Is What You Feel What They See?

Prominent and Subtle Identity Signaling in Inter-group Interactions

Abstract

Individuals often signal group affiliations to others and the display of such identity signals is frequently rather subtle. While prior work has focused on understanding an individual's choices of subtle versus prominent signals, in this work we look at the downstream consequences of such choices. Specifically, we explore how the prominence of identity signals may affect one's behavior in inter-group interactions. Drawing from literature on processing fluency, we propose that the use of difficult to process (subtle) identity signals in inter-group interactions leads signalers to experience identity threat, lowering confidence in their identity and leading them to engage in behaviors to recover from this experience. Across three different identity domains (college affiliation, political affiliation, brand loyalty), we show that when individuals use difficult to process identity signals, they derogate out-group members in communication and behave less cooperatively in inter-group interactions. We find that these effects depend upon the observability of the signals by out-group members, and only occur for individuals who are highly identified with the in-group. We also find that the effects are attenuated when behavior towards members of the out-group is made public. **(Word count: 185).**

Keywords: identity threat, signaling, processing fluency, intergroup interaction

Total Word Count: 9999

Blurred, washed-out logos are a staple of major clothing labels and are commonly displayed on the outfits of college students, sports fans, and activists. A significant body of research has examined the manner in which individuals use these types of signals to communicate their identity to others (Berger & Heath, 2007; Griskevicius, Tybur, & Van den Bergh, 2010). Generally, when an individual uses an object to say something about herself to others, she prefers signals that are conspicuous and clear (Wilcox, Kim, & Sen, 2009). However, in some contexts, such as when individuals desire to communicate exclusively to an in-group, less prominent signals are considered to be more useful because they are less likely to be copied by out-group members (Berger & Ward, 2010). While this literature provides some understanding of individuals' decisions to use prominent versus subtle signals of group affiliation, little research has examined the consequences of these decisions, such as how the use of such signals affects signaler's subsequent behavior. In this paper, we attempt to bridge this gap in the literature by considering how the experience of ease or difficulty in the processing of in-group identity signals may influence interactions with out-group members.

The metacognitive experience of ease or difficulty of information processing (processing fluency) has been shown to affect judgments in a variety of domains, by providing both information content and serving as an input to the decision (see Schwarz, 2010 for review). Building on this literature, we propose that feelings of difficulty when processing identity signals (such as a hard-to-see logo) in the context of intergroup interaction would negatively affect signaler's assessment of her own identity. Specifically, we expect that the experience of metacognitive difficulty when interacting with out-group members would lead the signaler to experience an identity threat (Higgins 1987; Branscombe, Ellemers, Spears & Doosje, 1999; Rydell, McConnel & Beilock 2009).

When an individuals' identity is threatened and their confidence is decreased, they normally engage in behaviors to reaffirm the value of their identity (Tajfel & Turner, 1979). To do so, they may derogate the out-group (Wills, 1981) and behave uncooperatively towards out-group members (Branscombe & Wann, 1994; Ellemers, Wilke, & van Knippenberg, 1993). Thus, we expect that using less prominent identity signals in intergroup interactions would negatively affect the outcomes of these interactions due to the experienced identity threat. We further anticipate that this effect would be stronger for individuals who feel closely associated with the signaled identity, because these individuals are more likely to view the experience as threatening and engage in efforts to defend the identity compared to those who possess lower levels of identification (Branscombe, Wann, Noel, & Coleman, 1993).

In the following sections, we discuss the literature on identity signaling, processing fluency and identity threat, and use this to build our propositions about the relationship between these constructs and their effect on intergroup interactions. We subsequently test our propositions in a series of studies using three common identity-signaling domains – college affiliation, political party membership and brand communities, closing with a discussion of the implications of the research.

IDENTITY SIGNALING

Individuals frequently use signals to express themselves to others (Belk, Bahn, & Mayer, 1982). Such signals may reflect one's attitudes or personality (Otnes, Lowrey, & Shrum, 1997; Shavitt, Swan, Lowrey, & Wänke, 1994), their personal tastes (Griskevicius et al., 2010; Kleine, Kleine, & Kernan, 1993) or associations with groups or organizations (Highhouse, Thornbury, & Little, 2007). People often feel strong connections to signals that allow them to express and

reinforce these group associations (Escalas & Bettman, 2003; Mead, Baumeister, Stillman, Rawn, & Vohs, 2011). In general, people tend to prefer signals that communicate their identity to others in the most efficient manner. Moreover, individuals avoid using signals that could be misinterpreted as identity signals of other groups or could lead observers to believe the individuals share undesirable traits associated with the out-groups (White & Dahl, 2006). Thus, in many contexts, individuals seem to prefer signals that are easily recognizable by observers (Wilcox et al., 2009) because these signals clearly communicate their in-group identity.

There are, however, some concerns signalers may have when using prominent signals to communicate their identity to others. For an object to signal effectively, it must unite the members of the in-group by clearly communicating the shared identity while differentiating them from non-group members. But the use of easy to recognize signals to indicate group membership may enable outsiders to copy and use these signals, particularly when membership in the group is highly desirable (Berger & Heath, 2008). Thus, groups may attempt to use identity signals that are more difficult for out-group members to imitate. For example, high-end handbag manufacturers frequently use understated branding, such as a small logo in an inconspicuous place. These subtle signals allow for communication of the message to in-group users, while simultaneously limiting the ability of out-group others to adopt them because the out-group does not have sufficient knowledge. This enables the in-group to resist co-option of their signals by mainstream consumers (Berger & Ward, 2010).

While prior research has explored the reasons why individuals may choose to use more (vs. less) difficult-to-process signals, it has largely neglected the consequences of these behaviors. To the best of our knowledge, no work has specifically examined how the use of such signals affects the signaler's behavior in subsequent inter-group interactions. Thus, the focus of

this research is to explore the behavior of the signaler in these inter-group interactions as a function of the use of subtle versus prominent identity signals. We draw from literature on metacognitive experiences to propose that the difficulty of processing associated with less prominent, less fluent identity signals, in the context of inter-group interactions, will temporarily create an identity threat, thus leading individuals to behave more negatively towards members of the out-group in an attempt to reaffirm their identity.

