


# Where Did This Thought Come From? A Self-Validation Analysis of the Perceived Origin of Thoughts

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## Abstract

Three experiments examined whether perceiving thoughts as coming from internal versus external origins are more impactful on attitudes. Participants generated either positive or negative thoughts about different attitude objects, including different diets, and plastic surgery. Then, participants were induced to think that their thoughts came from the self or from an external source. In Experiment 1, participants induced to believe their thoughts originated from the self versus an external source relied on them more to form their attitudes. Experiment 2 demonstrated that when the external origin was associated with properties of validity, people relied on their thoughts more than when thoughts were perceived to come from an internal origin associated with low validity. Experiment 3 showed that the impact of thought origin on evaluations was mediated by greater liking for one's thoughts when they originated in the self.

## Keywords

self-persuasion, attitudes, validation, source, origin

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## Persuasion as a Function of Thoughts

Contemporary research suggests that persuasion can follow a relatively thoughtful or non-thoughtful route (Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1986). When thinking is relatively high, attitudes depend on the beliefs and ideas people generate to the topic of influence and, when relatively low, attitudes depend more on the presence of simple valenced cues in the situation (e.g., an attractive source). Although most work on persuasion focuses on messages that people receive from others, messages that people generate themselves can also be effective in producing attitude change (Briñol, McCaslin, & Petty, 2012). The power of self-generated messages was shown in early research on role-playing in which people were asked to generate arguments on topics such as the dangers of smoking (Janis & King, 1954). Attitudes were typically compared with those in a control group who were passively exposed to a communication generated by another person. Consistently, active generation of a message was shown to be more successful than passive exposure (Greenwald & Albert, 1968).

The cognitive response approach to persuasion contended that nearly all thoughtful influence was self-persuasion because even when people were exposed to external messages, their effectiveness depended on the extent to which individuals

articulated their own favorable thoughts about the information (Petty, Ostrom, & Brock, 1981). When people generate primarily favorable thoughts toward a proposal, there is attitude change, whereas recommendations that elicit primarily unfavorable thoughts are less effective in changing attitudes in the intended direction. In addition to the direction of thoughts, the present research examines whether varying the perceived origin of those thoughts can influence the extent of persuasion.

## Perceived Validity of Thoughts

Self-persuasion approaches focus on the primary thoughts individuals have about attitude objects. People not only have initial thoughts, but they can have secondary thoughts or thoughts about their thoughts (meta-cognitions). From the point of view of meta-cognition, the extent to which valenced thoughts impact attitudes depends on what people think

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about them. That is, two people might have the *same* thought, but one person might consider that thought more valid than the other, and the greater the perceived validity of the thought, the greater its impact on judgment. This idea is referred to as the *self-validation hypothesis* (Petty, Briñol, & Tormala, 2002) which holds that anything that gives a thought “value” increases use of that thought in forming a judgment. Value can stem from affective sources (“I like myself so I like my thoughts and will use them”) or cognitive sources (“I feel knowledgeable about this, so my thoughts are likely to be true and I will use them”). We use the term “validation” to refer to any form of thought usage (e.g., we can use thoughts because we think they are right [cognitive validation] or because they make us feel good [affective validation]; see Briñol et al., 2018).

In an illustrative experiment (Briñol & Petty, 2003), participants were asked to think about and write down their best or worse qualities using their dominant or nondominant hand. Then, participants reported their self-esteem. As writing with the nondominant hand happens infrequently and is difficult whereas writing with the dominant hand is frequent and easy, it was expected and found that using the nondominant hand decreased the confidence with which people held the thoughts they had listed. As a consequence, the effect of the direction of thoughts (i.e., positive vs. negative) on state self-esteem was significantly greater when participants wrote their thoughts with their dominant versus nondominant hand. Subsequent research on self-validation has revealed that there are many variables associated with validity (e.g., feeling happy or powerful) that can interact with the direction of people’s thoughts to influence attitudes (see Briñol & Petty, 2009, for a review).

The goal of the present research is to examine whether a new variable—the perceived origin of one’s thoughts—can influence attitude change through a self-validation process. The origin of thoughts refers to its perceived source. People can ask themselves questions such as “Where did this thought come from?” and “Did I think of this myself, or did I hear somebody else say it?” We argue that thought origin is important because the more the origin of the thought is associated with perceived validity, the more impact the thought should have.

### Origin of Thoughts as a Validating Variable

Previous research has demonstrated that some origins of attitudes are associated with greater perceived validity than others. For instance, people perceive that attitudes originating in high rather than low amounts of thought are more valid (Barden & Petty, 2008). Also, attitudes that are seen as heritable (Brandt & Wetherell, 2012), or having a moral basis (Luttrell, Petty, Briñol, & Wagner, 2016), are also seen as more valid. Notably, attitudes with more valid bases have a greater impact on behavior than those that have a less valid basis. As introduced, in the current research, we hypothesize

that the perceived origin of one’s thoughts can affect their perceived validity and thereby whether they are used in forming attitudes. If our speculation is correct, then the first question one might ask is “What perceived origins would affect perceived thought validity?” Next, we outline why perceiving the origin to be either internal or external could be seen as more valid.

### Why Internal Versus External Origin Could be Associated With More Validity

By default, one could argue that the self is likely to be viewed as a more valid origin of thoughts than others. This possibility is based on the link between the self and a number of validity features. First, initial research on cognitive responses showed that the more that thoughts were expressed using personal pronouns (e.g., “I” or “my”), the greater the influence of those thoughts on attitudes (Brock & Shavitt, 1983). These correlational findings are in accord with the *endowment effect* in which people ascribe more value to things that they versus others own (Kahneman, Knetsch, & Thaler, 1991). Thus, prior research provides preliminary indirect evidence that people might tend to use their thoughts more when they are perceived to originate from the self rather than others.

Another reason people might attribute more validity to themselves than to others is that they think they know more (about themselves and other things) than others do. Thus, the self could be a more knowledgeable source of thoughts about attitude objects. Other research in persuasion has shown that most people tend to attribute epistemic authority to the self (Kruglanski et al., 2005; Ottati, Price, Wilson, & Sumaktoyo, 2015). In sum, the existing research provides some empirical support for the view that internally originating thoughts may be more impactful than those originating externally.

An important assumption behind the prior research is that the self is valued. Consistent with balance theory (Heider, 1958), recent research has shown that ownership and endowment effects are more likely to emerge for people high (vs. low) in either explicit or implicit self-esteem (Cooley, Payne, Loersch, & Lei, 2015; Gawronski, Bodenhausen, & Becker, 2007; Horcajo, Briñol, & Petty, 2010). Although high self-esteem can make self-relevant effects even stronger, it is important to note that most people have a relatively mid to high level of self-esteem, and therefore most self-relevant effects are typically found even when collapsing across natural levels of self-esteem (Baumeister & Leary, 1995).

### Why External Versus Internal Origin Could Be Associated With More Validity

In contrast to approaches indicating that the self as origin would always enhance thought validity relative to others, it

could be that the reverse is true. Others can bring value to our thoughts for a number of reasons. First, others might validate one's thoughts because people often explicitly look for external validation to be sure that their ideas are correct. Indeed, in one study, when people were led to believe that their thoughts fit with those of other people (vs. did not fit), reliance on those thoughts increased (Petty et al., 2002). Second, research on informational social influence (Festinger, 1954) suggests that when people do not know how to behave, they usually follow what other people in the situation do because they assume that others are knowledgeable about how to act.

A third possibility is that thoughts linked to others might be valued not only because others are a source of accuracy but also because people want to affiliate with and be accepted by others (Baumeister & Leary, 1995). The need-to-belong theory posits that people are motivated to form and maintain strong and stable interpersonal relationships. Reliance on the ideas of others is one way to foster acceptance.

