The influence of physical attractiveness on attitude confidence and resistance to change

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ABSTRACT

It is well established that the physical attractiveness of the source of a message can influence recipients' attitudes about the message proposal. The current research is the first to examine if attractiveness is also capable of affecting attitude confidence and resistance to change. Experiment 1 revealed that an attractive source decreased recipients' attitude confidence, even when it did not affect attitudes. Experiment 2 replicated this novel finding and identified a critical condition under which this effect is more likely to occur. Specifically, attractiveness only reduced attitude confidence when it was unrelated to the merits of the persuasive proposal. This moderation by message relevance suggests that people can correct the confidence in their judgment for inappropriate sources of bias. Experiment 3 specified the conditions under which correction is more likely to take place on attitudes and on attitude confidence. Specifically, correction for source attractiveness on attitudes required an explicit correction instruction but correction on attitude confidence occurred regardless of the instruction. Finally, Experiment 4 demonstrated that the effect of attractiveness in reducing attitude confidence is consequential by making attitudes less resistant to change when facing counter-attitudinal information. Taken together, the present research demonstrated that attractiveness can reduce attitude confidence as well as undermine subsequent resistance to counter-attitudinal messages, but only when attractiveness was viewed as an unwanted biasing factor (i.e., the message topic was unrelated to attractiveness).

1. Introduction

Extensive research in the field of attitudes and persuasion has demonstrated that the physical attractiveness of the source of a message can influence attitudes (e.g., see Petty & Wegener, 1998, for a review). In the present research, we examine for the first time whether source attractiveness can influence not only attitudes but also attitude confidence. Examining changes in attitude confidence is important because attitudes held with more confidence are more impactful in guiding behavior, are more likely to persist over time and to resist change (Rucker, Tormala, Petty, & Briñol, 2014).

1.1. Source attractiveness and attitude change

A wealth of research has examined the effects of message sources on attitudes and persuasion (Hovland, Janis, & Kelley, 1953; Kelman, 1958; see Briñol & Petty, 2009, for a review). Most of this research has

focused on the persuasive effects of source credibility, similarity, status, and power (Chaiken, 1980; Chaiken & Maheswaran, 1994; Kruglanski et al., 2005; Martin & Hewstone, 2008; Moscovici, 1980; Mugny & Perez, 1991; Priester & Petty, 1995; Tormala, Briñol, & Petty, 2006; Wood, Lundgren, Quellette, Busceme, & Blackstone, 1994; Ziegler, Diehl, & Ruther, 2002). Although relatively less studied, physical attractiveness of the source has also proven to be an important determinant of persuasion (DeBono & Harnish, 1988; Puckett, Petty, Cacioppo, & Fischer, 1983; see Guyer, Briñol, Petty, & Horcajo, 2019, for a recent review).

In general, relative to unattractive sources, attractive sources tend to generate more persuasion. The influence of source physical attractiveness, as well as other characteristics of the source of a message, can influence recipients' attitudes through each of the fundamental psychological processes of change identified by the Elaboration Likelihood Model (ELM) of persuasion (Petty & Briñol, 2012; Petty & Cacioppo, 1986; Petty & Wegener, 1999). According to this framework, variables

such as physical attractiveness can influence attitudes by one of the following processes depending on the situation: (1) determining the amount of issue-relevant thinking that occurs, (2) serving as a simple cues, (3) biasing the thinking that occurs, (4) being examined as an argument, and (5) by affecting what people think about their thoughts (i.e., meta-cognition; Petty, Briñol, & Tormala, 2002).

For example, when *no constraints* are placed on a person's ability and/or motivation to think, attractive sources can reduce (e.g., Dipboye, Arvey, & Terpstra, 1977; Pallak, 1983; Watkins & Johnston, 2000) or increase (Puckett et al., 1983) careful processing of a message under different circumstances and thereby influence attitudes. Under conditions that are not conducive to careful thinking (e.g., distraction, low-involvement, low relevance/responsibility, etc.) and/or for individuals who do not enjoy cognitively demanding tasks (i.e., low need for cognition; Cacioppo & Petty, 1982), attractiveness has been shown to influence attitudes by acting as a relatively simple acceptance or rejection cue (Haugtvedt, Petty, Cacioppo, & Steidley, 1988). Beyond affecting the amount of processing when thinking is not constrained to be either high or low, or serving as cue under low thinking conditions, source attractiveness can also play other roles under different circumstances. For example, when a person is able and motivated to carefully consider the merits of an issue (i.e., high-thinking), source attractiveness can bias the valence/direction of thoughts people generate in response to a persuasive message (Ziegler, von Schwichow, & Diehl, 2005). Under high-thinking conditions, source attractiveness can also serve as an issue-relevant argument when it is diagnostic of the merits of the attitude object under consideration (Petty & Cacioppo, 1981). Finally, more recent research has shown that the effects of attractiveness on persuasion can also occur through the meta-cognitive process of thought validation, making people rely on their thought more when they are the kind of person who values attractiveness (Evans & Clark, 2012).

In addition to this extensive body of research showing the multiple processes by which source attractiveness can influence attitudes, evidence has also revealed that sometimes people believe that their attitudes have been biased or inappropriately influenced by a feature of the source. If people believe that their thoughts have been biased or in some way inappropriately influenced by a feature of the source such as attractiveness, and they do not want this to occur, they can adjust their judgments in a direction opposite to the perceived bias (i.e., a correction effect; Petty, Wegener, & White, 1998; Wegener & Petty, 1995). People can believe attractiveness has served as a biasing factor for several reasons (e.g., the source served as an irrelevant peripheral cue; the source biased their thoughts to favor the message). These corrections can occur in different directions depending on recipients' naïve theories of how the biasing event or stimulus (e.g., an attractive source) is likely to have influenced their thoughts. When people are motivated and able to correct, theory-based corrections can lead to reversals of typical persuasion effects (e.g., an unattractive source is more persuasive than an attractive source if a person "overcorrects" for the presumed source influence. Importantly, meta-cognitive processes of correction are more likely to operate when thinking is relatively high because it is only in such situations that people have the motivation and ability to assess the accuracy of their judgments (Petty, Briñol, Tormala, & Wegener, 2007).

In one example of correction, Wegener and Petty (1995) tested the extent to which people corrected for attractiveness when its potential biasing influence was made salient. In this study, participants were asked to rate the quality of two products endorsed by attractive celebrities. Prior to this rating, they were either instructed to try to ignore the influence of the attractiveness of the source on their answers or received no instruction. The results indicated that when instructed to correct, the attractive source led to less favorable ratings of the product than when participants did not receive any instructions, consistent with a correction for the presumed biasing effect of attractiveness. In a subsequent study, Petty et al. (1998) showed that people corrected their

judgments for source likeability when instructed to do so regardless of whether source likeability had an initial impact on attitudes. That is, when people were not thinking carefully, source likeability had a positive impact on attitudes when there was no instruction to correct, but this simple source cue did not affect attitudes when thinking was high, consistent with prior work on the impact of peripheral cues (e.g., Petty, Cacioppo & Goldman, 1981). Nonetheless, when participants were instructed to correct their judgments for a possible bias, they did so regardless of whether source likeability did or did not have an initial impact on attitudes.

1.2. Attitude confidence

A common feature of prior work on source physical attractiveness was that its effect was often assessed on measures of attitude favorability (e.g., good-bad, like-dislike, etc.). Importantly, research has identified dimensions of attitudes beyond favorability that are also consequential. For instance, a burgeoning literature on attitude strength (Petty & Krosnick, 1995) has revealed that attitudes subjectively held with greater confidence are stronger (more persistent over time, resistant to change, and predictive of behavior) than attitudes held with doubt (e.g., see Fabrigar, MacDonald, & Wegener, 2005; Fazio & Roskos-Ewoldsen, 2005; Rucker et al., 2014; Visser, Bizer, & Krosnick, 2006, for reviews). Attitude certainty refers to the subjective sense of confidence or conviction one has about an attitude, i.e., a metacognitive assessment of one's attitude (Gross, Holtz, & Miller, 1995; Petrocelli, Tormala, & Rucker, 2007; Tormala & Rucker, 2007).[1]

Although attitude confidence has proven to be quite important in the persuasion literature, it has also been shown to be rather malleable. For example, previous research suggests that attitude confidence can be sensitive to the influence of source factors, even when no effects on attitudes are observed. For example, Tormala and Petty (2004) showed that when participants were led to believe they resisted being persuaded by a high rather than a low credibility source, their attitudes toward the topic were unaffected, but their attitude certainty increased (see also Clarkson, Tormala, & Rucker, 2008). However, as previously noted, research has yet to explore the interplay between physical attractiveness and attitude confidence. Thus, we sought to address this gap in the literature by exploring the effect and direction of the influence of source physical attractiveness on attitudes and attitude confidence. Moreover, we also strove to demonstrate a consequence of this attitude confidence in terms of resistance to attitude change.