EFFECT OF PERCEPTUAL FLUENCY ON INTER-GROUP INTERACTIONS

Beyond the actual content of information, the metacognitive feelings of ease (or difficulty) of processing information can serve as an input into judgment (Reber, Winkielman, & Schwarz, 1998; Schwarz, 2010). Generally, an increase in ease of processing (such as through repeated exposure, Zajonc, 1968) of an object is interpreted to indicate that the object is familiar (Jacoby, Kelley, & Dywan, 1989; Whittlesea, Jacoby, & Girard, 1990) and often improves its evaluation (Winkielman, Schwarz, Reber, & Fazendeiro, 2003). For example, words presented with high visual clarity were judged to be more familiar than words presented with low visual clarity (Whittlesea et al., 1990), and statements that are seen repeatedly are more likely to be evaluated as true (Scholl, Greifeneder & Bless, 2014). In contrast, difficulty in information processing – that is, low processing fluency – is predominately interpreted to mean an object is less familiar or uncommon, and in general, negatively affects attitudes towards it (Reber et al., 1998).

Importantly, research has also shown that processing fluency can affect assessments of confidence in one's thoughts and judgments (Labroo & Kim, 2009; Schwarz, 2010; Song &

Schwarz, 2009). For example, difficulty (vs. ease) of thought generation has been shown to affect confidence in judgments of one's assertiveness (Schwarz, Bless, Strack, & Klumpp, 1991), general knowledge (Kelley & Lindsay, 1993), memories of events and study materials (Shaw, 1996; Ball, Klein & Brewer, 2014), and attitudes towards policies (Haddock, Rothman, Reber, & Schwarz, 1999). In social contexts, difficulty in processing information has been shown to partly account for the negative evaluations of out-groups, such as migrants (Rubin, Paolini & Crisp, 2010) and homosexuals (Lick & Johnson, 2013). Further, writing about positive qualities of the self with one's non-dominant hand (an experience that is metacognitively difficult) reduced confidence in self-related thoughts (Briñol & Petty, 2003). Thus, while the effect of processing experiences have not been directly studied in the domain of identity threat, there is considerable support for the potential effects of the experience of processing fluency in assessments of the self.

Consistent with the view that metacognitive difficulty can reduce confidence in one's self-view, we propose that the use of low fluency identity signals may lead individuals to experience identity threat. Social identity threat occurs when individuals' beliefs about their identity are undermined (Branscombe, Ellemers, et al., 1999). These threats occur as a result of challenges to the value of a group's identity (Branscombe, Schmitt, & Harvey, 1999; Jetten, Postmes, & McAuliffe, 2002), the quality of the group's members (Steele, Spencer, & Aronson, 2002), or behaviors that damage the self-concept (Ward & Broniarczyk, 2011). In the context of an interaction with a person from an out-group, we expect that difficulty in processing an identity signal will lead individuals to experience an identity threat.

However, we expect that the identity threatening effect of using low fluency signals will only occur in the context of intergroup interactions. Prior work on processing fluency

demonstrates that metacognitions are understood within the context of an experience rather than having a consistent positive or negative effect on judgments (Briñol, Petty, & Tormala, 2006; Labroo & Pocheptsova, 2016; Schwarz, 2010). For example, Pocheptsova, Labroo and Dhar (2010) found that disfluent processing of products led to more positive evaluations in the context of luxury goods where the inferences of uncommonness would be desirable, but not in the context of everyday goods where, instead, the inference of familiarity is desirable. Building on this literature, we expect that the difficulty of processing identity signals is likely to produce identity threat only when the identity signal is meaningful – that is, when out-group members would observe it. This proposition is also consistent with prior work showing that individuals will alter their decisions when others are able to make inferences about them based upon those choices (Ratner & Kahn, 2002; Berger & Heath, 2007; Sengupta, Dahl & Gorn, 2002). In a product-signaling context, individuals avoid choosing a product associated with an out-group, but only when this behavior would be observable by others (White and Dahl, 2006), suggesting that the use of the product itself does not threaten the individuals' identity outside of a social context.

The proposed experience of identity threat due to the use of less fluent identity signals has important consequences for signalers in interactions with out-group members. Identity threats lead individuals to feel uncertainty regarding in-group identity (Gao, Wheeler & Shiv, 2009). To recover from these threats, individuals will attempt to reaffirm the value of their identity (Tajfel & Turner, 1979) and maintain self-esteem (Tesser, 2000) through a variety of different methods. One method to achieve this is to engage in derogation of the out-group (Wills, 1981; Fein & Spencer, 1997). By engaging in downward comparisons with the out-group, individuals are able to self-enhance and recover from the threat. For example, Branscombe and

Wann (1994) found that Americans engaged in derogation of Russians (an out-group) following

exposure to an identity threatening video where an out-group boxer defeated a member of the in-

group. A second method of recovering from an identity threat is to act more competitively in

interactions with members of the out-group, as a means to improve the status of the in-group and

the self (Ellemers et al., 1993). We expect that individuals using less fluent signals in interactions

with out-groups will experience an identity threat and try to reaffirm their identity by both

derogating the out-group and behaving less cooperatively with out-group members.

   Finally, we predict that the effect of using low fluency signals in interactions would be

moderated by the extent to which the individual identifies with the in-group. Prior research has

shown that reactions to identity threats are dependent upon identification with the group.

Following threatening experiences, highly identified people perform more consistently with

stereotypes of their identity (Schmader, 2002), feel increased cohesion among group members

(Turner et al., 1984), embrace group norms (Jetten et al., 2002), express higher degrees of

prejudice (Morrison, Plaut & Ybarra, 2010) and engage in out-group derogation to defend the

value of associating with the group (Branscombe & Wann, 1994). Conversely, people low in

identification tend to "cut off reflected failure" and separate themselves from the group (Snyder,

Lassegard & Ford, 1986; Branscombe et al., 1993). Because these people are less motivated to

reaffirm their identity compared to those who have high identifications with it (Branscombe,

Schmitt et al., 1999; Jetten et al., 2002), we expect that individuals who are highly connected

with the group will experience identity threat when using low fluency signals, while those who

are not highly connected would not perceive the experience as damaging to their identity.

   In summary, we propose that when people use less fluent identity signals in interactions

with out-group members, their feelings of difficulty in processing the signal will lead them to

experience identity threat. This experience of identity threat will manifest in decreased confidence in the self, out-group derogation and decreased cooperation with out-group members in interactions.