Other people are likely to be a valuable source of information especially when there is agreement and consensus among them. Indeed, sources in the numerical majority influence people's perceived validity of their thoughts (Horcajo, Petty, & Briñol, 2010). Beyond numerical status, external sources are expected to validate people's thoughts primarily to the extent that they are associated with validity features. For example, previous research has shown that external sources can increase people's reliance on their thoughts when the sources are credible, attractive, similar, and powerful (Briñol & Petty, 2009). Therefore, thoughts perceived to originate with others could lead to more thought use than self-originated thoughts if the external sources were perceived to be more valid or desirable in some way.

## Overview

Although there are reasons to believe that either the self or others as the origin of one's thoughts could bolster their impact, it is worth noting that it is also possible that it does not matter what the origin of the thoughts is. After all, once people already have their thoughts in mind, it may matter little from where the thoughts came. The current experiments were designed to explore these issues. Specifically, the primary goal was to examine whether the perceived origin of thoughts matters (keeping thought content constant), and if origin matters, *which* origin (self or other) is more likely to affect thought use and attitude change and *why*. Across three experiments, participants were first asked to generate positive or negative thoughts regarding different topics. Then, they were led to believe that their thoughts originated either externally or internally. The aim of the first experiment was to see which origin led to more thought use as indicated by greater use of one's valenced thoughts in forming attitudes. Our second experiment tested our presumed mechanism—perceived thought validity—by varying the levels of validity associated with the self and others. A final experiment

examined perceived thought validity as a mediator by measuring it.

## Experiment 1

The goal of Experiment 1 was to provide an initial exploration of the role of the perceived origin of thoughts on persuasion. First, participants were requested to generate positive or negative thoughts about one of two diets. One diet was considered to be an ingroup diet for the Spanish participants (the Mediterranean diet) and the other was not (a fast food diet, considered to be more American). After listing their thoughts, participants had to choose what they thought to be the origin of thoughts from a list of possibilities that listed exclusively external or exclusively internal options. This misleading questionnaire forced participants to think about only external or only internal origins of thoughts. Finally, attitudes toward the diets were assessed.

## Method

**Participants and design.** Participants were 180 students from a public high school in Albacete, Spain (111 females, 64 males, five unidentified) who voluntarily participated as part of a course on preventing eating disorders ( $M_{\text{age}} = 15.78$ ,  $SD = 1.12$ ). They were randomly assigned to the cells of a 2 (Topic: Mediterranean vs. Fast Food Diet)  $\times$  2 (Thought Direction: Positive vs. Negative)  $\times$  2 (Thought Origin: Internal vs. External) between-subjects factorial design. Sample size was determined simply based on the number of participants who could be collected from the start of the experiment until the end of the academic quarter. We thus had little control over the final sample size, but by starting the experiment at the beginning of the quarter, we anticipated that there would be a reasonable final sample on which to conduct the subsequent analyses (i.e., at least 20 participants per condition). This was achieved both when topic was considered as a factor (resulting in an average of 22 per condition) and when collapsing across topics (45 participants per condition).<sup>1</sup>

**Procedure.** In an experiment presumably about diets, all participants received a questionnaire containing several tasks and the appropriate instructions. As part of the first task, participants were randomly assigned to one of two diet topics on which to generate thoughts. Then, they were required to generate and write down either positive or negative thoughts about the topic. Following this, participants were randomly assigned to either the internal or external thought origin condition. Finally, all participants reported their attitudes toward the topic, and were thanked and debriefed.

## Independent variables

**Topic.** Half of the participants were required to write down thoughts toward a fast food diet and half about the Mediterranean diet. Although participants were expected to know

about each of these diets, we still reminded them about the basic features. For fast food, participants were reminded that this diet implied the consumption of saturated fat, whereas for the Mediterranean diet, participants were reminded that this diet involved high consumption of fruits, vegetables, legumes, and unrefined cereals, with olive oil as the basic fat. These two diets differ in the extent to which they are associated with the ingroup. Most Spaniards consider the Mediterranean diet as a cultural value even if they personally like the taste of fast food better (e.g., Entrena, 1997).

**Thought Direction.** Participants were instructed to write positive or negative thoughts about the diet to which they were randomly assigned. In the positive thoughts condition, participants were asked to list as many thoughts as they wanted to generate *in favor of* the diet, whereas in the negative thoughts condition, participants were asked to list as many thoughts as they wanted to generate *against* the diet. This manipulation has been successful in other studies (Briñol, Gascó, Petty, & Horcajo, 2013).

**Thought Origin.** After listing their thoughts, participants completed the Thought Origin task. Participants in the internal origin condition received a short newspaper article explaining that humans usually develop their preferences for foods as a function of their own personal characteristics. Then, they were asked to choose between personal experience (“when I made contact with it”) and personality (“in my childhood because they are part of my personality”) as the key determinant of their food preferences. Both of these response options suggest an internal origin for their preferences. In contrast, students in the external origin condition read a brief article stating that humans usually develop their preferences for foods depending on their environment. In this condition, participants were asked to choose between their peer group (“group of close friends and family”) and the media (“TV commercials and advertising campaigns”). Both of these responses suggest an external origin for their thoughts (see the online appendix for the full instructions).<sup>2</sup>

#### Dependent variable

**Thoughts.** Two independent judges coded the valence of participants’ thoughts on a continuum from *unfavorable* (1) to *favorable* (5) toward the topic. A continuous index of thought favorability was created for each participant by averaging the ratings of each thought. Judges also coded the thoughts with regard to abstraction. Judges agreed on 91.1% of the thoughts coded overall, and disagreements were resolved by discussion. Length was also coded by counting the number of words used.

**Attitudes.** To assess attitudes, participants rated the diet using three 9-point semantic differential scales (like–dislike, good–bad, and positive–negative). Ratings were intercorrelated ( $\alpha = .75$ ), so they were averaged to create a composite

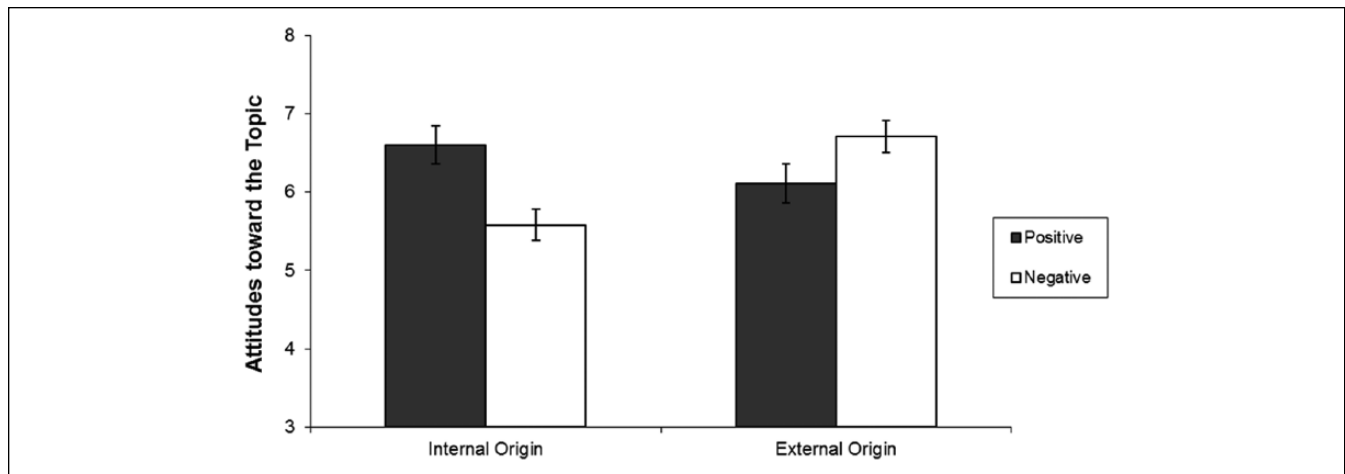
attitude index. Higher values on this index indicated more favorable evaluations of the diet.

