

# Journal of negotiation and conflict management research

2024

VOLUME 17 | ISSUE 2

INTERNATIONAL ASSOCIATION  
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FOR CONFLICT MANAGEMENT

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# Negotiation and Conflict Management Research

The Official Journal of the International Association for Conflict Management | iafrm.org

**ONLINE ISSN:** 1750-4716

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# Self-Affirmation Increases Men's Openness to Women's Dominance Behaviors

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## Keywords

gender bias, men's anxiety, self-affirmation, organizational behavior, leadership, experiments

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[doi.org/10.34891/1a9n-p522](https://doi.org/10.34891/1a9n-p522)

## Abstract

There is growing attention to the importance of factoring men's experience into theorizing around increasing women's advancement in organizations. Past research has documented that women face stronger penalties than men for displaying dominance behaviors (Williams & Tiedens, 2016). Recent research shows that men perceive negotiations and competition, especially against women, as activities that could threaten their masculinity and social status (Mazei et al., 2021), making them particularly sensitive to women's dominance displays. We theorize that men experience anxiety when interacting with women displaying dominance behaviors (e.g., women initiating negotiation or competing in a masculine contest) which decreases their willingness to work with them. We propose and test a self-affirmation intervention to increase men's openness to women displaying dominance behaviors through a reduction in anxiety. In Study 1, we examine negotiations between MBA students to show that women's dominance behaviors are associated with men's heightened anxiety. In Study 2a, we experimentally offer evidence that self-affirmation moderates the effect of women's dominance on men's lower willingness to work with them. In Study 2b, we demonstrate that self-affirmation increases men's openness to women displaying dominance behaviors through a reduction in anxiety. In Study 3, we manipulate men's feelings of anxiety and show that self-affirmation decreases anxiety and increases men's behavioral collaboration with women displaying dominance behaviors. We discuss the potential implications of these findings for our understanding of gender bias in organizations, in particular for work cultures that induce stress and anxiety in men.

Volume 17, Number 2, Pages 106-129

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## Acknowledgements

This project was made possible thanks to the generous support of the Harvard Kennedy School's Women and Public Policy Program and of the Fondazione Cariplo.

## Data Availability Statement

Data for all studies are available at:

[https://osf.io/yub25/?view\\_only=57fed87b8f734abe945331459e244417](https://osf.io/yub25/?view_only=57fed87b8f734abe945331459e244417)

## Introduction

Extant work on gender in leadership has largely focused on women, by examining how they are perceived when they behave in ways that violate gender norms, by for example displaying dominance behaviors (e.g., Eagly & Karau, 2002; Rudman et al., 2012). A smaller but growing body of research has started to study men (Berdahl et al., 2018; Mazei et al., 2021). Men face distinctive gender dynamics in comparison to women, particularly in relation to motivations to sustain (as opposed to gain) relatively higher social status vis a vis the opposite sex (Gilmore, 1990; Vandello & Bosson, 2013): "If men lose social status, they lose respect, which reduces their perceived worth, and this outcome is at odds with their basic motive for social status." (Mazei et al., 2021, p. 114). Focusing on men would not only allow a more comprehensive understanding of the gender effects in leadership, but it would also shed light on potential interventions to level the playing field.

Men dominate the current gender system (Ridgeway & Correll, 2004) and, as such, they are motivated to justify the society's extant status hierarchy and to defend it (Jost, 2019; Jost & Hunyady, 2005) by displaying masculine behaviors (Vandello et al., 2008). These behaviors range from expressing preference for working with other men rather than with women (Bowles et al., 2007), being less supportive of gender fair policies (Kuchynka et al., 2018), and even to harassing women (Berdahl, 2007). Increasing the proportion or the number of women in organizations has been associated with men's reduced well-being (Konrad et al., 1992). As a result, men are particularly motivated to look for opportunities to demonstrate their masculinity.

Negotiations or competition against women are opportunities for men to assert and demonstrate their masculinity by being successful in them (Kray & Haselhuhn, 2012; Kray & Thompson, 2004). At the same time, if men are not successful in negotiations, especially with a female counterpart, they could incur losses to their sense of gender and social status (e.g., Kennedy & Kray, 2015; Mazei et al., 2021) and associated increased anxiety (Eisler & Skidmore, 1987; Mazei et al., 2021; Trombini et al., 2020; Vandello et al., 2008). We define anxiety as a negatively valenced emotion: "a state of distress and/or physiological arousal in reaction to stimuli including novel situations and the potential for undesirable outcomes" (Brooks & Schweitzer, 2011, p. 44).

Self-affirmation interventions have been shown to reduce stress and anxiety in situations in which individuals experience or anticipate that their self-worth and self-concept are threatened (e.g., Steele, 1988; Cohen & Sherman, 2014). Self-affirmation practices consist of reflecting on core personal values and on how to express them in contexts that could be threatening or anxiety-inducing (e.g., at work or in school). In this paper, we propose and test a self-affirmation intervention to increase men's openness to women engaging in dominance behaviors by decreasing their anxiety levels. Women's display of dominance behaviors (Williams & Tiedens, 2016) includes actions such as being assertive,

initiating negotiation during a job interview, or successfully competing in male-dominated environments (Rudman & Fairchild, 2004; Williams & Tiedens, 2016). We theorize that women displaying dominance behaviors increase men's anxiety, leading to men's reduced willingness to work or collaborate with women. Moreover, by reducing experienced anxiety, a self-affirmation intervention would increase men's collaboration with women displaying dominance behaviors. Through our research, we address recent research calls (e.g., Mazei et al., 2021) to focus on men to enrich our understanding of the gender effects in leadership advancement as well as interventions to mitigate them.

### **Gender-Role Stereotypes and Perceptions of Women's Dominance Behaviors**

Men's reactance to women's dominance behaviors is often attributed to gender-role stereotypes (Eagly et al., 1992; Mazei et al., 2021). Gender-role stereotypes have both descriptive and prescriptive functions (Heilman, 2001): They define how men and women *are*, and how men and women are *expected to behave* according to their gender. The inconsistency between the *communal* characteristics (e.g., being nice, compassionate, other oriented) that are generally attributed to women and the *dominant* characteristics (e.g., being assertive, competitive, and self-oriented) that are generally attributed to leaders (Eagly & Karau, 2002; Heilman, 2001), can lead to women being penalized for engaging in dominant behaviors. Since dominant traits are more congruent with the male (vs. female) gender role, leadership tends to be associated with masculinity (Schein, 2001). This association not only affects how women are evaluated when they enact dominant behaviors, but also contributes to their lower attainment and maintenance of leadership positions within organizations (Eagly et al., 1992; Prentice & Carranza, 2002; Rudman et al., 2012).

Numerous studies have highlighted that female leaders are evaluated less favorably than their male counterparts when engaging in identical behaviors (e.g., Rudman, 1998; Rudman & Fairchild, 2004; Williams & Tiedens, 2016). For example, using a job-hiring paradigm, past research demonstrated that female candidates who violated the modesty prescription by self-promoting during an interview were evaluated as less likeable and less hireable than self-promoting male candidates (Rudman, 1998). These effects are especially pronounced in competitive situations, like negotiations. Specifically, Bowles et al. (2007) compared male and female job candidates negotiating pay during a videotaped job interview where actors were instructed to follow the exact same script either initiating or not initiating the negotiation. The videos were pre-tested, and although the actors were rated similarly on many characteristics such as age, socioeconomic status, and the emotions they displayed during the interview, participants' evaluations of the job candidates (e.g., on measures such as niceness, demandingness, and the extent to which they wanted to work with them) told a different story. Female job candidates were evaluated significantly more negatively when they did (as compared to did not) initiate negotiations, whereas act of initiating negotiations had relatively little influence on how men were evaluated. Specifically, evaluators were less willing to work with female candidates who negotiated (versus not) because they were perceived as less nice and more demanding (Bowles et al., 2007; Carli et al., 1995).

