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The influence of emotions on information processing and persuasion: A differential appraisals perspective

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ABSTRACT

The present research demonstrates for the first time that the very same emotion can influence information processing and persuasion depending on the appraisal of the emotion that is highlighted. Across studies, we predicted and found that anger, surprise, and awe can each lead to relatively higher or lower levels of information processing depending on whether it is the appraisal of pleasantness/unpleasantness or the appraisal of confidence/doubt within each of these emotions that is salient. When individuals focus on the unpleasantness that accompanies anger, relatively higher levels of processing occur (as indicated by more argument quality discrimination in attitudes) compared to when angry individuals focus on the confidence appraisal. In the latter case they process information to a relatively lesser degree (as illustrated by reduced argument quality effects on attitudes). The opposite interaction beween appraisal and argument quality was found for relatively more pleassant but uncertain emotions, such as surprise and awe. These effects of emotion on information processing were mediated by changes in thought favorability, and led to behavioral consequences. Importantly, the present studies also specify under what conditions the appraisals of the same emotion influence persuasion by affecting processing or by influencing meta-cognitive processes such as thought validation (Briñol et al., 2018), with the timing of the inductions playing a critical role.

1. Introduction

The role that incidental emotions play in producing persuasion has been of longstanding interest in the field (e.g., McGuire, 1968; Petty & Briñol, 2015). With respect to several emotions, prior research is inconclusive. Consider the case of anger where some past research has revealed that inducing anger prior to a persuasive message leads to a relatively high degree of message processing but other research has shown the opposite effect. We argue that whether anger and other emotions leads to higher or lower levels of information processing depends on the appraisal of the emotion that is highlighted. With respect to anger, when people focus on the unpleasantness that accompanies this emotion, they are postulated to process information to a greater degree than when they focus on the confidence appraisal. For other emotions such as surprise and awe, the opposite is hypothesized. For surprise, focusing on the degree of pleasantness that accompanies this emotion leads to less information processing than focusing on confidence. Before offering and providing evidence for our differential appraisals hypothesis, we first briefly review past persuasion work on anger.

2. Anger can lead to relatively high or low levels of information processing

In line with the idea that anger before a message can lead to a relatively high level of message processing, Moons and Mackie (2007) showed that people in an angry state processed the arguments contained

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in a persuasive message more carefully than those in a neutral state. This effect of anger increasing the extent of thinking was obtained using a paradigm that has become commonplace in the literature on persuasion – manipulating the quality of the arguments in the message (Petty, Wells, & Brock, 1976). The notion is that if people are processing the arguments carefully, the quality of the arguments presented should have a larger impact on attitudes than if message processing is minimal (see Carpenter, 2015, for a review of studies using argument quality to assess message processing). In one study of their series, Moons and Mackie (2007, Study 2) began by inducing participants to feel anger or a neutral emotional state by writing about past personal experiences. Then, participants read a proposal advocating the introduction of mandatory comprehensive exams as a graduation requirement for college seniors containing either strong or weak arguments in favor of the proposal. Next, the authors measured participants' attitudes toward the proposal by asking them to indicate their agreement with several statements related to the proposal. The results revealed an Emotion × Argument quality interaction on attitudes such that participants induced to feel anger reported attitudes that were more influenced by the quality of the arguments than those in a neutral state (see Calanchini, Moons, & Mackie, 2016, for additional evidence that anger can increase thinking).

Other research has shown the opposite – that anger can sometimes lead to relatively low levels of information processing. For example, Tiedens and Linton (2001) compared anger to worry and surprise and found that anger was associated with lower levels of processing compared to these emotions. In this paradigm, participants first wrote about a time when they felt anger, worry, or surprise, and then read a message advocating that there was too much grade inflation in colleges and that students should be graded more harshly. Half of the participants were told that the proposal was written by a distinguished professor (source with high expertise) and the other half that it was written by a student at a community college (source with low expertise). Next, participants evaluated the proposal by indicating their agreement with various statements supporting or opposing grade inflation. The results showed that participants who experienced anger were more influenced in their evaluations by source expertise and thus were more persuaded by the proposal when the source was expert than participants who felt worry or surprise. In accord with much research on dual process models of persuasion (see Petty & Briñol, 2008), relying on simple source cues is a relatively low effort persuasion strategy on the part of participants who are not thinking very carefully (e.g., Chaiken, 1980; Petty, Cacioppo, & Goldman, 1981). Tiedens and Linton (2001) interpreted their results as consistent with the view that the emotion of anger is related to an appraisal of confidence and thus people who experience it are less motivated to think. That is, confident individuals have less need to process a message and are thus more likely to rely on simple cues (such as source expertise) when making judgments than people who experience emotions linked to uncertainty (such as worry), who should be more focused on the message arguments (see Bodenhausen, Sheppard, & Kramer, 1994, for additional evidence that anger can reduce thinking).

As just reviewed, prior scholars have argued that anger can either lead to relatively high (Calanchini et al., 2016; Moons & Mackie, 2007) or low (Bodenhausen et al., 1994; Tiedens & Linton, 2001) degrees of information processing. However, to the best of our knowledge, no prior research has compared whether the very same emotion (e.g., anger) can lead to relatively more or less information processing (and ultimately persuasion) within the same experimental design. In the present research we examine for the first time to what extent anger (and other discrete emotions) are capable of inducing relatively high or low levels of information processing within the same study. As described next, we argue that the opposite effects of single emotions depend on the appraisal of the emotion that is highlighted. That is, when people focus on the unpleasantness that accompanies anger, information processing is relatively high, whereas when they focus on the confidence that accompanies that emotion, information processing is relatively low. As we explain shortly, the opposite would be true for the emotions of surprise and awe.

Our conceptual approach is consistent with the Appraisal Tendency Framework (ATF, Lerner & Keltner, 2000, 2001) which relies on the fact that emotions are associated with different appraisals (e.g., Ellsworth & Smith, 1988) and the impact of emotions on information processing will depend on the appraisal dimension that is salient. In addition to comparing different emotions under the same appraisal as previous research guided by the ATF has done, the present research also compares the same emotion under different appraisals thereby testing the unique prediction that the processing effects invoked by appraisals can be relevant even when varied within the same emotion. As described next, another innovation of the the current framework consists of proposing that the impact of appraisals within the same emotion can go beyond information processing and judgment, affecting attitude strength features such as attitude-behavior correspondence. Also, this research is unique in introducing timing as a key moderator of the process by which the appraisals of the same emotion influence cognitive and metacognitive processes.

3. Emotion effects as a function of appraisal

According to appraisal theories, emotions can be differentiated along several dimensions, two of which are pleasantness vs. unpleasantness and confidence vs. doubt (Ellsworth & Smith, 1988; Lerner & Keltner, 2000; Moors, Ellsworth, Scherer, & Frijda, 2013).[1] That is, appraisal theorists have argued and shown that whereas some emotions induce relatively pleasant experiences (e.g., happiness, awe, surprise), other emotions lead to relatively unpleasant states (e.g., anger, disgust, sadness).[2] Furthermore, the same emotions can be categorized as to whether they are associated with feelings of confidence or doubt. Specifically, the experiences of some pleasant emotions (e.g., happiness) as well as unpleasant ones (e.g., anger) are accompanied by feeling certain, having a sense of understanding of what is happening in the current situation, and feeling able to predict what will happen next. In contrast, other relatively pleasant emotions (e.g., surprise, awe) as well as unpleasant ones (e.g., fear) are characterized by feeling uncertain, not understanding what is happening, and feeling unsure about what will happen next (Roseman & Evdokas, 2004; Small & Lerner, 2008).

As noted, this differential appraisals framework is generally compatible with the Appraisal Tendency Framework (ATF, Lerner & Keltner, 2000, 2001). According to the ATF, emotions of the same valence (e.g., anger and sadness) can have different effects on information processing and judgment, whereas emotions with different valence (e.g., anger and happiness) can have similar effects depending

[1] Although there are other dimensions along which emotional experiences can vary (e.g., control, attention, etc.; see Frijda, 1993; Keltner et al., 1993; Lerner & Keltner, 2000; Smith & Ellsworth, 1985), in the present research we highlight the pleasantness and confidence dimensions because not only are they the most studied appraisals but they are also of longstanding importance in the domain of attitudes and social cognition. Furthermore, these particular dimensions have been argued to provide the two most fundamental criteria by which people judge their own beliefs (see Boden et al. 2016, for a review). It is also important to note that we use the terms confidence and certainty interchangeably. This equivalence is common in the literatures on attitude strength (Petty & Krosnick, 1995) and self-validation (Briñol & Petty, 2009) where the key issue is how confident, certain, or sure people are in the validity of their thoughts and attitudes. In the current research, we do not examine whether an emotion is associated with a certain or confident appraisal of the external situation. Instead, we examine whether an emotion is associated with certainty or confidence in what people have in mind at the time.

[2] Anger has been typically associated with unpleasanteness, but the degree of unpleasantness-pleasantness can vary depending on the circumstances (Aarts et al., 2010; Carver & Harmon-Jones, 2009; Ford et al., 2010; Humrichouse & Watson, 2010; Veling et al., 2011).

on the circumstances (Lerner, Li, Valdesolo, & Kassam, 2015). We concur with this perspective that appraisals are important and consequential in triggering different levels of processing when comparing different emotions. Furthermore, we build on the ATF by introducing the novel idea that the processing predispositions activated by appraisals can be relevant even when varied within the same emotion and that the impact of appraisals can go beyond affecting information processing also influencing attitude strength and other outcomes (e.g., affecting thought usage; Briñol et al., 2018). In the current research, we focus on the differential role of the pleasantness and confidence appraisals within the same emotion as they impact how anger (vs. surprise and awe) affects information processing, judgment, and attitude-behavior correspondence.

This differential appraisals approach is also compatible with the hierarchical structure approach to emotions (Tellegen, Watson, & Clark, 1999). For example, with respect to anger, this perspective holds that when the non-specific aspects of anger (i.e., unpleasantness) are controlled, anger is associated with self-assurance and confidence (Blankenship, Nesbit, & Murray, 2013; Humrichouse & Watson, 2010; Keating, 1985; Motro & Sullivan, 2017; Pettersson & Turkheimer, 2013; van Kleef, De Dreu, & Manstead, 2004; see also Veling, Ruys, & Aarts, 2011). The idea that anger can be associated with confidence is also consistent with the relationship found for anger and preparation for action (Carver & Harmon-Jones, 2009; Harmon-Jones, Schmeichel, Mennitt, & Harmon-Jones, 2011).

Having in mind both the pleasantness/unpleasantness and the confidence/doubt dimensions, we propose that when anger precedes a persuasive message it produces relatively high or low levels of information processing depending on the emotional appraisal that is either naturally salient or made salient at the time. On the one hand, if an individual feeling anger focuses on the pleasantness/unpleasantness appraisal of the emotion rather than the confidence/doubt appraisal, then the unpleasant feeling that accompanies anger would facilitate information processing. Specifically, as prior research has shown, being in an unpleasant mood state can lead people to relatively high levels of information processing because when feeling unpleasant, people think that there is a problem to be solved (Bohner, Crow, Erb, & Schwarz, 1992; Matovic & Forgas, 2018). However, if the person focuses on the confidence/doubt appraisal of anger rather than the pleasantness/unpleasantness appraisal, then the confident feeling from anger should lead to relatively low levels of information processing. Being in a confident state prior to a message can lead people to engage in relatively low levels of information processing, because when feeling confident, people think they already have a correct attitude (e.g., Briñol, Petty, Gallardo, & DeMarree, 2007; Briñol, Petty, Valle, Rucker, & Becerra, 2007).