1.3. The effect of source factors on attitude confidence

Studying the effects of source factors on attitude confidence is important because more confidently held attitudes are stronger. As already noted, attitudes held with high confidence are more likely to persist over time (e.g., Bizer, Tormala, Rucker, & Petty, 2006; Luttrell, Petty, & Briñol, 2016) to resist persuasive attacks (Bassili, 1996) and to predict thinking and behavior (see Petty & Krosnick, 1995).

As also noted previously, attitude confidence is sensitive to the influence of source factors such as credibility. In addition to credibility, the numerical status of a source can affect attitude confidence. Tormala, DeSensi, and Petty (2007) found a relationship between the numerical status of the source and attitude confidence toward a particular policy. In this study, learning that a large majority (vs. a small minority) of students on campus supported a policy was associated with more attitude confidence. This research revealed that derogating a message proposal simply because the source is in the minority is perceived to be

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[1] When describing attitude confidence, researchers sometimes have used synonymous terms and measures such as attitude certainty, validity, or correctness. In our studies, we focus our attention on *attitude confidence,* though the synonymous measures should produce similar results.

an illegitimate thing to do. Therefore, when people resisted changing their attitudes for that reason, their attitudes remained intact but they felt less certain about the attitude because they perceived that they had resisted change for an illegitimate reason (see Rucker et al., 2014, for further discussion of legitimacy and certainty).

As these examples illustrate, previous research on changes in attitude confidence have focused on source factors associated with validity, such as credibility and majority status. Instead of focusing on these factors informative of validity, the present research focuses on physical attractiveness. Contrary to the credibility or the numerical status of the source, attractiveness is often (but not always) unrelated to the merits of persuasive proposals (e.g., Petty & Cacioppo, 1981). Therefore, the effects of source attractiveness on attitudes and attitude confidence might depend on whether people perceive that source of information as valid.

2. Overview of the present research

As described, prior research investigating the effects of source factors on persuasion has focused not only on how features of the source of a message can influence attitudes but also attitude confidence. So far, the bulk of this research has focused on examining source variables such as credibility and majority/minority status. In the present work, we focus on physical attractiveness. At present, it is unclear whether physical attractiveness is capable of affecting attitude confidence, and if so, in what direction, and with what consequences. Here we explore whether and when physical attractiveness influences attitudes and attitude confidence.

Experiment 1 provides an initial exploration of the influence of source physical attractiveness on recipients' attitudes and attitude confidence by comparing different levels of physical attractiveness with a control condition. Experiment 2 focuses on replicating the effects obtained in the first study and exploring a moderator of that effect. Experiment 3 focus on specifying the conditions under which correction is more or less likely to take place on attitudes and attitude confidence. Finally, Experiment 4 tests whether the effect obtained on attitude confidence is consequential in terms of attitude resistance. Importantly, all measures, manipulations, and exclusions were reported in each study.

3. Experiment 1

The purpose of the first experiment was to provide an initial exploration of the influence of source physical attractiveness on message recipients' attitudes and attitude confidence. Participants were asked to read a message about a topic unrelated to attractiveness that presented a set of arguments advocating why children should not possess cell phones. Participants first read the message and were then presented with information about the source of the message. The critical manipulation exposed participants to one of three conditions: a picture of an unattractive source, no source (control condition), or a picture of an attractive source. Finally, participants reported their attitudes about the proposal and their confidence in those attitudes. As noted, our primary goal was to explore whether there was an effect of attractiveness on attitudes and attitude confidence and if so, in what direction.

3.1. Method

3.1.1. Participants and design

Ninety Amazon.com's *Mechanical Turk* workers (M_{age} = 29.6, 50.0% male) received $1.00 to complete this study designed to collect their opinions about different topics. Participants were randomly assigned to one of three experimental conditions: unattractive facial picture vs. no picture vs. attractive facial picture. A power analysis was conducted using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). In the absence of previous research examining the impact of attractiveness on attitude

confidence, we combined a generic overall medium effect size (f = 0.25; Cohen, 1988) with previous evidence of the direct role of attractiveness on attitudes (f = 0.45; Till & Busler, 2000). This study used a similar manipulation of physical attractiveness (e.g., close-up picture of a face with different levels of enhancement in attractiveness). The results of the power analysis on the estimated effect size (f = 0.34) indicated that the desired sample size for the one-way analysis with 3 groups with 0.80 power, was *N* = 87 participants. We performed a sensitivity power analysis (Faul et al., 2007) assuming an alpha significance criterion of 0.05. With a sample of ninety participants, the analysis had 80% power to detect a minimum effect size of f = 0.33.

3.1.2. Procedure

Participants were told that they would be required to read a message advocating against children owning a cell phone. Participants first read a message where the author presented six arguments of why children should not possess a cell phone (e.g. "*Conversation takes practice, dependence on electronic devices interferes with social interactions*"). Then, they were exposed either to an unattractive or attractive color photograph of the face of the author of the message or a blank space. After this manipulation, participants reported their attitudes toward the proposal and the degree of confidence in those attitudes. Finally, participants were thanked and debriefed.

3.1.3. Independent variables

3.1.3.1. Physical attractiveness of the source. There were three experimental groups varying the source of the message: unattractive source, attractive source, and no-face. In the unattractive and attractive source conditions, participants were exposed to a picture of a female face. These faces were selected from a larger set of faces previously evaluated in physical attractiveness using a 7-point scale (very unattractive - very attractive; Mello & Loureiro, 2015). We select the two female faces most discrepant in attractiveness. The unattractive source was rated as low in attractiveness (M = 1.71, SD = 0.98) and the attractive source was rated as high in attractiveness (M = 5.28, SD = 0.90), $t(43)$ = 19.96, p < .001. The no-pictureface condition did not provide participants with any information about the source and therefore served as a control condition. We conducted a separate study to pilot test these photographs to address other potential features that could have been confounded with the attractiveness of the faces. In this pilot testing, 45 participants (M_{age} = 28.6, 67.4% male) were randomly assigned to see either the selected attractive or the unattractive face. After exposure to one picture or the other, participants were asked to provide ratings on the following four dimensions: attractive, likable, powerful, and credible (1 = Not at all; 7 = Extremely). As expected, participants perceived the attractive source to be more attractive (M = 4.44, SD = 0.75) than the unattractive source (M = 3.91, SD = 0.86), $t(43)$ = −2.28, p = .028. Importantly, no significant differences were found for the ratings of likeability ($t(43)$ = −1.42, p = .163), power (t (43) = −1.57, p = .124), and credibility (t (43) = −0.96, p = .341).

3.1.4. Dependent variables

3.1.4.1. Attitudes toward the message. Participant's attitudes toward the topic were assessed with one item "*What is your opinion about children owning a cell phone?*" on a 7-point scale (1 = against; 7 = in favor). This single item is identical to the one used by Petrocelli et al. (2007) to assess attitudes. In this prior research, the authors also tested the impact of a persuasive treatment on both attitudes and attitude confidence (for another example, see also, Briñol, Petty, Stavraki, Lamprinakos, Wagner et al., 2018). Responses to this item were scored such that higher values indicated more agreement with the advocated position.