Importantly, in the aforementioned studies, both male and female participants penalized female candidates. However, there is evidence that men's and women's motivations for punishing women who violate gender norms and expectations may differ (Heilman, 2012). For women, punishing other women may stem from the desire to "keep other women down" due to social comparison processes or to avoid a painful upward comparison (Duguid, 2011; Ellemers et al., 2004; Parks-Stamm et al., 2008), particularly in situations in which they compete for limited resources (Derks et al., 2016). In contrast, men may have a vested interest in "keeping women down" to maintain their

superior status in the work setting and in society (Heilman, 2012). Our research focuses on the latter explanation by examining men's evaluation of women's dominance behaviors in an effort to offer interventions that specifically address threats to occupants of high status positions in organizations.

### **Hypothesized Effects of Women's Dominance Behaviors on Men**

Because men tend to dominate the social hierarchy of work organizations (Acker, 2006; Ridgeway & Correll, 2004), women's display of dominance has the potential to challenge the status quo and thereby threaten men's place (Lowery et al., 2006; Ridgeway & Correll, 2004). It, therefore, becomes important to understand how men experience such dominance displays. Evidence that men feel threatened by and have negative reactions to initiatives that seek to reduce their privileged positions (Harrison et al., 2006; Joshi et al., 2015; Leslie et al., 2014; Sherf et al., 2017) suggests that men may behave in a reactionary, sexist or prejudicial manners that evoke negative emotions (Berdahl, 2007; Netchaeva et al., 2015). For example, there is evidence that men who perceive their gender and social status to be at stake in negotiations with a female counterpart experience increased feelings of anxiety (Kennedy & Kray, 2015; Mazei et al., 2021; Scheepers et al., 2009; Vandello et al., 2008). Further, men's feelings of anxiety can be magnified when women compete effectively in male-dominated domains (Vandello & Bosson, 2013). For instance, Vandello et al. (2008) presented participants with bogus feedback on a test that measured their knowledge about stereotypically masculine or feminine topics. When men were told they scored poorly for their gender (and therefore similarly to women), they reported higher feelings of anxiety than men told they scored well for their gender (and therefore better than women). Similarly, Netchaeva, Kouchaki, and Sheppard (2015) found that men felt more threatened by women (vs. men) in superior roles and, as a result, asserted themselves more forcefully when women held those roles (e.g., by responding with assertive negotiation counteroffers and keeping larger sums of bonus money in a zero-sum resource allocation task). Further, following gender hierarchy threat, there is evidence that men are less supportive of gender equitable policies (Kuchynka et al., 2018). Moreover, this anxiety can manifest itself physiologically, particularly in the context of status threats, such that men, relative to women, show higher blood pressure (Scheepers et al., 2009). Given the above, we hypothesize that:

***H1. Women's display of dominance behaviors is associated with heightened anxiety in men.***

As a reaction to anxiety posed by masculinity threats, men tend to display toughness (Fowler & Geers, 2017; Vandello et al., 2008) and to engage in risky behaviors (Ely & Meyerson, 2010), as a way to maintain their superior status. To this end, they also tend to be less supportive of gender-equitable policies (Kuchynka et al., 2018), and to express greater preference for working with other men rather than with women (Bowles et al., 2007). Moreover, anxiety research documents its negative effects on numerous outcomes, including interpersonal relationships and collaboration (Leach et al., 2013). For example, in negotiations, negative moods increase competition (Forgas, 1998; Pillutla & Murnighan, 1996), whereas positive moods increase preferences for cooperation (Baron et al., 1990; Forgas, 1998). Further, the experience of anxiety at work can decrease willingness to collaborate with others and reduce work engagement (e.g., Kahn, 1990; Siemsen et al., 2009). Specifically, Siemsen et al. (2009) demonstrated that a work environment characterized by low levels of threats and anxiety enhanced collaboration among co-workers in both manufacturing and service operations.

Thus, we hypothesize the following:

*H2. Men's increased anxiety when experiencing women engaging in dominance displays is associated with (a) reduced willingness to work with them, and (b) reduced behavioral collaboration with them.*

### **The Role of Self-Affirmation in Men's Responses to Women's Dominance Behaviors**

Given the critical role self-affirmation plays in reducing anxiety in threatening contexts (Steele, 1998, 2011), we hypothesize that by affirming themselves, men's heightened feelings of anxiety may be reduced when interacting with women displaying dominance behaviors. Self-affirmation theory posits that individuals have the fundamental need to recognize the integrity of the self, perceiving themselves as good, moral, and virtuous people (Steele, 1988). When individuals' self-concept and self-worth are threatened, they experience distress and, as a result, they react defensively to situations (Steele, 1988; Cohen & Sherman, 2014). Self-affirmation entails reflecting on and writing about an alternative domain of self-worth (e.g., family and friends, sports, creativity), unrelated to the domain of the threat (e.g., work), which reduces distress in situations that threaten the sense of self (e.g., Sherman & Cohen, 2006).

Self-affirmation interventions have been applied to different disciplines, from health to education (e.g., Cohen & Sherman, 2014; Harris & Napper, 2005; Martens et al., 2006). In particular, self-affirmation has proven effective in decreasing stereotype threat experienced by members of minority groups. For instance, writing essays in which people describe a value that is important to them and a specific situation in which that value was crucial to them, helped close the racial gap in school performance for African American and Latino students (Cohen et al., 2009; Sherman & Cohen, 2002, 2006). Similarly, having MBA students complete a values assignment by selecting the core personal values that were important to them from a list of possible values (e.g., protecting the environment/issues of sustainability; helping people in need/participating in charitable organizations; relationships with family; relationships with friends, participating in my culture; learning about other cultures; health and fitness; and spirituality or religion. etc.) and writing about how they could express them in school helped close the gender gap in course performance for women in a business school environment where women are stereotyped to perform worse than their male peers (Kinias & Sim, 2016).

Self-affirmation interventions function by decreasing stress and anxiety (e.g., Creswell et al., 2005, 2013). For example, Creswell and colleagues (2013) showed that self-affirmation improved problem solving by decreasing stress levels participants were experiencing. Past work on self-affirmation has focused largely on how it can help members of stereotyped groups overcome the identity threat they experience when they are in situations in which they fear confirming the stereotypes attributed to their group. However, there is some evidence that self-affirmation could also help individuals who belong to dominant groups in situations in which they experience identity threats, for example at the prospect of losing their privileged position in society (Adams et al., 2006). Notably, Fowler and Geers (2017), demonstrated that men tend to respond with compensatory behaviors proving toughness (measured as the extent to which they were willing to receive electric shocks) when experiencing threats to their masculinity. The authors manipulated masculinity threat by giving participants bogus feedback on how they performed on a general knowledge inventory test. Specifically, participants in the masculinity threat conditions were told that their "score fell in the feminine knowledge range" and that they "have a lot of feminine knowledge". The authors further showed that a self-affirmation intervention was beneficial in reducing the expressions of toughness by decreasing the levels of threat men were experiencing.