Now consider the emotions of surprise and awe. If an individual feeling one of these emotions focuses on the pleasantess/unpleasantness appraisal rather than the confidence/doubt appraisal, then the pleasant feeling that accompanies surprise and awe should lead to relatively low levels of information processing. Again, when in a pleasant state, the world seems fine and thus information processing is reduced (see Bless, Mackie, & Schwarz, 1992; Forgas, Goldenberg, & Unkelbach, 2009; Matovic, Koch, & Forgas, 2014). However, if the person focuses on the confidence/doubt appraisal rather than the pleasantness/unpleasantness appraisal of surprise and awe, then the doubtful feeling from these emotions should make people unsure about what to think and thus lead to a relatively high degree of information processing (Maio, Bell, & Esses, 1996). In sum, we propose that when people feeling anger focus on the confidence/doubt appraisal of their emotion, increased confidence deriving from anger should lead to relatively low levels of processing compared to focusing on unpleasantness. Similarly, when focusing on the pleasantness/unpleasantness appraisal, the very same emotion should lead to relatively high levels in processing compared to focusing on confidence due to the feeling of unpleasantness. The opposite patterns are expected for surprise and awe. Specifically, when people focus on the confidence/doubt appraisal of the emotion rather than the pleasantness/unpleasantness appraisal, doubt deriving from surprise and awe should lead to a relatively high degree of processing, but when they focus on the pleasantness/unpleasantness appraisal of the emotion, the pleasant feeling related to surprise and awe should lead to relatively low levels of processing compared to a focus on confidence/doubt.

It is important to close this section by clarifying that the focus of the present work is not about the impact of appraisals on the feeling of emotion as this was established in prior research. That is, previous work has examined how appraisals lead people to experience different emotions. There is also work on how different appraisals can lead people to feel different levels of intensity within the same emotion. This particular side of the relationship in which appraisals are viewed as antecedents of emotion is well-established (Ellsworth & Scherer, 2003; see Scherer & Moors, 2018, for a recent review). However, instead of different appraisals leading to different emotional experiences, in the current research appraisals are not expected to change the experience of the emotions. Instead, appraisals were predicted to change whether the very same emotion was associated with relatively high or low levels of information processing leading to different outcomes in persuasion. In the current work, the appraisals are induced after the emotion, reducing the potential for the appraisal to affect the emotional experience.

4. Prior support for differential appraisals: Thought validation

Preliminary evidence in support of the utility of the differential appraisals approach comes from recent research on emotion and metacognition. In a series of studies, Briñol et al. (2018) introduced a framework to understand how emotions can validate or invalidate thoughts (rather than change the generation of thoughts, as is the goal of the present research). Specifically, this previous research showed that whether emotions, such as anger and disgust, lead to more or less thought use after thoughts have already been generated depends on the kind of appraisal that was highlighted at the time each emotion was salient. For example, when angry individuals were explicitly focused on the pleasantness appraisal of their emotion following the generation of thoughts, the unpleasant feeling of anger led to affective invalidation of thoughts (i.e., I don't feel good about my thoughts, so I will not use them). When, however, angry individuals were focused on the confidence appraisal of their emotion following thought generation, the enhanced confidence led to cognitive validation of thoughts (i.e., I believe my thoughts are correct, so I will use them). These findings revealed that the same emotion can increase or decrease thought usage depending on the appraisal of the emotion that is momentarily highlighted. In the current work, the differential appraisals framework is applied to situations in which the emotion precedes thought generation rather than follows thought generation, and therefore we provide the first examination of the impact of emotion on information processing rather than thought validation.

5. Overview

Participants in the first two studies of the current set received the emotion induction preceding the presentation of a persuasive message. Then, a third study isolated the effect of anger on information processing to when the anger is manipulated before rather than after the message. Participants were first induced to feel the randomly assigned emotion (anger, surprise, or awe, depending on experiment). Following the emotion induction, participants were induced to appraise that emotion either along a pleasantness/ unpleasantness dimension or a confidence/doubt dimension. Consistent with prior research (Briñol et al., 2018), the emotions reported by participants were not expected to vary as a function of the appraisal induction. Importantly, all emotions have appraisals associated with them and the present induction serves to highlight one of those appraisals to be dominant. Regardless of whether

emotions are conceptualized as *being* appraisals, or whether emotions are viewed as *having* appraisals, or whether emotions are theorized as *leading* to appraisals, what is important for the present research is that emotions are linked to particular appraisals and what appraisal dominates at the time participants receive the persuasive proposal. In sum, this induction focuses on the consequences (rather the antecedents) of appraisals of emotion, and it focuses on the consequences for information processing (rather than the consequences for the experience of emotion).

Participants in Studies 1 and 2 were asked to read persuasive messages composed of either strong or weak arguments. As noted earlier, the use of persuasive messages containing strong vs. weak arguments is a common technique in the domain of persuasion that is used to examine the degree of processing in which participants engage (e.g., Maio et al., 1996; Petty & Cacioppo, 1986). When people are thinking about the message, the strong arguments elicit mostly favorable thoughts toward the proposal and lead to favorable attitudes. When thinking about weak arguments, participants generate mostly negative thoughts about the proposal and, consequently, show less favorable attitudes. On the other hand, when amount of processing of the message is low, people show less differentiation between strong and weak arguments, and thus the effect of argument quality on attitudes is attenuated.

6. Experiment 1

Experiment 1 was primarily designed to examine the influence of the emotion of anger on information processing and persuasion as a function of our differential appraisals perspective. Specifically, we tested whether an emotion that is introduced prior to a persuasive message can influence evaluative judgments by producing a relatively high or low amount of information processing depending on the appraisal of the emotion that is made salient. In this study, participants were first assigned to write personal episodes in which they felt anger or surprise. We used surprise as a comparison emotion in this study because surprise is a relatively positive emotion that makes people feel uncertain about what is happening or what is going to happen. That is, its appraisal features are opposiste to anger on both appraisal features of interest and thus should show opposite results.[3] Several studies have provided support for the proposition that surprise is a relatively positive emotion that is also associated with doubt (Valenzuela, Mellers, & Strebel, 2010; Wilson, Centerbar, Kermer, & Gilbert, 2005). For example, Watson and Tellegen (1985) placed surprise in the top right quartile of their two-factor Positive Affect and Negative Affect model, supporting the idea that surprise has high loadings on positive affect. At the same time, in accord with appraisal theories, Tiedens and Linton (2001) demonstrated that surprise is an emotion that is associated with uncertainty and produces effects associated with doubt, such as enhanced information processing when it precedes a message and reduced reliance on simple heuristics. The uncertainty associated with surprise can emerge from a violation of expectations. In fact, it has been found that the degree of unexpectedness determines the intensity of felt surprise (Reisenzein & Studtmann, 2007).

After the emotion induction, we introduced the critical manipulation that was designed to facilitate participants' likelihood of making the pleasantness/unpleasantness or the confidence/doubt appraisal of the induced emotion salient. Next, the extent to which participants processed information was assessed by varying the quality of the arguments contained in the proposals, and by measuring the impact of those arguments on subsequent attitudes. We used two different persuasive proposals that varied in a number of features in order to generalize the results and keep close to prior research. We expected no effect of the proposal type on attitudes.

As explained earlier, we hypothesized that for angry participants, those in the confidence/doubt appraisal condition would show lower levels of information processing than those in the pleasantness/unpleasantness condition. This is because if individuals feeling anger focus on the confidence that accompanies their emotion, they may feel confident about their own existing views which would reduce their motivation to process new information compared to the unpleasant feeling that also accompanies anger. In the later case, when angry individuals focus on the unpleasantness of their emotion, they would be expected to feel unhappy about their existing views which would increase their motivation to process the upcoming message. Relatively low levels of information processing would be indicated by a reduced argument quality effect on attitudes.

In contrast, the opposite pattern is predicted for surprise. If individuals induced to feel surprise focus on the confidence/doubt appraisal of the emotion, then they would be expected to feel doubt about their existing views which would increase their motivation to process the upcoming message compared to those focused on the pleasantness/ unpleasantness dimension of the surprise. Relatively high levels of information processing would be indicated by an enhanced argument quality effect on attitudes. In sum, we expected a three-way interaction of Emotion, Appraisal Type and Argument Quality on attitudes. When decomposed, this 3-way interaction was predicted to show a 2-way interaction between Appraisal Type and Argument Quality in opposite directions for each of the two Emotions.

6.1. Method

6.1.1. Participants and design

Four hundrent and six psychology undergraduate students participated in the study. Aproximately half of the participants were students at a public university in Spain who read about a job candidate. The other half of the sample was composed of students at another Spanish university reading about senior comprehensive exams. Therefore, participants were not randomly assigned to this factor (Topic/Sample) in the design. In addition to this factor, participants were randomly assigned to the other cells of a 2 (Emotion: Anger vs. Surprise) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Argument qQuality: strong vs. weak) factorial. Sample size for this first study was determined based on the number of participants we anticipated could be collected from the start of the study until the end of the academic quarter at each institution. We thus had little control over the final sample size, but by administering the study at the beginning of the quarter, based on prior experience we anticipated that the final sample would contain at least 25 people per cell in the full design (50 collapsed across topic, which we did not expect to matter). We expected this sample to be sufficient to detect a generic small to medium effect size ($\eta^2_p = 0.02$; Cohen, 1988) for the predicted three way key interaction with at least 0.80 power (desired sample size, $N = 387$ from G*power; Faul, Erdfelder, Lang, & Buchner, 2007). Ultimately, we ended up with a number close to that initial estimate. No participants were excluded, and all measures and manipulations are reported.

6.1.2. Procedure

Upon arrival, participants were told that they were going to be involved in two separate projects. Specifically, they were told that the first study was about the way people remember past personal episodes and they were asked to write about personal occasions in which they felt either angry or surprised. After writing the emotion-induction essays, participants were told that in order to bring all participants back to the same baseline, they would have to answer some questions. Depending on their experimental condition, the questions posed were related to pleasantness/unpleasantness or confidence/doubt. This task served as the Appraisal Type manipulation. Participants in the pleasantness

[3] Not all surprises are pleasant. Indeed, surprise can sometimes be relatively unpleasant (e.g., Russell, 1994) and anger can sometimes be relatively pleasant (e.g., Netzer, Igra, Bar Anan, & Tamir, 2015). However, surprise is typically a more positive emotion than anger.

appraisal condition were asked to answer questions about how they felt, whereas those in the confidence appraisal condition answered questions about how confident they were. Next, participants read a proposal about the implementation of comprehensive exams or they were exposed to a CV from a job candidate that contained either strong or weak arguments. Participants were expected to form more positive attitudes after reading the strong (vs. weak) arguments messages, independently of the topic, though as noted, the magnitude of this argument quality effect on attitudes should vary with the other experimental inductions as hypothesized. After reporting their attitudes, participants were debriefed, thanked, and dismissed.

