

The Polarizing Effect of Arousal on Negotiation

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Abstract

In this research, we examined the impact of physiological arousal on negotiation outcomes. Conventional wisdom and the prescriptive literature suggest that arousal should be minimized given its negative effect on negotiations, whereas prior research on misattribution of arousal suggests that arousal might polarize outcomes, either negatively or positively. In two experiments, we manipulated arousal and measured its effect on subjective and objective negotiation outcomes. Our results support the polarization effect. When participants had negative prior attitudes toward negotiation, arousal had a detrimental effect on outcomes, whereas when participants had positive prior attitudes toward negotiation, arousal had a beneficial effect on outcomes. These effects occurred because of the construal of arousal as negative or positive affect, respectively. Our findings have important implications not only for negotiation, but also for research on misattribution of arousal, which previously has focused on the target of evaluation, in contrast to the current research, which focused on the critical role of the perceiver.

Keywords

negotiation, misattribution of arousal, emotions, subjective value, economic outcomes, interpersonal interaction

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Our stomachs get tied up in knots. Our hearts start to pound. Our faces flush. Our palms sweat. These are all visceral responses signaling that something is wrong and that we are losing our composure in the negotiation. (Ury, 2006, p. 43)

Conventional wisdom suggests that heightened physiological activation is both pervasive and pernicious during negotiations. It is true that demanding or competitive situations often are accompanied by hallmark physiological responses, such as an upset stomach, quickened heart rate, a flushed face, increased blood pressure, or shaking legs (Adler, Rosen, & Silverstein, 1998; Despres, 1997; Malhotra, 2010; Wheeler, 2004), and many individuals may even fear or dread these physical reactions (Williams, Chambless, & Ahrens, 1997). Yet despite its prevalence and perceived negative effects, physiological activation (or arousal) has rarely been examined in empirical research on negotiation (Wheeler, 2004) and has received limited attention in decision-making research more broadly (Ku, Malhotra, & Murnighan, 2005; Malhotra, 2010). In the current research, we sought to fill this gap

by examining the effects of physiological arousal on negotiation and, in particular, by questioning whether such effects are necessarily detrimental for negotiation outcomes.

In two studies, we explored whether the effect of arousal on negotiation outcomes might actually depend on whether an individual has negative or positive preexisting attitudes toward negotiation. Arousal is not defined consistently in the psychological literature (Blascovich et al., 1992), but we use the term “arousal” to mean activation of the autonomic nervous system (see Schachter & Singer, 1962), including physical manifestations, such as increased heart rate and sweat gland secretion. Although empirical research has not focused on the impact of arousal on negotiation specifically, researchers have examined its effect on subjective evaluations and behaviors in other contexts. A common finding of this research,

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which is consistent with the theory of misattribution of arousal (Schachter & Singer, 1962), is summarized by Storbeck and Clore (2008) as follows: "Arousal can make judgments of positive objects more positive and of negative objects more negative" (p. 1837). Yet whether negotiation is a "positive object" or a "negative object" is in the eye of the beholder—and, consequently, negotiations provide a fitting context in which to test whether the effect of arousal might vary depending on a perceiver's prior attitudes.

By examining the effect of arousal on negotiation outcomes as a function of prior attitudes, we aimed to advance research and theory in two important ways. First, the theory of misattribution of arousal until now has been investigated predominantly by controlling the valence (i.e., positivity or negativity) of the object of judgment (or target being evaluated) while manipulating participants' levels of arousal (Reisenzein, 1983). For instance, in one of the most famous studies on misattribution of arousal, Dutton and Aron (1974) selected an attractive female confederate as the target and measured male participants' romantic attraction to her after crossing either a swaying bridge in a high-arousal condition or a stable bridge in a low-arousal condition (for studies containing both positively and negatively valenced targets, see Gorn, Pham, & Sin, 2001; White, Fishbein, & Rutstein, 1981). In our studies, we extended the theory of misattribution of arousal by focusing on the role of the perceiver and exploring how the effect of arousal varies based not on the target's valence, but on the individual evaluating the target. This shift in focus to the perceiver was a meaningful extension because, under such conditions, not all participants were expected to respond to arousal in the same direction, even when experiencing the same object of judgment. Instead, perceivers' prior attitudes were hypothesized to moderate the impact of arousal, resulting in a polarization effect.