Self-affirmation is thought to decrease individuals' stereotyped-based judgements in reaction to the threats they experience (Adams et al., 2006; Fein & Spencer, 1997; Phillips & Lowery, 2015; Kinias & Fennessy, 2016; Lowery et al., 2007; Unzueta & Lowery, 2008; Sherman & Kim, 2005). An early demonstration of this effect (Fein & Spencer, 1997) showed that people were more likely to stereotype when they felt threatened, and that self-affirmation decreased the propensity to make stereotype-based judgments, by decreasing threat perception. Specifically, participants randomly assigned to receive negative feedback on an intelligence task (i.e., threat condition) made more stereotypic evaluations of a gay male than those randomly assigned to receive neutral feedback (i.e., control condition). Further, participants were less likely to stereotype a target of evaluation if they had undergone a self-affirmation procedure. These findings extend to the domain of demographic differences as there is evidence that self-affirmation can help White Americans acknowledge the presence of racism against Black and Latinos in the United States (Adams et al., 2006). Given these findings on the benefits of self-affirmation as it relates to stereotyping in domains including race and sexual orientation, we hypothesize it may play a role in attenuating the anxiety associated with gender threats. Specifically, we hypothesize:

**H3.** *Men who engage in a self-affirmation intervention will be more likely to collaborate with women displaying dominance behaviors than those experiencing no such intervention.*

**H4.** *Reduced anxiety will explain (mediate) the effect of self-affirmation on men's increased collaboration with women displaying dominance behaviors.*

### Overview of the Studies

We test our proposed model (see Figure 1) in four studies<sup>1</sup>. In Study 1, we explore the relationship between women's dominance behaviors and men's feelings of anxiety in negotiations between male and female Master of Business Administration (MBA) students. In Study 2a, we examine the effects of a self-affirmation intervention on men's willingness to work with women exhibiting dominance behaviors. Using a sample of online workers, Study 2b aims to replicate, integrate, and extend the effects found in Studies 1 and 2a, as well as test a moderated mediation model in which self-affirmation mitigates the effect of men's anxiety on their willingness to work with dominant women. In Study 3, we experimentally manipulate men's feelings of anxiety to causally test the effects found in Studies 2a and 2b using a behavioral dependent variable.

#### Study 1

The goal of Study 1 was to conduct a preliminary test to see whether women's dominance behaviors are positively associated with men's heightened feelings of anxiety. We tested Hypothesis 1 with data from MBA students at a large, private university, in the Northeast United States.

#### Participants

Seventy-six students (38 women;  $M_{\text{age}} = 27.64$ ,  $SD = 1.79$ , range = 25-34) were recruited from the MBA program of a large private East Coast university. The racial composition of the sample was

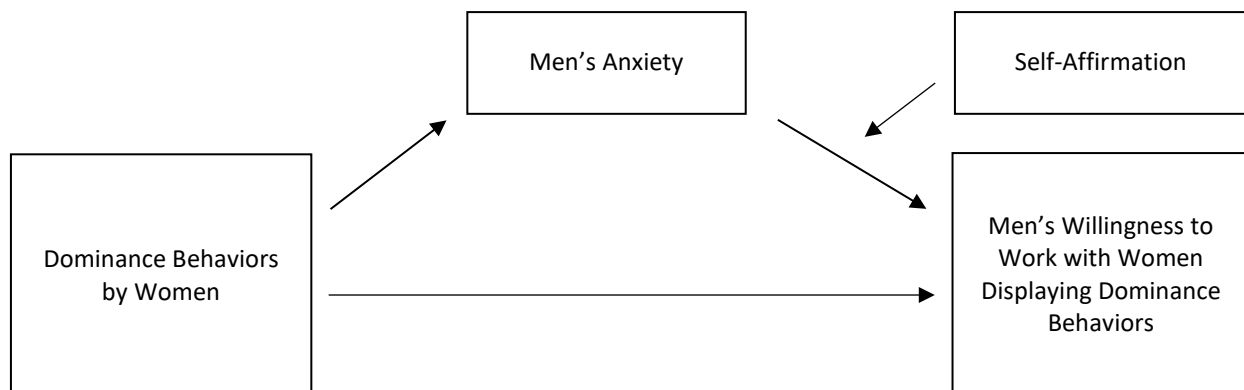
<sup>1</sup> Data for all studies are available at: [https://osf.io/yub25/?view\\_only=57fed87b8f734abe945331459e244417](https://osf.io/yub25/?view_only=57fed87b8f734abe945331459e244417)



50% Caucasian, 7% Black, 30% Asian, 9% Hispanic, 4% other. The 38 female participants and 38 male participants composed 38 mixed-gender negotiating dyads.

**Figure 1**

*Proposed Model: Men's reaction to women's dominance behaviors*



### **Procedure**

Prior to the session, participants completed an online survey where they were asked demographic information to facilitate dyad pairings and to assign participants to one of three study sessions based on their availability. Two study sessions were held on the same day and the third 10 days later to accommodate available participants. Upon arrival at the study session, participants completed informed consent forms and were given an overview of the session<sup>2</sup>. Each participant then received a set of confidential instructions which described their role in the negotiation exercise, the relevant issues to be negotiated, and point totals reflecting the priority they should attach to each issue. Participants were then made aware of who their negotiation partner would be, were given 10 minutes to read through their materials, after which they completed a questionnaire assessing their perceptions of the upcoming negotiation. Dyads were then paired and given 30 minutes to negotiate. The negotiation concluded when both parties reached a mutual agreement or when the full 30 minutes had elapsed. Immediately following the negotiation, participants completed a post-negotiation questionnaire assessing their negotiation experience and their perceptions of their counterpart. Participants were then thanked, debriefed, and paid \$100 each.

### **Negotiation Task**

The negotiation task was about a potential acquisition. Participants were assigned to either the role of a Vice President of Business Development for one of CPC International's Consumer Food Divisions, or the President and majority stakeholder of a closely held private food company that was the target of the acquisition. Negotiators had to seek agreement on four issues: financial terms, non-compete periods, family employees, and contingent liability. All participants were instructed that their

<sup>2</sup> During this period, we also collected saliva samples, later assayed for hormones, from all participants. We do not report on these hormones as they are not the theoretical focus of the current research.

goal was to maximize their own personal gain – that is, to reach an agreement with the other person on all four issues that was best for them. In addition, participants were prohibited from showing their payoff table to the other person.

### **Measures**

We measured self-reported anxiety after the negotiation with an average of participants' responses to two items (scared, afraid;  $\alpha = 0.81$ ) that used a 5-point scale (1 = not at all, 5 = a great deal; Watson & Clark, 1994) ( $M = 1.16$ ,  $SD = 0.39$ ). We measured perception of counterpart dominance with the following item "How would you describe your partner during the negotiation?" that used a 7-point scale (1 = submissive, 7 = dominant) ( $M = 4.41$ ,  $SD = 1.06$ ).

### **Results and Discussion**

Supporting Hypothesis 1, we found that women's displays of dominance behaviors were associated with men's higher feelings of anxiety ( $r = .349$ ,  $p = .032$ ). Conversely, men's display of dominance behaviors was not associated with women's feelings of anxiety ( $r = .241$ ,  $p = .145$ ). We acknowledge the potential limitations of a 1-item measure of dominance and the 2-item measure of anxiety. Studies 2-4 used alternative measures of these constructs to corroborate our hypotheses. Since Study 1 provides correlational evidence for our hypothesized effect, in Studies 2 and 3 we used an experimental design to causally test Hypothesis 1 and to examine the moderating role of self-affirmation in our hypothesized effects (Hypothesis 3).

### **Study 2a (Pilot)**

In Study 2a, we have two goals. First, to replicate prior research showing that men prefer to work with dominant men relative to dominant women. Second, to *preliminary* examine whether self-affirmation mitigates that effect.

### **Participants**

We recruited 145 participants via Prolific Academic to complete an online survey. After completing data collection, we conducted a sensitivity analysis with G\*Power showing that our sample size was sufficient to detect effect sizes of  $\eta^2 = .052$  or larger with 80% power. Prolific Academic is a crowdsourcing platform with a participant pool composed of individuals from the UK (51%), the US (28%), and other (mainly) European countries (21%). Participants in our study were 59% male ( $n = 86$ ) and had a mean age of 30.1 years ( $SD = 9.7$ , range = 18-72). Seventy-two percent self-identified as White, 10% as Asian, 5% as Hispanic, 3% as African, 4% as Mixed, and 6% as Other. Eighty-one percent were currently employed, 54% had management experience, and 34% had hiring experience.