6.1.3. Independent variables

Emotion. Participants were first asked to think about recent occasions in which they felt either angry or surprised. Specifically, participants were asked to write brief essays summarizing these anger or surprise inducing events. This induction is similar to that used in much prior research manipulating emotions in the domain of persuasion (DeSteno, Petty, Wegener, & Rucker, 2000; Fetterman & Robinson, 2013; Keltner, Ellsworth, & Edwards, 1993; Schwarz & Clore, 1983; Strack, Schwarz, & Schneidinger, 1985). Participants could take as long as they needed and stop whenever they wanted when writing about emotions. As explained, anger is an unpleasant emotion associated with confidence. In contrast, surprise is a relatively pleasant emotion that makes people feel uncertain about what is happening or going to happen.

Appraisal Type. An important aim of the present study was to manipulate participants' appraisal of their emotion in order to examine the conditions under which emotion would enhance versus reduce message thinking. To achieve this manipulation, we used an induction employed successfully in prior research (Briñol, et al., 2018, Study 3) where participants had to respond to questions containing words either related to pleasantness/unpleasantness or confidence/doubt. For example, in the pleasantness appraisal condition, participants were asked, "How pleasant did the emotional experience make you feel?" In the confidence appraisal condition, they were asked questions like, "How confident did the emotional experience make you feel?" In the pleasantness appraisal condition, participants received questions with the following four words included: good, pleasant, bad, and unpleasant. For the confidence appraisal condition, the four words were: confident, sure, uncertain, and doubtful (for conceptually similar procedures, see Smith & Ellsworth, 1985; Tiedens & Linton, 2001). In the pleasantness appraisal conditions, participants were expected to focus primarily on the pleasantness or unpleasantness accompanying their emotion, whereas in the confidence appraisal conditions, participants were expected to focus primarily on the confidence or doubt accompanying their emotion. In other words, participants were led to focus on one specific appraisal of the emotion.[4]

Topic. Some participants received a message about the implementation of senior comprehensive exams at their university and others received the CV of a prospective job candidate applying for an Assistant Manager position. To generalize the results across topics, we selected one topic that had been used previously in the literature on anger and persuasion (Moons & Mackie, 2007) and is relevant to participants (i.e. senior comprehensive exams) and another topic that is less relevant to them (i.e. the job candidate vita). We expected to find the same pattern of results for both topics.

Argument Quality. In order to manipulate argument quality, some participants received a message containing strong or weak arguments about the implementation of senior comprehensive exams and others a CV describing either a very qualified (strong arguments) or an unqualified (weak arguments) candidate for a job position. The extent to which participants processed the message information was assessed by examining the extent to which the quality of the arguments affected post-message attitudes. The gist of some strong arguments in favor of the exam policy were that students' grades would improve if the exams were adopted and that the average starting salary of graduates would increase. The gist of some weak arguments in favor of the exam policy were that implementing the exams would allow the university to take part in a national trend and that the exams would give students the opportunity to compare their scores with those of students at other universities. The quality of these arguments has been tested in prior research revealing that they differ in merits, but they are equivalent in other dimensions such as length, complexity, abstraction (see Petty & Cacioppo, 1986).

Participants assigned to evaluate the job candidate received a CV from a job candidate for an Assistant Manager position in Marketing which contained strong information implying that the candidate would be highly qualified for the supposed position, or they read a vita containing weak information suggesting that the candidate would be poorly qualified to fill the position. The CV containing strong arguments indicated that the candidate had earned his degrees from a prestigious university, had professional experience in well-known corporations (National Geographic, IBM, Repsol), spoke three relevant languages (French, English and German), and had high knowledge about specific software programs. In essence, the CV containing strong arguments clearly indicated that the candidate was well qualified for the position. In contrast, the weak vita indicated that the candidate had yet to get some of his degrees, had experience in unrelated jobs, spoke just one foreign language, and did not have experience with specific software. Thus, the weak vita plainly indicated that the candidate was not well-suited for the job. Both versions of the vita were designed to be different in quality, while being equivalent in length, format, complexity, etc. (see Johnson, Petty, Briñol, & See, 2017; Petty, Tormala, Briñol, & Jarvis, 2006).

6.1.4. Dependent measure: Attitudes

The dependent measure was participants' attitudes toward senior comprehensive exams or the job candidate. Specifically, participants were asked to report their attitudes toward the candidate or toward the implementation of comprehensive exams on a series of three 9-point (1–9) semantic differential scales (i.e. good-bad, like-dislike, in favor-against). These items have the benefit of being very broad and therefore they served to assess attitudes toward both topics equally. The specific items were taken from previous research on emotion and persuasion (Briñol et al., 2018). Ratings on these items were highly intercorrelated ($\alpha = 0.92$), so they were averaged to form one overall attitude index. Responses to the semantic differential scales assessing attitudes were standardized and higher numbers represented more favorable attitudes toward the issue and job candidate.

6.2. Results

Results of a 2 (Emotion: Anger vs. Surprise) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Argument Quality: Strong vs. Weak) × 2 (Topic: Senior comprehensive exams vs. Job candidate) ANOVA on attitudes revealed the hypothesized three-way interaction among the independent variables, $F(1, 390) = 19.91$, $p < .001$, $\eta_p^2 = 0.05$. As expected, this interaction was not further qualified by Topic, $F(1, 390) = 1.40$, $p = .24$, $\eta_p^2 = 0.004$.

As illustrated in Fig. 1 (top panel), among participants in the anger condition, the Argument Quality × Appraisal interaction was significant, $F(1, 192) = 8.17$, $p = .005$, $\eta_p^2 = 0.04$, indicating that a focus on the unpleasantness appraisal led to a higher level of information processing compared to a focus on the confidence appraisal. That is, for participants

[4] Participants answered these items using four 9-point scales. The average level of confidence reported in the confidence/doubt appraisal conditions was (M = 6.97; *SD* = 1.57). The average level of pleassantness reported in the pleasantness/unpleasantness condition was (M = 5.61; *SD* = 2.65). Each of these ratings is above the midpoint of the scale suggesting that people agreed that the induction produced the intended state (i.e., confidence/doubt or pleasantness/unpleasantness).

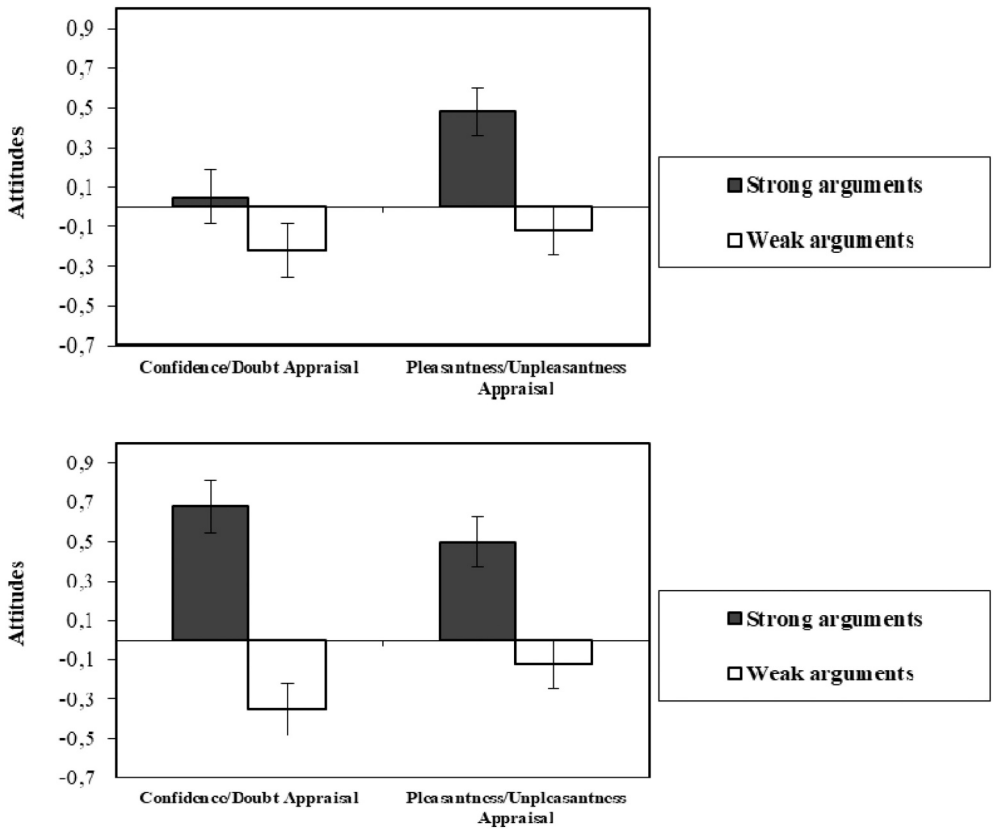

Fig. 1. Top panel: Attitudes (standardized) as a function of Argument Quality and Appraisal Type in the Anger condition in Study 1. Bottom panel: Attitudes (standardized) as a function of Argument Quality and Appraisal Type in the Surprise condition in Study 1.

made to feel angry, attitudes were more reflective of the quality of the arguments they received when the appraisal of pleasantness/unpleasantness was made salient than when the appraisal of confidence/doubt was salient. This interaction showed that participants in the pleasantness/unpleasantness condition formed more favorable attitudes after reading the strong arguments message ($M = 0.48$, $SD = 0.90$) than after reading the weak arguments message ($M = -0.56$, $SD = 0.96$), $F(1, 192) = 39.17$, $p < .001$, $\eta_p^2 = 0.17$. In the confidence/doubt appraisal condition, participants' attitudes were also more favorable between those who read the strong arguments message ($M = 0.05$, $SD = 0.95$) than those who read the weak arguments message ($M = -0.22$, $SD = 0.82$), though this difference was less pronounced, $F(1, 192) = 3.22$, $p = .08$, $\eta_p^2 = 0.016$. Importantly, this 2-way interaction between Argument Quality and Appraisal was not further qualified by the Topic, $F(1,192) = 0.80$, $p = .37$, $\eta_p^2 = 0.004$.