We also contribute to the negotiation literature by challenging the common intuition that arousal is necessarily harmful for negotiations. Although negotiation researchers previously have considered the effect of certain discrete, high-arousal emotions, such as anger (e.g., Sinaceur & Tiedens, 2006; Van Kleef, De Dreu, & Manstead, 2004), anxiety (Brooks & Schweitzer, 2011), and envy (Moran & Schweitzer, 2008), arousal has not been studied in isolation. Disentangling arousal from valence is important, as evidenced by research from other domains showing that arousal and valence have distinct effects (e.g., Gorn et al., 2001; Stefanucci & Storbeck, 2009). In decision-making studies, arousal specifically has been found to increase decision-making speed (Hackley & Valle-Inclan, 1999), promote shallow-level processing (Shapiro, MacInnis, & Park, 2002), and foster risk-seeking behavior (Ditto, Pizarro, Epstein,

Jacobson, & MacDonald, 2006; Mano, 1994), all of which may have important implications in negotiations.

In the studies reported here, we evaluated the interaction of arousal and prior attitudes on subjective evaluations (Studies 1 and 2) and objective outcomes (Study 2). To examine the underlying process, we also explored whether heightened arousal from physical exercise is misattributed to the negotiation and, in turn, interpreted as negative or positive affect, depending on prior attitudes toward negotiation (Study 1).

Study 1

In Study 1, we explored how prior attitudes might moderate the impact of arousal on subjective negotiation outcomes. We focused initially on subjective evaluations to be consistent with past work on misattribution of arousal, in which researchers predominately have evaluated subjective responses to targets, such as ratings of liking (Storms & Thomas, 1977), attraction (Dutton & Aron, 1974; Meston & Frohlich, 2003), or humor (Cantor, Bryant, & Zillmann, 1974). We manipulated arousal using physical exercise, as has commonly been done in research on misattribution of arousal, because this is considered an affectively neutral procedure (e.g., Foster, Witcher, Campbell, & Green, 1998; White et al., 1981). We predicted that the impact of arousal on subjective outcomes would depend on prior attitudes.

Method

The study was conducted in two stages at different points in time. In the first stage, 247 students at a northeastern university responded to a survey distributed through a behavioral lab as part of a longer battery of surveys from various researchers. Respondents separately rated the extent to which they dread (−4) versus look forward to (+4) negotiating, bargaining, and haggling; we then averaged the three ratings to define each participant's prior attitudes toward negotiation ($\alpha = .83$). Respondents also indicated their attitudes toward 21 other unrelated life activities adapted from Kahneman, Krueger, Schkade, Schwarz, and Stone (2004). Participants were compensated with a \$5 gift certificate to Amazon.com.

In the second stage, 176 individuals were randomly selected out of the 247 questionnaire respondents and invited via e-mail to participate in a laboratory experiment several weeks later. Given constraints in the lab, a limited number of individuals could participate each week, so invitations were distributed in waves until all experimental conditions were filled. This procedure resulted in 84 participants (51 male, 33 female) completing the experiment for payment of \$20 each and entry into a \$100 raffle contingent on negotiation performance.

Analyses of demographic variables provided no evidence of response bias. Specifically, participants in the follow-up experiment did not differ significantly from participants who completed the survey on prior attitudes in terms of age, sex, or native language.

At the point of recruitment, no connection was communicated between the survey on prior attitudes and the laboratory experiment, and participants were not aware that the experiment would involve a negotiation. Once they arrived, participants were informed that the researchers were interested in the effects of negotiating while on mobile phones and that participants would be walking on a treadmill while negotiating, given that people are often active when using mobile phones. The negotiation task was a distributive bargaining case in which participants negotiated over the price of a used car based on provided information.

Participants were led to believe that they were negotiating with another participant, yet they actually negotiated with a confederate. All participants were told that they had been randomly assigned to the role of a potential buyer of the car and that their objective was to negotiate a purchase price that was as low as possible. The confederates, who were blind to study hypotheses and experimental condition, were trained to follow a negotiation script to maximize consistency (see also Filipowicz, Barsade, & Melwani, 2011). Two participants expressed suspicion about the authenticity of the confederate and were excluded from analyses.

Participants had approximately 5 min to prepare. During this time, they were walking on the treadmill to become accustomed to the setup. The treadmill speed (which was set by the experimenter) served as the experimental manipulation of arousal. Participants were randomly assigned to either a high-arousal condition ($n = 42$), in which the treadmill was set at 3.0 mph, or a low-arousal condition ($n = 40$), in which the treadmill was set at 1.5 mph. Participants were instructed to hold on tightly to the treadmill handlebars at all times (while using a mobile phone headset), which allowed us to measure participants' heart rates surreptitiously via the treadmill's heart rate monitor. As a manipulation check, we confirmed that the average heart rate of participants was significantly higher in the high-arousal condition ($M = 117.02$ beats per minute, $SD = 13.75$) than in the low-arousal condition ($M = 87.75$ beats per minute, $SD = 14.65$), $t(80) = 9.33$, $p < .001$.

