interaction on the measure of attitudes,  $F(1, 95) = 2.48$ ,  $p = .12$ ,  $d = 0.24$  (see [Fig. 4](#)).

### 10.5. Mediation analyses

Given that there was no interaction between the direct and indirect induction of preparedness on attitudes, we switched from a mediated moderation analysis to use [Hayes \(2013\)](#) process macro for compound serial mediation. We examined mediation separately for the direct and indirect inductions of preparedness. In the first mediation analysis, the direct preparedness induction was treated as the independent variable, preparedness (M1) and confidence (M2) as the mediators, and attitudes as the dependent variable. This model calculated 95% confidence intervals for the predicted indirect effects of the direct preparedness manipulation via implementation intentions on attitudes through feelings of preparedness and confidence, based on 10,000 bootstraps and controlling for the indirect preparedness manipulation via expectancy (see [Fig. 5](#)). As predicted, the significant total effect of the implementation intention manipulation as the predictor  $c = 2.2537$ ,  $BootSE = 0.2589$ , 95% CI [1.7396, 2.7679], decomposed into a non-significant direct effect,  $c' = 0.4421$ ,  $SE = 0.2771$ , 95% CI [-0.1083, 0.9925], and a significant indirect effect,  $a^*b_{total} = 1.8116$ ,  $BootSE = 0.3244$ , 95% CI [1.2951, 2.6120].

Moreover, upon decomposing the total indirect effect further, the predicted serial indirect effect of the direct preparedness manipulation via implementation intentions on attitudes through feelings of preparedness and, in turn, confidence was significant,  $a_1a_3b_2 = 0.3690$ ,  $BootSE = 0.1592$ , 95% CI [0.1443, 0.8121], controlling for the indirect preparedness manipulation via expectancy. In addition, the separate simple pathways through *both* preparedness feelings,  $a_1b_1 = 0.5471$ ,  $BootSE = 0.2643$ , 95% CI [0.1223, 1.2022], and confidence,  $a_2b_2 = 0.8956$ ,  $BootSE = 0.2813$ , 95% CI [0.4522, 1.5726], were significant, controlling for the indirect induction.

Next, to examine the validating effect of the indirect preparedness manipulation via expectancy, we re-ran the model with the indirect induction of preparedness as the key independent variable and the direct preparedness manipulation as the control variable (vs. predictor). This model revealed a significant total effect of the expectancy manipulation,  $c = 0.6790$ ,  $BootSE = 0.2590$ , 95% CI [0.1647, 1.1932], that decomposed into a non-significant direct,  $c' = 0.2559$ ,  $BootSE = 0.1962$ , 95% CI [-0.1339, 0.6457], and a significant indirect effect,  $a^*b_{total} = 0.4230$ ,  $BootSE = 0.1978$ , 95% CI [0.0778, 0.8535]. Although the simple pathway through confidence was significant,  $a_2b_2 = 0.2325$ ,  $BootSE = 0.1368$ , 95% CI [0.0058, 0.5472], the full serial pathways through *both* preparedness feelings and confidence,  $a_1a_3b_2 = 0.0767$ ,  $BootSE = 0.0627$ , 95% CI [-0.0075, 0.2581], as well as the simple pathway through preparedness feelings,  $a_2b_2 = 0.1138$ ,  $BootSE = 0.0997$ , 95% CI [-0.0128, 0.4100] were non-significant, controlling for the direct preparedness induction. Having said that, we did replicate the Study 2 mediation analyses by showing a significant serial indirect effect via feelings of preparedness