OVERVIEW OF STUDIES

Building on prior research, we hypothesized that (i) individuals who use less fluent signals would experience an identity threat when those signals are observable by out-group members; (ii) that this relationship would be moderated by the extent to which individuals associate with the in-group; and (iii) that the experience of identity threat would lead individuals to engage in behaviors to recover from threat. To test these hypotheses, we present five studies involving three distinct identity domains: college affiliation, political party membership, and brand communities. In the first three studies, we explore our core proposition that using low fluency signals leads individuals to experience an identity threat. The first study shows that using low fluency signals leads individuals to engage in out-group derogation, a behavior commonly associated with identity threats. The second study more directly shows that the experience of using low fluency signals in interactions leads to identity threat by demonstrating that the negative effect of low fluency signals is attenuated when individuals are given a chance to self-affirm. The third study clarifies the identity-driven nature of the process in two ways. First, we show that experience of identity threat associated with using low fluency signals only occurs when the receivers observe the signal. This highlights the importance of context in the interpretation of fluency experiences. Second, we show the moderating effect of identification, with the effects only emerging for those who strongly identify with the in-group. Having

established the connection between use of low fluency signals in inter-group interactions and identity threat, the final two studies show how the experience of identity threat can affect subsequent interactions in the context of an ultimatum game, where we find that individuals using low fluency signals behave less cooperatively with out-group members. Study 5 provides a replication of these results, as well as showing effects consistent with the findings of prior work on ultimatum games where individuals will alter their behavior towards out-group members when game outcomes are made visible to others outside the interaction.

STUDY 1

The purpose of the first study was to provide an initial demonstration of the relationship between the experience of processing fluency and identity threat in an inter-group context. Prior research has shown that one potential response to identity threat is for individuals to engage in out-group derogation, which helps them to maintain a positive view of the group and their identification with it (Branscombe & Wann, 1994). Based on this, we predicted that participants using less fluent logos of their identity to represent themselves to an out-group member would be more likely to make negative attributions about the out-group to recover from the identity threat. To establish the in- and out-groups, we asked participants (college students) to imagine that they were interacting with a student from another university, a frequent athletic rival. Students typically identify strongly with their universities (Cialdini et al., 1976), and thus a challenge to their university identification would likely be perceived as identity threat.

Method

The study employed a 2-level (processing fluency: high, low) between-subjects design. One hundred and six undergraduate students from a large mid-Atlantic university participated in the study for partial course credit (39.6% women). Participants were told they would be paired with a student from another (rival) university and were given a forced choice between two of their university's logos to represent themselves in an interaction. Allowing participants to choose between a set of two different signals, instead of assigning participants a particular signal, was done to increase participants' perceived agency in the use of the signal in interactions.

In the high fluency condition, the two logos were presented in their original form. In the low fluency condition, the logos were manipulated to make them more difficult to process, by increasing their pixilation and decreasing their contrast (see Appendix A). This design, employing a choice between two logos of similar fluency, was used because we were interested in examining the behavior of the individuals, conditioned on their use of low vs. high fluency signals. We conducted two pretests to validate this approach. The first (N = 44) was to demonstrate the manipulation of processing fluency. The pretest used a counter-balanced within-subjects design with two levels, corresponding to the high and low fluency logo sets. Participants were told they would be interacting with a student from the out-group university. Next, they chose between two of their university's logos (either two high or two low fluency logos) to represent themselves in the interaction. They were then asked to rate the logo they chose using five seven-point items (1 = Difficult to process, Effortful to process, Difficult to recognize, Difficult to understand, Took much time to process; 7 = Easy to process, Effortless to process, Easy to recognize, Easy to understand, Took little time to process), which were derived from prior work (Lee & Aaker, 2004; Schwarz, Labroo, & Dhar, 2008). These items were combined into a measure of processing fluency (α = .86). After rating the first set, they were asked to rate

the second set of logos that they had not yet seen (either high or low fluency). The processing

fluency of the high fluency logo set was higher (M = 6.66) compared to the low fluency logo set

(M = 6.03, t(43) = 3.76, p < .01). This suggests that the intended manipulation of fluency would

be successful.

We conducted a second pretest (N = 35) to rule out the possibility that the act of choosing

between sets of either low or high fluency signals may affect participants' moods, which could

potentially affect their behavior. Participants followed the same procedure as in the first pretest

and then responded to two seven-point scale-items (1 = Happy, Good; 7 = Sad, Bad), which were

combined to form a measure of mood (r = .85, p < .01). Mood did not differ across the two

fluency conditions (t(34) = 1.30, p > .20), suggesting that the choice between low fluency logos

did not negatively affect participants' moods compared to those choosing between high fluency

logos.

In the main study, participants first selected a logo, and then were asked to write a

message describing themselves that would supposedly be sent to their out-group partners. Two

research assistants, who were blind to the hypothesis of the study, coded the number of

positively (e.g., "love", "proud") and negatively (e.g., "dislike," "hate") valenced descriptive

words about participants' own university or student body and the out-groups' university or

student body. The number of negatively valenced descriptive words used to describe the out-

group university served as a measure of participants' desire to reaffirm their identity by

derogating their interaction partners' group (the out-group). Examples of derogating statements

included "I hate [Out-group University]", "[Out-group University] sucks" and "[In-group

university] is better than [Out-group university]." Inter-coder reliability for the measure was high

(Cohen's $\varkappa$ = .91, p < .01), and disagreements were resolved through discussion between the

coders.

Results and Discussion

We expected that participants who sent low fluency signals to their out-group partner

would experience an identity threat, leading them to derogate the out-group, which would be

evidenced by the higher number of negative words related to the out-group. Because the measure

of derogation was the count of negative attributions, we employed a negative binomial regression

to model the relationship. Consistent with our predictions, participants in the low fluency

condition made more negative attributions about their interaction partner's group (M = .30) than

those in the high fluency condition (M = .04, Wald $\chi^2(1) = 7.39$, p < .01[1]). There were no effects

of fluency on positive and negative attributions about participants' own university, or on positive

attributions about the out-group group (in-group positive: M_{Low} = .31, M_{High} = .31, Wald $\chi^2(1)$ = .00,

p > .94; in-group negative: M_{Low} = .00, M_{High} = .11; out-group positive: M_{Low} = .00, M_{High} = .00[2]). These

results suggest that participants who used a low fluency signal recovered from the identity threat

by selectively derogating the out-group, a finding consistent with prior work showing that

identity threat recovery is generally manifested in out-group derogation rather than in-group

positivity (Branscombe & Wann, 1994, Fein & Spencer, 1997).