3.1.4.2. Attitude confidence. Participant's level of confidence in their attitudes was assessed using one item "*How confident are you of your*

attitude toward the message you just read?" on a 7-point scale (1 = not confident at all; 7 = very confident). This item was identical to the one used by Clarkson et al. (2008) to measure attitude confidence in research relevant to the present study because it was used to test the influence of source factors on attitudes and attitude confidence. We elected to use a single-item to capture attitude confidence because recent literature has tested and validated the use of the identical single-item measure of certainty to moderate the relationship between diverse judgments and behaviors (Shoots-Reinhard, Petty, DeMarree, & Rucker, 2015; Santos, Briñol, Petty, Gandarillas, & Mateos, 2019; Paredes, Santos, Briñol, Gómez, & Petty, 2019; see also, Robins, Hendin, & Trzesniewski, 2001).

3.2. Results

3.2.1. Attitudes

The three group one-way ANOVA revealed no effect of physical attractiveness on attitudes, $F(2, 87) = 1.86$, $p = .161$, $\eta_p^2 = 0.04$. We conducted a series of pairwise comparisons. We found no significant differences between the unattractive ($M = 3.83$, $SD = 2.07$) and no-face condition ($M = 3.77$, $SD = 2.01$), $t(87) = -0.13$, $p = .898$. We also found no significant difference between the no-face and attractive conditions ($M = 4.67$, $SD = 1.95$), $t(87) = 1.73$, $p = .087$. Finally, the same occurs when comparing the unattractive condition with the attractive condition, $t(87) = 1.60$, $p = .112$, though as expected, the direction is for attitudes to be more favorable with the attractive than the unattractive source.

3.2.2. Attitude confidence

A separate one-way ANOVA revealed a significant effect of physical attractiveness on attitude confidence, $F(2, 87) = 7.03$, $p = .001$, $\eta_p^2 = 0.14$. To fully interpret this effect, we conducted a series of pairwise comparisons using the Least Significant Difference (LSD) test. First, the comparison between the unattractive and no-face condition revealed a non-significant difference, $t(87) = 0.36$, $p = .720$. In the comparison between the no-face and attractive conditions, we found a significant difference, $t(87) = 3.41$, $p = .001$. It showed that the attractive condition led to lower attitude confidence ($M = 4.50$, $SD = 1.83$) than the no-face condition did ($M = 5.77$, $SD = 1.19$). The same effect was found when comparing the unattractive condition to the attractive condition, $t(87) = -3.05$, $p = .003$. This effect revealed that the unattractive condition lead to more attitude confidence ($M = 5.63$, $SD = 1.19$) than the attractive condition.

3.3. Discussion

The results of experiment 1 suggest that the physical attractiveness of the source can influence attitude confidence even if attitudes are not affected. Specifically, our data revealed that attractive sources are associated with less attitude confidence when compared with both an unattractive source and a no-picture control condition. This is a new finding and suggests not only that the physical attractiveness of a source can affect attitude confidence and attitudes in different ways, but also that an attractive source can provoke individuals to adjust their confidence ratings presumably by correcting for the potentially biasing impact of physical attractiveness. To the best of our knowledge, this is the first time that research has documented adjustments for biasing variables on attitude confidence rather than a measure of attitudes, per se. In a second experiment, we introduce some changes to test to what extent these effects would replicate and generalize to other topics. Most importantly, we test a possible moderator for this effect.

4. Experiment 2

After having shown in Experiment 1 that physical attractiveness is capable of decreasing attitude confidence compared to a control

condition and an unattractive source, we conducted a second experiment with two goals in mind. The first goal was to replicate the observed pattern of effects found in experiment 1 on attitude confidence using different materials.[2] The second goal was to propose and test a moderator for the effect of attractiveness on attitude confidence. We speculate that the decrease in attitude confidence occurs because individuals do not want to base their confidence on information that is not relevant to the merits of the persuasive proposal (see Wegener & Petty, 1995). Therefore, we decided to manipulate the extent to which the topic of the message was related or unrelated to attractiveness (Kang & Herr, 2006; Petty & Cacioppo, 1981). Specifically, participants read either a message about the merits of new detergents (product unrelated to physical attractiveness) or about skincare products (product relevant to physical attractiveness).

Considering the findings of the previous experiment, we expected that an attractive source would lead to less attitude confidence when the topic was unrelated to attractiveness, thus replicating the findings of study 1 in the domain of consumer products. Importantly, we expected attractiveness to lead to more attitude confidence when presenting a message related to attractiveness, where it was relevant. This finding would reverse our original result but be consistent with the direction of effect found in prior research on source expertise where high expertise tended to increase attitude confidence over low expertise. Therefore, we predicted an interaction between the attractiveness of the source and the message-type on attitude confidence. Furthermore, this effect was expected to occur regardless of whether attractiveness affected attitudes.

4.1. Method

4.1.1. Participants and design

One hundred and twenty- six participants ($M_{age} = 27.1$, 55.6% male) recruited from the Prolific Academic platform received £ 1.10 (approximately $1.30) to complete a study designed to collect their opinions about different topics. In this study, participants were randomly assigned to one of four conditions defined by a 2 (Message-type: topic related vs. unrelated to attractiveness) × 2 (Physical attractiveness of the source: unattractive vs. attractive) between-subjects design. The final sample size was decided based on collecting the maximum number of participants who signed up to participate in the study during the day in which it was posted. We aimed to stop the collection after achieving a final sample with at least 30 participants per condition as was the case in Experiment 1. Our final sample slightly exceeded this goal with an average of 32 participants per condition. We performed a sensitivity power analysis (Faul et al., 2007) assuming an alpha significance criterion of 0.05. With a sample of one hundred and twenty-six participants, the analysis had 80% power to detect a minimum effect size of f = 0.25 for the interaction, sufficient to detect an effect on attitude confidence in the condition that replicates Experiment 1.

4.1.2. Procedure

Participants were told that they would be required to read a message written by the author of a blog. Similar to Experiment 1, participants first read the message. After this, they were exposed to either an attractive or unattractive facial picture of the source of the message. After this manipulation, participants reported their attitudes toward the message and attitude confidence. Finally, participants were thanked

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[2] In another study ($N = 167$) designed to pilot test new materials, we obtained additional evidence consistent with the hypothesis that an attractive face is associated with less attitude confidence ($M = 5.17$, $SD = 1.40$) when compared to an unattractive face ($M = 5.58$, $SD = 1.27$), $t(165) = 1.96$, $p = .052$) associated with the same proposal. In this study, participants also read a message and then saw the face of the source. This message was about the topic of governmental controls on the industry to minimize the effects of pollution.

and debriefed.

4.1.3. Independent variables

4.1.3.1. Message-type. Participants read one of two messages. In the message related to attractiveness condition, the author presented six arguments about the use of specialized skincare products (e.g. "*A beautiful skin makes people feel more beautiful, and this will only be obtained with the use of these specific products*"). In the message unrelated to attractiveness condition, the author presented six arguments about the use of specific detergents to clean dishes (e.g. "*There may be times when we have to use these types of products to remove difficult stains or food residue*").

4.1.3.2. Physical attractiveness of the source. The attractiveness of the source was manipulated using the same materials as in Experiment 1.

4.1.4. Dependent variables

4.1.4.1. Attitudes toward the message. Attitudes toward the topic were assessed using the same item as in Experiment 1.

4.1.4.2. Attitude confidence. Attitude confidence was assessed using the same item as in Experiment 1.

4.2. Results

4.2.1. Attitudes

A 2 (Message-type: relevant or irrelevant to attractiveness) $\times$ 2 (Physical attractiveness of the source: unattractive or attractive) factorial ANOVA revealed a main effect of physical attractiveness on attitudes, $F(1,122) = 6.59$, $p = .011$, $\eta_p^2 = 0.05$. This effect indicated that participants had more favorable attitudes toward the message when they were exposed to an attractive ($M = 5.73$, $SD = 1.16$) than to an unattractive source ($M = 5.09$, $SD = 1.57$). This analysis revealed a non-significant effect of message type and therefore no differences emerged between the message unrelated ($M = 5.31$, $SD = 1.48$) and the message related to attractiveness condition ($M = 5.50$, $SD = 1.35$), $F(1, 122) = 0.75$, $p = .388$, $\eta_p^2 = 0.01$. Finally, no significant interaction between the two factors emerged, $F(1, 122) = 0.38$, $p = .541$, $\eta_p^2 = 0.003$ (see Fig. 1, top panel).