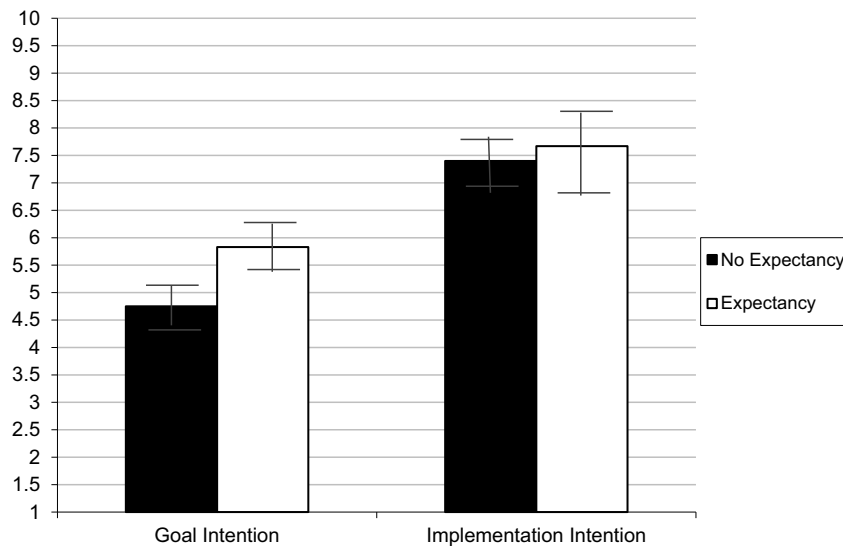


Fig. 4. Study 3 attitudes as a function of indirect preparedness induction (expectancy) and direct preparedness induction (implementation intentions) (error bars represent 95% confidence intervals).

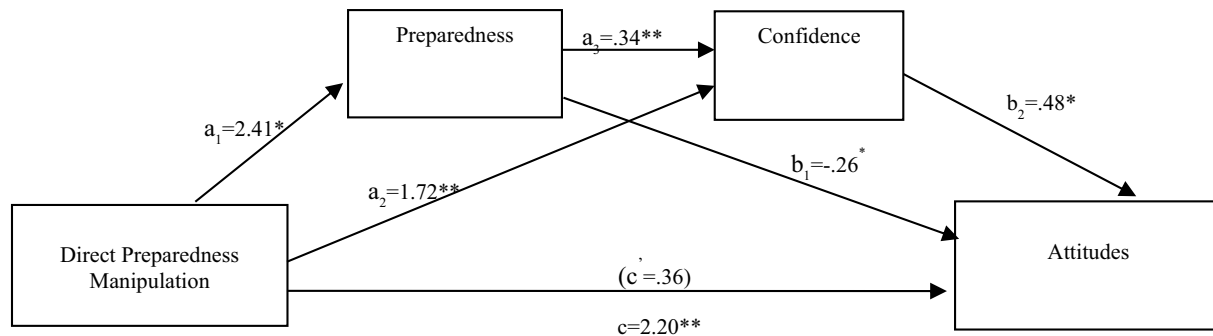


Fig. 5. Study 3 serial mediation model of the indirect effect of the direct preparedness induction (implementation intentions) on attitudes via feelings of preparedness and confidence. Note: \* indicates  $p < .05$ . Value in the parenthesis indicates the direct effect of the preparedness induction on attitudes while accounting for the effect through the indirect path.

and confidence exclusively within the control intention condition that was identical to study 2,  $a_1 a_3 b_2 = 0.2189$ ,  $BootSE = 0.1566$ , 95% CI [+0.0261, +0.7180].

### 11. Discussion

In addition to replicating the thought-validation effects of preparedness observed in Studies 1–2, Study 3 replicated the evidence found in Study 2 that feeling prepared influences attitudes by increasing thought-confidence. Study 3 also extends the findings of the first two studies by ruling out emotion (positive or negative) as an alternative explanation for the thought-validation effects of the preparedness inductions. Importantly, although consistent with the hypothesis that both (indirect and direct) preparedness inductions influenced attitudes via feelings of confidence (as in Study 2), the Study 3 findings were also consistent with our hypothesized serial mediation pathway by which the direct induction influenced attitudes through feelings of preparedness and confidence as well as through the simple mediation pathway of feelings of preparedness. However, in line with recent recommendations regarding mediation analyses reports, we again acknowledge that these findings might also be consistent with other plausible alternative models not considered here (Fiedler et al., 2018).

Furthermore, the results of Study 3 replicated the findings of Study 2 for the indirect induction of preparedness in the conditions that were most comparable (i.e., when there were no explicit implementation

intentions). The results of Study 3 overall suggest that both indirect and direct inductions of preparedness can influence attitudes but, comparatively speaking, the effects of direct inductions (implementation intentions) are somewhat stronger than the indirect inductions (expectancy clarity) in affecting feelings of preparedness. In so doing, Study 3 demonstrated that, while expectancy manipulations can produce validating effects by inducing preparedness, preparedness is not merely reducible to expectancies and, in fact, it can be induced more directly from other manipulations (e.g., implementation intentions) even if no explicit expectancies are provided.