## Results

**Thoughts.** The 2 (Topic)  $\times$  2 (Thought Direction)  $\times$  2 (Thought Origin) ANOVA conducted on thought favorability revealed the predicted main effect of Thought Direction,  $F(1, 172) = 668.81, p < .001, \eta^2 = 0.795$ . Participants’ thoughts were judged to be more favorable in the positive ( $M = 4.488, SD = 0.902$ ) than in the negative ( $M = 1.31, SD = 0.72$ ) Thought Direction condition. In addition, a main effect of Topic,  $F(1, 172) = 6.235, p = .013, \eta^2 = 0.04$ , appeared with participants having more favorable thoughts toward fast food than the Mediterranean diet. The main effect of Thought Origin was not significant nor were there any significant interactions among the variables (all  $ps > .10$ ). There were also no significant effects on the measures of thought abstraction or thought length (all  $ps > .11$ ; see online appendix).

**Attitudes.** The 2  $\times$  2  $\times$  2 ANOVA on the attitude measure revealed a significant main effect of Topic, such that participants generating thoughts about fast food had more favorable attitudes ( $M = 7.04, SD = 1.39$ ) than those generating thoughts about the Mediterranean diet ( $M = 5.45, SD = 1.82$ ),  $F(1, 171) = 40.64, p < .001, \eta^2 = 0.19$ . Thought Direction,  $F(1, 171) = 0.47, p = .49, \eta^2 = 0.003$ , and Thought Origin,  $F(1, 171) = 0.001, p = .98, \eta^2 < 0.001$ , did not show significant main effects. More critical to our primary concerns, the two-way interaction between Thought Direction and Thought Origin was significant,  $F(1, 171) = 10.63, p = .001, \eta^2 = 0.06$ . In the internal origin condition, attitudes were significantly more favorable in the positive,  $M = 6.60, SD = 1.61$  (95% confidence interval [CI] = [6.36, 6.84]), than in the negative ( $M = 5.58, SD = 2.09, 95\% CI = [5.27, 5.89]$ ) thought condition,  $F(1, 171) = 9.075, p = .003, \eta^2 = 0.050$ . In the external origin condition, there was no significant difference between the positive ( $M = 6.11, SD = 1.86, 95\% CI = [5.84, 6.38]$ ) and negative ( $M = 6.71, SD = 1.37, 95\% CI = [6.51, 6.91]$ ) thought conditions,  $F(1, 171) = 2.904, p = .090, \eta^2 = 0.017$  (see Figure 1). No other effects were significant ( $ps > .76$ ).

The larger Thought Direction effect for the internal than the external origin suggested that these participants were relying more on their thoughts in forming their attitudes. Regressing attitudes onto the relevant variables, a significant interaction emerged between the thought favorability index and the Thought Origin condition,  $B = .498, t(177) = 3.29, p = .001$ . This pattern revealed that the favorability of the thoughts was more closely associated with attitudes for participants in the internal origin condition,  $B = .249, t(177) = 2.53, p = .012$ , than in the external origin condition,  $B = -.25, t(177) = -2.17, p = .03$ . Indeed, in the latter case, the relationship was reversed.



**Figure 1.** Experiment 1: Attitudes toward the topic as a function of Thought Direction and Thought Origin. Note. Error bars represent standard error. Higher numbers indicate more favorable attitudes. Evaluations ranged from 1 to 9.

## Discussion

The results of the first experiment showed that manipulating where thoughts were perceived to come from influenced the impact of those thoughts on attitudes. We found that the effect of the direction of thoughts on diet-evaluations was greater when participants were led to believe that thoughts had an internal rather than an external origin. Importantly, the induction of Thought Origin did not affect the valence, length, or abstraction of participants' thoughts. This is not surprising as the origin induction followed the generation of thoughts.

The obtained findings were not moderated by the topic of the thoughts (type of diet). There are a number of potential interpretations for that absence of moderation. One is that the self is more valid than external origins even for topics for which external consensus could provide important value. Another possibility is that although fast food is relatively less prototypical of Spain than the Mediterranean diet, it can still be perceived as highly relevant to the ingroup in absolute terms, especially for the younger generation. At least when it comes to food attitudes, the initial results suggest that an internal origin of thoughts appears to be associated by default with more validity than an external origin.<sup>3</sup>

## Experiment 2

The goal of the next experiment was to manipulate the proposed mediator of the Thought Origin effect. We argue that perceived validity is the critical element for thought use, and therefore, if we disrupted the normal link between origin and validity, we could modify the results. Thus, in addition to manipulating Thought Direction and Thought Origin, we introduced a new variable manipulating the validity of the origin orthogonal to the other variables. Of particular interest was whether making the external source high in perceived

validity would lead to as much thought use (or even more) than the internal origin with low validity.

Experiment 2 was designed to meet two additional objectives. First, for greater generalizability, we used a different attitude object—a relatively new type of plastic surgery. Finally, the first experiment established that origin can have an impact on attitudes by affecting thought reliance. It remains an open question whether the impact of origin on validation of thoughts could extend to other outcomes which are the downstream consequences of attitudes, such as behavioral intentions. If so, this would provide an important extension as previous research has established that behavioral intentions are the best verbal predictors of behavior (Fishbein & Ajzen, 1975).

## Method

**Participants and design.** Participants were 403 undergraduate students at a university in Madrid, Spain (320 females, 75 males, eight unidentified) who voluntarily participated in partial fulfillment of a course requirement ( $M_{age} = 19.71$ ,  $SD = 3.02$ ). They were randomly assigned to the cells of a 2 (Thought Direction: Positive vs. Negative)  $\times$  2 (Thought Origin: Internal vs. External)  $\times$  2 (Origin Validity: High vs. Low) between-subjects factorial design. We intended to obtain around 50 participants per cell (Simmons, Nelson, & Simonsohn, 2013).<sup>4</sup>

**Procedure.** All participants in the experiment, presented as an opinion survey, received a questionnaire containing several tasks and the appropriate instructions. Participants first read about bariatric surgery and then were randomly assigned to write down either positive or negative thoughts about it. Then, they were randomly assigned to the internal or external origin condition that was made to appear either high or low in validity. Finally, all participants reported their

attitudes toward bariatric surgery and were thanked and debriefed.

#### Independent variables

**Thought Direction.** Participants were instructed to list their positive or negative thoughts about bariatric surgery after being told that this kind of surgery consists of a variety of procedures performed on people with obesity (see the online appendix). This topic is important because this type of surgery is growing in popularity as a desired strategy to cope with obesity and other problems (Buchwald & Oien, 2009; Nerini, Matera, & Stefanile, 2014).

**Thought Origin.** After listing their thoughts about the surgery, participants completed either the internal origin or the external origin task. Students in the internal origin condition were told that the knowledge about this kind of surgery comes from personal intuition. In the external condition, the students were told that their knowledge about this kind of surgery comes from external sources, especially from clinics that carry out the surgery (see the online appendix for complete details).

**Origin validity.** Perceived validity was manipulated orthogonal to manipulated origin. For the internal origin high validity condition, personal intuitions were said to be accurate, certain, and useful. For the internal origin low validity condition, intuitions were said to include many biases, often causing doubts and leading people to make mistakes. In the external origin high validity condition, clinics that carry out the surgery were described as companies that genuinely care about the health of their clients, funding research on obesity prevention, and providing aid to patients with lower incomes. In the external origin low validity condition, clinics were described as heartless businesses focused exclusively on making a profit from their clients.