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[1] These results are unchanged by the inclusion of response length (number of words) as a
covariate (Fluency: Wald $\chi^2(1) = 6.91$, p < .01; Response Length: Wald $\chi^2(1) = 2.18$, p > .14).
[2] Because the frequency for some cells was equal to zero, estimating a negative binomial model
was not possible. Recoding in-group negative attributions to a binary indicator variable revealed
no effect of fluency ($\chi^2(1) = .97$, p > .32).

STUDY 2

The purpose of the second study was to provide additional evidence for our proposed process, by demonstrating that the effect of low fluency signals could be attenuated with an independent confidence prime, which prior work has shown can undermine the effects of an identity threat (Gao et al., 2009). In our first study, we measured behaviors used to recover from an identity threat, which were directed towards the outgroup, consistent with prior work (Branscombe and Wann 1994). In study 2, we turn our focus inward and use a measure of the experience of identity threat: self-evaluations of performance on a task that was diagnostic of the identity. Similar measures have been shown to decrease in response to identity threats in prior research (Steele & Aronson, 1995; Rydell, McConnel & Beilock, 2009). Thus, while Study 1 showed participants reaffirming their identity after experiencing a threat, in Study 2 we more directly test the process by showing lower perceived performance on an identity-relevant task.

Method

The study employed a 2 (processing fluency: high, low) X 2 (confidence prime: control, confidence) between-subjects design. One hundred eighty-five undergraduate students from a large southern university participated in the study for partial course credit (54.3% female). Forty-eight percent of the participants completed the study in an experimental lab, while the remaining participants completed the study online. An indicator-coded variable for online-offline participation indicated there were no significant main or interaction effects (all Fs < .61, all ps > .43) of the experimental setting, suggesting that there were no differences between the pools and is not discussed further.

The overall setup was similar to that of study 1. Participants were told they would be interacting with a student from another (rival) university and were given a choice between two of their university's logos to represent themselves to an out-group partner, which were presented in either their original format or modified to be less fluent (see Appendix B). After participants made their choice between the two logos, their selection was displayed to them and they were given an opportunity to send a brief message about themselves to their out-group partners. Next, participants were told they would be completing a word puzzle task that was "a good measure of verbal ability" (an academic behavior task diagnostic for undergraduate students), and that their scores would be compared to those of their out-group partner. Participants were given 90 seconds to find as many words as possible, and then completed either a confidence prime manipulation adapted from Petty, Briñol and Tormala (2002) or a control task. The timing of the confidence manipulation – after the word puzzle task – was used to ensure that the manipulation would only affect the subjective evaluation of the performance and not performance on the task itself. In the confidence priming condition, participants were asked to recall two personal experiences where they felt confident in their thoughts and then to list and describe these experiences. In the control condition, participants recalled and listed everything they had eaten for their last two meals. Participants then rated their performance relative to the out-group member using a seven-point scale (1 = Much worse, 7 = Much better), which served as the primary dependent measure. Finally, participants rated how eye-catching and attractive they found the image they used to represent themselves was using two measures (1 = Not eye-catching/attractive, 7 = Eye-catching/Attractive), which were combined into a measure of the perceived attractiveness of the image (r = .79, $p < .01$).

Results

We hypothesized there would be an interaction effect of processing fluency and the confidence prime, such that in the control condition, we would replicate the findings of Study 1, where the use of a low fluency signal would lead to an experience of identity threat, reflected in lowered self-evaluations of the performance on an identity-relevant task. However, we expected these effects would be attenuated when participants were primed with confidence.

Manipulation Check. A two-way ANOVA including fluency and the confidence prime revealed no significant main or interaction effects on the attractiveness measure (all Fs < 2.61, all ps > .10). Overall ratings of attractiveness for the images were reasonably high (M = 6.22), suggesting that participants did not feel that the images were unfavorable representations of themselves or their identity.

A two-way ANOVA revealed a marginal main effect of the confidence prime ($F(1, 181) = 3.30, p < .08$), qualified by the predicted interaction effect ($F(1, 181) = 4.68, p < .03$). Planned contrasts indicated that in the control condition, participants using low fluency images to represent themselves evaluated their performance lower (M = 2.29) compared to those using high fluency images (M = 2.98, $F(1, 181) = 5.62, p < .05$). Similarly, when using low fluency signals, participants evaluated their performance lower in the control condition compared to the confidence prime condition (M = 3.14, $F(1, 181) = 7.81, p < .01$). As we predicted, however, when confidence was primed, there were no differences between the high and low fluency conditions ($M_{High} = 2.91$, $M_{Low} = 3.14$, $F(1,181) = .56, p > .45$).

Discussion

The results of our second study provide additional evidence that the experience of using low fluency signals can lead to identity threats in an inter-group context. Consistent with prior research on social identity threats (Steele & Aronson, 1995; Rydell et al., 2009), when participants were given the opportunity to complete an identity relevant task (a test of abilities related to a college student identity) and compare the results to that of an out-group member, participants who had used less fluent identity signals perceived their performance to be poorer compared to members of an out-group. However, when participants' confidence was boosted through confidence priming task, this negative evaluation disappeared.

It is important to note that while participants were supposedly paired with out-group members in studies 1 and 2, the entire experience was one-way, as participants did not receive any information about their partners' reactions to their choice of signals, self-descriptions or performance on the task. This suggests that the observed results do not depend on the signaler's assumptions about how interaction partners would react to the signals. However, as we argued earlier, the difficulty of processing of identity signals is likely to only produce identity threat when the identity signal is meaningful – that is, when out-group members would observe it. In the next study, we test this proposition directly by manipulating whether participants believe their chosen image is visible to their interaction partners. Because we argue that the process is driven by the experience of identity threat when using low fluency signals in interactions, we expect that the effects observed in the prior studies will be attenuated when the image is not used in a social context, where the out-group members can observe it.

STUDY 3

The purpose of our third study was three-fold: first, we sought to provide evidence that the negative effect of using low fluency signals only manifests when the signal is visible to out-group members. We tested this by manipulating whether participants were told that their choice of signals would or would not be visible to their out-group partners, with the expectation that if the partner could not see the signal, the effects observed in the earlier studies would be attenuated. Second, though our Study 2 demonstrated that boosting confidence can attenuate the effect of using low fluency identity signals in a fashion consistent with our proposed mechanism, in this study we employ a more direct measure of identity threat – certainty in their group identity (Gao et al. 2009) – as our primary dependent variable, which more directly assesses the mechanism.