The opposite pattern of results was found for participants in the surprise condition, $F(1, 198) = 11.92$, $p = .001$, $\eta_p^2 = 0.06$. This interaction indicated that a focus on confidence/doubt led to a higher degree of information processing compared to a focus on pleasantness/unpleasantness. That is, for participants induced to feel surprise, attitudes were more reflective of the quality of the arguments when the appraisal of confidence/doubt was made salient than when the appraisal of pleasantness/unpleasantness was salient (Fig. 1, bottom panel). Specifically, this interaction showed that surprised participants in the confidence/doubt condition formed more favorable attitudes after reading the strong arguments message ($M = 0.68$, $SD = 0.96$) than after reading the weak arguments message ($M = -0.35$, $SD = 0.92$), $F(1, 198) = 32.83$, $p < .001$, $\eta_p^2 = 0.14$. In the pleasantness/unpleasantness appraisal condition, there was no difference between surprised participants who read the strong arguments message ($M = 0.05$, $SD = 0.90$) and those who read the weak arguments message ($M = -0.12$, $SD = 0.99$), $F(1, 198) = 1.12$, $p = .29$, $\eta_p^2 = 0.006$. As was the case for anger, this interaction found for surprise was not further qualified by the Topic, $F(1,198) = 0.61$, $p = .44$, $\eta_p^2 = 0.003$.[5]

In addition, an unexpected interaction between Topic and Argument Quality emerged, $F(1, 390) = 23.11$, $p < .001$, $\eta_p^2 = 0.06$. This interaction indicated that the effect of Argument Quality was more prominent in the job candidate topic condition, $F(1, 390) = 66.97$, $p < .001$, $\eta_p^2 = 0.15$, than in the senior comprehensive exams one, $F(1, 390) = 3.65$, $p = .06$, $\eta_p^2 = 0.009$, suggesting that the argument quality induction was stronger for one topic than the other. Furthermore, a marginally significant interaction between Topic and Appraisal emerged, $F(1, 390) = 3.34$, $p = .07$, $\eta_p^2 = 0.008$. This interaction indicated that in the comprehensive exams topic condition, the confidence appraisal lead to more favorable attitudes ($M = 0.12$, $SD = 1.01$) than the pleasantness one ($M = -0.12$, $SD = 0.97$, $F(1, 390) = 3.70$, $p = .06$, $\eta_p^2 = 0.001$). On the other hand, for

[5] This three-way interaction can also be decomposed differently as a function of the Appraisal Type manipulation. This decomposition showed that among participants in the confidence appraisal condition, the Emotion × Argument Quality interaction was significant, $F(1, 185) = 8.13$, $p = .005$, $\eta_p^2 = 0.04$, indicating that anger reduced information processing relative to surprise. That is, participants' attitudes were more reflective of the quality of the arguments when they felt surprise than when they felt anger. In contrast, in the pleasantness appraisal condition, a significant Emotion × Argument Quality interaction also emerged but revealed the opposite pattern of results, $F(1,213) = 11.70$, $p = .001$, $\eta_p^2 = 0.05$, such that anger increased information processing relative to surprise. That is, participants' attitudes were more reflective of the arguments contained in the message when they felt anger rather than when they felt surprise.

participants who read the job candidate topic there was no impact of the appraisal condition on attitudes, $F(1, 390) = 0.529$, $p = .47$, $\eta_p^2 = 0.009$.

6.3. Discussion

The results of Experiment 1 revealed that the salience of the emotional appraisal affects the extent to which both anger and surprise affect information processing. That is, when anger versus surprise precede a persuasive communication, they have different (and opposite) effects on information processing depending on whether the confidence □r the pleasantness appraisal of those emotions is made salient. More specifically, the same emotional inductions were shown to produce a relatively high or low degree of information processing depending on the appraisal that was made momentarily salient. The observed moderation of the degree of thinking across appraisal conditions in the manner expected, provides support for the underlying conceptualization. Specifically, when participants feeling anger were focused on the pleasantness/unpleasantness appraisal, the unpleasantness that accompanies anger led to a relatively high level of information processing compared to when they focused on the confidence/doubt appraisal of their emotion. Or viewed differently, when angry participants were focused on confidence/doubt, the confidence that accompanies anger led to a relatively low level of information processing compared to when they focused on pleasantness/unpleasantness. This is consistent with the hypothesis that different appraisals for the same emotion can affect information processing. When the unpleasantness of an emotional state is experienced prior to the introduction of a message, information processing is relatively high (e.g., Bless et al., 1992; Bodenhausen et al., 1994). However, when the confidence associated with the same emotional state is experienced, information processing is relatively low (e.g., Briñol, Petty, Gallardo, & DeMarree, 2007; Lerner & Keltner, 2001; Tiedens & Linton, 2001).

In contrast, when surprised participants focused on the confidence/doubt appraisal of their emotions, the doubt that derives from surprise led to a relatively high level of information processing compared to when they focused on the pleasantness/unpleasantness appraisal of surprise. This is consistent with the idea that in a doubtful state people are unsure what to think and thus enhanced information processing is useful (see Briñol, Petty, Valle, et al., 2007; Maio et al., 1996), but while in a pleasant state, the world seems fine and thus information processing is reduced (see Bless et al., 1992; Forgas et al., 2009; Matovic et al., 2014). In short, anger and surprise led to opposite patterns of results (i.e., relatively high or low levels of information processing) depending on whether participants focused on the confidence or pleasantness appraisal □f their emotion. These findings provide support for the notion that appraisals are important for understanding the impact of emotions on information processing and judgment as the very same emotion was shown to have different consequences for processing depending on the appraisal of the emotion that was made salient.

In sum, the present experiment revealed that the emotions of anger and surprise can have different effects on information processing when they precede a persuasive message. To address the issue of the proposed mediation of thought favorability on attitudes, in Experiment 2 we asked participants to list their thoughts on the topic. Also, past studies on persuasion have provided support for the Elaboration Likelihood Model's elaboration-strength postulate (Petty & Cacioppo, 1986) that claims that attitudes formed in high elaboration conditions are more predictive of behavior than attitudes formed from relatively less thoughtful processes (Cacioppo, Petty, Kao, & Rodriguez, 1986; Kallgren & Wood, 1986; Leippe & Elkin, 1987; Petty, Cacioppo, & Schumann, 1983; Verplanken, 1991). In order to provide more evidence for attitudes being more consequential in high versus low elaboration conditions, in Experiment 2, apart from attitudes, we also assessed participants' attitude-relevant behavior.

7. Experiment 2

In Experiment 1 we relied on a moderation approach to provide support for our conceptualization. Beyond moderation, mediational evidence can also help build the case that the same emotion can lead to more or less message processing depending on the appraisal of the emotion that is highlighted. Therefore, in this experiment we relied on a mediational approach to testing the proposed impact of emotions and appraisals on elaboration along with the moderation approach.[6] Furthermore, Experiment 2 was designed to examine an important potential consequence of emotion induced elaboration – the ability of attitudes to predict behavior. More specifically, we hypothesized an interaction between attitude ratings and elaboration condition on behavior such that the ability of attitudes to predict relevant behavior would be greater for participants in the high compared to participants in the low elaboration conditions.

We also introduced four more changes with respect to the previous study. First, we aimed to test the extent to which we could generalize our results to another complex, multi-faced emotion in addition to anger and surprise – awe (see Briñol et al., 2018; Horberg, Oveis, & Keltner, 2011; Stellar et al., 2017). Awe is relevant in this context because prior research has supported the view that like surprise, awe is a pleasant emotional state that is associated with doubt (e.g., Rudd, Vohs, & Aaker, 2012; Shiota, Keltner, & Mossman, 2007). For example, Rudd et al. (2012) found that awe was associated with positive feelings, life satisfaction, and well-being. Similarly, Shiota et al. (2007) found that participants induced to feel awe experienced that emotion as high in pleasantness and they did not want the experience to end. At the same time, awe led people to report greater tolerance for uncertainty. Furthermore, awe inductions often involve the presence of contemplating something greater than the self making people think they are relatively small, insignificant, and humble (Keltner & Haidt, 2003; Valdesolo & Graham, 2014). Moreover, Stellar et al. (2017) demonstrated that awe is an emotion that can challenge world-views leading to a self-diminishing perception and decreased egotism (for another example, see Bai et al., 2017). Therefore, although pleasant, awe can make people doubt their self-generated thoughts making them look relatively insignificant and invalid.

The second change was related to the topic. In this experiment we selected another topic previously used in the persuasion literature (Calanchini et al., 2016; Weisbuch, Mackie, & Garcia-Marques, 2003) containing either strong or weak arguments in favor of a tax increase to improve highways. The third change was related to the emotional induction. We used 5-min films previously used in the literature when inducing anger (Finucane, 2011; Gino & Schweitzer, 2008; Lobbestael, Arntz, & Wiers, 2008) or awe (Gordon et al., 2016; Piff, Dietze, Feinberg, Stancato, & Keltner, 2015; Valdesolo & Graham, 2014). The fourth variation was that participants completed manipulation checks for the independent variables. Thus, an important new feature of this study was the addition of a manipulation check for the appraisal and the emotion variables. The goal of these measures was to ensure that we induced the intended emotion instead of other affective states also capable of affecting processing (e.g., arousal; (Schwarz and Clore, 2007; Storbeck & Clore, 2008).

We expected that participants feeling anger would process the message to a lower degree in the confidence/doubt appraisal condition than when in the pleasantness/unpleasantness appraisal condition, providing a conceptual replication of Study 1. Furthermore, we expected that the opposite would occur for awe. That is, participants feeling awe would process the message to a higher degree in the confidence/doubt appraisal condition than when in the pleasantness/unpleasantness

[6] We use the terms elaboration, processing and thinking, intercheangably. This equivalence is common in the attitude change and persuasion literature (see Briñol & Petty, 2012).

appraisal condition, again serving as a conceptual replication of Study 1. As noted, the amount of information processing would be assessed as in the prior study by comparing the relative impact of strong vs. weak arguments on attitudes. In line with the previous experiment, we expected the attitude measure to reveal a three-way Emotion × Appraisal Type × Argument Quality interaction. In addition, however, the elaboration mechanism will be tested with a mediational approach aiming to show that the impact of the inductions on attitudes is mediated by the valenced thoughts people generate during the message.

7.1. Method

7.1.1. Participants and design

Participants were 264 business undergraduate students at a public university in Greece. Students were randomly assigned to the cells of a 2 (Emotion: Anger vs. Awe) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Argument Quality: Strong vs. Weak) between-subjects factorial design. In order to calculate sample size, we conducted a power analysis using G*Power (Faul et al., 2007). Based on the three-way interaction effect observed in study one ($\eta_p^2 = 0.05$), we anticipated that the desired sample size for a two-tailed test ($\alpha = 0.05$) of this interaction with 0.80 power was a total of $N = 152$. Given that such an estimate is less than 25 participants per condition, and that we wanted to detect the effect even if it turned out to be smaller than estimated based on Study 1, we decided to again collect as many participants as possible during the second academic quarter, resulting in about 33 participants per condition. No participants were excluded, and all measures and manipulations are reported.

7.1.2. Procedure

Upon arrival, participants were told that they were going to be involved in three separate unrelated research projects. For the first part of the session, participants were seated at computers in private cubicles and were provided with headphones. Participants were randomly assigned to watch one of two videos: either an awe or an anger inducing video. For the next part of the session (i.e., the 'second study') the manipulation of appraisal was induced. Similar to Experiment 1, half of the participants responded to questions related to confidence/doubt in the confidence appraisal condition and the other half responded to questions related to pleasantness/unpleasantness in the pleasantness appraisal condition. After completing the first two inductions, participants were given a message containing either strong or weak arguments about a proposed tax for repairing the highways. Before leaving, participants completed the dependent measures and were then debriefed, thanked, and dismissed.

7.1.3. Independent Variables

Emotion. Participants were randomly assigned to the conditions of anger or awe. In the anger conditions, participants watched an approximately 5-min anger inducing clip taken from the movie My Bodyguard," portraying a man being treated unfairly. Previous studies have used the same induction to successfully manipulate the level of anger participants experienced (Finucane, 2011; Gino & Schweitzer, 2008; Lobbestael et al., 2008). In the awe conditions, participants watched an approximately 5-min awe inducing film, consisting of nature clips from the BBC's Planet Earth series composed of grand, sweeping shots of scenic vistas, mountains, plains, forests, and canyons. This manipulation was used in much prior research to induce awe (Gordon et al., 2016; Piff et al., 2015; Valdesolo & Graham, 2014; for similar induction procedures see also Wegener and Petty, 1994); (Wegener et al., 1995).