### **Procedure**

In the consent form, participants read that they would participate in two separate studies. The first study, described as a "Study of Values," contained a self-affirmation manipulation following procedures validated in prior research (Fein & Spencer, 1997; McQueen & Klein, 2006; Sherman et al., 2000). We presented participants with a list of 11 values, such as relationships with friends and family, creativity, and sense of humor, and asked them to rank the values in order of their personal importance. In the affirmation condition, we asked participants to write about why their top ranked (#1) value was important to them. In the control condition, we asked participants to write about why their lowest ranked (#11) value might be important to someone else.

The second study, described as a “Job Interview Study,” was an adapted version of an online survey used by Bowles and Babcock (2013) to measure backlash against female negotiators. The background information asked participants to imagine they were working at a large corporation in the automotive industry and explained that their task was to evaluate an internal candidate for a job placement in their department based on a videotaped job interview. According to the information provided to participants, the candidate had just completed an internal management training program and had graduated from a “top school,” performed well in the training program, and was entering their first management position.

After reading the background information, each participant watched the purported job interview tape, a short video of either a female or a male candidate who attempted to negotiate for a higher salary and an end-of-the-year bonus. Specifically, the candidate said the following at the end of the video:

“I do have some questions with regard to the salary and benefits package. It wasn't clear to me whether this salary offer represents the top of the pay range. I understand that there's a range in terms of how much managers are paid in their first placement. I think I should be paid at the top of that range. And I would also like to be eligible for an end-of-year bonus.”

We selected this stimulus because numerous studies have documented that self-advocating for higher pay makes women appear dominant (e.g., insufficiently nice, too demanding) and elicits backlash against them (Amanatullah & Morris, 2010; Bowles et al., 2007; Duguid & Thomas-Hunt, 2015). The candidates were professional actors trained to enact the script as similarly as possible. Pretesting indicated no significant differences in perceived age, socio-economic status, physical attractiveness, or facial expressions of the candidates (Bowles & Babcock, 2013). The survey completed by participants was paced so that it would not progress until the end of the video, after which participants indicated their willingness to work with the candidate.

### **Measures**

We measured willingness to work with the candidate with an average of participants' responses to three items (how beneficial it would be for them to have this person on their team, how much they would enjoy having this person working on their team, and how much they would want this person on their team) that used a 7-point scale (1 = not at all, 7 = extremely) ( $\alpha = 0.91$ ) (adapted from Bowles et al., 2007).

### **Results and Discussion**

We conducted an ANOVA on willingness to work with the candidate by evaluator gender, candidate gender and self-affirmation condition. Consistent with prior research, we found, with marginal significance, that in the control condition, men were more likely to work with the dominant male candidate ( $M = 4.25$ ,  $SD = 1.40$ ) than with the dominant female one ( $M = 3.40$ ,  $SD = 1.24$ ),  $F(1,137) = 3.876$ ,  $p = .051$ ,  $\eta_p^2 = .03$ . This effect was mitigated when men self-affirmed. In other words, in the self-affirmation condition, male evaluators were equally likely to work with the male ( $M = 4.20$ ,  $SD = 1.40$ ) or the female candidate ( $M = 4.76$ ,  $SD = 1.34$ ),  $F(1,137) = 2.02$ ,  $p = .157$ ,  $\eta_p^2 = .02$ , supporting Hypothesis 3 (see Figure 2).

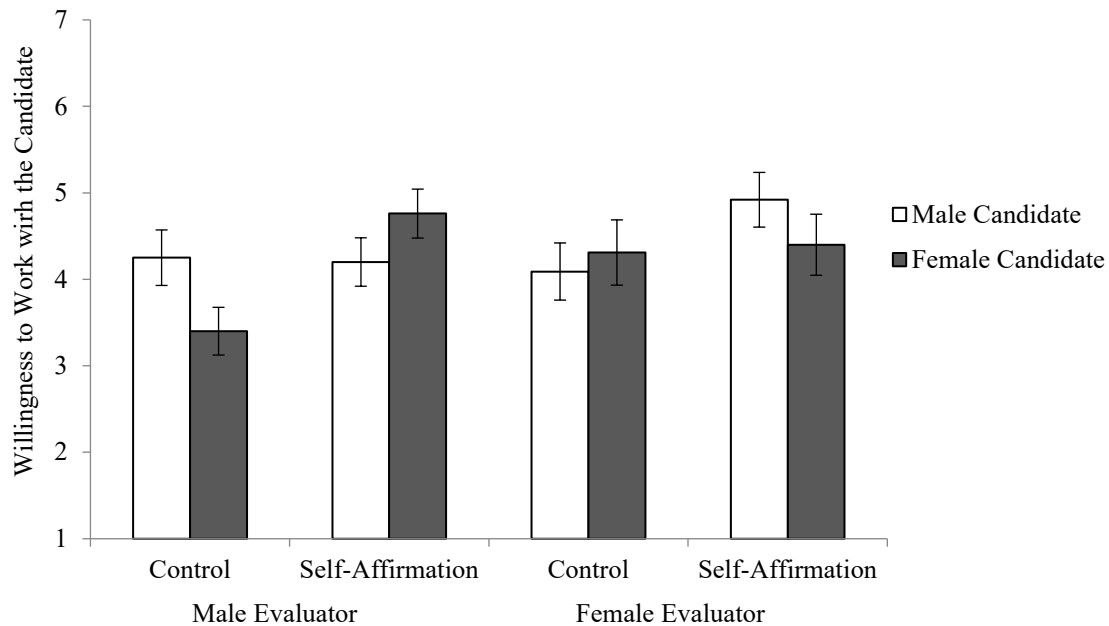
Although the focus of the current paper is on male behavior, out of curiosity we examined whether similar effects were observed among female evaluators. In the control condition, female evaluators did not have any preference to work with the male ( $M = 4.09$ ,  $SD = 1.40$ ) or the female candidate ( $M = 4.31$ ,  $SD = 1.41$ ),  $F(1,137) = 0.206$ ,  $p = .651$ ,  $\eta_p^2 = .00$ . When self-affirmed, female evaluators were still equally likely to work with the male ( $M = 4.92$ ,  $SD = 1.14$ ) or the female candidate ( $M = 4.40$ ,  $SD = 1.32$ ),  $F(1,137) = 1.007$ ,  $p = .317$ ,  $\eta_p^2 = .01$ .

Overall, we observed a main effect of self-affirmation condition ( $F[1,137] = 6.01, p = .015, \eta_p^2 = .04$ ), such that evaluators who had been self-affirmed ( $M = 4.53, SD = 1.33$ ) were more willing to work with the candidates than evaluators in the control condition ( $M = 3.98, SD = 1.38$ ). This main effect was qualified by a significant three-way interaction,  $F(1,137) = 5.49, p = .021, \eta_p^2 = .04$ . No other effects (nor interactions) were significant (all  $F_s < 1.524$ , all  $p_s \geq .22$ , all  $\eta_p^2 < .01$ ).

In Study 2a we replicated prior research showing that men prefer to work with dominant men relative to dominant women, and we found preliminary evidence for self-affirmation to mitigate that effect. Study 2b will test this effect with a bigger sample, as well it will examine its mechanism.

## Figure 2

*Study 2a: Means of willingness to work with candidate by evaluator gender, candidate gender, and self-affirmation condition. Error bars show standard errors.*



## Study 2b

In Study 2b, we aimed to replicate, integrate, and extend the results of Studies 1 and 2a by testing the moderated mediation model whereby self-affirmation increases men's willingness to work with women displaying dominance behaviors through a reduction in anxiety. We tested Hypotheses 1-4.