As should be obvious from this description, the validity conditions differ in many features associated with value (expertise, likeability, etc.). We used multiple approaches because different people look to different aspects of the source when assessing validity. For example, some people (e.g., high in self-monitoring; Snyder, 1974) are particularly interested in image-related information and thus base thought validity decisions on source attractiveness whereas other people (e.g., low self-monitors) are particularly influenced by merit information and are particularly drawn to expert sources and base thought validity decisions on this source characteristic (see Evans & Clark, 2012). Thus, we aimed to create conditions of high versus low validity that would be effective for most people.

#### Dependent variable

**Thoughts.** Two independent judges—unaware of experimental conditions—coded participants' thoughts with regard to degree of valence (on a 5-point Likert-type scale). As in the prior experiment, abstraction was also coded,

and the number of words counted (length). Judges agreed on 92.7% of the thoughts coded overall and disagreements were resolved by discussion.

**Behavioral intentions.** To measure participants' behavioral intentions toward bariatric surgery, they were asked to rate different probabilities (9-point Likert-type scale from 1 = *low probable* to 9 = *highly probable*) with respect to the following three items: "How likely is it that you would want to undergo bariatric surgery?" "How likely is it that you would defend bariatric surgery instead of other surgeries aimed at tackling the same problem?" and "How likely is it that you would sign a petition in favor of bariatric surgery?" These items were averaged to form a single index ( $\alpha = .80$ ). Higher values on this index indicated more favorable behavioral intentions toward bariatric surgery.

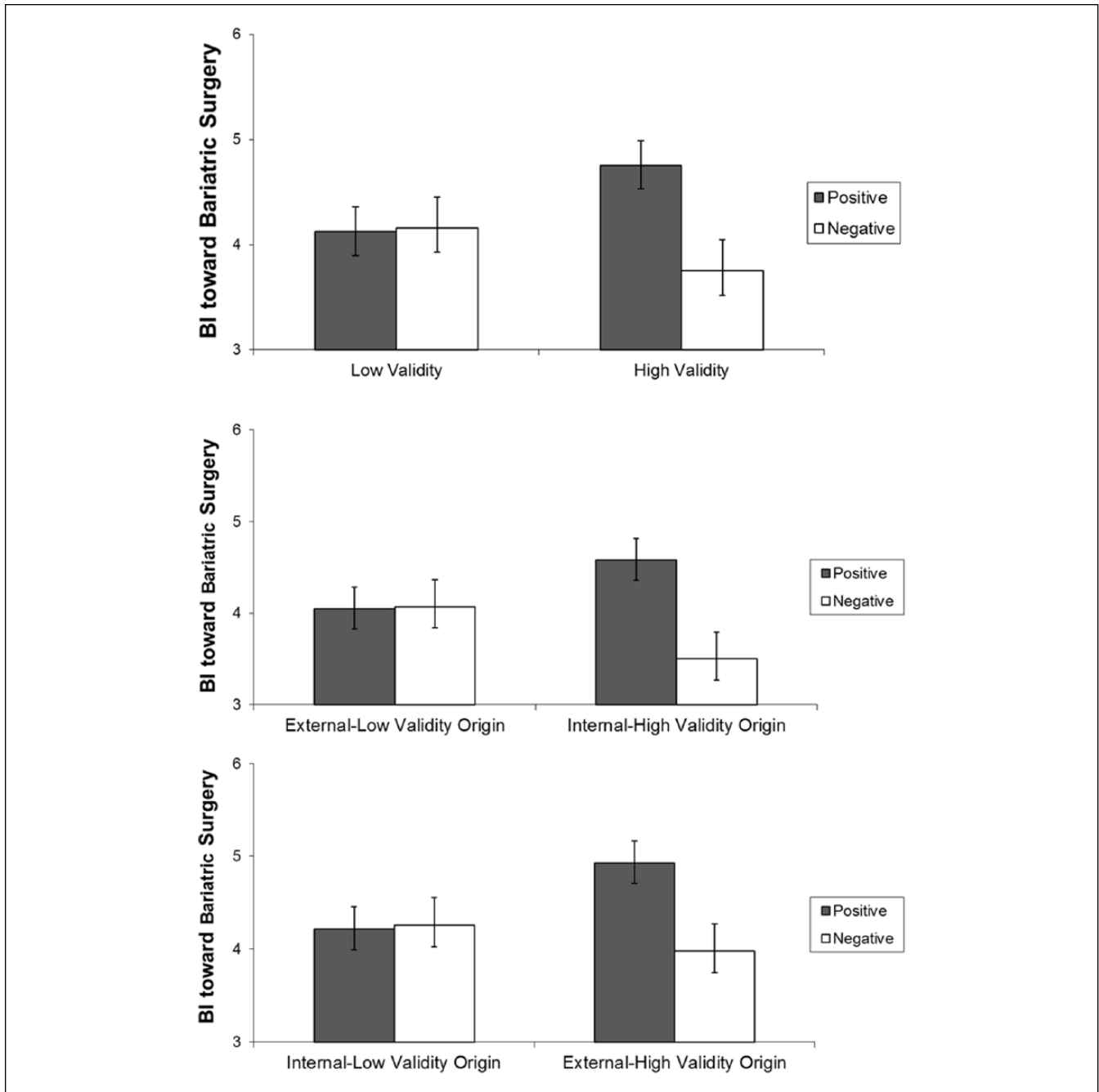
#### Results

**Thoughts.** The  $2 \times 2 \times 2$  ANOVA conducted on thought favorability revealed a main effect of Thought Direction,  $F(1, 391) = 3,102.29, p < .001, \eta^2 = 0.89$ . Participants' thoughts were more favorable in the positive ( $M = 4.77, SD = 0.71$ ) than in the negative ( $M = 1.28, SD = 0.52$ ) Thought Direction condition. No other effects were significant ( $ps > .12$ ). See the online appendix for results on other thought-codings.

**Behavioral intentions.** The  $2 \times 2 \times 2$  ANOVA conducted on behavioral intentions revealed a significant main effect of direction of thoughts, such that participants who generated positive thoughts had more favorable intentions ( $M = 4.45, SD = 1.77$ ) than those who generated negative thoughts ( $M = 3.95, SD = 1.79$ ),  $F(1, 395) = 7.69, p = .006, \eta^2 = 0.02$ . More critically, the analysis revealed a significant interaction between Thought Direction and Origin Validity,  $F(1, 395) = 8.75, p = .003, \eta^2 = 0.02$ . That interaction was not further qualified by Thought Origin, as revealed by the nonsignificant three-way interaction,  $F(1, 395) = 0.05, p = .83, \eta^2 < 0.001$ . This means that once Origin Validity was controlled, Thought Origin per se no longer affected thought use.<sup>5</sup>

As illustrated in the top panel of Figure 2, in the high origin validity condition, behavioral intentions were significantly more favorable in the positive ( $M = 4.76, SD = 1.78, 95\% \text{ CI} = [4.59, 4.93]$ ) than in the negative ( $M = 3.75, SD = 1.88, 95\% \text{ CI} = [3.57, 3.93]$ ) Thought Direction condition,  $F(1, 395) = 17.13, p < .001, \eta^2 = 0.04$ . In the low origin validity condition, there was no significant difference between the positive ( $M = 4.12, SD = 1.72, 95\% \text{ CI} = [3.95, 4.29]$ ) and negative ( $M = 4.16, SD = 1.67, 95\% \text{ CI} = [4, 4.32]$ ) Thought Direction conditions,  $F(1, 395) = 0.02, p = .90, \eta^2 < 0.001$ .