Appraisal Type. The appraisal induction was the same as in Experiment 1. That is, participants had to respond to questions containing words either related to pleasantness/ unpleasantness or words related to confidence/doubt.[7]

Argument Quality. After completing both inductions, participants received a message about the implementation of a new government tax for repairing the highways. The message contained either strong or weak arguments in favor of the tax implementation. As in Study 1, this manipulation was designed to influence the favorability of participants' cognitive responses if they were thinking about the message. The gist of one of the strong arguments in favor of the tax was that: "An increase in tax rates would directly benefit the taxpayers' safety. The increase would be used to repair potholes in our highways. Highway potholes play a part in 38% of all highway traffic deaths every year." The gist of one of the weak arguments was that: "Increasing tax rates would additionally reduce the number of hitchhikers by making our highways more attractive. That is, hitchhikers would stand out against this more attractive highway background, and as such, it would be easier for police to ticket these individuals." Again, it is important to note that both strong and weak arguments argued *in favor of the proposal*, but strong arguments provided more compelling reasons than did the weak ones. Thus, the strong version of the message produces mostly favorable thoughts whereas the weak one produces mostly negative thoughts (e.g., Calanchini et al., 2016). Also, both messages were equivalent in length, complexity, and abstraction.

7.1.4. Measures

Attitudes. Participants were asked to report their attitudes toward the implementation of the tax policy using the same three 9-point (1–9) semantic differential scales as used in Study 1. The anchors were good/bad, like/dislike, and in favor/against. These items were highly correlated ($\alpha = 0.89$) and they were aggregated to form a global index of evaluation.

Thought favorability. Participants were given 2 min to write up to 10 thoughts in boxes provided about the tax policy following the message (see Petty & Cacioppo, 1986). An independent judge, unaware of the experimental conditions, coded each thought participants wrote with respect to whether it was favorable or unfavorable toward the proposal using a 3-point scale (−1 = unfavorable, 0 = neutral, 1 = favorable). An index of the valence of thoughts was created for each participant as in previous studies, by subtracting the total number of negative thoughts generated from the number of positive thoughts that the participant had listed and this difference score was then divided by the total number of message-related thoughts (Cacioppo & Petty, 1981).

Behavior. Participants were asked whether they would be willing to sign a petition in favor of the tax increase policy. They were provided with the opportunity to introduce their electronic signature in support to the persuasive proposal. Signing versus not signing a petition has been used in previous research as a public behavior that represents a psychological commitment (e.g., Cialdini, 1993; Kiesler, 1971; for similar techniques see also Ratner & Miller, 2001; Sia, Lord, Blessum, Ratcliff, & Lepper, 1997).

Emotion manipulation check. Participants were asked to indicate the degree of awe and anger that they were experiencing using 9-point (1 = not at all, 9 = very much) Likert scales. Furthermore, participants were asked if they felt high or low in arousal on a 9-point scale (1 = not at all, 9 = very much).

Appraisal manipulation check. In order to examine whether the

[7] As in Study 1, participants answered these items using four 9-point scales. The average level of confidence reported in the confidence/doubt appraisal conditions was ($M = 6.62$; $SD = 1.66$). The average level of pleassantness reported in the pleasantness/unpleasantness condition was ($M = 4.80$; $SD = 3.02$).

appraisal manipulation was successful, participants were asked to report whether they based their decisions on pleasantness/unpleasantness or confidence/doubt on a 9-point scale (1 = pleasantness/unpleasantness, 9 = confidence/doubt). Responses to scale were scored so that higher numbers represented greater focus towards confidence/doubt.

7.2. Results

7.2.1. Manipulation checks

Emotions. A 2 (Emotion: Awe vs. Anger) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Argument Quality: Strong vs. Weak) ANOVA was conducted for awe, revealing the expected main effect on emotions, $F(1, 256) = 107.66$, $p < .001$, $\eta_p^2 = 0.30$. Participants in the awe condition, felt significantly more awe ($M = 5.68$, $SD = 2.10$) than participants in the anger condition ($M = 3.02$, $SD = 2.04$). No other significant main or interaction effects emerged ($ps > 0.15$). Moreover, the same ANOVA was conducted for reported anger, revealing as expected, a significant main effect of emotions, $F(1, 256) = 167.77$, $p < .001$, $\eta_p^2 = 0.40$. That is, participants in the anger condition, felt significantly more anger ($M = 5.71$, $SD = 2.14$) than participants in the awe condition ($M = 2.43$, $SD = 1.95$). No other main or interaction effects emerged on these ítems ($ps > 0.10$). This is important because we did not expect nor find appraisals to change the experience of emotions ($ps > 0.25$). Furthemore, we did not find any effects of any of the manipulations with regard to reported arousal ($p > .38$).

Appraisals. Results of a 2 (Emotion: Awe vs. Anger) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Argument quality: Strong vs. Weak) ANOVA revealed a significant main effect of Appraisal Type on whether participants reported basing their decisions on pleasantness/unpleasantness or confidence/doubt. As mentioned before, responses to this scale were scored so that higher numbers represented greater focus towards confidence/doubt. Participants in the confidence/doubt appraisal condition reported basing their choices more on confidence/doubt ($M = 6.14$, $SD = 2.01$) than participants in the pleasantness/unpleasantness condition ($M = 5.41$, $SD = 2.05$), $F(1, 256) = 7.38$, $p = .007$, $\eta_p^2 = 0.03$. No other significant main or interaction effects emerged ($ps > 0.18$). This is important because we did not expect nor find emotions to change the appraisal manipulation check ($p > .45$).

7.2.2. Dependent measures

Attitudes. Results of the 2 (Emotion: Awe vs. Anger) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Argument Quality: Strong vs. Weak) ANOVA on attitudes revealed a significant main effect of Argument Quality on attitudes, $F(1, 256) = 20.21$, $p < .001$, $\eta_p^2 = 0.07$, such that participants reported more favorable attitudes toward the implementation of the tax increase in the strong ($M = 5.62$, $SD = 2.10$) than in the weak ($M = 4.45$, $SD = 2.03$) arguments condition. Most importantly, we also found the predicted three-way interaction among these variables, $F(1, 256) = 11.55$, $p = .001$, $\eta_p^2 = 0.04$.

As in the previous study, we analized each emotion separately to test our prediction that there will be an Argument Quality × Appraisal interaction on attitudes within each of the emotions tested. As expected, within anger, the Argument Quality × Appraisal interaction was significant, $F(1, 129) = 6.18$, $p = .014$, $\eta_p^2 = 0.05$, indicating that participants' attitudes were more reflective of the quality of the arguments when the appraisal of pleasantness/unpleasantness was made salient than when the appraisal of confidence/doubt was salient (Fig. 2, top panel). This interaction showed that participants in the pleasantness/unpleasantness condition reported more favorable attitudes after reading the strong arguments message ($M = 6.21$, $SD = 2.39$) than after reading the weak arguments message ($M = 4.17$, $SD = 2.09$), $F(1, 129) = 16.25$, $p < .001$, $\eta_p^2 = 0.11$. In the confidence/doubt appraisal condition, there was no difference between the strong arguments message ($M = 5.02$, $SD = 1.86$) and the weak arguments message ($M = 4.80$, SD

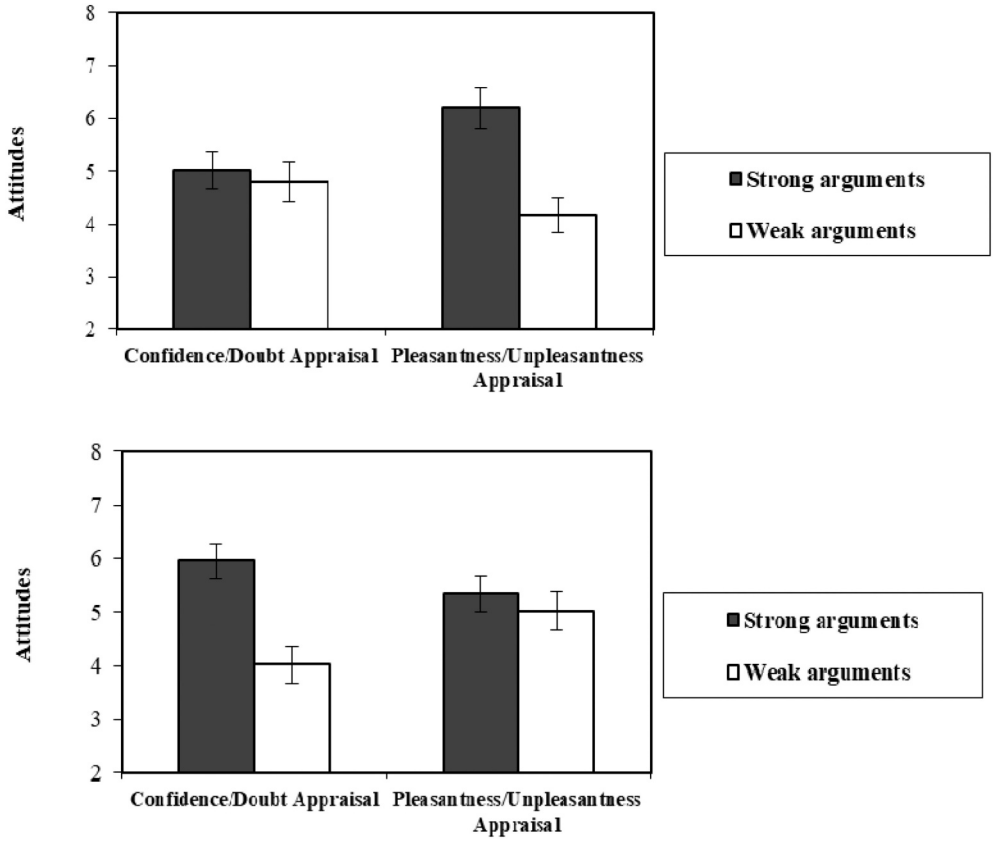

Fig. 2. Top panel: Attitudes as a function of Argument Quality and Appraisal Type in the Anger condition in Study 2. Bottom panel: Attitudes as a function of Argument Quality and Appraisal Type in the Awe condition in Study 2.

= 1.97), $F(1, 129) = 0.18$, $p = .68$, $\eta_p^2 = 0.001$.

For awe, the 2-way interaction between Argument Quality × Appraisal was also significant, but in the opposite direction, $F(1, 127) = 5.38$, $p = .02$, $\eta_p^2 = 0.04$, indicating that participants' attitudes were more reflective of the quality of the arguments when the appraisal of confidence/doubt was made salient than when the appraisal of pleasantness/unpleasantness was salient (Fig. 2, bottom panel). This interaction showed that participants in the confidence/doubt condition reported more favorable attitudes after reading the strong arguments message ($M = 5.96$, $SD = 1.85$) than after reading the weak arguments message ($M = 4.02$, $SD = 2.14$), $F(1, 127) = 16.47$, $p < .001$, $\eta_p^2 = 0.12$. In the pleasantness/ unpleasantness appraisal condition, there was no difference between those who read the strong arguments message ($M = 5.35$, $SD = 2.09$) and those who read the weak arguments message ($M = 5.02$, $SD = 1.79$), $F(1, 127) = 0.44$, $p = .51$, $\eta_p^2 = 0.003$.[8]

Thought Favorability. The thought valence index based on the external judge's ratings was also submitted to the same ANOVA. Results showed a significant main effect of Argument Quality on thought favorability, such that those in the strong arguments condition ($M = 0.33$, $SD = 0.74$) showed greater positivity in thought content toward the tax than did those in the weak arguments condition ($M = -0.39$, $SD = 0.59$), $F(1, 256) = 73.97$, $p < .001$, $\eta_p^2 = 0.22$. This finding shows that the manipulation of argument quality was successful. Also, an unexpected marginal main effect of Emotion on attitudes occurred, such that participants who felt awe generated more favorable thoughts ($M = 0.08$, $SD = 0.76$) than participants who felt anger ($M = -0.14$, $SD = 0.75$), $F(1, 256) = 3.27$, $p = .07$, $\eta_p^2 = 0.01$. No other significant main or interaction effects were obtained.