### Participants

We recruited 280 adults to complete an online study via Prolific Academic. As in Study 2a, we conducted a sensitivity analysis with G\*Power. The analysis showed that, assuming 80% power, our sample size was sufficient to detect effect sizes of  $\eta^2 = .028$  or larger. The sample was 59% male ( $n = 164$ ), their mean age was 28.3 years ( $SD = 8.2$ , range = 19-67). Seventy-eight percent self-identified as

White, 9% as Asian, 6% as Hispanic, 2% as Middle-Eastern, 5% as Mixed. Eighty-nine percent were currently employed, 38% percent had management experience, and 27% had hiring experience.

### **Procedure**

The procedure was identical to Study 2a, with the exception that we included additional measures of dominance behaviors and anxiety. After watching the video, participants rated the extent to which they perceived the candidate to be dominant, their emotional reaction (i.e., sense of anxiety), and then their willingness to work with him or her.

### **Measures**

We measured anxiety with the average of four items (nervous, anxious, worried, and apprehensive;  $\alpha = 0.87$ ) used in previous research on anxiety (adapted from Brooks & Schweitzer, 2011). We measured dominance behaviors with eight items (hostile, arrogant, boastful, greedy, dictatorial, looks out only for self, egotistical, and cynical;  $\alpha = 0.88$ ) from the Personality Attributes Questionnaire (PAQ; Spence et al., 1979). Finally, participants indicated their willingness to work with the candidate ( $\alpha = 0.92$ ) using the same measure as in Study 2a.

### **Results**

In further support for Hypothesis 3, we found that, in the control condition, men were more willing to work with the dominant male candidate ( $M = 4.51$ ,  $SD = 1.13$ ) than with the dominant female candidate ( $M = 3.64$ ,  $SD = 1.27$ ),  $F(1,272) = 11.35$ ,  $p = .001$ ,  $\eta_p^2 = .04$ ., replicating prior research. This effect was mitigated when men are affirmed; in the self-affirmation condition, male evaluators were equally likely to work with the male ( $M = 4.43$ ,  $SD = 1.20$ ) or the female candidate ( $M = 4.47$ ,  $SD = 1.43$ ),  $F(1,272) = 0.23$ ,  $p = .879$ ,  $\eta_p^2 = .00$ . Study 2b provided further evidence for the effect of self-affirmation on men's willingness to work with dominant women (See Figure 3).

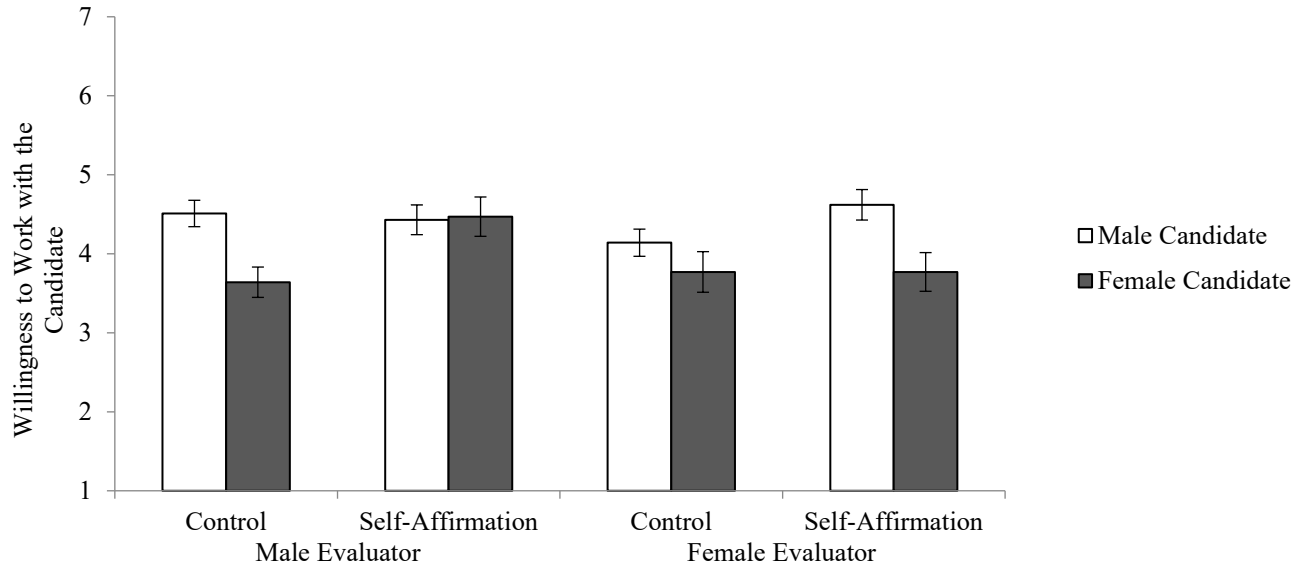
Overall, we observed a main effect of candidate gender ( $F[1,272] = 11.83$ ,  $p = .001$ ,  $\eta_p^2 = .04$ ), indicating that evaluators were less willing to work with a female candidate ( $M = 3.90$ ,  $SD = 1.38$ ) than with a male candidate ( $M = 4.44$ ,  $SD = 1.10$ ). There was also a main effect for self-affirmation ( $F[1,272] = 4.29$ ,  $p = .039$ ,  $\eta_p^2 = .02$ ), indicating that evaluators who were self-affirmed ( $M = 4.33$ ,  $SD = 1.29$ ) were more willing to work with the candidate than evaluators in the control condition ( $M = 4.03$ ,  $SD = 1.23$ ). These effects were qualified by a significant three-way interaction of Evaluator Gender  $\times$  Candidate Gender  $\times$  Self-Affirmation,  $F(1,272) = 5.47$ ,  $p = .020$ ,  $\eta_p^2 = .02$ .

**Mediation Analyses.** We used a moderated mediation model to test our prediction summarized in Figure 1. Specifically, we tested whether women's dominance behaviors was associated with higher anxiety for men and in turn reduced men's willingness to work with women, and that self-affirmation moderated the effect of men's anxiety on their willingness to work with dominant women. Only men evaluating the female candidate were included in the analyses. Using the PROCESS SPSS macro (Model 14) to test for moderated mediation (following Hayes, 2017), we calculated the 95% bootstrap confidence intervals based on 10,000 bootstrap samples. The predictor variable was dominance behaviors, the mediator variable was anxiety, the dependent variable was willingness to work and the moderator was self-affirmation. Table 1 reports the regression output.

Our analyses supported the predicted mediation model. As expected, women's dominance had a significant effect on men's anxiety ( $b = 0.48$ ,  $SE = 0.05$ ,  $p < .001$ ), and the interaction effect of anxiety and self-affirmation predicting willingness to work was negative and significant ( $b = -0.45$ ,  $SE = 0.17$ ,  $p = .011$ ). The index of moderated mediation ( $b = -0.22$ ,  $SE = 0.84$ ) was significantly different from zero (95% CI = [-0.40, -0.70]), suggesting that self-affirmation is a significant moderator of our model.

**Figure 3**

Study 2b: Means of willingness to work with candidate by evaluator gender, candidate gender, and self-affirmation condition. Error bars show standard errors.



**Ancillary Analysis.** Again, even though the focus of this paper is on male behavior, out of curiosity we examined female evaluators' ratings to see if the effects seen in males generalized to females. In the control condition, female evaluators did not show a preference for working with the male ( $M = 4.14$ ,  $SD = 0.91$ ) or female candidate ( $M = 3.77$ ,  $SD = 1.38$ ),  $F(1,272) = 1.32$ ,  $p = .252$ ,  $\eta_p^2 = .01$ , consistent with prior research and our findings in Study 2a. Interestingly, and counter to our findings in Study 2a, when self-affirmed, female evaluators were *more* likely to work with the male ( $M = 4.62$ ,  $SD = 1.04$ ) than with the female candidate ( $M = 3.77$ ,  $SD = 1.34$ ),  $F(1,272) = 7.15$ ,  $p = .008$ ,  $\eta_p^2 = .03$ .