Third, we explored how identification with the in-group would moderate the effect. In prior research, identification has been observed as a boundary condition for the experience of identity threat (Branscombe, Schmitt et al., 1999; Jetten et al., 2002), and we therefore expected that, for individuals who highly associated with the in-group, using visible low fluency identity signals would lead them to experience identity threat when interacting with others, but that these effects would not emerge for those who were not strongly associated with the in-group. We tested these predictions in the context of political groups, which have been shown to be a source of identity (Greene, 1999) and can sharply influence people's attitudes and beliefs (Cohen, 2003), as well as their behaviors towards out-group members (Fowler and Kam, 2007).

Method

Seven hundred participants from the United States were recruited from the Mechanical Turk panel to complete a screening questionnaire, ostensibly about a U. S. presidential election. Participants were asked the extent to which they identified with the Democratic and Republican parties using two measures, each anchored by seven-point scales (1 – Not at all, 7 – Very strongly). Out of this initial group, 370 participants rated themselves as above the midpoint of the scale for their identification with the Democratic Party, while 134 rated themselves above the midpoint for their identification with the Republican Party. We invited those participants who rated themselves above the midpoint on identification with the Democratic Party to complete the main study. Three hundred and three participants (82.0% of the invited group, 48.8% female, 32.5 mean age) completed the main study. The study employed a 2 (processing fluency: high, low) X 2 (visibility of signal to receiver: visible, not visible) between-subjects design, with identification with a political party as a measured factor.

Participants were told they would be completing an interaction task with a partner over the Internet. Participants were told their partner had responded to a question about the extent to which he/she identified with the Republican Party (the same question that appeared in the screener questionnaire) by saying "7 – Very strongly," identifying the interaction partner as likely to be an out-group member. Next, participants were asked to choose an image to represent themselves in their interaction. Their choice was between two cartoon donkey images, the symbol of the Democratic Party. The fluency of the images was manipulated as in the previous studies (see Appendix C).

To manipulate visibility, in the visible condition, participants were told that the image they chose "will represent you to your partner in the interaction." In contrast, in the not visible condition, participants were told, "This image was only for you, and your partner will not see it."

After choosing their image, participants were asked to send a brief message to their partners (as in Study 2), and then responded to two items measuring their self-certainty: how confident they felt in their identity and how self-assured they felt, which were subsequently combined to form a measure of self-certainty (r = .68, $p < .01$). Finally, participants completed the measure of group identification, along with a manipulation check for processing fluency and demographic measures. Identification was measured with three seven-point items by asking the extent to which participants felt similar to other Democrats, to which they felt like members of the Democratic electorate, and to which they felt like good representatives of the Democratic electorate (1 = Not at all, 7 = Very much). These items were combined to form a measure of identification ($\alpha = .81$). The fluency measure was composed of the same five items used in the pretests for study 1 ($\alpha = .93$).

Results

Manipulation Check. A two-way ANOVA including the manipulated factors of processing fluency and visibility revealed a marginal main effect of fluency ($F(1, 299) = 3.62$, $p < .06$), and no other significant effects (all Fs < .89, all ps > .34). Participants in the high fluency condition rated their chosen image as more fluent (M = 5.83) compared to those in the low fluency condition (M = 5.54), suggesting the manipulation of fluency was successful. The same two-way ANOVA model with identification as the dependent measure revealed no significant main or interaction effects (all Fs < 2.57, all ps > .11), suggesting that the measured factor was unaffected by the manipulations.

We predicted that the effect of fluency on self-certainty would be moderated by the strength of in-group identification and the visibility of the signal to the out-group. Specifically,

we expected to observe a decrease in self-certainty after using low fluency identity signals, but only when the signal was visible to their interaction partners, who were members of the out-group. Further, we expected that only participants who were strongly associated with the in-group would experience lowered self-certainty after using a visible low fluency image. To account for higher degrees of variance in individual differences present in the MTurk sample (Goodman, Cryder & Cheema 2013), we included gender and age as covariates in our analysis, as is typically done when using the MTurk panel (Rand, Newman & Wurzbacher 2015). However, the inclusion of covariates in our analysis does not substantively affect our conclusions in this or the subsequently reported studies employing MTurk samples.

FIGURE 1 ABOUT HERE

The data was analyzed using a regression model with self-certainty as the dependent variable, and including main effects of processing fluency and visibility (both dummy-coded), identification, and all two- and three-way interaction effects, along with age and gender as covariates. The analysis revealed significant main effects of processing fluency ($\beta = -1.78$, $t(293) = -2.37$, $p < .02$), visibility ($\beta = -2.24$, $t(293) = -2.61$, $p < .01$) and identification ($\beta = .27$, $t(293) = 2.68$, $p < .01$). These effects were qualified by significant interactions of fluency and identification ($\beta = .36$, $t(293) = 2.50$, $p < .02$), fluency and visibility ($\beta = 2.63$, $t(293) = 2.16$, $p < .04$), visibility and identification ($\beta = .42$, $t(293) = 2.55$, $p < .02$), and the predicted three-way

interaction (β = -.48, t(293) = -2.09, p < .04, see Figure 1[3]). To clarify the nature of the interactions, we analyze the two visibility conditions separately.

When the identity signal was visible to the interaction partner, significant main effects of fluency (β = -1.75, t(151) = -2.20, p < .05) and identification (β = .26, t(151) = 2.49, p < .05) were qualified by a significant interaction effect (β = .35, t(151) = 2.32, p < .05). As expected, a spotlight analysis (Aiken & West 1991; Hayes 2013) indicated that at high levels of identification (+1SD), participants indicated lower levels of self-certainty after using a low fluency signal (M = 5.88) compared to those using high fluency signals (M = 6.33, t(151) = 1.97, p = .06). At low levels of identification (-1SD), the difference was not significant (M_{Low} = 5.28, M_{High} = 4.94, t(151) = -1.40, p > .16). In contrast, when identity signal was not visible to the interaction partner, only the main effect of identification was significant (M_{Low} = 5.13, M_{High} = 6.31, β = .70, t(140) = 5.66, p < .01), but no other effects were significant (all ts < 1.00, all ps > .32).