Next, we conducted a 2 (Thought Origin/Validity: internal origin with high validity vs. external origin with low validity)



**Figure 2.** Experiment 2: Behavioral intentions as a function of Thought Direction and Thought Origin validity as a function of experimental conditions.

Note. Higher numbers indicate more favorable intentions.

× 2 (Thought Direction) ANOVA. Conceptually, this comparison should mimic the results observed in Experiment 1 where internal origin seemed to be by default more valid than external origin. As expected, this interaction was significant,  $F(1, 208) = 4.94, p = .03, \eta^2 = 0.023$ , conceptually replicating the pattern observed in Experiment 1 (see middle panel of Figure 2).

Third, we conducted a 2 (Thought Origin/Validity: internal origin with low validity versus an external origin with

high validity) × 2 (Thought Direction) ANOVA. This interaction was significant,  $F(1, 187) = 3.89, p = .05, \eta^2 = 0.02$ . As illustrated in the bottom panel of Figure 2, when the external origin is made higher in validity than the internal origin, the effects observed in Experiment 1 are reversed.

In sum, we found that participants in the valid origins conditions (regardless of whether they were internal or external) relied more on their thoughts when forming intentions than participants in invalid origins conditions. Regressing

behavioral intentions onto the relevant variables, a significant interaction emerged between the Thought Favorability Index and the Origin Validity condition,  $B = .52$ ,  $t(397) = 2.78$ ,  $p = .006$ . Consistent with a self-validation view, this pattern revealed that the favorability of the thoughts was more closely associated with behavioral intentions for participants in the valid origins conditions,  $B = .50$ ,  $t(397) = 3.86$ ,  $p < .001$ , than in the invalid origins conditions,  $B = -.02$ ,  $t(397) = -.13$ ,  $p = .90$ .

### Discussion

The second experiment extended our previous findings. Although use of thoughts with an high validity internal origin exceeded use of thoughts with a low validity external origin (replicating Experiment 1 where external origins was presumably associated with lower validity by default), we also showed that the opposite result could occur when the internal origin was lower in validity than the external origin. Therefore, Experiment 2 suggests that the key element for Thought Origin to affect thought use is the perceived validity of that origin.

### Experiment 3

Experiment 2 offered initial evidence of process by having a relatively direct manipulation of the proposed mechanism (perceived validity). In contrast, the final experiment addresses this issue by shifting to a mediational approach. Participants first were asked to generate either positive or negative thoughts about fast food (one of the topics used in Experiment 1). Following the thought listing task, participants were randomly assigned to either the internal or external Thought Origin condition. No explicit information relevant to validity (beyond origin itself) was included. Next, participants reported both their attitudes toward the topic (as in Experiment 1) as well as their behavioral intentions (as in Experiment 2). Importantly, participants were asked to complete new measures designed to test the extent to which we could rule in thought validation as a mediating process. Participants reported both the extent to which they liked their thoughts (tapping affective validation) and the extent to which they had confidence in their thoughts (tapping cognitive validation). Furthermore, participants were asked about perceived bias and correction. Specifically if external thoughts are seen as biasing, people might correct for them (Petty & Wegener, 1993).

We expected to replicate the two-way interaction between Thought Direction and Thought Origin (as in Experiment 1) and to extend the contribution by providing mediational evidence for a thought validation process. We expected that an internal origin would lead to more thought use than an external origin because these thoughts would be seen as more valid, and not because external thoughts would be seen as more biasing. If an internal origin is associated with

pleasantness, these positive feelings would be misattributed to the thoughts leading to affective validation (“I like my thoughts, so I will use them”). If an internal origin is associated with confidence, this would be misattributed to the thoughts leading to cognitive validation (“I am sure my thoughts are right, so I will use them”).

### Method

**Participants and design.** Participants were 188 undergraduate students from a public university in Madrid, Spain (170 females and 18 males) who voluntarily participated as part of a course on eating disorders ( $M_{age} = 19.05$ ,  $SD = 1.43$ ). They were randomly assigned to the cells of a 2 (Thought Direction: Positive vs. Negative)  $\times$  2 (Thought Origin: Internal vs. External) between-subjects factorial design. A power analysis was conducted based on the key average interaction effect size obtained in the prior experiments and the additional experiment reported in Footnote 3.<sup>6</sup> Analyses were conducted using *G\*Power* (Faul, Erdfelder, Lang, & Buchner, 2007) entering the interaction average effect size across experiments (Cohen’s  $f = .23$ ). Results of this analysis suggested that the desired sample size for a two-tailed test ( $\alpha = .05$ ) with .80 power is  $N = 152$ .<sup>7</sup>

**Procedure.** All participants received a questionnaire containing several tasks and the appropriate instructions. Participants were first randomly assigned to generate and write down either positive or negative thoughts about the topic. Then, they were randomly assigned to either the internal or external Thought Origin condition. Finally, all participants completed the dependent measures before being thanked and debriefed.

#### Independent variables

**Thought Direction.** This induction was exactly the same as in Experiment 1. Specifically, participants wrote positive or negative thoughts about fast food.

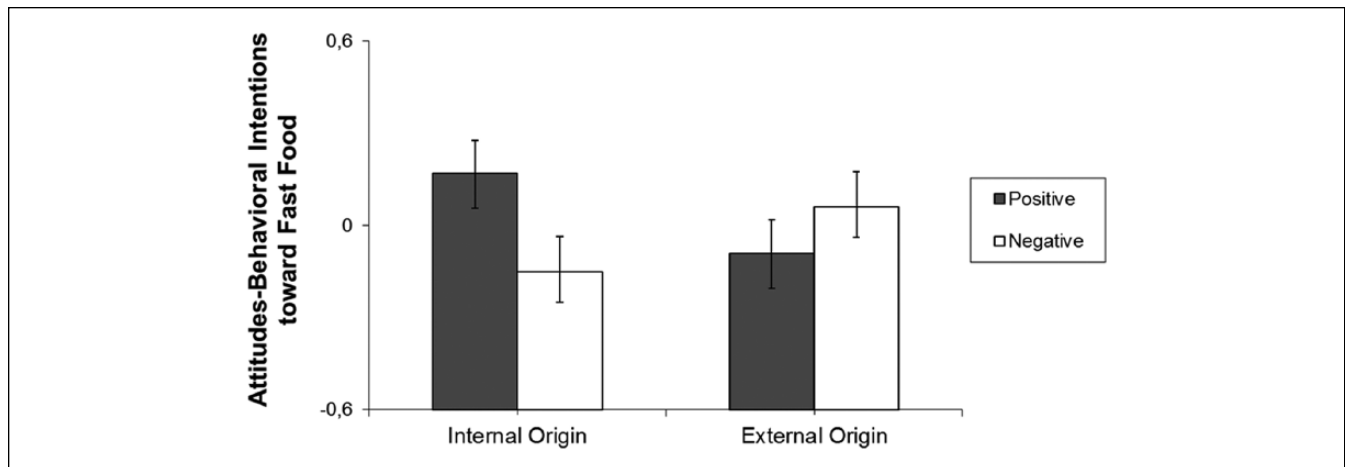
**Thought Origin.** This manipulation was also identical to Experiment 1. After listing their thoughts, participants were led to believe that their preferences for foods come from the self (internal origin) or from their environment (external origin).

#### Dependent variables

**Thoughts.** Participant’s thoughts were coded using the same procedure as in Experiments 1 and 2. Judges agreed on 92.6% of the thoughts coded overall and disagreements were resolved by discussion.

**Attitudes.** To assess attitudes toward the diet, participants rated the diet using the same three items used in Experiment 1. Ratings were intercorrelated ( $\alpha = .65$ ), so they were averaged to create a composite attitude index.





**Figure 3.** Experiment 3: Evaluations toward fast food as a function of Thought Direction and Thought Origin. Note. Higher numbers indicate more favorable evaluations.