### 12. General discussion

Feeling prepared polarized attitudes in domains completely unrelated to the domain of preparation. Consistent with self-validation theory, results across studies showed that the effect of the direction of thoughts (positive/negative) on attitudes was significantly greater in the preparation conditions than in the control conditions. Importantly, the validating effect of preparedness emerged regardless of whether the manipulation was direct or indirect, for positive or negative outcomes, or for a social or academic domain. Moreover, it emerged regardless of whether participants initially generated positive or negative thoughts, and regardless of whether thoughts were about a tuition increase or genetically modified foods. Moreover, because the preparedness induction occurred after (vs. before) the thought direction manipulation, it could not have affected the content of the initial thoughts

participants' generated. Instead, by virtue of our studies' designs, preparedness could *only* have affected the *use* of whatever thoughts that the participants had *already* generated in the initial phase.

Finally, consistent with self-validation theory, Studies 2–3 supported the mediating pathways through feelings of preparedness and confidence. Study 2 showed that the thought confidence evoked by feeling prepared mediated the moderated effect of preparedness on attitude extremity across levels of thought direction. Study 3 replicated the indirect effect through feelings of preparedness and confidence. Moreover, Study 3 extended the findings of Study 2 by showing that emotion could not account for the effects (either direct or indirect effects) of preparedness on attitudes. Finally, Study 3 extends Studies 1 and 2 by showing that, even though the indirect (expectations) and direct (implementation intentions) preparedness inductions influenced attitudes via confidence (as in Study 2), *only* the direct induction influenced attitudes through the hypothesized serial mediation pathways of felt preparedness as well as confidence. In so doing, Study 3 demonstrated that, even though expectancy manipulations can induce felt preparedness, preparedness is not merely reducible to expectancy inductions and, in fact, can be induced more directly from other manipulations (e.g., implementation intentions). In turn, the greater feelings of preparedness induced by these more direct inductions ultimately carry stronger validating effects on attitudes via confidence.

This research has implications for preparedness and self-validation. With regard to preparedness, the present studies extend previous research that focused on the effects of being objectively prepared for a concrete scenario (e.g. taking a test) to the effects of more general feelings of subjective preparedness. Our results suggest that people may misattribute the confidence associated with feeling prepared to any thoughts currently available in mind, thereby increasing one's reliance upon those thoughts in making relevant judgments. This work also extends prior work on preparedness, which has primarily focused on expectations as the mechanism of preparedness. Although an important one, the present work clarifies that expectations represent only one means to the ultimate end of preparedness that people may use either in conjunction with or in the absence of more direct means of preparing oneself to respond to future outcomes.

Indeed, Study 3 suggests that the experience and effects of preparedness were greater when one knew how to respond to both possible outcomes but lacked any expectation as compared to when they held a negative expectation but did not know how to respond to either. Despite providing preparatory information in terms of what the likely outcome would be (bad), the negative expectation lacked the additional information on exactly how to respond to that anticipated outcome (or an alternative good outcome). Of course, at the same time, it is easier to prepare for something (negative feedback) that one already expects. Thus, relative to those who neither knew what to expect nor how to respond (no expectancy/preparedness control conditions), this study suggests that those who have a negative expectation should feel more prepared and show greater preparedness effects. However, mere anticipation is not tantamount to full preparedness to respond. Even when one has an expectation, one must go further to prepare a clear response to that anticipated outcome. Thus, relative to those who knew how to respond to either outcome (implementation intention conditions), those who only had an expectation but did not know how to respond should feel less prepared and show weaker validating effects. Unlike implementation intentions, then, the expectation did not directly provide the same preparedness to *respond* to the expected future outcomes. These findings suggest that researchers should expand the focus on preparedness beyond expectations alone. Even though an expectation would promote efforts to bolster response preparedness, preparedness is ultimately about knowing how to respond to future outcomes.

With respect to the implications for self-validation, prior work has shown that positive experiences such as power, happiness and perceived social consensus can enhance thought use (Briñol & Petty, 2009). The current studies add to previous work by suggesting that other

experiences like feeling prepared can determine confidence and that confidence can be misattributed to any thoughts currently in mind enhancing thought-use in forming evaluations. Given preparedness effects occurred across positive and negative conditions, this work has potentially paradoxical implications for dealing with people who have low self-worth. For example, for individuals with low (vs. high) self-esteem, our findings suggest that it would more beneficial to induce feelings of “non-preparedness” so they do not trust and act on their negative self-evaluations (e.g., Wichman et al., 2010; Wood, Perunovic, & Lee, 2009).