4.2.2. Attitude confidence

A separate 2×2 factorial ANOVA on attitude confidence revealed no main effect of attractiveness. This suggests that there were no significant overall differences on attitude confidence between those who were exposed to an unattractive ($M = 5.33$, $SD = 1.33$) and those who were exposed to an attractive source ($M = 5.50$, $SD = 1.03$), $F(1, 122) = 0.85$, $p = .358$, $\eta_p^2 = 0.01$. We also found no significant effect of message-type, suggesting no differences on ratings of attitude confidence between the message unrelated ($M = 5.60$, $SD = 1.17$) and the message related to attractiveness condition ($M = 5.19$, $SD = 1.56$), $F(1,122) = 2.34$, $p = .129$, $\eta_p^2 = 0.02$.

More importantly, a significant interaction between the two independent variables emerged, $F(1, 122) = 12.65$, $p = .001$, $\eta_p^2 = 0.09$. As predicted, the pattern of this interaction suggests that that for the message unrelated to attractiveness (i.e., dish detergents), an attractive face was associated with less attitude confidence ($M = 5.29$, $SD = 1.17$) than an unattractive face ($M = 5.91$, $SD = 1.11$), $F(1, 122) = 3.79$, $p = .054$, $\eta_p^2 = 0.03$, thus replicating Experiment 1. In contrast, for the message related to attractiveness (i.e., specialized skincare products), an attractive face was associated with more attitude confidence ($M = 5.77$, $SD = 0.77$) than an unattractive face ($M = 4.72$, $SD = 1.87$), $F(1, 122) = 9.25$, $p = .003$, $\eta_p^2 = 0.07$, (see Fig. 1, bottom panel).

Given that attractiveness affected attitudes in this study, we also ran an ANCOVA in order to control the effect of attitudes on attitude confidence. No main effect of attitudes emerged, $F(1,121) = 1.18$,

$p = .280$, $\eta_p^2 = 0.01$, and the interaction between physical attractiveness of the source and message-type remained significant, $F(1, 121) = 13.05$, $p < .001$, $\eta_p^2 = 0.09$.

4.3. Discussion

Experiment 2 replicated the effect of physical attractiveness on attitude confidence and identified a condition under which this effect is more likely to occur. Specifically, source attractiveness reduced attitude confidence only when the source advocated for a topic unrelated to attractiveness, consistent with the idea that people are correcting for an inappropriate bias (Wegener & Petty, 1997). Importantly, we found the opposite effect when the same source presented a message related to this physical feature. That is, attractiveness increased (rather than decreased) attitude confidence when it was relevant to the persuasive proposal.

So far, we have identified a new effect and demonstrated a condition that facilitates the emergence of that effect, and a condition under which it can be reversed. Indeed, as noted above, this moderation suggests why the effect is likely to have occurred. However, it remains an open question to address why the lack of legitimacy of physical attractiveness leads to correction effects on attitude confidence but not on attitudes. One possibility is that although people might have spontaneously formed their attitudes without considering the possibility of bias (e.g., Bargh, Chaiken, Raymond, & Hymes, 1996; Fazio, 1995) it is less likely that they do the same with judgments of confidence. That is, people may not form a confidence judgment spontaneously and thus when receiving the confidence question, some explicit thought is prompted which causes people to consider whether they have a good basis to be confident. With this additional thought, they realize that attractiveness is not a good reason to be confident (if irrelevant) and therefore correct for this possible bias. With respect to attitudes, however, this extra thought does not take place when the attitude question is confronted because people have already spontaneously formed their attitudes. Indeed, prior research on attitude correction has shown that correction does not take place unless people are explicitly prompted to consider the possibility of bias. That is, in previous research, individuals corrected for the influence of physical attractiveness and other biasing factors on their attitudes but only when the source of the bias was specifically pointed out (e.g., Petty et al., 1998; Wegener & Petty, 1995). To examine this, Experiment 3 compares an explicit instruction to correct for bias with no instruction. We hypothesized that in accord with prior research, this explicit correction instruction would be necessary to observe correction for attractiveness on the attitude measure, but the correction instruction would not be necessary to observe correction on the attitude confidence measure.

5. Experiment 3

In Experiment 3 we address whether explicitly making the potential for bias salient is needed to produce correction on measures of attitudes but not on measures of attitude confidence. To do this, we decided to use the same manipulation of the salience of bias from physical attractiveness used previously in research by Wegener and Petty (1995). Specifically, participants in the bias salient condition were instructed to try to ignore the level of physical attractiveness of the source of the message on their judgments. In the control condition, no such instruction was provided (mimicking the conditions of Experiments 1 and 2 in the current research).

By manipulating whether bias was made salient or not, we expected to specify the conditions under which correction is more likely to take place on attitudes (replicating previous literature) versus on attitude confidence (replicating the new finding introduced in this research). We predicted that this prompt draws attention to the possibility of bias in one's attitudes. The salience of bias is what promotes attitudinal correction. Specifically, we predicted that for the attitude measure, bias
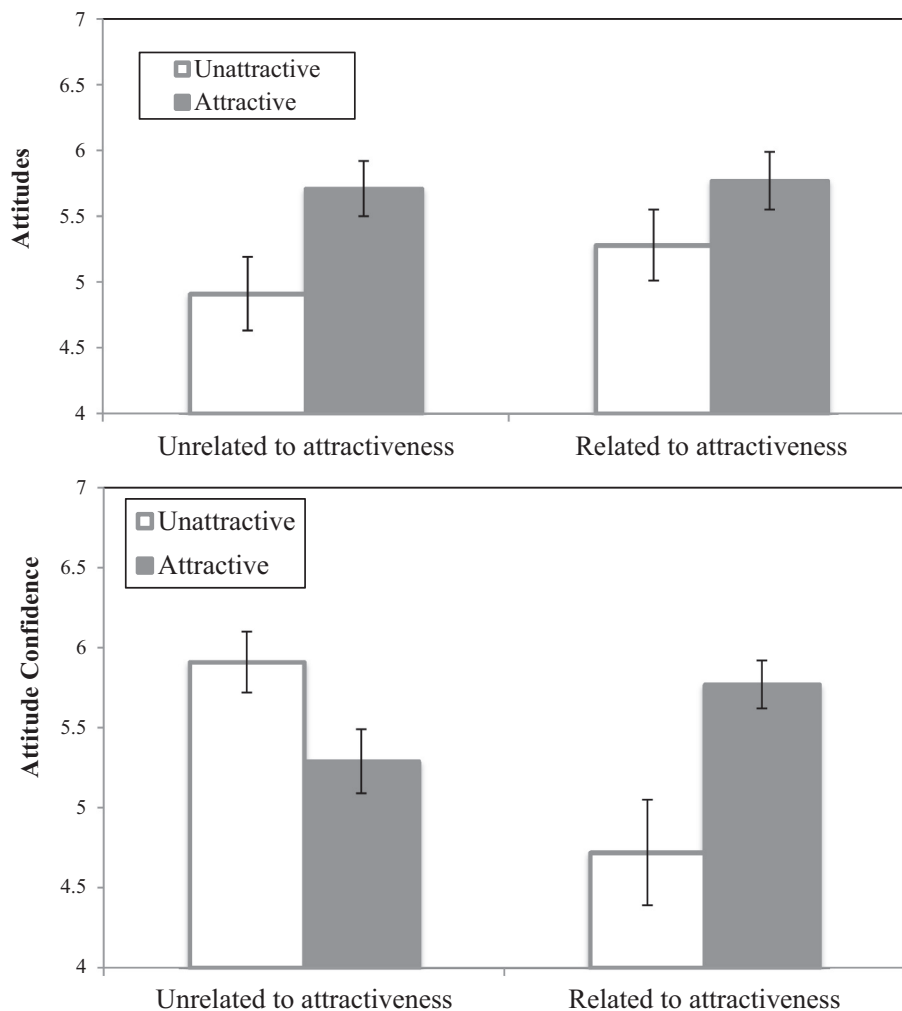
Fig. 1. Top panel: Attitudes as a function of the condition of Physical Attractiveness of the source and Message-Type in Experiment 2.
Bottom panel: Attitude confidence as a function of the condition of Physical Attractiveness of the source and Message-Type in Experiment 2. Error bars represented standard errors.

instructions would interact with attractiveness and therefore moderate the outcome such that when there was no instruction, attitudes would be more favorable when the source was attractive rather than unattractive. More importantly, however, when the potential for bias was made salient with the instructions, attitudes would be more favorable when the source was unattractive than attractive because people would correct their attitudes for the presumed biasing effect of attractiveness. This would replicate prior research on the impact of providing explicit bias correction instructions on attitudes.