**Behavioral intentions.** This measure was similar to the one used in Experiment 2. Participants responded on 9-point Likert-type scales to the following questions adapted from the previous experiment: “How likely is that you would want to buy fast food?” “How likely is that you would defend fast food instead of other types of foods?” and “How likely is that you would sign a petition in favor of fast food?” These items were averaged to form a single index ( $\alpha = .71$ ).

**Thought confidence.** Thought confidence was rated on one single-item anchored at *not at all* (1) and *extremely* (9) asking how much confidence participants had in their thoughts ( $M = 7.28$ ,  $SD = 1.41$ ).

**Thought liking.** Thought liking was rated on one single-item anchored at *not at all* (1) and *extremely* (9) asking how much participants liked their thoughts ( $M = 5.63$ ,  $SD = 2.14$ ).

**Perceived bias.** Participants rated the extent they perceived the origin of thoughts as biasing their opinions toward fast food, anchored at *not at all* (1) and *extremely* (9) ( $M = 4.87$ ,  $SD = 2.38$ ).

**Correction.** Participants rated the extent they tried to correct for the origin of their thoughts, anchored at *not at all* (1) and *extremely* (9) ( $M = 3.94$ ,  $SD = 2.34$ ).

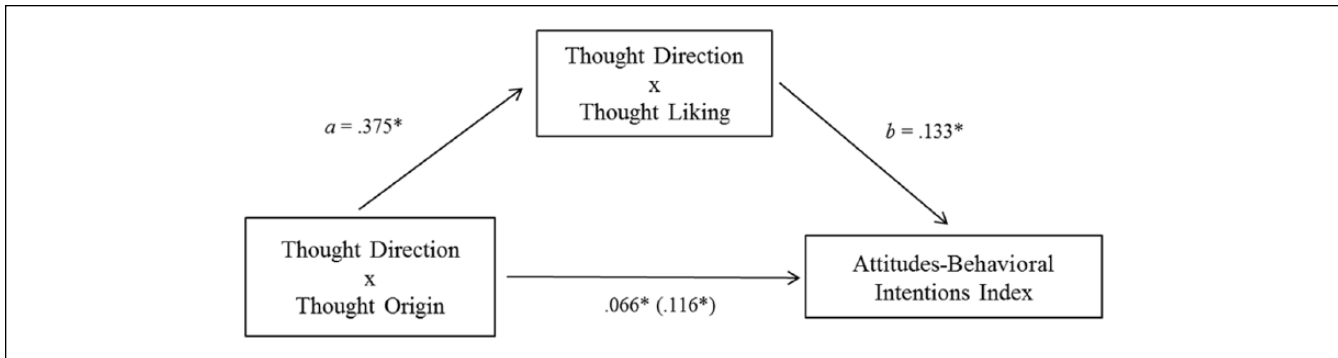
## Results

**Thoughts.** The  $2 \times 2$  ANOVA conducted on the thought favorability index revealed a main effect of Thought Direction,  $F(1, 184) = 2,204.789$ ,  $p < .001$ ,  $\eta^2 = 0.923$ . Participants’ thoughts were judged to be more favorable in the positive ( $M = 4.63$ ,  $SD = 0.59$ ) than in the negative ( $M = 1.26$ ,  $SD = 0.38$ ) Thought Direction condition. No other effects were significant ( $ps > .11$ ). See the online appendix for results on other thought-codings.

On thought length, a main effect of Thought Direction emerged,  $F(1, 184) = 6.873$ ,  $p = .009$ ,  $\eta^2 = 0.036$ , indicating that participants wrote more words in the negative ( $M = 8.48$ ,  $SD = 5.20$ ) than in the positive condition ( $M = 6.75$ ,  $SD = 4.06$ ). A significant interaction,  $F(1, 184) = 7.051$ ,  $p = .009$ ,  $\eta^2 = 0.04$ , indicated that this valence effect was stronger in the internal than the external origin condition. There was no main effect of Thought Origin on word length,  $p = .72$ . On thought abstraction, no effects were significant ( $ps > .14$ ).

**Attitudes-behavioral intentions index.** An index combining attitudes and behavioral intentions items was created ( $\alpha = .76$ ). The items were standardized before aggregation. The  $2 \times 2$  ANOVA conducted on this combined index revealed a two-way interaction between Thought Direction and Thought Origin,  $F(1, 184) = 5.652$ ,  $p = .018$ ,  $\eta^2 = 0.03$ .<sup>8</sup> This interaction replicated the results obtained in previous experiments. In the internal origin condition, evaluations were significantly more favorable in the positive ( $M = 0.17$ ,  $SD = 0.81$ , 95% CI = [0.05, 0.29]) than in the negative ( $M = -0.15$ ,  $SD = 0.53$ , 95% CI = [0.07, 0.23]) thought condition,  $F(1, 184) = 5.115$ ,  $p = .025$ ,  $\eta^2 = 0.027$ . In the external origin condition, there was no significant difference between the positive ( $M = -0.09$ ,  $SD = 0.69$ , 95% CI = [-0.19, 0.01]) and negative ( $M = 0.06$ ,  $SD = 0.65$ , 95% CI = [-0.03, 0.15]) thought conditions,  $F(1, 184) = 1.184$ ,  $p = .278$ ,  $\eta^2 = 0.006$  (see Figure 3). There were no other significant effects,  $F_s < .731$ ,  $ps > .394$ .

Once again, we found that participants in the internal origin condition relied more on their thoughts when forming attitudes and behavioral intentions than participants in the external origin condition. Regressing the attitudes-behavioral intentions index onto the relevant variables, a significant interaction emerged between the thought favorability index and the Thought Origin condition,  $B = .154$ ,  $t(186) = 2.756$ ,  $p = .006$ . This pattern revealed that the favorability of the thoughts was more closely associated with attitudes and intentions for participants in the internal origin condition,



**Figure 4.** Experiment 3: Mediation model showing the effect of Thought Direction  $\times$  Thought Origin, as mediated by Thought Direction  $\times$  Thought Liking on attitudes-behavioral intentions index.

Note. The figure in the parenthesis is the direct effect of "Thought Direction  $\times$  Thought Origin" on the "attitudes-behavioral intentions index" after the effect through the indirect path is accounted for.

\* $p < .05$ .

$B = .099$ ,  $t(186) = 2.506$ ,  $p = .013$ , than in the external origin condition,  $B = -.055$ ,  $t(186) = -1.396$ ,  $p = .165$ .

**Thought confidence.** Participants did not express greater confidence in their thoughts in the internal ( $M = 7.20$ ,  $SD = 1.59$ ) than the external ( $M = 7.36$ ,  $SD = 1.28$ ) origin condition,  $F(1, 184) = 0.666$ ,  $p = .415$ ,  $\eta^2 = .004$ . A main effect for Thought Direction,  $F(1, 184) = 24.256$ ,  $p < .001$ ,  $\eta^2 = .116$ , indicated that participants in the negative thought condition ( $M = 7.76$ ,  $SD = 1.03$ ) had higher thought confidence than those in the positive thought condition ( $M = 6.80$ ,  $SD = 1.59$ ). The interaction was not significant,  $F(1, 184) = 0.039$ ,  $p = .843$ ,  $\eta^2 < .001$ .

**Thought liking.** Participants expressed greater liking for their thoughts in the internal ( $M = 6.01$ ,  $SD = 2.10$ ) than the external ( $M = 5.27$ ,  $SD = 2.12$ ) origin condition,  $F(1, 184) = 6.135$ ,  $p = .014$ ,  $\eta^2 = .032$ . A main effect for Thought Direction,  $F(1, 184) = 8.342$ ,  $p = .004$ ,  $\eta^2 = .043$ , indicated that participants in the negative thought condition ( $M = 6.06$ ,  $SD = 2.24$ ) expressed higher Thought Liking than those in the positive thought condition ( $M = 5.19$ ,  $SD = 1.94$ ). The interaction was not significant,  $F(1, 184) = 0.142$ ,  $p = .707$ ,  $\eta^2 = .001$ .