Discussion

In our third study, we again observed that using low fluency signals led individuals to experience identity threat during out-group interactions, as demonstrated by lowered self-certainty. Importantly, we also demonstrated two qualifications for this effect: the strength of in-group identification and the visibility of the signal to the out-group member. Consistent with prior research, we found that the negative effect of the experience of identity threat only occurred for those who were strongly identified with the in-group. Moreover, the effects were attenuated when the signal was not visible to the out-group member. As we proposed, this suggests that the

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[3] In a model not including age and gender as covariates, there are no changes in the results of the analysis, and the predicted three-way interaction effect of identification, visibility and fluency remains significant (t(295) = -.52, p < .03).

use of the low fluency signal in the context of an out-group interaction leads individuals to experience an identity threat, and is not due merely to the use of the low fluency signal.

In the remaining studies, we explore how identity threat associated with using less fluent signals can have real financial consequences in inter-group interactions by having participants imagine completing an ultimatum game (Güth, Schmittberger, & Schwarze, 1982) with an out-group member. In this game, the two players in the interaction are given roles of a proposer and a decider. The proposer is asked to divide a given amount of money between the two players, and the decider makes a choice to either accept or reject the offer. If the decider accepts the offer, both players receive the proposed amounts of money. If the decider rejects the offer, neither player receives any money. Though the economically rational choice is for the proposer to offer a small amount and for the decider to accept (as both will be strictly better off), offers diverging significantly from a relatively equal split of the money have been shown to decrease the likelihood of acceptance of the offers (Güth et al., 1982; Kahneman, Knetsch, & Thaler, 1986), leaving both participants worse off. The ultimatum game is frequently used in studies of fairness (Forsythe, Horowitz, Savin, & Sefton, 1994) and prior work has shown that offers in the game are sensitive to the factors that signal identity of the participants, such as the gender (Eckel & Grossman, 2001) and group membership (Gil-White, 2003). Prior research has shown that individuals are willing to incur painful costs to themselves to prevent out-group members from profiting (Garcia, Tor, Bazerman & Miller, 2005), and studies of the related dictator game (where the proposer's offer cannot be rejected) showed that increasing the social distance between the players (as exists between an in-group and an out-group) decreased offers in the game (Hoffman, McCabe, & Smith, 1996).

We expected offers in the ultimatum game to be negatively affected by the use of less fluent signals, as participants who experience an identity threat will attempt to recover by acting less cooperatively with out-group members (Ellemers et al., 1993). In Study 4, we tested this prediction by recruiting Apple product owners as the target in-group. They are characterized as a diverse community with a range of different levels of identification with the brand, while still being distinct from the out-group, "PC" users (Muniz & O'Guinn, 2001).

STUDY 4

Method

One hundred and eight self-identified Apple products owners were recruited from the Mechanical Turk online panel (63.6% female, mean age 33.4 years). The study used a 2-level (processing fluency: high, low) between-subjects design, with identification with the Apple brand community as a measured factor. Participants were paid a base rate for completing the experiment ($.50), plus an additional payment based on the outcome of the interaction. Participants were asked to imagine they are completing a game with a partner over the Internet, a scenario that has been successfully used in prior work (Summerville & Chartier, 2013). The participants were told that their partner owned a Dell laptop, an out-group member to Apple owners (Muniz & O'Guinn, 2001). Next, participants chose between two logos to represent themselves in the interaction. Their choice was between two Apple brand logos, with fluency manipulated as in the prior studies (see Appendix D).

After participants chose a logo, they were told that the logo had been sent to their partner. Next, instructions for the ultimatum game were provided. Participants were tasked with splitting

$2.25 between themselves and the interaction partner. They were further told that they would be the proposer in the game; that they would decide the split and their partner would accept or reject the offer. If the offer was accepted, both parties would receive the money according to the offer, but if the offer was rejected, each party would receive nothing. Participants entered their offer, from $0.00 to $2.25, in five-cent increments.

After making an offer, participants responded to manipulation checks while ostensibly waiting for their partner's decision. All the items were completed using seven-point scales. Participants rated the processing fluency of the logo they chose using the same items as in the prior studies (α = .88). To control for potential alternative explanations, participants also rated how unique (1 = Not unique, 7= Unique) the logo was, along with how eye-catching and attractive the logo was using the same measures as in Study 2, which were again combined into a measure of attractiveness (r = .73, p < .01). Participants' identification with the Apple community was measured using two items: the extent to which they felt similar to and different from (reverse coded) other Apple users (1 = Not at all, 7 = Very much; r = .72, p < .01). Finally, all participants were told their offers were accepted, responded to demographic measures, and were subsequently issued a payment of the difference between the initial $2.25 and their offer to their out-group partner.

Results

Manipulation Checks. Participants in the high fluency condition rated the processing fluency of their logo as marginally higher (M = 6.14) compared to the low fluency condition (M = 5.75, F(1, 106) = 3.21, p < .08), suggesting that the manipulation of fluency was successful. Identification with the Apple in-group was unaffected by the fluency manipulation (F(1, 106) =

.60, $p < .44$), ruling out the possibility that fluency of the logo affected in-group identification. The uniqueness and attractiveness measures were also unaffected by the fluency manipulation (all Fs < .18, all $ps > .67$), again suggesting that differences in these perceptions were unlikely to explain our results.

FIGURE 2 ABOUT HERE

Ultimatum Game Offers. The average offer was $1.05, or 47% of the total sum, which is consistent with prior ultimatum game studies (Güth et al., 1982; Hoffman et al., 1996). A regression analysis was conducted with offer as the dependent variable, and identification, a dummy coded variable representing processing fluency, and the interaction of identification and fluency as independent variables, along with age and gender as covariates. The analysis revealed significant main effects of the control variable age ($\beta = .01$, t(102) = 2.13, $p < .05$) and of brand identification ($\beta =.16$, t(102) = 1.98, $p < .05$), along with the predicted two-way interaction of brand identification and fluency ($\beta = -.12$, t(102) = -2.40, $p < .02$, see Figure 2[4]). To clarify the nature of this interaction, we again employed a spotlight analysis. At high levels of identification (+1SD), participants using low fluency signals made significantly lower offers to their out-group partners (M = $0.90) compared to those who used high fluency signals (M = $1.16, t(102) = -2.47, $p < .02$). At low levels of identification (-1SD), there was not a difference in offers between those who used low and high fluency signals (M_{Low} = $1.13, M_{High} = $1.03, t(102) = .93, $p > .35$).

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[4] In a model not including age and gender as covariates, the predicted interaction effect of brand identification and fluency remains significant (t(104) = -2.17, $p < .04$).