We expected a different pattern on the confidence measure, however. Here, we predicted that correction is provoked when people are confronted with the attitude confidence question. As explained earlier, although people tend to spontaneously form attitudes when they are confronted with evaluative information (e.g., Fazio, 1995), they may be less likely to spontaneously form confidence judgments unless prompted. In day to day life, people might be prompted when they are considering acting on their attitude. This need for behavior may prompt consideration of how much confidence to place in one's attitude. In the current context, it is the confidence question that prompts this consideration. That is, when asked the confidence question, people would deliberate about just how confident they should be. With a modicum of thought, they would realize that an attractive source is not a good basis to be certain in one's attitude and thus would correct for this potential bias (as in Experiments 1 and 2). When the explicit bias instructions are presented, they should likewise correct for a possible bias from

attractiveness, but these instructions are not necessary (as they are for attitudes) because the confidence question itself serves as a prompt to consider whether they should be confident or not. Thus, unlike for attitude judgments where making bias salient should interact with the attractiveness manipulation, for the confidence judgment we only anticipated a main effect for the attractiveness induction showing that people corrected for a possible attractiveness bias regardless of the salience induction.

5.1. Method

5.1.1. Participants and design

One hundred and twenty-four participants (M_{age} = 27.3, 53.2% male) recruited from the Prolific Academic platform received £ 0.98 (approximately $1.20) to complete a study designed to collect their opinions about different topics. In this study, participants were randomly assigned to one of four conditions defined by a 2 (Physical attractiveness of the source: unattractive vs. attractive) × 2 (Correction manipulation: no instructions vs. correction instructions) between-subjects design. The final sample size was decided based on collecting the maximum number of participants who signed up to participate in the study during the day in which it was posted. Based on experience, we anticipated that we would obtain at least 100 participants. We performed a sensitivity power analysis (Faul et al., 2007) assuming an alpha significance criterion of 0.05. With a sample of one hundred and

twenty-four participants, the analysis had 80% power to detect a minimum effect size of f = 0.25 for the interaction.

5.1.2. Procedure

Participants were told that they would be required to read a message written by the author of a blog. Participants first read the same message unrelated to attractiveness used in Experiment 2 which advocated for the use of specialized detergents to clean dishes. Next, participants were exposed to either an attractive or unattractive facial picture of the source of the message. Then, participants were exposed either to an instruction to correct for the influence of the attractiveness on their judgments or they received no correction instructions. After this manipulation of correction, participants reported their attitudes toward the proposal and the confidence associated with their attitude. Finally, participants were thanked and debriefed.

5.1.3. Independent variables
5.1.3.1. Physical attractiveness of the source.
The attractiveness of the source was manipulated using the same materials as in Experiments 1 and 2.

5.1.3.2. Correction manipulation.
There were two experimental groups varying the type of instructions participants received prior to their judgments of attitudes and attitude confidence. In the correction instructions condition, participants received the following instruction, "Please try to make sure your perceptions about the level of physical attractiveness of the person who wrote this message do not influence your ratings and judgments about the topic written in the message." This instruction is the same as the one used by Wegener and Petty (1995). The no-instructions condition replicates Experiments 1 and 2 and did not provide participants with any instructions before making ratings of attitudes and attitude confidence.

5.1.4. Dependent variables
5.1.4.1. Attitudes toward the message.
Attitudes toward the topic were assessed using the same item as in the prior experiments.

5.1.4.2. Attitude confidence.
Attitude confidence was assessed using the same item as in the prior experiments.

5.2. Results

5.2.1. Attitudes

A 2 (Physical attractiveness of the source) × 2 (Correction manipulation) factorial ANOVA on attitudes revealed no significant differences between the unattractive ($M = 3.54$, $SD = 1.65$) and the attractive face ($M = 3.54$, $SD = 1.27$), $F (1,120) = 0.004$, $p = .949$, $\eta_p^2 = 0.001$. This analysis revealed also no significant main effect promoted by the correction instructions, and therefore no differences emerged between the no-instruction ($M = 3.60$, $SD = 1.60$) and the instruction condition ($M = 3.48$, $SD = 1.33$), $F (1, 120) = 0.17$, $p = .681$, $\eta_p^2 = 0.001$. More importantly, an interaction between the two manipulations emerged, $F (1, 120) = 3.89$, $p = .051$, $\eta_p^2 = 0.03$. As predicted, the pattern of this interaction was such that when participants received no instructions to correct, an attractive face tended to be associated with more agreement with the message ($M = 3.87$, $SD = 1.43$) than an unattractive face ($M = 3.33$, $SD = 1.73$), $F (1, 120) = 2.02$, $p = .158$, $\eta_p^2 = 0.02$. In contrast, for the correction instructions condition, an attractive face tended to be with less agreement ($M = 3.24$, $SD = 1.03$) than an unattractive face ($M = 3.74$, $SD = 1.57$), $F (1, 120) = 1.88$, $p = .173$, $\eta_p^2 = 0.02$. (see Fig. 2, top panel). Although neither of these cell comparisons reached significance at 0.05, the interaction was in the pattern obtained by prior research on attitude correction processes.

5.2.2. Attitude confidence

A separate 2 × 2 factorial ANOVA on attitude confidence revealed only a main effect of attractiveness, $F(1, 120) = 4.08$, $p = .046$, $\eta_p^2 = 0.03$. This effect indicated that an attractive face was associated with less confidence ($M = 4.59$, $SD = 1.25$) than an unattractive face ($M = 5.03$, $SD = 1.29$). No significant main effect of the correction manipulation emerged, and therefore no differences between the no-instruction ($M = 4.87$, $SD = 1.31$) and the correction instructions condition ($M = 4.75$, $SD = 1.22$) were evident, $F(1, 120) = 0.26$, $p = .612$, $\eta_p^2 = 0.002$. Finally, we found no significant interaction between the two factors, $F(1, 120) = 1.57$, $p = .213$, $\eta_p^2 = 0.013$ (see Fig. 2, bottom panel).

5.3. Discussion

Experiment 3 provided another replication of the effect of attractiveness on attitude confidence. Regardless of whether people were explicitly told to correct their judgments or not, people were less confident in their attitudes when the message was presented by an attractive than an unattractive source. In contrast, the correction instructions did have an impact on attitudes. When no particular instructions were given to participants, the tendency was for attractiveness to have a positive impact on attitudes and there was no evidence of correction. However, when participants were instructed to correct their judgments, attitudes tended to be less favorable when the source was attractive than when it was not. This moderation effect on attitudes replicated prior research on bias correction (e.g., Wegener & Petty, 1995).

The pattern of results we obtained on the attitude and confidence measures is consistent with our suggestion that when no correction instructions were given, participants spontaneously formed their positive attitudes toward the issue based on the attractiveness of the source. However, when instructed to correct, they adjusted their attitudes away from the presumed direction of the bias. Thus, a correction on attitudes occurs because individuals' attention was directed to the possibility of a bias and they adjusted their attitude to remove this bias. More importantly, we found that regardless of whether instructed to correct or not, participants corrected for the attractiveness of the source on their ratings of attitude confidence (i.e., an attractive face was associated with less attitude confidence than an unattractive face). Thus, asking participants about their confidence in their attitudes might make them think more about the potential bias of attractiveness on their judgments. In this sense, the meta-cognition required by thinking about confidence serves in a similar role to when we gave explicit instructions to correct the influence of attractiveness. However, one open question is whether the change in attitude confidence induced by the correction for attractiveness is of any consequence. Thus, Experiment 4 was designed to test whether a decrease in attitude confidence as invoked by correction would reduce resistance to attitude change.