All negotiations were interrupted before an agreement was reached to remove the salience of the agreement (or lack thereof) from participants' reports of their global subjective outcomes. The experimenter interrupted the negotiation at a specific point in the confederate script or at the 10-min mark, whichever occurred more quickly, and participants were told that they would be able to

continue the negotiation if time permitted (for a similar procedure, see Van Kleef et al., 2004).

Participants then completed a postnegotiation questionnaire to measure subjective outcomes (i.e., feelings about the self, process, relationship, and instrumental outcome), using the previously validated 16-item Subjective Value Inventory (Curhan, Elfenbein, & Xu, 2006). Responses were measured on a 7-point scale, and a score for global subjective value was formed based on average responses across all items ($\alpha = .80$; see Curhan, Elfenbein, & Eisenkraft, 2010). Participants also rated (on separate scales ranging from 1, *very slightly or not at all*, to 5, *extremely*) the degree to which they had experienced each of three indicators of negative affect—nervousness, frustration, and irritability ($\alpha = .78$)—and each of three indicators of positive affect—excitement, enthusiasm, and contentment ($\alpha = .72$)—during the negotiation. Participants then described in their own words why they felt physiologically aroused (e.g., increased heart rate, sweating palms), if at all, and answered demographic questions.

Results and discussion

Subjective value. To test our interaction hypothesis, we regressed subjective value on arousal, prior attitudes, and the interaction of arousal with prior attitudes. We also included a control variable for whether English was the participant's native language because past research has found this variable to have an effect on subjective value (Elfenbein, Curhan, Eisenkraft, Shirako, & Baccaro, 2008). We found a significant interaction between arousal and prior attitudes, $\beta = 0.46$, $t(77) = 2.83$, $p = .006$.¹ Among those who had negative prior attitudes, participants in the high-arousal condition reported lower subjective value, on average, than participants in the low-arousal condition. By contrast, among those who had positive prior attitudes, participants in the high-arousal condition reported higher subjective value, on average, than participants in the low-arousal condition (see Fig. 1). The English-language control variable was not significant.

Mediation analysis. We next examined whether negative and positive affect mediate the relationship between prior attitudes and subjective outcomes using participants' ratings of the emotions experienced during the negotiation. Given that our prediction concerned the construal of heightened arousal, we expected mediation in the high-arousal condition but not in the low-arousal condition. To statistically compare the indirect effects across the high- and low-arousal conditions, we included prior attitudes as the independent variable in our model, subjective value as the dependent variable, negative and positive affect as simultaneous mediators, and arousal

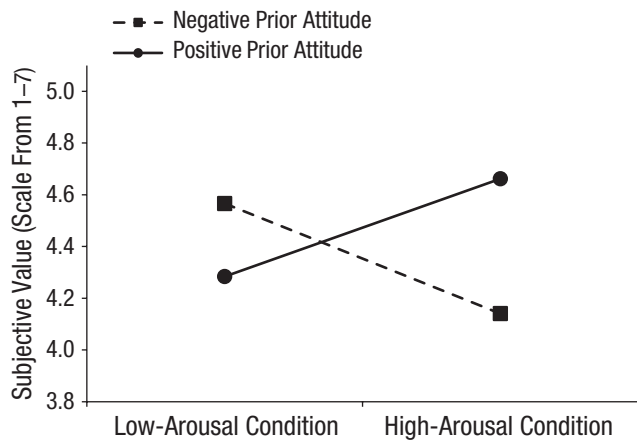


Fig. 1. Results from Study 1: mean score for subjective value as a function of experimental condition and prior attitude toward negotiation. All continuous independent variables were centered by transforming them into deviation scores (see Aiken & West, 1991). To display the interaction involving prior attitudes (i.e., a continuous variable), we chose prototypical values based on ± 1 standard deviation (1.51) from the mean (-0.68); the dichotomous covariate was set to equal zero (see Aiken & West, 1991).

and native language as covariates. The bootstrap estimates and bias-corrected 95% confidence intervals (CIs) reported hereafter were based on the SPSS version of the Preacher and Hayes (2008) macro with 5,000 samples. Consistent with our hypothesis, the total indirect effect of prior attitudes on subjective value through negative and positive affect was significant in the high-arousal condition, $b = 0.12$, 95% CI = [0.048, 0.20], but not in the low-arousal condition, $b = 0.019$, 95% CI = [-0.015, 0.054]. A pairwise contrast confirmed that these indirect effects were statistically different from each other, 95% CI = [0.023, 0.18]. These results suggest that heightened arousal is construed as negative or positive affect as a function of one's prior attitudes, which in turn influence evaluations of the negotiation experience (i.e., subjective value).