Thus, as expected, the effect of signal fluency on offers only emerged for participants who strongly identified with the group of brand users.

Discussion

The results of this study provide evidence that the identity-threatening experience of using a low fluency logo can affect signaler's behavior towards an out-group member in an interaction with real consequences, and replicates the findings of Study 3 by showing that these effects only occur for those highly associated with the in-group identity. Participants who were highly associated and used a low fluency identity signal behaved less cooperatively towards an out-group member by making lower offers in the ultimatum game, which would presumably help them reaffirm their in-group identity.

In the final study, we return to the political affiliation domain, with the goal of replicating the findings of Study 4. In addition to showing the robustness of our effects in a different identity domain, we also sought to show that our findings were consistent with prior work on economic games. Specifically, it has been shown that public observability of behavior can have significant impacts on how individuals distribute resources (Hamilton, 2006) and explicitly telling proposers in ultimatum games that their offers would be made public leads to higher offers, as doing so may affect their reputation (Lamba & Mace, 2010). Thus, we expected that these public self-presentation concerns could present a boundary condition for the uncooperative behaviors observed in Study 4, such that when the signalers' behavior would be observable outside the inter-group interaction, these behaviors would be attenuated.

STUDY 5

Method

The recruitment procedure was similar to that of Study 3. Eight hundred and fifty participants from the United States were recruited from the Mechanical Turk panel to complete a screening questionnaire, ostensibly about a U. S. presidential election. Participants were asked the extent to which they identified with the Democratic and Republican parties, and out of this initial group, 343 participants rated themselves as above the midpoint of the scale for their identification with the Democratic Party, and 39 were above the midpoint for identification with the Republican Party. Based on this distribution, we invited those participants who identified with the Democratic Party to complete the main study. Participants' responses to this measure of identification with the Democratic Party served as the measure of political party identification in the subsequent analysis. Two hundred and fifteen participants (63%) from the invited group completed the main study. The study used a 2 (fluency: high, low) X 2 (outcome observability: receiver only, public) between-subjects design, with party identification as a measured factor.

The procedure in the main study was similar to that of the Study 4. First, participants were told they would be completing an interaction task with a partner over the Internet. Participants were told their partner had responded to a question about the extent to which he/she identified with the Republican Party (the same question that appeared in the screener questionnaire) by saying "7 – Very strongly," identifying the interaction partner as an out-group member. Next, participants were asked to choose an image to represent themselves in their interaction, using the same images as in Study 3 (see Appendix C).

After participants chose an image, the same instructions for the ultimatum game were provided as before, but with the addition of a sentence describing who would be able to see their

offers and the outcome of the game. In the receiver-only condition, participants were told that the

offer and the outcome of the game would not be shared with anyone except their interaction

partner (similar to Study 4). In the public condition, they were told that the offer and the outcome

of the game would be shared with all other out-group members currently playing the game.

Participants then completed the ultimatum game and, after making their offer, were informed

their offer had been accepted. Demographic information was collected, which was included as

covariates in the subsequent analysis. Finally, participants were debriefed, which included an

explanation of the purpose of the visibility manipulation and assurance that the outcomes of the

game would not be made public.

Results

The data was analyzed using a regression model with offer as dependent variable, and the

model included main effects of processing fluency and outcome observability (both dummy-

coded), identification and all two- and three-way interactions between these as independent

variables, along with age and gender as covariates. The average offer was $.96, or 43% of the

total sum.

FIGURE 3 ABOUT HERE

The analysis revealed a significant effect of outcome observability ($\beta = -1.24$, $t(205) = -$

2.34, $p < .03$), of the interaction between party identification and outcome observability ($\beta = .21$,

$t(205) = 2.29$, $p < .03$), and a marginal effect of the predicted three-way interaction ($\beta = -.22$,

$t(205) = -1.78, p < .08$, see Figure 3[5]). To clarify the nature of this interaction, we split the data

by outcome observabililty. When responses were to be kept private, there was a significant main

effect of age ($\beta = -.01$, $t(99) = -2.12$, $p < .04$) and, replicating the findings in Study 4, a

marginally significant interaction of party identification and fluency ($\beta = .12$, $t(99) = 1.65$, $p =$

.10). A spotlight analysis indicated that, as in the prior studies, highly identified participants

made lower offers to their out-group partners when they used a low fluency signal (M = $0.87)

compared to those who used high fluency signals (M = $1.10, $t(99) = -2.63$, $p < .01$). Participants

who were not highly identified did not differ in their offers ($M_{Low} = 1.00, $M_{High} = 1.04, $t(99) = -$

$.49, p > .62$). In the public condition, where offers were to be made public, none of the effects

were significant (all ts < 1.54, all ps > .13). This suggests that participants' knowledge that their

offers would become public can undermine the potential ability of uncooperative behavior to

recover from an identity threat.

Discussion

        The results of our final study replicate the effects from Study 4 in a different identity

domain, by again showing that highly associated individuals who used less fluent signals

behaved more uncooperatively in their interactions with out-group members. We also show that,

consistent with prior literature on behavior in economic games, when the individuals knew that

their behavior towards their out-group partner in the interaction would be made public, the effect

of fluency on the offers was attenuated. While the effects of experiencing disfluency in a

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[5] In a model not including age and gender as covariates, the predicted three-way interaction effect of party identification, fluency and visibility is marginally significant ($t(215) = -1.70$, $p < .09$).

signaling context can lead to identity threat and behaviors to recover from this, the potential self-presentation concerns that would come from being publicly seen as uncooperative with out-group members can attenuate this effect. This finding also suggests there are limits to how far individuals will go to recover from identity threats of this nature.

GENERAL DISCUSSION

The goal of this research was to provide insight into how the experience of processing fluency of identity signals in interactions with out-group members affects individuals' views of themselves and their subsequent behavior towards these out-group members. Taken together, the results of the five studies we present show that when individuals use less fluent images to represent themselves to members of an out-group, they experience identity threat. This is demonstrated by both behavioral measures (in the form of out-group derogation), as well as self-reports of evaluations of performance on an identity-diagnostic task and on a measure of self-certainty. Moreover, we showed that the observed identity threats are not triggered by the mere act of using low fluency identity signals, but depend upon the visibility of the signals by out-group members. The experience of identity threat affected subsequent behavior towards out-group members, leading participants to behave less cooperatively, as exhibited by lower offers in an ultimatum game, even at risk of their own financial penalty. We find these effects across three distinct identity groups: university communities, political party affiliation, and brand communities.