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**Table 1**

*Study 2b: Moderated Mediation Results (X=Dominance, M=Anxiety, W=Self-Affirmation; Y=Willingness to Work)*

	Anxiety	Willingness to Work (WTW)
Dominance	.481***(.049)	-.669***(.077)
Anxiety		.020 (.153)
Self-Affirmation (SA)		1.048 (.450)
Anxiety*SA		-.454*(.173)
R <sup>2</sup>	.57***	.76***
Direct Effect (Dominance → WTW)	-.669***(.077)	95% CI [-.822; .516]
Indirect Effect	-.218 (.084)	95% CI [-.401; -.073]

*Note.* Coefficients are unstandardized, and standard errors are in parentheses.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### Discussion

Thus far, we found evidence in support of our four key hypotheses, showing that dominance displays in women are associated with heightened anxiety for men and with a reduced willingness of men to work with women viewed as dominant. Moreover, self-affirmation moderated this effect. While we observed preliminary evidence that these effects are not seen in women evaluators, this evidence was inconsistent across Studies 2a and 2b. Given that the focus of the paper is on men, we did not explore this difference further, but encourage future work examining this topic.

Importantly, in Studies 2a and 2b, our dependent variable was attitudinal, leaving open the question of men's actual behaviors when interacting with dominant women, which we examine in Study 3. Further, in Study 3 we provide additional evidence for the model's *causal* claims, by manipulating our proposed mediator: anxiety.

### Study 3

In Study 3, we test Hypothesis 2b, Hypothesis 3 and Hypothesis 4. Participants had an opportunity to collaborate with a dominant woman (a woman excelling in a masculine environment; Rudman and Fairchild, 2004; Williams and Tiedens, 2016), and since our effects for men were robust in all three studies leading up to Study 3, we recruited only male participants for parsimony. Borrowing from Rudman and Fairchild (2004), we created a paradigm in which men had the opportunity to aid a dominant woman, operationalized as the *sole* female contender (against four men), in the final round of an online competition by providing clues that would either hinder or help her in solving anagram puzzles (Rudman et al., 2012). We operationalized dominance behavior as a woman excelling in a

masculine contest as Rudman and Fairchild (2004). Specifically, the authors found that women excelling in a masculine contest were more likely to be sabotaged (that is less likely to be helped) by participants.

One of our main goals in this study was to manipulate anxiety. Given that past literature has demonstrated how hard it is to induce anxiety in a laboratory setting, and even more so in an online setting, we relied on past work suggesting that the level of competition of a context is an important antecedent of anxiety (Glick et al., 2018). We then designed stimuli that varied the competition vs. cooperation level in the environment to indirectly manipulate the level of anxiety experienced. In the high-anxiety condition, we adapted items from a scale of Organizational Culture as a Masculinity Contest (OCMC; Glick et al., 2018) to prime masculine competitive work norms that have been linked to feelings of anxiety (Glick et al., 2018). These work norms include, for example, the perceived need to display confidence and high physical stamina. In the low-anxiety condition, we adapted items from Edmondson's (1999) scale of psychological safety, which includes norms, such as, willingness to collaborate and help others.

In order to ensure generalizability, we used a different type of self-affirmation manipulation in which participants are asked to reflect on their personal values and how they could express them in their organization (adapted from Cable et al., 2013). Past work has shown that the self-affirmation manipulation we used in Studies 2a and 2b, as well as the one we used in the current study have similar effects on eudemonic wellbeing and openness to potentially threatening intergroup information (Kinias & Fennessy, 2016). We predicted that increased anxiety would decrease men's collaborative work with the female contestant and that self-affirmation would reduce men's anxiety and thus increase their propensity to work collaboratively with her.

### ***Pilot Study***

Given past studies have shown that competition within an environment is a source of anxiety (Edwards et al., 2006, Gonzalez-Bono et al., 1999), we recruited 130 men via Prolific Academic to pre-test our anxiety manipulation. Participants read a passage about the types of employees companies are trying to recruit in "today's fast-changing markets." Participants randomly assigned to the high anxiety condition read the following:

"In competitive, fast-changing markets, there are companies looking to recruit competitive, hard-charging employees. They are looking to recruit people who display confidence, who have the physical stamina for long demanding hours of work, and who can handle stress without becoming emotional. Some executives believe that these qualities predict people's success."

Participants were then asked to rate their fit with this particular type of work environment on a 7-point scale (1 = strongly disagree, 7 = strongly agree). Sample items included "I am physically strong and healthy," "I am confident," and "Nothing wears me down."

Participants randomly assigned to the low anxiety condition read the following:

"In today's fast-changing markets, there are companies looking to recruit cooperative employees who are able to work in teams to get the job done. They are looking to recruit people who are able and willing to collaborate, discuss problems and tough issues, and help their coworkers. Some executives believe that these qualities predict people's success."

As in the high anxiety condition, participants rated their fit with this type of work environment. Sample items included "I value others' perspectives," "I like sharing my ideas," and "I like helping my peers with their work."

To test whether the manipulation had its intended effect of producing anxiety, we next asked participants to complete a seven-item word-completion task used in prior research (Vandello et al.,



2008). Each letter string could be completed to form a word related to anxiety. For example, the string "STRE \_ \_" could be completed as "STRESS" or as "STREET." The seven anxiety-related words were stress, threat, shame, loser, bother, weak, and upset. One hundred and twenty-nine men completed the study. As intended, men in the high anxiety condition completed the letter strings with more stress-related words than men in the low-anxiety condition,  $t(127) = 2.58$ ,  $p = .011$ ,  $d = .46$ . These results suggest that the stimulus was a reliable (indirect) manipulation of anxiety.

### **Participants**

We recruited 180 men to complete an online study via Prolific Academic. We conducted a sensitivity analysis with G\*Power. The analysis showed that our sample size was sufficient to detect effect sizes of  $\eta^2 = .042$  or larger with 80% power. The mean age was 31.4 ( $SD = 11.1$ , range = 19-65). Eighty-six percent of the participants values identified as White, 7% as Asian, 4% as Hispanic, 2% as Middle-Eastern, 1% as Mixed.

### **Procedure**

In the consent form, participants read that they would participate in multiple studies. On the first page, we asked participants (all men) to indicate their age and gender by selecting either a female or a male icon. All participants selected a male icon.

The next part of the survey was described as a "Work Environment Study" and replicated the anxiety manipulation pretested above. Following the anxiety manipulation, we randomly assigned participants to a self-affirmation or control condition. In the self-affirmation condition, the men were asked the following four questions: (1) What three words best describe you as an individual? (2) What is unique about you that leads to your happiest times and best performance at work? (3) Can you please describe a time (perhaps on a job, perhaps at home) when you were acting the way you were "born to act?" and (4) How can you repeat that behavior on the job? (adapted from Cable et al., 2013). Adapting from similar studies, we asked men in the control condition to write about their last trip to the grocery store.

Following the self-affirmation manipulation (or control), participants entered the "Verbal Study" in which they had the opportunity to help a contestant in an online gaming competition. The general instructions read as follows:

"We previously randomly selected 50 participants to compete in a gaming tournament. In each round participants competed in online games. Only the top players continued to the next round. The following five players advanced to the third and final round: MARK, JEFF, FELIPE, ERIKA, and JOHN. You will be randomly assigned to help one of those five finalists on their final round. In the final round they will be solving anagrams. Your job is to select clues you want him/her to receive."

To clarify that only one woman made the final round, participants also saw four male icons (MARK, JEFF, FELIPE, and JOHN) and one female icon (ERIKA). These icons were of the same type they assigned to themselves at the beginning of the study.