6. Experiment 4

In Experiment 4 we tested whether the effect of an attractive source on attitude confidence matters for attitude strength outcomes. Specifically, we examined whether the effect of attractiveness on attitude confidence was consequential for resistance to persuasion. Attitudinal resistance refers to the ability of an attitude to maintain itself in the face of an attack and is one of the defining features strong attitudes (see Petty & Cacioppo, 1986; Petty & Krosnick, 1995).

In Experiment 4, we used the same topic as in Experiment 1 (i.e., children owning a cell phone). However, two important changes in the procedure were made. First, at the end of the study, we exposed participants to a second message that opposed the arguments in the first message. Second, we measured attitudes about the topic a second time after the presentation of the second message. This method of assessing resistance to persuasion is important because attitudes held with more
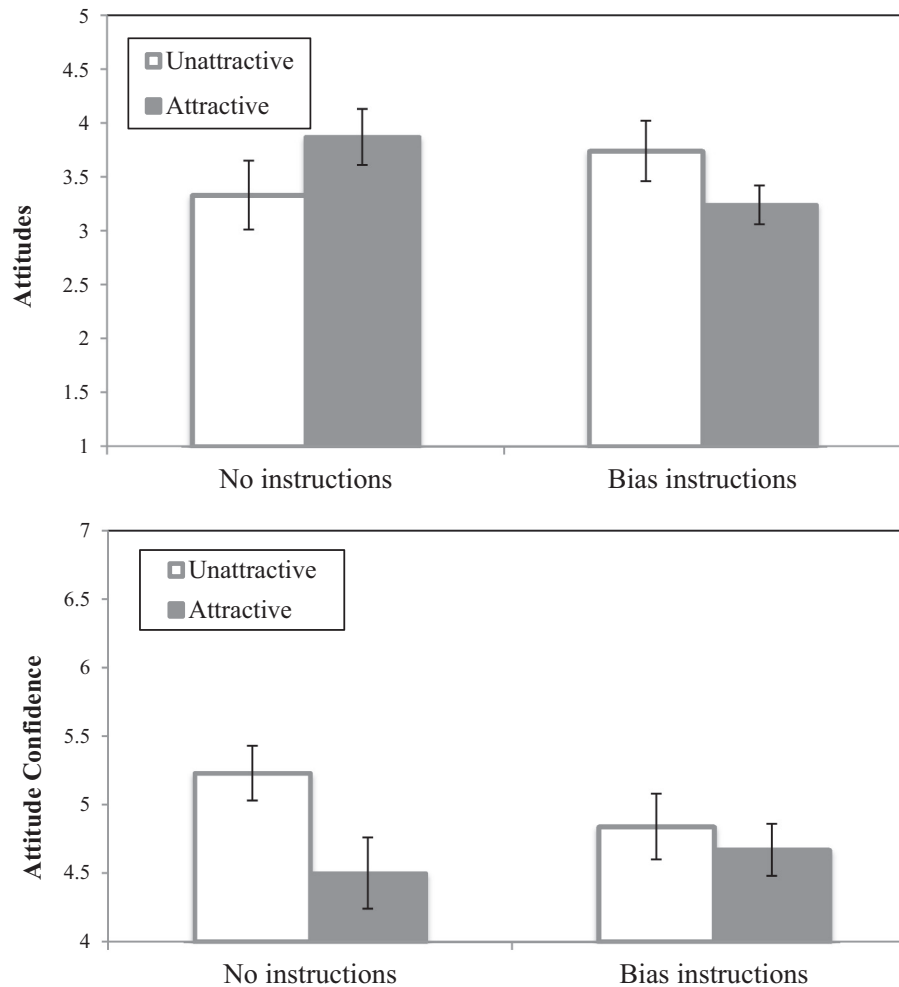
Fig. 2. Top panel: Attitudes as a function of the condition of Physical Attractiveness of the source and Correction Manipulation in Experiment 3.
Bottom panel: Attitude confidence as a function of the condition of Physical Attractiveness of the source and Correction Manipulation in Experiment 3. Error bars represented standard errors.

confidence are less likely to change as a result of being attacked (see Gross et al., 1995; Tormala & Rucker, 2007).

The general prediction was that individuals whose attitudes were held with less confidence would show less resistance to the influence of the attack. We expected that individuals exposed to an attractive source would be less likely to maintain their initial attitudes than those exposed to an unattractive source. Thus, for participants in the attractive source condition, we expected a lower consistency between attitudes measured before and after the attacking message. We also expected that this effect would occur regardless of whether physical attractiveness initially affected attitudes or not. More importantly, we expected attitude confidence to mediate the effect of physical attractiveness on resistance to change.

6.1. Method

6.1.1. Participants and design

One hundred and twenty-two participants (M_{age} = 27.1, 53.3% male) were recruited from the Prolific Academic platform and received £0.80 (approximately $1.00) to complete a study to collect their opinions about different topics. In this study, participants were randomly assigned to one of two conditions of the physical attractiveness of the source (unattractive vs. attractive). The desired sample size for the one-way analysis of variance based on the minimum effect sized planned for previous experiments (f = 0.25) to detect the impact of attractiveness

on attitude confidence with 0.80 power, was N = 128. The final sample size was determined based on the maximum number of people who participated during the day in which the study was posted aiming to achieve an approximate number to the previous experiment. We performed a sensitivity power analysis (Faul et al., 2007) assuming an alpha significance criterion of 0.05. With a sample of one hundred and twenty-two participants, the analysis had 80% power to detect a minimum effect size of f = 0.26.

6.1.2. Procedure

Participants were told that they would be required to read a message written by the author of a blog. First, participants were asked to read a message advocating against the use of cell phones by children. This message was the same as used in Experiment 1. Then, they were exposed to the face of the source of the message. The photo was manipulated to be perceived as either high or low in attractiveness. After being exposed to this manipulation of attractiveness, participants reported their attitudes toward the message (measure at Time 1) and attitude confidence. At the end of the study, participants were asked to read a second message. This second message presented arguments advocating in favor of children having a cell phone. More specifically, it presented five arguments in the direction opposite to the initial message, therefore arguing about the benefits for children to have this device (e.g., "*Against popular views, it turns out that children using cell phones are more in touch with their parents*"). Finally, participants

reported their attitudes toward the topic a second time (measure at Time 2), then were thanked and debriefed.[3]

6.1.3. Independent variables

6.1.3.1. Physical attractiveness of the source. Physical attractiveness was manipulated using the same materials as in the previous experiments.

6.1.4. Dependent variables

6.1.4.1. Attitude confidence. Attitude confidence was assessed using the same item as in the prior experiments.

6.1.4.2. Attitudes at Time 1 and attitudes at Time 2. Participants' attitudes were measured at both times using the same item as in the prior experiments. Both measures were scored such that higher values indicated a higher agreement with the direction of the original message (i.e., the message presented at Time 1).

6.2. Results

6.2.1. Attitude confidence

Replicating the previous experiments using a message that was irrelevant to attractiveness, the 2 group ANOVA revealed a significant effect on attitude confidence, $F(1, 120) = 4.28$, $p = .041$, $\eta_p^2 = 0.03$. Participants reported more attitude confidence when exposed to an unattractive face ($M = 5.37$, $SD = 1.03$) than when exposed to an attractive face ($M = 4.90$, $SD = 1.90$) (Fig. 3, top panel).

6.2.2. Attitudes at Time 1

The one-way ANOVA on time 1 attitudes revealed no significant effect of attractiveness of the source, suggesting no differences between the unattractive ($M = 3.19$, $SD = 1.03$) and attractive source condition ($M = 3.17$, $SD = 1.40$), $F(1, 120) = 0.003$, $p = .958$, $\eta_p^2 = 0.0001$.

6.2.3. Attitudes at Time 2

Likewise, a separate one-way ANOVA revealed no significant effect of attractiveness of the source, suggesting no differences between the unattractive ($M = 2.34$, $SD = 1.12$) and attractive source condition ($M = 2.49$, $SD = 1.13$) on attitudes measured at Time 2, $F(1, 119) = 0.52$, $p = .474$, $\eta_p^2 = 0.004$.