We also demonstrate that the effect of processing difficulty of identity signals on behavior in intergroup interactions is moderated by the degree of individuals' identification with

the signaled in-group. Prior research on identity threats has shown that, compared to those who are less connected, individuals who feel a stronger connection to a group respond to these threats differently by defending the group and the value of associating with it (Jetten et al., 2002). Consistent with these findings, we observed that only individuals who strongly identified with the in-group experienced identity threat after using a low fluency signal and engaged in behaviors to reaffirm the value of their identity. Those who did not feel strong associations with an in-group were not affected by the fluency of identity signals.

The paper makes several contributions. We expand current knowledge of identity signaling by showing one way in which identity signals can influence their users' behavior. Extending the recent findings that people having strong identification with an in-group prefer more obscure identity signals to communicate with other group members (Berger & Ward, 2010), the current work shows that these choices may have pernicious effects for these individuals in their interactions with out-group members. Our research also develops an area that has yet to have been explored in the literature, by examining the intersection of identity threats and processing fluency. We show that a decrease in fluency of identity signals can lead to identity threat in inter-group interactions, and further research can explore other potential ways in which these identity threats may occur.

Moreover, our findings expand the understanding of the role of fluency in judgments. While previous research has primarily shown the effects of processing fluency of objects on judgments of and preference for those objects (Cho & Schwarz, 2010; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006), the current research shows that the fluency of one object (an in-group signal) affects attitudes and behavior towards a group of people who do not own this

object (the out-group). As such, the current paper proposes a more complex view of the effects of fluency on judgments that incorporate the social environment.

Further Research

This research explores the idea that the experience of difficulty in processing an identity signal leads individuals to experience identity threats. While prior research has explored some situations in which individuals choose to use less obvious signals (Han, Nunes & Drèze, 2010), our focus was on the consequences of these decisions. Therefore, the studies were designed in a way that, while participants chose the signals used, they did not face a choice between more and less fluent signals. It is possible that the choice to use signals out of a set that includes both subtle and prominent signals may lead individuals to respond differently to this experience, and could be explored in further research.

Likewise, we propose that the act of using observable but less fluent signals leads to an experience of identity threat and that this effect is based on metacognitive feelings of difficulty in processing the signal. However, it is possible that in this context one might make a cognitive appraisal of the less fluent signal as being a bad representation of the self to the outgroup, similar to work by Berger & Ward (2010) where participants consciously selected less visible signals. We believe that this is unlikely. First, our account is consistent with prior work that suggests that processing fluency effects are affective in nature and do not require cognitive appraisal (Shapiro, 1999; Winkielman & Cacioppo, 2001). Further, prior studies have demonstrated that drawing participant's attention to the source of perceptual fluency (such as a degraded font) attenuates fluency

effects (Novemsky, Dhar, Schwarz & Simonson, 2008), suggesting a subjective feelings

account of processing fluency. Finally, participants' ratings of the attractiveness of

identity signals in our studies did not differ between fluency conditions. Further research

should identify conditions where affective versus cognitive appraisal routes would be

observed in a signaling context (for example, when signalers are trying to differentiate

themselves from the outgroup) and explore whether the effects of identity threat are

stronger if signalers recognize that their signals are poor representations of their identity.

Another possible area for future investigation is to consider how the interpretation of the

fluency of a signal depends upon context. Our findings and prior research (Briñol et al., 2006)

have shown that what individuals derive from the experience of processing fluency is driven by

the context in which it is experienced. Thus, it is possible that there may be situations in which

the experience of difficulty (as opposed to ease) in processing an identity signal may lead

individuals to feel more confident in their identity. Since disfluency has been shown to indicate

lower frequency (Jacoby et al., 1989) and exclusivity (Pocheptsova et al., 2010), using less fluent

signals may be interpreted positively when individuals are trying to communicate exclusivity or

higher status. For example, signaling these traits may be important when interacting with a lower

ranked out-group member, rather than an equal member as in the present research. This would

provide another explanation of why exclusive in-groups are less likely to use prominent identity

signals (Han et al., 2010). Further research could clarify how lay theories associated with the

group identity might affect the interpretation of low fluency signals and subsequent behavior in

inter-group interactions.

In our studies, we exclusively focused on the effect of disfluency of identity

signals in interactions with out-group members. Though we do not consider other types

of interactions, it is likely that our effects would be different in interactions with in-group members. In-group interactions are generally less likely to result in the experience of identity threat (Hornsey, Oppes & Svensson, 2002), and prior research has shown that individuals choose less visible, less fluent signals in contexts where they are signaling to in-group members (Han et al., 2010), which suggests that using these signals in these types of interactions is unlikely to provoke identity threats. It is possible, though, that if the in-group structure involves hierarchy (Pinto, Marques, Levine & Abrams, 2010), use of low fluency signals by lower ranked members could lead to the experience of identity threat in a similar way to the effects we report, which would be an interesting topic for further inquiry.

Another potential extension of the present work would be to examine how observers may react to the use of less fluent signals by others in inter-group settings. While the present work focused exclusively on the behavior of the signaler, it is possible that the receivers of these signals may hold different expectations about how signalers will behave, leading to potential friction in their interactions. We conducted an exploratory study to examine this possibility ($N =$ 180), where student participants were asked to imagine attending a university sporting event, and having to approach a rival fan for assistance. Two pictures of the fans were presented: one wearing a more fluent t-shirt with the rival team's logo displayed clearly and the other, wearing a less fluent t-shirt that was faded and washed out. In contrast to the findings of our studies, participants expected that the individual wearing the more fluent t-shirt would be more uncooperative ($M_{More\ Fluent} = 3.69$ vs. $M_{Less\ Fluent} = 3.20$, $F(1, 178) = 15.31$, $p < .01$), less helpful ($M_{More\ Fluent} = 4.43$ vs. $M_{Less\ Fluent} = 4.92$, $F(1, 178) = 12.23$, $p < .01$), and indicated they would be more likely to approach him ($M_{More\ Fluent} = 4.21$ vs. $M_{Less\ Fluent} = 5.09$, $F(1, 178) = 9.81$, $p < .01$). This suggests the

possibility for conflict between the expectations individuals have, depending upon the signals others display to them, and the actual behavior of the signalers as reported in this paper. Further research should examine how these expectation gaps affect inter-group interactions, and how these negative outcomes can be avoided.

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