**Perceived bias.** There were no differences in perceived bias across origin conditions,  $F(1, 184) = 0.634$ ,  $p = .427$ ,  $\eta^2 = .003$ . No other effects reached significance,  $F_s < .547$ ,  $p_s > .461$ .

**Correction.** There were no differences in correction for Thought Origin across origin conditions,  $F(1, 183) = 0.024$ ,  $p = .876$ ,  $\eta^2 < .001$ . No other effects reached significance,  $F_s < 2.641$ ,  $p_s > .106$ .

**Mediation analysis.** To examine whether the level of perceived Thought Liking mediated the effect of the key theorized interaction on the attitudes-behavioral intentions index,

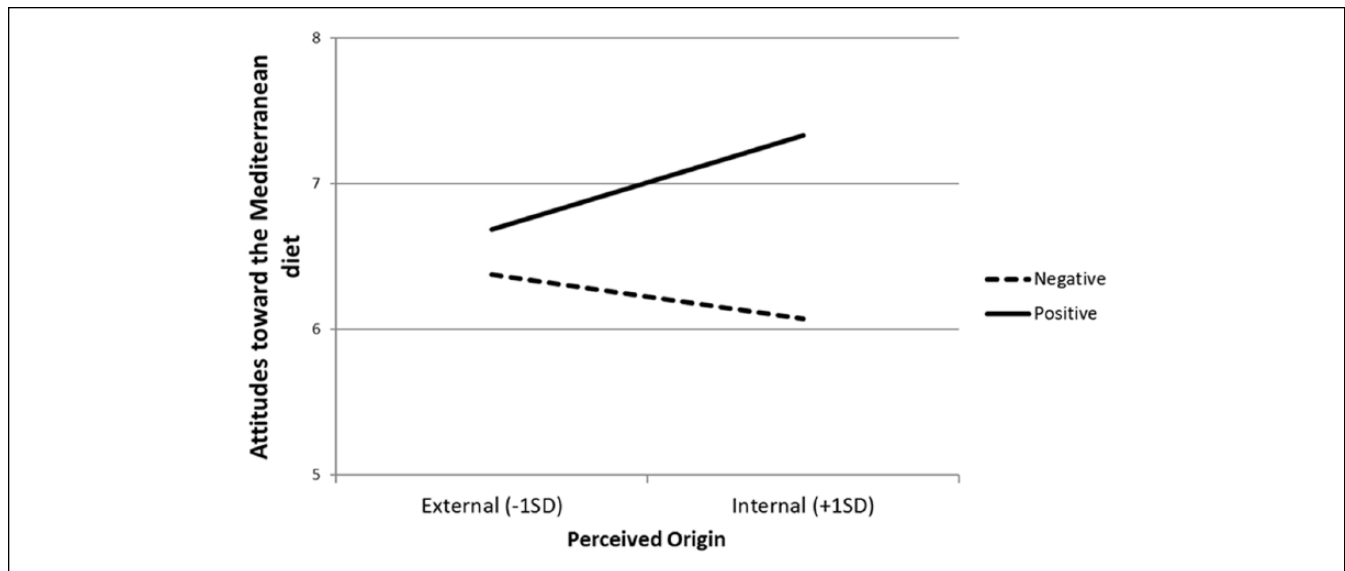
we conducted a mediated moderation test using bootstrapping methods (Muller, Judd, & Yzerbyt, 2005). In this procedure, both Thought Direction (i.e., negative thoughts =  $-1$ , positive thoughts =  $1$ ) and Thought Origin (external =  $-1$ , internal =  $1$ ) were contrast coded, and perceived Thought Liking was mean-centered. To test the hypothesized mediation by Thought Liking, we conducted a biased corrected bootstrapping procedure with 10,000 bootstrap re-samples using Hayes process macro (Model 4) (Preacher & Hayes, 2004; Shrout & Bolger, 2002). In this analysis, Thought Direction  $\times$  Thought Origin was an independent variable, attitudes-behavioral intentions toward fast food index was a dependent variable, and Thought Direction  $\times$  Thought Liking was a mediating variable (see Figure 4). This approach includes procedures that compute a 95% CI around the indirect effect and mediation is indicated if this CI does not include zero. As predicted, the result of this bootstrapping procedure revealed that the 95% CI of the indirect effect (i.e., the path through the mediator) did not include zero (Indirect Effect  $a \times b = .05$ , 95% CI =  $[0.01, 0.10]$ ; Figure 4). Therefore, the mediation by Thought Liking is supported as plausible (Shrout & Bolger, 2002).<sup>9</sup>

## Discussion

Experiment 3 replicated the two-way interaction between Thought Direction and Thought Origin, and found the impact of the manipulations on attitudes and behavioral intentions to be mediated by Thought Liking. Therefore, this final experiment provided convergent evidence for the key interaction, and extended the contribution by providing meditational evidence of the proposed process.

## General Discussion

The current research shows that the perceived origin of thoughts can be an important dimension to examine because it



**Figure 5.** Attitudes toward the Mediterranean diet as a function of Thought Direction and Measured Thought Origin. Note. Higher numbers indicate more favorable attitudes.

has the potential to influence evaluative judgments. Our research suggests that thoughts perceived to come from the self are typically more impactful in changing attitudes than thoughts perceived to come from others. We proposed that this is true to the extent that the self is considered a valid source by most people. Indeed, based on the results of Experiments 1 and 3, it is reasonable to propose that an internal (self) origin for one's thoughts is by default associated with more validity than is an external (other) origin for one's thoughts.

The second experiment demonstrated that what matters for thought usage is the perceived validity of the origin of thoughts, regardless of whether that origin is internal or external. Experiment 2 revealed that just as an external source can be seen as valid, an internal origin can be perceived as invalid when discredited. The final experiment examined mediation and showed that it was Thought Liking (but not Thought Confidence) that was associated with the impact of Thought Origin on attitudes and intentions. That is, people liked their thoughts more when they perceived them to be originated internally than externally, and thus, they were used more. This experiment also ruled out potential alternative accounts based on one origin seeming more biasing than the other and motivating a correction for it.

One might wonder which origin is more naturally associated with higher validity (i.e., greater use of thoughts) when no manipulation of origin is used. To address this empirically, we analyzed an available dataset that included a measure rather than a manipulation of perceived origin. Although the original goals of this study were different, it still allowed us to examine this question. In this study, 174 participants were randomly assigned to either generate positive or negative thoughts about the Mediterranean diet (a topic used in Experiment 1). Then, Perceived Thought Origin was

measured on a continuous 9-point scale with the anchors *externally originated* and *internally originated*. Responses to this item were normally distributed around the midpoint ( $M = 5.2$ ,  $Mdn = 5$ ,  $SD = 2.27$ ), with 46.6% of participants reporting external origin and 53.4% reporting internal origin. Following this, participants reported their attitudes toward the Mediterranean diet using the same three items we used in Experiment 1 ( $\alpha = .81$ ). Attitudes were submitted to a multiple hierarchical regression analysis, where Thought Direction (dummy coded) and Perceived Thought Origin (mean-centered) were entered as predictors and attitudes were the criterion variable. As shown in Figure 5, results revealed the predicted two-way interaction between Thought Direction and Perceived Thought Origin,  $B = .210$ , 95% CI = [0.004, 0.415],  $t(169) = 2.017$ ,  $p = .045$ . The interaction showed that there was greater impact of manipulated Thought Direction on attitudes as the perceived internal origin of one's thoughts was increased. Indeed, at one  $SD$  above the mean on the internal–external origin scale, positive thoughts led to more favorable attitudes than negative thoughts,  $B = 1.261$ , 95% CI = [0.606, 1.915],  $t(169) = 3.803$ ,  $p = .002$ . In contrast, for participants at one  $SD$  below the mean on this scale, there was no significant difference between the positive and negative thought conditions,  $B = .308$ , 95% CI = [-0.348, 0.965],  $t(169) = .927$ ,  $p = .355$ . This study revealed that naturally perceiving one's thoughts as internally (vs. externally) originated was associated with greater impact of thoughts on attitudes. Thus, using a measure (rather than a manipulation), this study replicated the same pattern of results obtained across other experiments in this research.