Mediation by Thought Favorability. In order to examine whether Thought Favorability mediated the effect of the key theorized interaction on attitudes, we conducted a mediated moderation test using bootstrapping methods (Muller, Judd, & Yzerbyt, 2005). We first constructed a new two-level Elaboration independent variable. Specifically, the high elaboration condition consisted of the angry participants in the pleasantness appraisal condition and the surprised participants in the confidence appraisal condition (i.e., those expected and shown to engage in relatively high thinking). The low elaboration condition consisted of the angry participants in the confidence appraisal condition and the surprised participants in the pleasantness appraisal condition (i.e., those expected and shown to engage in relatively low thinking). In this analysis, both Elaboration (i.e., high elaboration = −1, low elaboration = 1) and Argument Quality (i.e., weak arguments = −1, strong arguments = 1) were contrast coded, and Thought Favorability was mean-centered. In order to test the hypothesized mediation by Thought Favorability, we conducted a bias corrected bootstrapping procedure with 10,000 bootstrap re-samples using Hayes process macro (model 4) (Preacher & Hayes, 2004; Shrout & Bolger, 2002). In this analysis, Elaboration × Argument Quality was an independent variable, attitudes toward the proposed tax increase was a dependent variable, and Thought Favorability was a mediating variable (see Fig. 3). This approach includes procedures that compute a 95% confidence interval (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% confidence interval of the indirect effect (i.e., the path through the mediator) did not include zero (Indirect Effect a × b = −0.07, CI95% = from −0.14 to −0.01). Therefore, the mediation by elaboration (thought favorability) is supported as plausible (Shrout & Bolger, 2002).

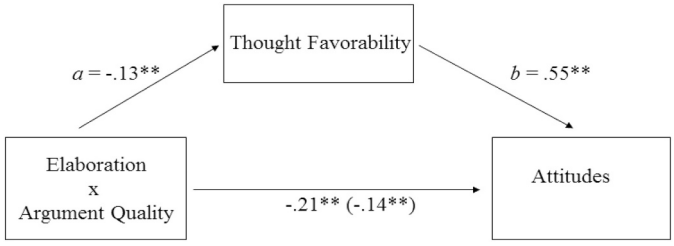

Fig. 3. Mediation model showing the effect of Elaboration conditions × Argument Quality, as mediated by Thought Favorability, on Attitudes in Study 2. Note: ** indicates $p < .005$. Figure in the parenthesis (i.e., −0.14) is the direct effect of Elaboration conditions × Argument Quality on Attitudes while accounting for the effect through the indirect path.

Attitude-Behavior-Correspondence. An important prediction for this experiment was that if high elaboration increases information processing, then it would be expected to enhance the extent to which attitudes predicted behaviors. To test this prediction about elaboration and attitude strength, we again used the two-level Elaboration independent variable just described. Then, we conducted a logistic binary regression analyses on signing the petition with Attitudes, Elaboration, the Elaboration × Attitudes interaction and the Attitudes × Elaboration × Appraisal Type interaction using the procedure suggested by Hayes (2013). In this procedure, Elaboration (i.e., high elaboration = −1, low elaboration = 1) and Appraisal Type (i.e., confidence = −1, pleassantness = 1) were contrast coded, Attitudes was mean-centered and Behavior (i.e., not signing = 0, signing = 1) was dummy coded. This logistic binary regression showed that attitudes predicted behavior overall, $B = 1.78$, $z(256) = 5.55$, $p < .0001$, CI [1.15 2.41]. More importantly, the Elaboration × Attitudes interaction was also significant, $B = -1.04$, $z(256) = -3.34$, $p < .001$, CI [−1.65–0.43]. As illustrated in Fig. 4, this interaction revealed that attitudes were a better predictor of submitting a signature in the high elaboration, $B = 2.56$, $z(256) = 5.38$, $p < .0001$, CI [1.63 3.49], than in the low elaboration conditions $B = 0.68$, $z(256) = 2.16$, $p = .03$, CI [0.06 1.30]. This was not further moderated by Appraisal Type, $B = 0.21$, $z(256) = 0.68$, $p = .50$. A separate analysis also showed that the effect was not moderated by Argument Quality, $B = -0.16$, $z(256) = -0.42$, $p = .68$. Importantly, the Elaboration × Attitudes interaction was significant when each emotion was analyzed separately. That is, the Elaboration × Attitudes interaction was signifiant for anger, $B = -0.37$, $z(129) = -1.96$, $p = .05$, CI [−0.74 0.00], and for awe, $B = -0.62$, $z(127) = -2.71$, $p < .01$, CI [−1.07–0.17].

7.3. Discussion

In this second study, we found again that the impact an emotion has on information processing is a function of appraisal. This was observed for anger, and also for a new pleasant emotion associated with doubt (awe). Taken together with the previous experiment, across two different countries (Experiment 1: Spain; Experiment 2: Greece) using different samples (Experiment 1: undergraduates in psychology; Experiment 2 undergaduates in business), we found that the same emotion can lead to a relatively higher or lower degree of elaboration depending on the appraisal that is salient. Specifically, when angry participants were focused on the pleasantness/unpleasantness appraisal, they processed information to a greater degree than when they were focused on the confidence/doubt appraisal of anger. This is consistent

[8] An alternative decomposition of this three-way interaction revealed that the pattern of results also varied as a function of the Appraisal Type manipulation. Among participants in the confidence appraisal condition, the Emotion × Argument Quality interaction was significant, $F(1, 127) = 6.24$, $p = .01$, $\eta_p^2 = 0.05$, indicating that participants processed the message less carefully when experiencing anger than awe. That is, attitudes were more reflective of the quality of the arguments when they felt awe than when they felt anger. In the pleasantness appraisal condition, a significant Emotion × Argument Quality interaction also emerged but revealed the opposite pattern, $F(1, 129) = 5.38$, $p = .02$, $\eta_p^2 = 0.04$, such that participants' processed the message more carefully when experiencing anger than awe. Attitudes were more reflective of the arguments contained in the message when they felt anger rather than when they felt awe. Finally, the Emotion × Appraisal Type interaction was not significant, $p = .87$, $\eta_p^2 < 0.001$.

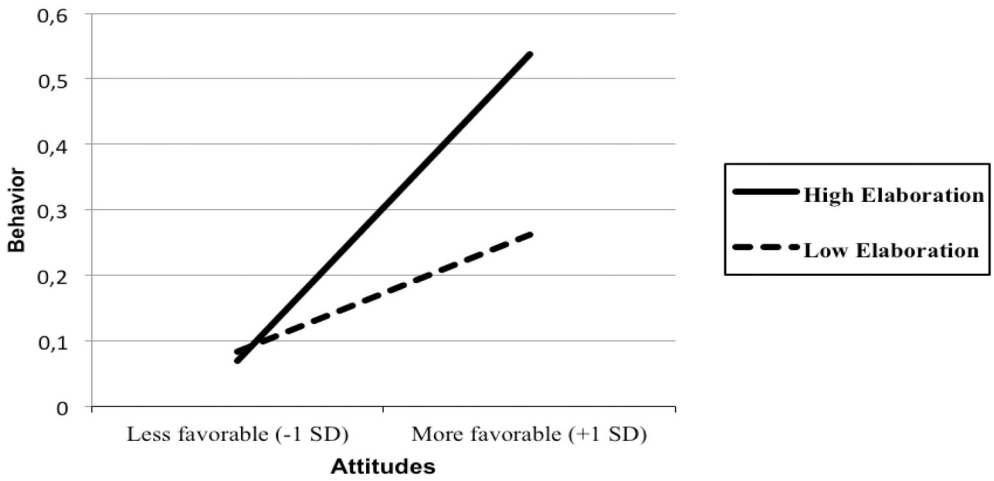

Fig. 4. Behavior as a function of Attitudes and Elaboration conditions in Study 2.

with the hypothesis that anger can lead to relatively high or low levels of information processing depending on the appraisal of the emotion that is momentarily salient. In contrast, when participants feeling awe focused on the pleasantness/unlpesantness appraisal of their emotion, there was a lower level of information processing compared to when they focused on the confidence/doubt appraisal of that emotion. In short, in both Studies 1 and 2, anger, surprise and awe led to greater or lesser degrees of information processing depending on whether people focused on the confidence or pleasantness appraisal of their emotion.

Moreover, we tested the underlying proposed mechanism by which the inductions affected attitudes through a mediation approach. Consistent with our hypothesis, Study 2 showed that the interaction of argument quality and elaboration conditions influenced attitudes by affecting the favorability of the thoughts generated. First, as intended, argument quality affected the direction of participants' thoughts. Also, in accord with our hypothesis, thought favorability mediated the effects of the interaction of argument quality and elaboration condition on attitudes. Specifically, argument quality had a larger effect on attitudes when people were in the high elaboration conditions than when they were in the low elaboration conditions and this relation was mediated by thought favorability.

Importantly, we also examined the ability of attitudes to predict behavior under the different elaboration conditions. Results showed that attitudes toward the proposed tax increase to fix highways predicted petition signing behavior more in conditions of high elaboration than in conditions of low elaboration. This finding is consistent with an Elaboration Likelihood Model interpretation in that attitudes based on careful thought should predict behavior better than those that are not based as much on thinking (Petty & Cacioppo, 1986).

The data from our studies so far provide clear support for an elaboration explanation of the emotion effects we observed when emotion was induced before message exposure. That is, when anger (or awe or surprise) is induced before a message is presented, it can affect how much thinking about that message occurs. And, we have seen that when anger comes before a message it can lead to relatively high or low degrees of message processing relative to surprise and awe depending on what appraisal of that emotion is salient. But what if anger or other emotions are induced *after* a message has already been processed? As noted earlier, prior research by Briñol et al. (2018) has shown that when emotions follow a message, they do not affect how much processing a message receives, but they affect how much people rely on the thoughts they have generated after processing the message. And, whether the emotion leads to relatively high or low degrees of thought reliance depends on what appraisal of the emotion is salient. When the confidence appraisal is salient, anger leads people to rely on their thoughts to a relatively high degree because anger is a confident emotion and people feel more sure of their thoughts. However, when the pleasantness appraisal is salient, anger leads people to rely on their thoughts to a relatively low degree because anger is an unpleasant emotion that leads people to dislike their thoughts. The opposite is true for emotions that are pleasant but uncertain such as surpise and awe. In order to demonstrate that the effect of emotions on attitudes is different because of the different mechanisms involved depending on whether the inductions precede (as in Experiments 1 and 2) or follow a persuasive message (as in Briñol et al., 2018), Study 3 manipulates the timing of the emotion and appraisal manipulations (for similar procedures, see Tormala et al., 2007).