Participants then received ten anagrams and possible clues for their solutions (based on Rudman et al., 2012). We told participants that the contestant they would be helping was "ERIKA" (i.e., the only woman in the final round). For each of the ten anagram puzzles, they could choose no more than one clue from a list of three possible clues or they could choose to provide no clue at all.

### **Measures**

We measured behavioral collaboration based on how helpful the clues selected for ERIKA would be for solving the 10 anagrams. We presented the clues in random order. Following Rudman

et al. (2012), we scored the clues on a scale of 1 to 4 (1 = no clue provided, 4 = most helpful). A sample anagram was "CPESNRAA" (answer = "PANCREAS"). An example of an unhelpful clue (rated 2) would be "It starts with the letter 'P.'" An example of a more helpful clue (rated 3) would be "It's an organ in your body." The most helpful clue (rated 4) would be "It's the organ in your body that starts with 'P.'" The collaboration measure was the sum of the scores for whatever clues they provided (possible range 10–40).

### Results

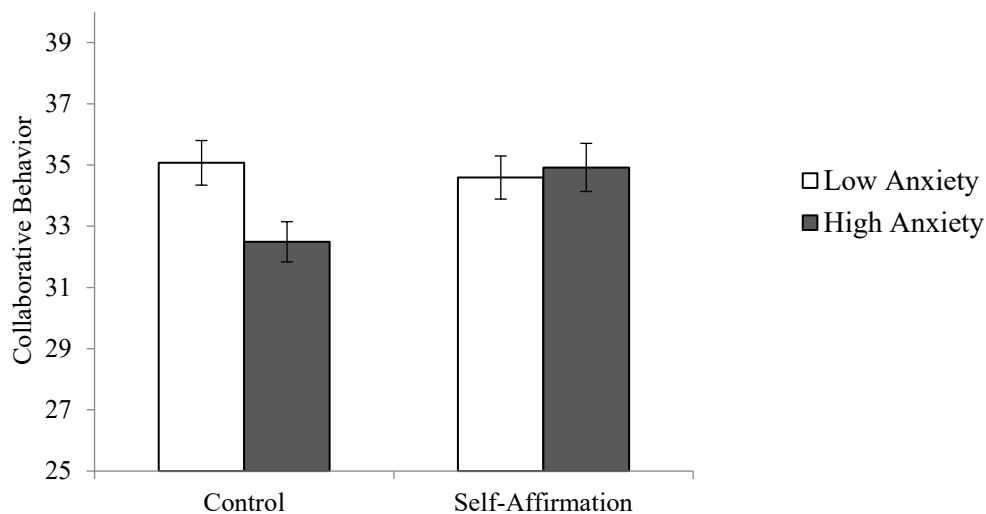
All recruited participants but one completed the study. We report results for the 179 participants who completed the study. Results of the ANOVA on collaboration by anxiety condition and self-affirmation condition revealed a significant interaction of Anxiety  $\times$  Self-affirmation,  $F(1, 175) = 4.08, p = .045, \eta_p^2 = .02$ . Figure 4 depicts the pattern of effects. In the control condition, men did collaborate with women less in the high anxiety condition ( $M = 32.49, SD = 4.56$ ) compared to the low-anxiety condition ( $M = 35.07, SD = 5.13$ ),  $F(1, 175) = 6.90, p = .009, \eta_p^2 = .04$ . This effect was mitigated when men were affirmed. Specifically, in the self-affirmation condition, anxiety had no significant effect on the propensity to collaborate with women (high anxiety condition:  $M = 34.92, SD = 4.73$ ; low anxiety condition:  $M = 34.59, SD = 4.75$ ,  $F(1, 175) = 0.10, p = .754, \eta_p^2 = .00$ ), providing further support for reduction in anxiety as a mechanism through which self-affirmation increases men's propensity to work collaboratively with dominant women.

### Discussion

The results of Study 3 replicated the pattern of effects observed in Studies 2a and 2b and extend them by manipulating anxiety directly and employing a behavioral indicator of men's propensity to work collaboratively with women. Under heightened male anxiety, men were less likely to collaborate with the sole woman finalist in an online contest. However, as before, self-affirmation mitigated this effect.

**Figure 4**

*Study 3: Average levels of men's collaboration with female contestant by anxiety and self-affirmation conditions. Error bars show standard errors.*



## General Discussion and Conclusion

The current research proposes self-affirmation as a potential intervention to mitigate gender bias. Across four studies we showed that women's displays of dominance behaviors are associated with men's heightened feelings of anxiety and a decreased willingness to work with women. Moreover, we showed that self-affirmation moderated this effect by reducing men's feelings of anxiety and, thereby, increasing their attitudinal and behavioral propensity to work collaboratively with women. Our work contributes to the literature on gender in leadership by highlighting the potential for men's anxiety in response to dominant women to heighten gender bias favoring men. Our results suggest that anxiety undermines men's willingness to support women displaying dominance behaviors. Using multiple forms of self-affirmation, we found that reflecting on one's most important values reduces men's anxiety and increases willingness to engage collaboratively with female co-workers.

### Theoretical Contribution

The current research has relevant theoretical implications for the study of gender bias and work discrimination more broadly. Traditionally, self-affirmation interventions have focused on decreasing the threat experienced by *targets* of stereotypes. Few studies have demonstrated the effect of self-affirmation on the *perpetrators* of discrimination who experience identity threat (Adams et al., 2006; Fein & Spencer, 1997; Unzueta & Lowery, 2008), although this prior research had not focused on *gender* bias specifically. Our study provides further evidence that self-affirmation may help reduce the propensity for stereotyped-based judgements, specifically in relation to gender, and mitigate its potentially damaging effects.

This set of studies addresses research calls inviting greater focus on men for a more comprehensive understanding of gender effects in leadership, as well as to shed light on potential interventions to level the playing field (e.g., Mazei et al., 2021). Men face distinctive gender dynamics in comparison to women, particularly driven by their motivation to sustain (vs. gain) higher social status (Ridgeway & Correll, 2004; Jost, 2019; Jost & Hunyady, 2005). Recent research shows that men perceive negotiations and competition as activities that could threaten their masculinity and social status (Mazei et al., 2021; Vandello & Bosson, 2013). In our research, we theorize and find that men experience anxiety when interacting with women displaying dominance behaviors (i.e., women initiating negotiation or women excelling in a masculine contest) which leads to a reduced willingness to work with them. Moreover, we contribute to this line of research by finding support for a self-affirmation intervention to decrease men's anxiety in response to women's displays of dominance behaviors.

### Limitations and Future Directions

Prior research has highlighted that gender effects in leadership are context-specific (e.g., Kennedy & Kray, 2015; Mazei et al., 2015), thus it is important to note that in this paper we focused on documented situations in which gender bias favoring men is more likely to emerge. Future research should examine the generalizability of these effects in other domains and with other types of dominance behaviors, such as self-promoting during a job interview or a performance review meeting. Further, our work leaves open some important questions for future research. We find that self-affirmation reduces gender bias because it reduces men's anxiety, but our research does not explain why this occurs. Prior research on self-affirmation has not established a unique mechanism

underlying its effects. Some studies have found that affirmation operates through increasing positive mood (Koole et al., 1999; Raghunathan & Trope, 2002), or by decreasing self-doubt (Kinias & Sim, 2016). Some other studies found that self-affirmation increases self-esteem (Fein & Spencer, 1997), while others found no such effects (Schmeichel & Martens, 2005). More research is needed to illuminate the mediating mechanisms through which self-affirmation affects individuals' attitudes and behavior (Cohen & Sherman, 2014).