There are both situational and individual variables that could further modify the effects uncovered. For example, not only might individuals differ in their orientation toward

internal or external cues but situations might also vary in this regard. For example, in circumstances where the authority is held by one person with power over others, external origins may be perceived as more valid sources such as in the military or in an educational context (e.g., these ideas are from my professor or my commander). Also, if an internal origin is perceived as something invalid (e.g., because of low self-esteem, low self-confidence, low self-clarity; Pelham & Swann, 1994), then thought use could be diminished.

Furthermore, individuals differ in their general sense of self-confidence and some people use all of their self-views more in guiding information processing and behavior than others (DeMarree, Clark, Wheeler, Briñol, & Petty, 2017). Due to the lower reliance on their self-views, those with low (vs. high) self-confidence could be likely to show more use of thoughts when they come from external rather than internal sources. Of course, other dimensions beyond self-doubt that are also associated with a relatively weak self-view (e.g., unstable, ambivalent, discrepant, changeable, etc.) are also likely to reduce the reliance on the self as a valid source for using one's thoughts.

Of course, there are some limitations to the present research. For example, although these results support our predictions using different attitude objects within the health context (diet, bariatric surgery), it would be desirable to replicate the Thought Origin  $\times$  Thought Direction interaction in other domains to further test the generalizability of the findings. Also, our participant samples were composed of students, and future research should examine the extent to which the observed effects hold for different populations.

Finally, there are implications for re-interpreting past research in different areas. For example, demonstrating that the self is a more valid origin by default than other people can help to explain why self-persuasion is such a powerful approach to changing attitudes compared with paradigms of persuasion in which messages are delivered by external sources (Janis & King, 1954). Traditional interpretations of this effect were that when people generate arguments on their own, they tend to come up with reasons that they find the most compelling (Greenwald & Albert, 1968). Another possible interpretation is that people generate more thoughts when they are personally involved (Petty & Cacioppo, 1986). Instead of having thoughts differ in terms of these two dimensions of primary cognition (quality or quantity of thoughts), the present research provides a new interpretation. That is, it could be that arguments from the self are more impactful than arguments from others not because people generate arguments that are uniquely persuasive for themselves or because there are more of them, but rather it could be that they simply like the arguments more when they originate in themselves because they like themselves (a balance theory interpretation). In accord with the self-validation logic, keeping the content and the number of thoughts controlled, our experiments suggest that people can still differ in the extent to which they use those thoughts in forming judgments.

The present research also might have implications for the literature on direct versus indirect experience with the attitude object. Previous research demonstrated that attitudes formed via direct experience (e.g., behavioral interaction with the attitude object) are stronger (e.g., held with more confidence) than attitudes formed via indirect experience (e.g., non-behavioral experience; Fazio & Zanna, 1981). The traditional interpretation of this effect is that attitudes based on direct (vs. indirect) experience allow for more precise, and accessible associations, and therefore for more mental representations of greater complexity. Based on the current research, we can interpret the effect of direct versus indirect experience differently based on meta-cognitive processes. That is, even when the amount and accessibility of underlying associations is kept constant, people can still differ in the extent to which they use their thoughts in forming judgments (and maybe the extent to which their attitudes predict their behaviors) as a function of perceived origin. Specifically, origin can vary with direct versus indirect experience with the former being more likely to be associated with the self than the later.

In closing, the current research focused on the origin of thoughts, but one may question not only the value of the origin but also the value of the *destination* of one's thoughts. Recent research has provided some evidence that thoughts can be perceived to go to other locations that vary in validity. For example, Briñol and colleagues (2013) asked participants to write down their positive or negative thoughts about the Mediterranean diet on a piece of paper and the participants then either threw that paper in the garbage (location associated with invalidity), kept it in their pockets (location associated with validity), or placed the thoughts on a table (control condition). Results indicated that physically disposing of one's thoughts led to mentally invalidating those thoughts as shown by the reverse impact of the direction of thoughts in forming attitudes toward the diet (i.e., negative thoughts led to more positive evaluations of the diet than positive thoughts). The opposite was true for those who protected their thoughts—more positive evaluations were provided after listing positive rather than negative thoughts. Taken together, these two lines of research illustrate that perceptions about origin and destination of one's thoughts can influence attitudes by influencing thought usage.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## Notes

1. Post hoc power analysis indicated that the sample had a power of .92 to detect the interaction effect size obtained.
2. Results did not vary as a function of the specific choice made by participants. That is, the effect of the external origin on thought reliance was equivalent for participants choosing the peers/family option and those choosing the TV/advertising option ( $p = .55$ ). There also was no difference in thought reliance between those choosing the experience and the personality options ( $p = .36$ ).
3. These results were replicated in another experiment using a different topic. In this study, 76 students at a public high school in Albacete, Spain, were randomly assigned to write positive or negative thoughts about their body image, a topic, though self-relevant, that is heavily affected by the cultural environment (Heinberg & Thompson, 1995). After listing thoughts, participants read a scientific article leading them to believe that thoughts about body shape and beauty were likely to have an internal (self) or an external (others) origin. Finally, attitudes toward body image were assessed. Consistent with Experiment 1, a significant Thought Direction  $\times$  Thought Origin interaction emerged, indicating that the effect of the direction of thoughts on body-evaluations was greater for participants in the internal than external origin condition,  $F(1, 72) = 5.74, p = .02, \eta^2 = 0.07$ . See the online appendix for details.
4. Post hoc power analysis indicated that the sample had a power of .82 to detect the interaction effect size obtained.
5. The  $2 \times 2 \times 2$  ANOVA revealed that the interaction between Thought Direction and Thought Origin was not significant,  $F(1, 389) = 0.023, p = .878, \eta^2 < 0.001$ , suggesting that validity differences are the key ingredient for the effects observed in Experiment 1.
6. Another power analysis was conducted based on the key average interaction effect size obtained in Experiment 1 and in the Footnote 3 Experiment, revealing that the desired sample size was  $N = 125$ .
7. More participants than 152 were included because more people than we anticipated signed up for the experiment and we decided to include them rather than cancel their participation. When we compute the interaction with the first 152 participants in the pool, the key two-way interaction remains significant,  $F(1, 148) = 5.251, p = .023, \eta^2 = 0.03$ .
8. The attitude index alone reveals the predicted two-way interaction,  $F(1, 184) = 5.902, p = .016, \eta^2 = 0.03$ . For the behavioral intentions measure alone, the same interaction pattern was obtained, but it did not achieve significance,  $F(1, 184) = 2.410, p = .122, \eta^2 = 0.013$ .
9. For the attitudes measure alone, the mediation was still supported as plausible (Indirect Effect  $a \times b = .06, 95\%$  confidence interval [CI] = [0.02, 0.14]). For the intentions measure alone, the mediation was also supported as plausible (Indirect Effect  $a \times b = .07, 95\%$  CI = [0.03, 0.23]).

## Supplemental Material

Supplementary material is available online with this article.

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