8. Experiment 3

In this final experiment, we manipulated the timing of the emotion and appraisal inductions (i.e., before or after the persuasive message) to demonstrate the predicted consequences of both psychological processes postulated to stem from confidence/doubt and pleasantness/unpleasantness within the same experimental design. Because this study is primarily a methodological advance over our previous studies, we decided to use only one persuasive message composed exclusively of strong arguments to simplify the design. Thus, we exposed participants to the strong persuasive message in favor of comprehensive exams used in Study 1. As noted, this proposal was also used in Moon's and Mackie's Experiment (Moons & Mackie, 2007, Study 2) and stems from Petty and Cacioppo (1986). The message was presented either immediately before or after participants engaged in both emotion and appraisal manipulations.

We expected that when the emotion and appraisal inductions preceded the persuasive message, we would replicate our Studies 1 and 2. If an individual feeling anger was focused on the pleasantness/unpleasantness appraisal of the emotion, the message would be processed to a greater degree than if the focus was on the confidence/doubt appraisal of the emotion. That is, when the emotion precedes the message, the unpleasantness that accompanies anger would lead to more favorable attitudes than the confidence that accompanies anger because individuals may not like their current views and thus would be more interested in processing information they receive than when they feel confident about their views. In this case, enhanced processing of strong arguments in the unpleasantness salient condition would lead them to be more persuasive thus leading to more favorable attitudes than in the confidence salient condition. On the other hand, when the emotion and appraisal inductions followed the persuasive message, we expected to replicate the results by Briñol et al. (2018) and demonstrate that emotions affect thought reliance (i.e., the extent to which people use the thoughts previously generated; Petty, Briñol, & Tormala, 2002). That is,

when the emotion followed the message, we expected that participants feeling anger would use their thoughts more in the confidence/doubt appraisal condition than in the pleasantness/unpleasantness condition, because anger is associated with confidence and feeling confident following thought generation would lead to more thought use (I feel confident about my thoughts, so I will use them) than when the unpleasantness of the emotion was salient (I don't feel good about my thoughts, so I will not use them). When thoughts are favorable as they would be to strong arguments, more thought use in the confidence salient condition would result in more favorable attitudes than in the unpleasantness salient condition.

The opposite pattern of results was hypothesized for surprise. Again, a replication of Study 1 was expected when emotion and appraisal inductions preceded the persuasive message and a replication of the results of Briñol et al. (2018) was expected when the inductions followed the message. Specifically, when emotion and appraisal inductions preceded the message and an individual feeling surprise was focused on the pleasantness/unpleasantness appraisal of the emotion, it would lead to a relatively lower level of processing compared to if she focuses on the confidence/doubt appraisal of that emotion. In this case, individuals in the pleasantness/unpleasantness (vs. confidence/doubt) condition were expected to process strong arguments to a lesser degree and would thus form less favorable attitudes. In contrast, when the emotion and appraisal inductions followed the persuasive message, we expected that participants feeling surprise when in the pleasantness/unpleasantness appraisal condition would use their thoughts to a greater degree than those in the confidence/doubt condition, because surprise is relatively positive emotion and feeling good following thought generation (i.e., when focused on the pleasantness appraisal) would lead to more thought use (I feel good about my thoughts, so I will use them; Briñol, Petty, & Barden, 2007; Paredes, Stavraki, Briñol, & Petty, 2013) than when feeling doubt (i.e., when focused on the confidence appraisal; I am not sure of my thoughts, so I will not use them). In short, we expected a three-way interaction of Emotion, Appraisal Type, and Timing of the inductions on attitudes.

8.1. Method

8.1.1. Participants and design

Participants were 191 psychology undergraduate students at a public university in Spain. Students were randomly assigned to the cells of a 2 (Emotion: Anger vs. Surprise) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Timing: Before vs. After the persuasive message) between-subjects factorial design. All participants received a strong message designed to elicit mostly favorable thoughts. The predicted three-way interaction between timing, emotion, and appraisal just outlined is a novel prediction for which there is no prior precedent in the literature on emotions. Therefore, sample size was calculated using the same procedure as in Experiment 1 – that is to say based on the number of participants who could be collected from the start of the study until the end of the academic quarter. We anticipated that the final sample would contain at least 25 people per condition (resulting in a total of 200 participants). Ultimately, we ended up with a number very close to that initial estimate. No participants were excluded and all measures and manipulations are reported. In a sensitivity power analisis, the sample size obtained allow an interaction effect of $f =$. 20 ($\eta_p^2 = 0.04$) to be detected with 0.8 power according to G*power.

8.1.2. Procedure

Upon arrival, participants were told, as in our previous studies, that they were going to be involved in two separate projects. For half of the participants, the persuasive message was presented immediately after they engaged in the emotion and appraisal manipulations, and for the other half, the message was presented right before the emotion and appraisal manipulations. In both cases, the impact of the message on participants' attitudes toward the message was assessed. As in Experiment 1, for the emotion manipulation, participants were told that this study was about the way people remember past personal episodes and they were asked to write about personal experiences in which they felt either anger or surprise. After writing the emotion-induction essays, participants were told that in order to bring all participants back to the same baseline, they would have to answer a few questions. The questions asked were related to either pleasantness/ unpleasantness or to confidence/doubt. Similar to Experiments 1 and 2, this task served as the Appraisal Type manipulation. Participants read a proposal about the implementation of comprehensive exams that contained only strong arguments either before or after the emotion and appraisal inductions, depending on the timing condition to which they were randomly assigned. After reporting their attitudes, participants were debriefed, thanked, and dismissed.

8.1.3. Independent variables

Emotion. As in Experiments 1 and 2, participants were asked to write a short essay describing a recent personal experience related to anger or surprise. Participants could take as long as they needed and stop whenever they wanted when writing.

Appraisal Type. The appraisal induction was the same as in Experiments 1 and 2. Participants were asked to respond to questions containing words either related to pleasantness/unpleasantness (e.g., How pleasant did the emotional experience make you feel; Pleasantness Appraisal Type) or words related to confidence/doubt (e.g., How confident did the emotional experience make you feel; Confidence Appraisal Type).[9]

Timing. Half of the participants received the emotion and appraisal inductions before receiving the message (as in Experiments 1 and 2), whereas the other half engaged in the same inductions just after processing the message. Thus, participants received the proposal about the implementation of comprehensive exams containing strong arguments before or after receiving the emotion and appraisal manipulations.

8.1.4. Dependent measure: Attitudes

The dependent measure was participants' attitude toward the proposal. Participants were asked to report their attitudes toward the implementation of comprehensive exams on the same series of three 9-point (1–9) semantic differential scales (i.e. good-bad, like-dislike, in favor-against) used in the previous studies. Ratings on these items were highly intercorrelated ($\alpha = 0.90$), so they were averaged to form one overall attitude index.

8.2. Results

Results of a 2 (Emotion: Anger vs. Surprise) × 2 (Appraisal Type: Confidence vs. Pleasantness) × 2 (Timing: Before vs. After the message) ANOVA on attitudes revealed the hypothesized three-way interaction among the independent variables, $F(1, 183) = 21.37$, $p < .001$, $\eta_p^2 = 0.11$. In order to test our differential appraisals hypothesis, we analyzed each emotion separately to check our prediction that there will be a Timing × Appraisal interaction on attitudes for each of the emotions tested.

As expected, within anger, the Timing × Appraisal interaction was significant, $F(1, 91) = 8.57$, $p = .004$, $\eta_p^2 = 0.09$ (Fig. 5, top panel). This interaction showed that for participants who received the emotion induction before the message, attitudes tended to be more positive in the pleasantness/unpleasantness appraisal condition ($M = 5.80$, $SD = 1.40$) than in the confidence/doubt appraisal condition ($M = 4.94$, $SD = 1.81$), $F(1, 91) = 3.09$, $p = .082$, $\eta_p^2 = 0.03$, as would be expected if the unpleasantness from anger led to relatively higher levels of processing of

[9] Participants in the confidence/doubt appraisal condition provided a Mean = 7.67 ($SD = 1.39$) and participants in the pleasantness/unpleasantness condition provided a Mean = 5.67 ($SD = 2.59$).

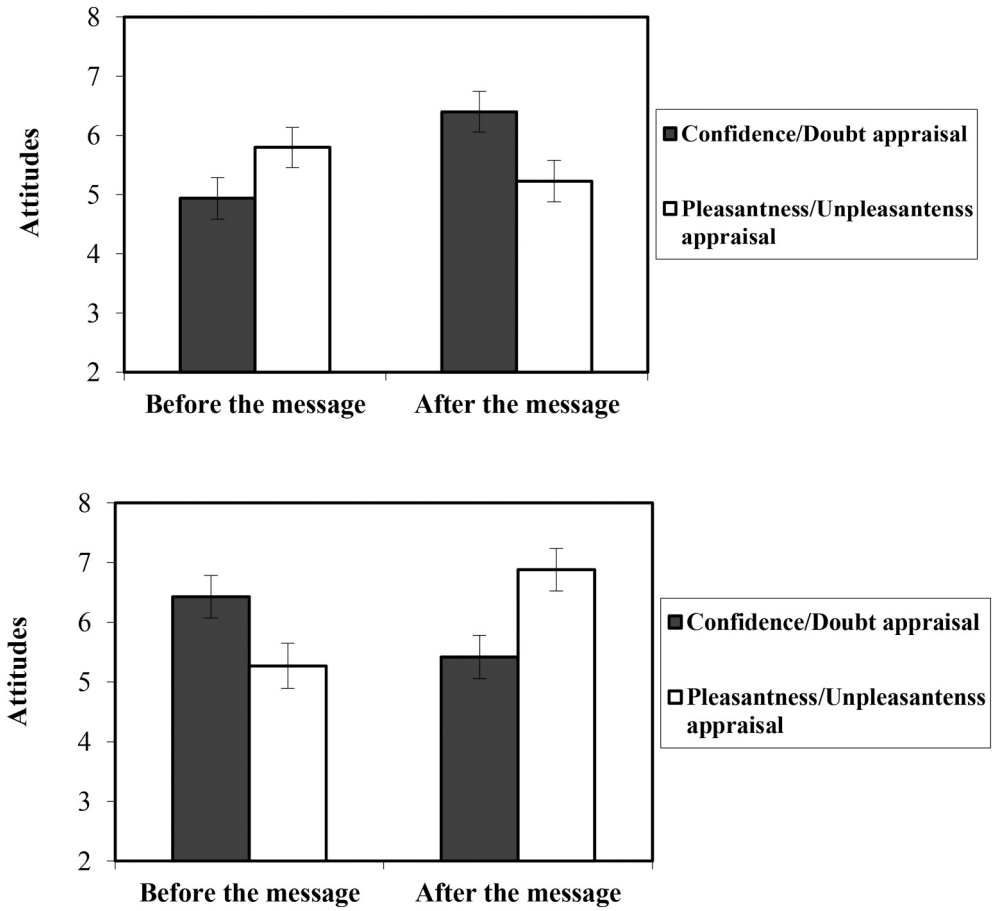

Fig. 5. Top panel: Attitudes as a function of Timing and Appraisal Type in the Anger condition in Study 3. Bottom panel: Attitudes as a function of Timing and Appraisal Type in the Surprise condition in Study 3.

the strong arguments relative to the confidence experienced in confidence/doubt appraisal condition. In contrast, for participants who received the emotion induction after the message, attitudes were less positive in the pleasantness/ unpleasantness appraisal condition (M = 5.23, SD = 1.62) than in the confidence/doubt appraisal condition (M = 6.40, SD = 1.91), $F(1, 91) = 5.65$, $p = .020$, $\eta_p^2 = 0.06$, as would be expected if the unpleasantness from anger reduced reliance on the positive thoughts to the strong arguments relative to the confidence experienced in confidence/doubt appraisal condition.