### 12.1. Future directions

Although promising, the present findings do not exhaust the important questions about preparedness that remain. First, an interesting question for future research would be whether the effects of preparedness for one's own outcomes, as in the present work, would occur if one prepared for the outcomes of a close other that implicate the self? For example, romantic partners felt as much disappointment over the unexpected negative outcomes of a spouse as they did for their own unexpected negative outcomes (Carroll, Shepperd, Sweeny, Carlson, & Benigno, 2007; Sweeny, Shepperd, & Carroll, 2009). This suggest that feeling prepared for others could also validate thoughts.

Furthermore, would similar effects emerge from the feeling that others are prepared to respond on one's own behalf—even if the person does not actually feel prepared themselves? For example, people feel prepared for their legal trial proceedings because they have paid an attorney to prepare on their behalf. Alternatively, people may feel prepared to respond to security threats because they have paid a body-guard to protect them. In each of these cases, the person is not prepared for the outcomes him or herself, but, instead feels prepared because someone else is prepared for those outcomes. As shown in the present studies, the feeling of preparedness can produce validation effects on its own regardless of the origin of that feeling, regardless of whether it is grounded in reality, and regardless of the domain of preparation.

Future work might also profit by further considering whether feeling prepared even for the unexpected would be capable of producing similar validation effects. For example, military specialists teach army trainees and anti-terrorism professionals to “be prepared for anything,” to be ready, and to expect the unexpected (the S.E.E.R military program). In these complex situations, the validation effects might depend on the extent to which people focus mostly on the confidence that accompanies the feeling of preparedness or whether they focus on the feeling of not knowing what to expect instead.

Future work could also examine whether the effects of preparedness would depend upon the meaning of preparedness in a particular context. Although the current work demonstrates that preparedness has positive effects on confidence, this effect requires that the individual perceives preparedness in a positive way, as indicating confidence and thus validity. Prior research shows that the effects of very basic experiences commonly associated with validity (e.g., ease of retrieval; Schwarz et al., 1991) may change when experimental manipulations change the naïve theories associated with these experiences to indicate low validity (e.g., when ease is associated with simplicity and stupidity rather than with familiarity; Briñol et al., 2006; for a review, see, Briñol, Petty, Santos, & Mello, 2018). This work could examine the broader question of whether the apparent positive effects of preparedness on confidence could be attenuated or even reversed (that is, preparedness leading to doubt) when participants are induced to view preparedness as a signal of low (instead of high) validity (e.g., when feeling prepared is associated to anticipatory responding, too early starts, or impulsivity).

Beyond these questions, future work could explore whether all people are equally likely to experience these effects of preparedness. For example, individual differences in action orientation could moderate the strength of the preparedness effects. Given preparedness

involves a sense of readiness to respond to future outcomes, one could predict that action oriented people would likely show more pronounced preparedness effects than state oriented people (Van Putten, Zeelenberg, & Van Dijk, 2009).

## 12.2. Concluding remarks

Although additional questions await further research, the results across multiple studies provide strong support for the core hypotheses tested here. First, as predicted, preparedness enhanced confidence, thought use, and thus attitude extremity. Second, confidence mediated the effect of preparedness on attitude judgments. Finally, Study 3 ruled out emotion as an alternative explanation for the validating effects of preparedness on attitudes and showed that preparedness is not solely a result of expectancies. The current work also extends earlier research that examined the effect of preparedness on confidence as an outcome or mediator of preparedness effects on related judgments within a given domain of judgment. Although prior work has demonstrated effects of preparedness on confidence and judgments within the same domain (career), this is the first work to show that the effect of preparing in one domain (e.g., career preparedness) can generalize via the mediating mechanisms of feelings of preparedness and confidence to ultimately enhance the extremity of attitudes in a completely unrelated domain (e.g., genetically modified food).

## Open science statement

Open Science: In the event of publication, the paper will be accompanied with open data and materials at the Mendley platform. Open data and materials for all three studies, are available here: <http://dx.doi.org/10.17632/sxxmzcp66h.1>.

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