Study 2

In Study 2, we tested whether the pattern of results found for subjective outcomes also extends to economic performance. This study not only replicated and extended our Study 1 findings, but also further extended the paradigm of misattribution of arousal, which has not previously been used to evaluate economic outcomes. We also enhanced the external validity of Study 2 through three procedural revisions. First, we increased the representativeness of the negotiation by using an integrative negotiation task. Second, we increased the generalizability of the results by having pairs of real participants negotiate (as opposed to participants paired with a confederate).

Finally, we increased the ecological validity by using a more naturalistic manipulation of arousal in which participants were instructed either to walk (high-arousal condition) or to be seated (low-arousal condition) during their negotiations.

We hypothesized that an interaction between arousal and prior attitudes would predict not only subjective outcomes, as in Study 1, but also economic outcomes. We reasoned that participants would construe their own arousal as negative or positive affect depending on their prior attitudes, and that this negative or positive affect, in turn, would drive economic performance. This logic was supported by past research demonstrating that positive affect is associated not only with higher subjective value but also with higher objective outcomes (e.g., Elfenbein et al., 2008).

Method

Similar to Study 1, Study 2 involved two stages that were administered in seemingly unrelated contexts and separated in time by several weeks. All 1st-year M.B.A. students at a northeastern university ($N = 401$) were invited to participate, although not all students completed the two required stages. Our sample included 125 dyads (comprised of 164 males and 86 females) whose members participated in both stages. Analyses of demographic variables suggested no evidence of response bias. Students who participated did not differ significantly from those who did not participate in terms of age, sex, or native language.

In the first stage, prior attitudes toward negotiation ($\alpha = .80$) were measured using the same approach as in Study 1. In the second stage, participants completed a scored negotiation simulation based on the new-recruit exercise (Neale, 1997). Participants were randomly assigned to job candidate or recruiter roles, and the negotiation involved eight issues, each worth a specified number of points, concerning the job candidate's compensation package. Two of these issues were distributive (i.e., one party's gain is the other party's loss), two of the issues were compatible (i.e., one party's gain is also the other party's gain; Thompson & Hrebec, 1996), and four of the issues were integrative (i.e., both parties benefit if they trade off concessions on different issues; Froman & Cohen, 1970; Pruitt, 1983). Participants were told that each point earned in the negotiation would secure them one raffle ticket and that four tickets, each worth \$125, would be drawn.

Participants were told to negotiate via phone. In their confidential instructions, participants assigned to the low-arousal condition were instructed to remain seated throughout the entire negotiation, whereas participants assigned to the high-arousal condition were instructed to

walk continuously, either indoors or outdoors, throughout the entire negotiation. The rationale provided was that students frequently negotiate their compensation packages by phone, and with people's ever-increasing reliance on mobile phones, these negotiations often occur with one or both parties walking. All participants were informed that some individuals would be seated and others would be walking, but despite such disclosure, participants were asked not to discuss whether they were seated or walking to minimize the chance that some participants might feel as though they were at an advantage or a disadvantage relative to their counterpart.

We treated participants in the job candidate role as the focal subjects, theorizing that our sample could relate to this role most readily in the immediate future. Therefore, we assigned the high-arousal condition to half of the job candidates, and the low-arousal condition to the other half of the job candidates—and only job candidates are included in the analyses reported below. Participants in the recruiter role were conceptualized as randomly selected counterparts, and therefore, to make the counterparts as uniform as possible, we instructed all participants playing the recruiter role to be seated.

Immediately after their negotiations, participants were instructed to complete a postnegotiation questionnaire that included the same measure of subjective value used in Study 1 ($\alpha = .93$). Participants also reported the agreement reached and total points earned (all dyads reached an agreement). As a manipulation check, participants were asked whether they were walking or sitting during their negotiations, whether they disclosed this information to their counterpart, and what their primary mode of communication was (to check for protocol violations). Ten participants were excluded from analyses for not following the protocol. Finally, participants answered demographic questions and reported whether they had a preexisting relationship (in real life) with their counterpart.