6.2.4. Attitude-change from Time 1 to Time 2

Attitude change was analyzed using a 2 (Attractiveness of the source) × 2 (Time of measure of attitudes: Pre-Post treatment) repeated-measures ANOVA, with the last factor as a repeated measure. This model reveled a main effect of time of measure, $F(1, 119) = 34.14$, $p < .001$, $\eta_p^2 = 0.22$, such that participants reported higher agreement with the original message when attitudes were measured at time 1 ($M = 3.17$, $SD = 1.22$) compared with time 2 ($M = 2.42$, $SD = 1.12$). No main effect of attractiveness was found, $F(1, 119) = 0.24$, $p = .629$, $\eta_p^2 = 0.002$, nor did an interaction emerge with attitudes as a repeated measure, $F(1, 119) = 0.25$, $p = .618$, $\eta_p^2 = 0.002$. This suggests that all participants changed their attitudes in the same direction across time.

6.2.5. Attitudes at Time 1 predicting attitudes at Time 2

Another analysis relevant for our purposes was whether attitudes at time 2 were predicted by attitudes at time 1 differently based on source attractiveness. Prior research has used this analysis to gauge attitude stability (e.g., Cunningham, Preacher, & Banaji, 2001; Krosnick, 1988; Xu et al., in press). We first centered and then regressed attitudes at time 2 on attitudes at time 1. This analysis showed that attitudes at time 1 predicted attitudes at time 2, $B = 0.28$, $t(117) = 3.30$, $p = .001$, 95% CI: [0.11, 0.45]. Using the PROCESS add-on for SPSS (Hayes, 2018), we

then tested the interaction between the Physical attractiveness of the source and attitudes at time 1 on attitudes at time 2, which was significant, $B = -0.17$, $t(117) = -2.04$, $p = .044$, 95% CI: [-0.36, -0.01]. As expected, this interaction revealed that attitudes at time 1 were a better predictor of attitudes at time 2 for those exposed to an unattractive face (higher in certainty), $B = 0.53$, $t(117) = 3.56$, $p < .001$, 95% CI: [0.23, 0.82], compared to those exposed to an attractive face (lower in certainty), $B = 0.16$, $t(117) = 1.58$, $p = .117$, 95% CI: [-0.03, 0.36] (see bottom panel of Fig. 3).

6.2.6. Mediation

The physical attractiveness of the source significantly predicted attitude confidence and moderated the relationship between Time 1 and Time 2 attitudes. We next examined whether attitude confidence at Time 1 mediated the impact of physical attractiveness on the relationship between Time 1 and Time 2 attitudes. This is a case of mediated moderation. To do this, we first tested the hypothesis that attitude confidence at Time 1 also moderates the relationship between Time 1 and Time 2 attitudes. Using the PROCESS add-on for SPSS (Hayes, 2018), we tested the interaction between attitude confidence and attitudes at Time 1 on attitudes at Time 2, which was significant, $B = 0.10$, $t(117) = -2.04$, $p = .044$, 95% CI: [0.02, 0.18]. This interaction revealed that attitudes at Time 1 were a better predictor of attitudes at Time 2 for those that report more confidence in their attitudes at Time 1, $B = 0.24$, $t(117) = 2.75$, $p = .007$, 95% CI: [0.07, 0.42], compared to those who report less attitude confidence, $B = 0.04$, $t(117) = 0.47$, $p = .637$, 95% CI: [-0.13, 0.26].

We then tested the mediated moderation analysis. We tested this analysis since the proposed mediator (attitude confidence at Time 1) is causally determined by the experimental manipulation of physical attractiveness as the proposed predictor. Also, the outcome (i.e., the path between Time 1 and Time 2 attitudes) is causally determined by the sequential logic of both measures. To examine this relationship, we conducted a path analysis using Mplus (Muthén & Muthén, 2011). In this model, we first predicted the mediator (attitude confidence at Time 1), from physical attractiveness of the source (coded -1 for unattractive source, $+1$ for attractive sources). We then simultaneously predicted attitudes at Time 2 from attitudes at Time 1, physical attractiveness of the source, attitude confidence, and the interactions of the latter two variables with attitudes at Time 1 (see Fig. 4).

In this model, physical attractiveness of the source as an antecedent of attitude confidence at Time 1 was significant ($B = -0.23$, $SE = 0.11$, $p = .042$). After showing that attitude confidence also emerges as a potential mediator for this model we test for the remaining paths. Attitudes at Time 2 were significantly predicted by attitude confidence at Time 1 ($B = -0.71$, $SE = 0.29$, $p = .013$), physical attractiveness of the source ($B = 0.93$, $SE = 0.34$, $p = .007$), and by the interaction between attitudes at time 1 × physical attractiveness of the source ($B = -0.30$, $SE = 0.11$, $p = .008$). The interaction between attitudes at Time 1 × attitude confidence did not emerge as significant ($B = 0.11$, $SE = 0.08$, $p = .151$). Critically and most importantly, bootstrap confidence intervals for the indirect effect of the physical attractiveness of the source (estimate = 0.07, 95% CI: [0.001; 0.19]) through attitude confidence (interacting with attitudes at Time 1) did not contain 0, consistent with the predicted mediation. This suggests that attitude confidence at Time 1 mediates, at least in part, the impact of physical attractiveness on the relation between attitudes measured at Time 1 and at Time 2.

6.3. Discussion

Experiment 4 replicated the effect of physical attractiveness on attitude confidence. Importantly, the results showed that this effect matters for attitude strength outcomes. That is, the decrease in attitude confidence associated with an attractive source led to less relative attitudinal stability in the face of an attacking message compared to an

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[3] Due to a technical problem, one participant did not complete the measure of attitudes at Time 2.
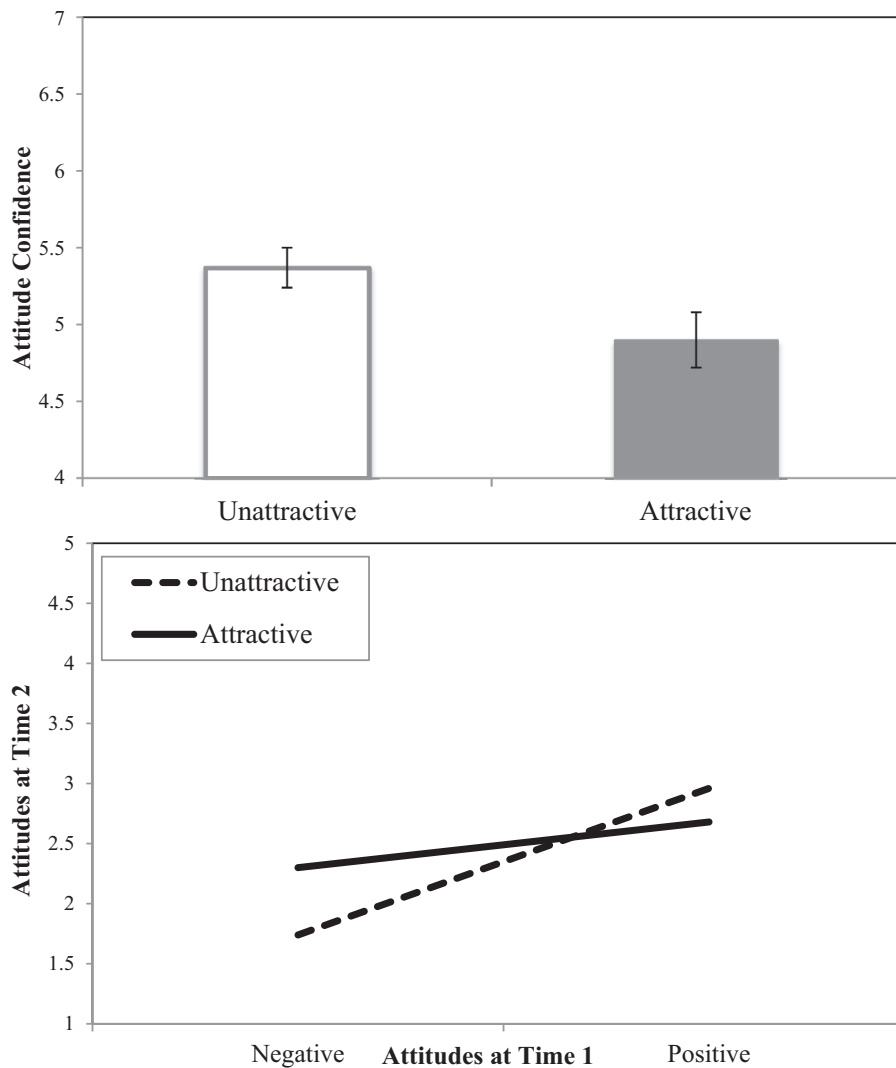
Fig. 3. Top panel: Attitude confidence as a function of the condition of Physical Attractiveness of the source in Experiment 4.
Bottom panel: Attitudes at Time 2 as a function of attitudes at Time 1 and the condition of Physical attractiveness of the source in Experiment 4.

unattractive source. Beyond identifying an important consequence, the results of this study are also critical in showing that changes between attitudes at time 1 and time 2 were mediated by attitude confidence.