For the emotion of surprise, the 2-way interaction between Timing × Appraisal was also significant, but in the opposite direction, $F(1, 92) = 12.95$, $p = .001$, $\eta_p^2 = 0.12$ (Fig. 5, bottom panel). As expected, this interaction showed that for participants who received the emotion induction before the message, attitudes were more positive in the confidence/doubt appraisal condition (M = 6.43, SD = 1.61) than in the pleasantness/unpleasantness appraisal condition (M = 5.27, SD = 1.95), $F(1, 92) = 4.92$, $p = .029$, $\eta_p^2 = 0.05$, as would be expected if the doubt from surprise led to relatively higher levels of processing of the strong arguments relative to the pleasantness experienced in the pleasantness/ unpleasantness appraisal condition. In contrast, for participants who received the emotion induction after the message, attitudes were more positive in the pleasantness/unpleasantness appraisal condition (M = 6.88, SD = 1.46) than in the confidence/doubt appraisal condition (M = 5.42, SD = 2.07), $F(1, 92) = 8.29$, $p = .005$, $\eta_p^2 = 0.08$, as would be expected if the pleasantness from surprise increased reliance on the positive thoughts to the strong arguments relative to the doubt experienced in the confidence/doubt appraisal condition.

8.3. Discussion

The results of this experiment confirm that emotions can have different (and opposite) effects in persuasive settings, depending on when the manipulation is introduced as well as the appraisal that is salient. When anger preceded the persuasive message and participants focused on the pleasantness/unpleasantness appraisal, anger affected attitudes as would be expected if it led to a relatively high level of information processing compared to participants who were focused on the confidence/doubt appraisal of anger. Thus, these participants had more positive attitudes toward the issue since high levels of processing of strong arguments should lead to more persuasion. In contrast, when anger followed the persuasive message, and participants focused on the pleasantness/unpleasantness appraisal, anger led to less positive attitudes compared to participants focused on the confidence/doubt appraisal, as would be expected if anger produced less use of their positive thoughts to the strong arguments due to anger feeling unpleasant (affective invalidation; see Briñol et al., 2018) as well as due to the confidence that accompanies anger in the confidence/doubt appraisal condition (cognitive validation).

Conversely, when surprise preceded the message and participants focused on the pleasantness/unpleasantness appraisal of their emotions, surprise affected attitudes as would be expected if it led to a relatively low level of information processing compared to participants who were focused on the confidence/doubt appraisal, resulting in less positive attitudes toward the issue since low levels of processing of strong arguments should lead to less persusion. In contrast, when surprise followed the message and participants focused on the pleasantness/ unpleasantness appraisal of their emotions, surprise led to more positive

attitudes compared to participants focuced on the confidence/doubt appraisal as would be expected if surprise produced more use of their positive thoughts due to the association between surprise and pleasantness in the pleasantness appraisal condition (affective validation; Briñol et al., 2018) as well as doubt in the confidence/doubt appraisal condition (cognitive invalidation).

9. General discussion

Prior research had clearly shown that anger could influence persuasion by either increasing (Moons & Mackie, 2007) or decreasing (Tiedens & Linton, 2001) information processing. In the present research, based on the *differential appraisals hypothesis* (Briñol et al., 2018), we argue that anger as well as other emotions, such as surprise and awe are all capable of showing relative high or low levels of information processing depending on the appraisal that is highlighted within each of these emotions. In the pleasantness/ unpleasantness appraisal conditions of the current studies, participants were induced to focus primarily on how good or bad they felt, whereas in the confidence/doubt appraisal conditions, participants were induced to focus instead on how sure or doubltful they felt. Importantly, the present studies demonstrate that not only can the same emotion influence processing and persuasion as a function of appraisals but also that varying appraisals within the same emotion can lead to additional consequences. Specifically, this research reveals that different appraisals within a single emotion can influence attitude strength (as indicated by attitude-behavior correspondence).

As noted earlier, the differential appraisals hypothesis is consistent with the Appraisal Tendency Framework (ATF, Lerner & Keltner, 2000, 2001) in showing that different emotions can have different effects on information processing and judgment depending on the cognitive predisposition triggered by the dominant appraisals of the emotions (Lerner et al., 2015). Beyond this framework that focuses on comparing different emotions, the present findings highlight that the processing effects invoked by appraisals can be relevant even when varied within the same emotion. As noted, the present results also show that the impact of appraisals within the same emotion can go beyond information processing and judgment, affecting also strength features such as attitude-behavior correspondance.

Across studies, the results showed that that when angry individuals focused on the pleasantness appraisal (that is, they assessed their emotion in relation to the pleasantness/unpleasantness dimension), then the negative feelings coming from this emotion made people process the message to a relatively high degree consistent with prior research showing that negative (versus positive) moods put people in a problem solving mindset and enhance message processing (e.g., Clore et al., 2001; Schwarz & Bless, 1991; Schwarz, Bless & Bohner, 1991). When, however, angry individuals instead focused on the confidence appraisal of this emotion (that is, they assessed their emotion in relation to the confidence/doubt dimension), then the confident feelings coming from this emotion induced a relatively low level of processing, consistent with prior research showing that confident (versus uncertain) feelings lead to reduced information processing (e.g., Briñol, Petty, Gallardo, & DeMarree, 2007; Briñol, Petty, Valle, et al., 2007; Lerner & Keltner, 2001; Tiedens & Linton, 2001).

Finally, in Study 3 we showed that the information processing effects of anger (and surprise and awe) are confined to situations in which the emotion precedes the message. When the emotion follows the message, it cannot affect how much processing the message receives. Instead, the emotion affects how much thoughts that have already been generated to the message are used in forming judgments.

In sum, we showed that emotions have different effects on information processing depending on the appraisal that is momentarily salient, and influence attitude change through different psychological processes depending on whether they precede or follow a persuasive proposal. These effects of emotion on information processing were demonstrated by examining different emotions, using different emotion inductions, and different persuasion topics. Moreover, we showed that the impact of emotion on attitudes in the pre-message conditions was mediated by thought favorability. Furthermore, we also showed that attitudes are more predictive of behaviors (i.e., signing a petition) when emotions led elaboration to be high (i.e., when anger was assessed in the appraisal of pleasantness/unpleasantness and awe in the appraisal of confidence/doubt) than when elaboration was low (i.e., when anger was assessed in the confidence/doubt appraisal and awe in the pleasantness/unpleasantness appraisal). Finally, these results are supported independently of the nationality of the sample (Spain, Greece), the type of inductions used to manipulate emotion (generate instances versus film clips), and regardless of the persuasive topic (senior comprehensive exams, job candidate, road tax).

Thus, a key feature of the present research is the idea that the effects of emotions depend on what appraisal dominates. Therefore, our contribution focuses on the consequences (rather than the antecedents) of appraisals of emotion, and especially on the consequences for information processing and persuasion (rather than the consequences for the experience of emotion). This idea brings an important innovation to the literature on emotion because most prior work has focused on how appraisals lead people to experience different emotions, and to feel different levels of intensity within the same emotion. For example, prior research has shown that different appraisals can influence the extent to which people experience the same emotion. Winterich, Han, and Lerner (2010) showed that people experienced more or less anger depending on whether they were primed with a high agency appraisal (the self) or a relatively low agency appraisal (the situation), respectively (see also Keltner et al., 1993; Roseman & Evdokas, 2004). In the current research, instead of different appraisals leading to different emotional experiences, activated appraisals did not change emotions. Instead, appraisals were found to change whether the very same emotion was associated with a relatively high or low degree of processing of a persuasive message. Importantly, the current research contributes to the literature on appraisal theories of emotion by showing that the same emotion can operate through different appraisals within the same experimental design leading to opposite elaboration and judgmental consequences.

In addition to the contribution of the current research to the study of anger, surprise and awe, our approach makes similar predictions for other emotions for which these appraisls are dissociated (hope vs. helplessness, curiosity vs. boredom, forgiveness vs. revenge, pride vs. embarrassment, compassion vs. resentment). Finally, the present research provides a deeper understanding on the effect of emotions on cognitive and meta-cognitive processes. Recent research has shown that anger can produce opposite effects on persuasion by a completely different process. Specifically, Briñol et al. (2018) showed that anger leads to opposite argument quality effects on attitudes when anger follows rather than precedes the generation of thoughts. When people feeling anger (vs. surprise or awe) focused on the pleasantness/unpleasantness appraisal, they felt bad about the thoughts they had in mind and thus did not use them to form attitudes. In this case, the argument quality effect on attitudes was not so prominent. In contrast, when people feeling anger (vs. surprise or awe) focused on the confidence/doubt of their emotion, they used the thoughts they had in mind to form attitudes and thus had more favorable attitudes after reading a strong than a weak message. In these studies on thought use, the emotions always followed the persuasive message and we argue that this order of events is critical for these validation effects to emerge. Therefore, in Experiment 3 of the current set of studies we manipulated that variable (timing) to reconcile past research (Briñol et al., 2018) with the current research. As predicted, the results from Experiment 3 revealed that whether emotions affect attitudes by influencing the generation of thoughts (elaboration) or the use of previously generated thoughts (validation) depended on whether the emotion preceded or followed the persuasive proposal. In other words, when emotions follow a persuasive proposal, anger (vs. surprise and awe), instead of affecting the extent of

elaboration, impacted people's use of their own thoughts (Briñol, Petty, & Barden, 2007; Clore & Huntsinger, 2007; Huntsinger, 2013; Huntsinger, Isbell, & Clore, 2014).

In closing, we note that some scholars might wonder if the impact of appraisals on how emotions affect information processing is mostly due to the pleasantness/unpleasantness appraisal or to the confidence/doubt appraisal. For example, when the pleasantness appraisl of anger leads to more information processing than the confidence appraisal, is this because the pleasantness appraisal is producing more processing than a no-appraisal control or whether the confidence appraisal is leading to less processing than a no-appraisal control. Having a control group that is not primed to make a particular appraisal could potentially address this issue. However, if no appraisal was primed, participants would presumably naturally make one appraisal or the other. Thus, if most people naturally made a pleasantness appraisal in the control condition, then only the confidence prime group would produce a difference from the control. However, if most people naturally made a confidence appraisal in the control condition, then only the pleasantness appraisal condition would differ from the control. To produce a control that fell precisely in-between our appraisal inductions would require testing an emotion or situation where people were naturally balanced in their default appraisals. In our view, identifying whether pleasantness or confidence primes produce stronger effects compared to a control is not as critical as showing that the same emotions can indeed have different effects on information processing and attitudes depending on the appraisals that are salient.

Similarly, some scholars might wonder whether the effects obtained in this research are attributable mostly to the manner in which anger affects information processing or to how surprise and awe influence the extent to which people process new information, or a combination of both. Having a control group with a neutral emotion would contribute to making more precise statements, but as was the case with the appraisals, this too is not critical for our conceptual contribution. That is, identifying which side of the anger-surprise (or awe) is relatively more likely to be responsible for the processing effects is not as informative as showing that these divergent emotions can have opposite effects on processing and attitudes depending on the appraisals that are salient.

Open Science: All data and materials are available at the OSF platform: https://doi.org/10.17605/OSF.IO/XBSFP

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