Results and discussion

Subjective value. As in Study 1, we regressed subjective value on arousal, prior attitudes, the interaction of arousal with prior attitudes, and a control variable for participants' native language. We also included two control variables pertaining to the dyadic nature of Study 2 (i.e., unlike Study 1, neither role was played by a confederate), including whether the candidate and recruiter had a preexisting relationship and counterparts' prior attitudes toward negotiation.

Results for subjective value replicated those of Study 1. That is, we found a significant interaction between arousal and prior attitudes on subjective value, $\beta = 0.26$, $t(108) = 2.13$, $p = .03$. Among participants with negative

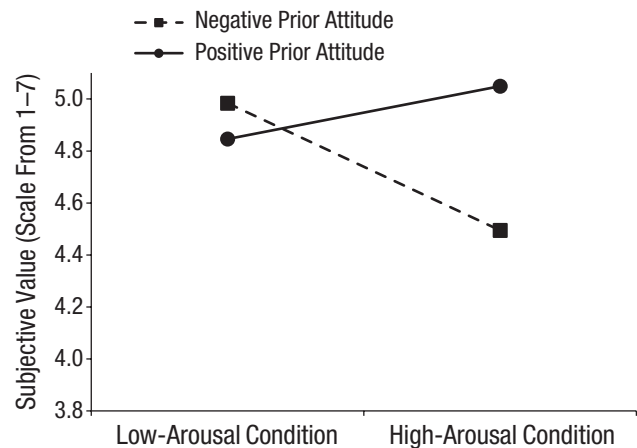


Fig. 2. Results from Study 2: mean score for subjective value as a function of experimental condition and prior attitude toward negotiation. All continuous independent variables were centered by transforming them into deviation scores (see Aiken & West, 1991). To display the interaction involving prior attitudes (i.e., a continuous variable), we chose prototypical values based on ± 1 standard deviation (1.59) from the mean (0.21); the dichotomous covariates were set to equal zero, and the continuous covariate was set to equal its mean value (see Aiken & West, 1991).

prior attitudes, those in the high-arousal (walking) condition reported lower subjective value, on average, than those in the low-arousal (seated) condition. By contrast, among participants with positive prior attitudes, those in the high-arousal condition reported higher subjective value, on average, than those in the low-arousal condition (see Fig. 2). Additionally, the control variable for counterparts' prior attitudes was significant, $\beta = -0.23$, $t(108) = -2.45$, $p = .02$, which indicates that the more one's counterpart looked forward to negotiation, the lower one's own subjective value was. No other control variables were significant.

Objective value. To test our hypothesis with respect to objective outcomes, we regressed the number of points earned by the job candidate on arousal, prior attitudes, and the interaction of arousal with prior attitudes. We also included the same control variables as those used in the regression model with subjective value. The interaction term between arousal and prior attitudes was significant in predicting objective value, indexed by points, $\beta = 0.31$, $t(108) = 2.56$, $p = .01$. As hypothesized, among participants with negative prior attitudes, those in the high-arousal condition earned fewer points, on average, than those in the low-arousal condition, whereas among participants with positive prior attitudes, those in the high-arousal condition earned more points, on average, than those in the low-arousal condition (see Fig. 3). In addition, the control variable for participants' native language was significant, $\beta = 0.29$, $t(108) = 3.04$, $p = .003$, which

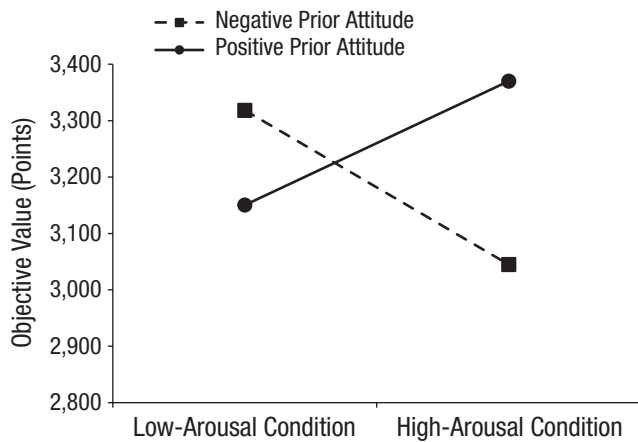


Fig. 3. Results from Study 2: mean points earned as a function of experimental condition and prior attitude toward negotiation. All continuous independent variables were centered by transforming them into deviation scores (see Aiken & West, 1991). To graphically display the interaction involving prior attitudes (i.e., a continuous variable), we chose prototypical values based on ± 1 standard deviation (1.59) from the mean (0.21); the dichotomous covariates were set to equal zero, and the continuous covariate was set to equal its mean value (see Aiken & West, 1991).

indicates that native English speakers, on average, earned more individual points than did non-native English speakers.