7. General discussion

Past research has focused on examining the persuasive impact of source physical attractiveness on attitudes. In the present research, we explored the influence of attractiveness not only on attitudes but also on attitude confidence. We focused on attitude confidence because of its novelty, importance, and potential malleability.

Across four studies, we found that attractiveness is capable of affecting attitude confidence regardless of its observable impact on attitudes and can even have opposite effects on each such as when attractiveness makes attitudes more positive but attitude confidence weaker (i.e., less confident). When participants were exposed to a message presented by a source whose attractiveness was irrelevant to the nature of the message, they reported less attitude confidence than when exposed to the identical messaged presented by an unattractive source. We replicated this effect across different attitude objects and samples. In Experiment 1, we explored the effect of physical attractiveness on attitudes and attitude confidence and showed that physical attractiveness decreased attitude confidence. In Experiment 2 we proposed and tested bias correction as the most likely explanation for the

effect. The results obtained in the second study confirmed that attractiveness reduced attitude confidence only when the attractiveness was irrelevant to the message suggesting that attractiveness was viewed as an unwanted biasing factor in this context. Importantly, we found the opposite effect when attractiveness was relevant to the persuasive topic. This suggests that when attractiveness was relevant to the attitude object, it augmented attitude confidence much as source expertise has been shown to do in prior research (Tormala & Petty, 2004).

To the best of our knowledge, this is the first empirical evidence in a persuasion context that people can correct for a perceived biasing effect of some variable (i.e., source attractiveness) on a dimension other than the attitude itself. In Experiment 3 we proposed and show that the corrections for attitudes and confidence are differentially affected by explicit correction instructions. The results from this study suggest that a correction process stemming from a perception of bias can be activated either by simply posing a confidence question or by explicitly providing correction instructions. Finally, Experiment 4 demonstrated the consequential nature of this new effect by showing that individuals report attitudes that are less stable following a a persuasive attack when an initial message was presented by an attractive relative to an unattractive source.

It is worth noting that beyond correction, there might be other possible explanations for the effects we observed. It is possible that attractiveness might have captured most of the attentional resources,
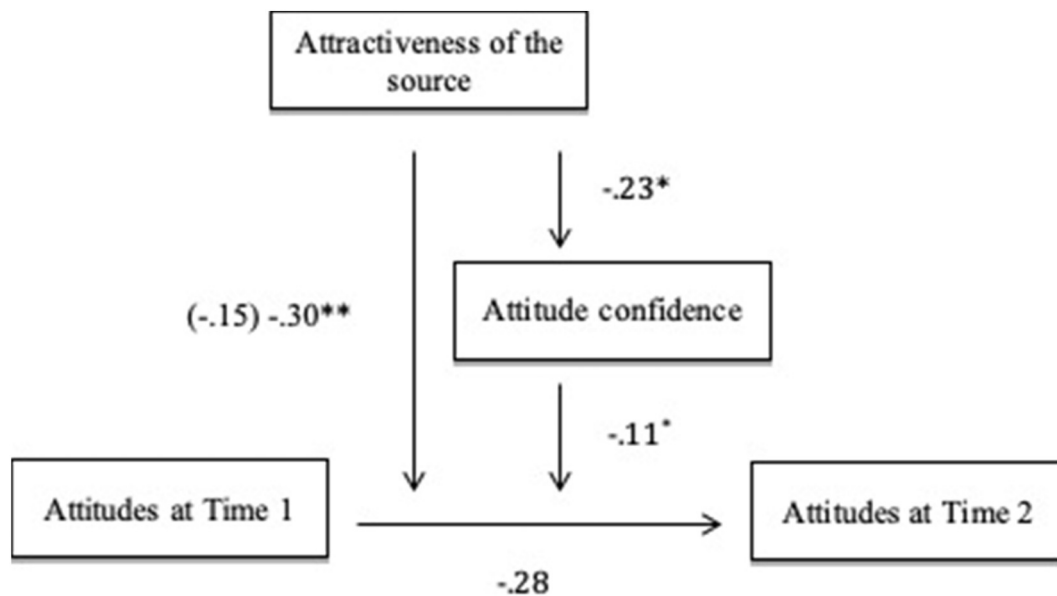
Fig. 4. Mediated moderation model predicting Attitudes at Time 2 as a function of Attitudes at Time 1, Physical attractiveness of the source, with Attitude confidence at Time 1 as the mediating variable (Experiment 4). Value in parentheses represents remaining direct effect (an interaction in this context) when controlling for the Attitudes at Time 1 × Attitude confidence interaction. Confidence interval for the indirect effect did not include 0, indicating significant indirect effects. Values in the figure are unstandardized coefficients.

thus distracting participants from the content of the message and in turn reducing attitude confidence. This seems unlikely because Experiment 2 showed that attractiveness does not always reduce confidence but can also increase it when the attractiveness is relevant to the advocacy. Another possibility is that an attractive face can promote self-comparison on self-evaluations (Cash, Cash, & Butters, 1983; Thornton & Moore, 1993). Similarly, this mental comparison could cause distraction, which may reduce confidence in one's attitude toward the object. Once again, however, although distraction could account for the drop in attitude confidence, it would be unlikely to accommodate the moderation obtained by the manipulation of the relevance of the topic in Experiment 2.

One caveat is that the effects obtained in this research are likely to be dependent on the meaning that people ascribe to source attractiveness. That is, the effect of physical attractiveness on attitude confidence might also vary also according to individuals' naive theories about the role and effect of this feature within persuasive contexts (Briñol, Petty, Santos, & Mello, 2018). For example, if attractiveness is seen as an acceptable tactic to attend to a message, then less correction on confidence judgments would be expected. However, if attractiveness is seen as a manipulative and deceptive tool, then correction effects on attitude confidence would be expected. Thus, individuals' naïve theories of the appropriateness and role of attractiveness in their judgments play an important role in understanding correction effects (e.g., Wegener & Petty, 1997). Previous research already shows that, when motivated to do so, naïve theories can influence individuals' anticipation of persuasive success from an attractive person (Vogel, Kutzner, Fiedler, & Freytag, 2010). This can suggest a trade-off between a correction effect promoted by physical attractiveness with other relevant features, such as the meaning of attractiveness, sufficient to lead individuals to adjust their ratings of attitude confidence. A second aspect for future research is that, although the present research examined the consequences of attractiveness on attitude confidence and attitude resistance, subsequent research should also examine other properties of attitude strength, including the impact of attitudes and confidence on real-world behaviors.

Finally, future research should also address the timing of the presentation of the source and message. In this research, we first presented

the message followed by the source of the message. If the information about the source preceded rather than followed, then the processes and outcome might be different. Past research on source credibility (Tormala, Briñol, & Petty, 2007) and power (Briñol, Petty, Valle, Rucker, & Becerra, 2007) has shown that when the key source variable precedes rather than follows information processing, it is more likely to influence the amount and direction of thoughts people generate in response to the proposal, therefore, affecting attitudes and attitude confidence by affecting the amount of thought the message receives. Therefore, future research should examine the multiple processes by which attractiveness can influence not only attitudes but also attitude confidence.

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