General Discussion

Negotiation can be viewed as either a negative or a positive endeavor; some individuals dread it, whereas others look forward to it. Using the paradigm of misattribution of arousal, we showed that arousal polarizes negotiators' subjective and objective value in a direction consistent with negotiators' preexisting attitudes toward negotiation. Taken together, our findings suggest that individuals who dread negotiation, consistent with conventional wisdom, feel worse and perform less well in negotiations when they are more physiologically aroused, because they construe their arousal as negative affect. In contrast, individuals who look forward to negotiation have more favorable subjective experiences and perform better when their arousal is heightened, because they construe their arousal as positive affect.

Until now, the vast majority of research on misattribution of arousal has documented effects moderated by the valence of the target. We shifted attention from the target to the perceiver, demonstrating a polarization effect whereby perceivers' prior attitudes moderated the impact of arousal. This extension of the theory of misattribution of arousal is critical given that arousal often is misattributed to targets that do not have a single valence.

The current findings also have important implications for negotiation practice. The effect of arousal on negotiation outcomes has been largely overlooked by researchers,

which is ironic given the prevalence of heightened arousal while negotiating. Despite the absence of empirical research, lay theories and prescriptive literature (e.g., Ury, 2006) suggest that arousal should be detrimental for negotiation. However, our findings demonstrate that this is not always the case. In fact, some individuals seem to benefit from arousal in terms of its effect on subjective and objective outcomes.

This research represents an important step toward examining the role of arousal as an independent variable in negotiation, yet it is not without limitations. First, our studies relied on self-reports of individuals' prior attitudes toward negotiation, and we measured these attitudes in generalized terms, whereas they may vary by negotiation type or nature of the relationship between negotiators. We made these design choices because we prioritized collecting attitudinal measures in a separate context from the negotiation studies to minimize demand effects. Second, our manipulations of arousal were rather rudimentary—albeit consistent with previous research on misattribution of arousal. In Study 1, for example, we carefully monitored heart rate via the treadmill readout, but we did not obtain other measurements of arousal, such as galvanic skin response or blood pressure. Consequently, we cannot pinpoint the exact impact of our arousal manipulations on the autonomic nervous system.

Future research might continue to focus on the role of the perceiver in misattributing arousal from one source to another. For instance, negotiation was a compelling context because prior attitudes toward negotiation vary considerably, but additional studies might explore other contexts, such as public speaking, academic performance, or competitive sports. Across all of these contexts, research could investigate strategies to train individuals to develop more positive attitudes toward the target, including emotion regulation (Gross, 1998), in light of the possible beneficial effects associated with arousal for individuals with positive prior attitudes.

Author Contributions

Both authors developed the study concept, designed the study, and interpreted the results. Data collection and analysis were performed by A. D. Brown under the supervision of J. R. Curhan. A. D. Brown drafted the manuscript, and J. R. Curhan provided critical revisions. Both authors approved the final version of the manuscript for submission.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Note

1. A strict interpretation of misattribution of arousal requires that the arousal source be ambiguous (for a review, see Foster, Witcher, Campbell, & Green, 1998). To explore this issue, we

coded the written descriptions of participants ($n = 58$) who reported feeling aroused; some participants attributed their arousal fully to the treadmill (i.e., an unambiguous source), whereas others attributed their arousal at least in part to the negotiation (i.e., an ambiguous source). We then examined a three-way interaction among arousal, prior attitudes, and participants' perceptions of the arousal source as a predictor of subjective value. The three-way interaction was significant, $b = 0.79$, $t(49) = 2.35$, $p = .02$. Further probing, following Hayes (2013), revealed that the two-way interaction between arousal and prior attitudes was not a significant predictor of subjective value when the arousal source was unambiguous, $b = -0.32$, $t(49) = -1.03$, $p = .31$, but was significant when the source was ambiguous, $b = 0.47$, $t(49) = 3.73$, $p = .0005$; this suggests that misattribution of arousal provides a better process account than alternative theories do.

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