Another open question is the extent to which self-affirmation could have lasting effects in mitigating gender bias in organizations. Field research suggests that self-affirmation can have lasting effects for the individuals who are the targets of stereotypes (Cohen et al., 2009). For instance, Cohen et al. (2009) demonstrated that periodic self-affirmation (i.e., 3-5 times per year) helped minority students' manage stereotype threat for as long as two years. In two field experiments, Kinias and Sim (2016) demonstrated that a one-time self-affirmation during the orientation week ameliorated stereotype-consistent gender performance gaps in course grades among MBA students at an international business school. Similarly, Cable et al. (2013) implemented a one-time self-affirmation intervention during a work orientation program and found that having newcomers reflect on their personal values and how they could express them at work had positive effects on employee retention six months after the intervention.

To enhance the practical relevance of this work (Reed & Aspinwall, 1998), future research should move to the field and consider implementing self-affirmation practices in organizations when hiring, promotions, and performance evaluations decisions have to be made. As an example, during certain committee meetings where hiring, promotion, or performance review-related decision are made, the committee could ask their members to share how they bring their personal values to their work.

### Conclusion

Taken together, our findings suggest that managers should be mindful of how cultural norms in their organizations, such as whether their culture functions as a masculinity contest, might heighten the potential for discriminatory attitudes. Additionally, work contexts that heighten employee anxiety may lead to gender discriminatory behavior. However, by using self-affirmation as a brief and low-cost intervention, it may be possible to improve men's collaboration with women exhibiting dominance behaviors, and more broadly to improve diversity, equity, and inclusion initiatives by focusing on targeting men's anxiety.

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# The Language of Conflict Transformation: Assessing Psychological Change Patterns in Israeli-Palestinian Track Two Interactive Problem Solving

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## Keywords

Track Two diplomacy, Interactive Problem-Solving, mediation, conflict transformation, Israel-Palestine conflict, LIWC

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[doi.org/10.34891/svxv-s665](https://doi.org/10.34891/svxv-s665)

## Abstract

Intergroup conflict and hostility remain pertinent problems, often involving mass violence and fundamental harm to the well-being of individuals and societies. Previous studies suggest unofficial third-party dialogue is valuable for changing intergroup disputes and achieving sustainable conflict transformation. However, the *exact mechanisms* that define how it impacts participants remain unclear. To better understand how psychological processes influence dialogue outcomes, we analyzed conflict discourse, specifically examining *linguistic* patterns as the basis for *outcome* assessments of Interactive Problem-Solving in the Israeli-Palestinian conflict using natural language processing (LIWC) and qualitative thematic analysis.

Results indicate substantial cognitive-affective shifts in participant interactions during the dialogue process. Psychological changes in response to the interaction include expressing more positive emotions, and substantial cognitive and social engagement, combined with decreasing psychological distance from outgroup members. Overall, we suggest that Interactive Problem Solving facilitates linguistic and psychological attitude changes away from destructive conflict-supporting beliefs.

## Acknowledgements

Work on this study for OF was enabled through an SNSF Postdoc Mobility Fellowship. SS, AS, and JCE were supported by the Stanford Institute for Human-Centered AI. We thank Ron Fisher for his expertise and assistance, particularly for his valuable support during the writing phase.

## Introduction

In many regions of the world, intergroup conflict and hostility remain pertinent problems (Geoghegan, 2017). They often involve mass violence and fundamental harm to the well-being of the entangled citizens and whole societies, recently exemplified by the tragic October 7<sup>th</sup> events. Complementing official diplomacy, unofficial Track Two processes have been suggested as useful for changing intergroup disputes and achieving sustainable conflict transformation. Scholars such as John Burton (1997) and Herbert C. Kelman (2009) have developed fundamental conceptualizations in this field, utilizing seminal theories of social psychology (Cuhadar & Dayton, 2011). Despite this excellent scholar-practitioner work on conflict transformation, hardly any research to date has systematically addressed the impact of specific microfoundations such as cognitions or emotions, describing the exact *psychological processes* between participants and facilitators. They influence process *outcomes* in terms of direct results but also impact harmful conflict-supporting attitudes of participants.

Without these foundations, we remain ill-informed about concrete functional mechanisms and, most importantly, about the basis for implementing a transfer of these outcomes, which is essential for the enduring impact of dialogue approaches. Our study extends the existing literature by addressing this gap in our psychological understanding of individual transformation, analyzing an example of intergroup discourse within the Israeli-Palestinian conflict from Kelman's Track Two approach. The study tracks linguistic indicators of psychological change reflecting the dialogue process. In line with Kelman's 'links-in-the-chain' assessment model (Kelman, 2008), the article first presents the participants' motivations to engage in the dialogue and then examines engagement and interaction patterns followed by psychological attitude changes, namely process outcomes. Finally, we propose lessons drawn, providing initial suggestions on how problem-solving discourse could be used in intergroup conflict dialogue and mediation, including helpful agonistic elements (Fisher et al., 2023).

### Track Two Dialogues -- Outcome as Basis for Transfer

A growing body of literature has recognized the importance of Track Two dialogue as a third-party intervention method facilitating conflict transformation within *protracted* intergroup conflict, complementing official Track One diplomacy. Namely, Herbert C. Kelman's 'Interactive Problem Solving' (IPS) is an innovative Track Two approach to transform individual and societal disputes (Burton, 1997; Dudouet, 2006; Kelman, 2009). Track Two dialogue has been conceptualized as an unofficial form of conflict resolution between representatives of adversarial groups aiming to de-escalate conflict, improve understanding between the parties, and develop new ideas to be used in the official peace processes (Bercovitch, 2007; Fisher, 1997). Particularly its interactive component as well as its application in *protracted* conflict have been underlined (Fisher, 2007; Fisher & Keashly, 1988). While specific practices in Track Two dialogues vary (Cuhadar, 2009; Çuhadar & Dayton, 2012), the objectives of Track Two in contrast to other third-party conflict dialogue efforts such as mediation,

arbitration, or classic Track One diplomacy are well-described (Bercovitch, 2007; Richmond, 1998). Next to developing creative ideas for solutions, Track Two dialogue wants to *change people* – their intergroup emotions and outgroup attitudes, not just make the parties pragmatically accept any mediation proposal (Clayton & Dorussen, 2022; Fisher et al., 2023; Fisher, 2007; Yawanarajah, 2021). Direct contact and interactions between members of adversarial groups in an affirmative unofficial setting should help *improve relations* and generate a *joint understanding* of the conflict (Kelman, 2008). This is the direct outcome. The improved relations and jointly formulated ideas are then transferred into each society or the official policymaking processes (Cuhadar & Paffenholz, 2020). Recently, deliberations about the necessity for *agonistic* dialogue – discourse about particularly deep intergroup divides such as identity and social justice – have been raised (Fisher et al., 2023). Psychological principles of intergroup contact facilitate these dynamics (Cuhadar & Dayton, 2011; Deutsch, 1994; Pettigrew, 1998; Pettigrew et al., 2011). The recategorization to a common ingroup identity eliciting empathy, trust, and attitude change is suggested as one relevant mechanism (Anastasio et al., 1997; Gaertner et al., 1993). However, intergroup encounters normally avoid antagonistic topics, underlining positive intergroup experiences and similarities. Track Two approaches purposefully discuss opposing perspectives.

Although Track Two activities have become increasingly common over the last couple of decades, the effectiveness of these efforts has rarely been evaluated mainly for practical and confidentiality reasons. While there are multiple quantitative and meta-studies of mediation outcomes (Bercovitch & Houston, 2000; Coleman et al., 2015), very few quantitative analyses of problem solving dialogue exist (Fisher, 2001; Rouhana, 1995). *How* dialogue increases sustainable attitude changes such as trust remains unclear (Fisher et al., 2023; Kressel, 2006), and a specific ‘theory of change’ is still missing (Shillings & Jones, 2020). Several studies suggest that Track Two successfully evokes positive intergroup encounter effects despite the controversial topics discussed, although the findings rely almost exclusively on case study methods (Fisher, 2007; Fisher et al., 2023).

The study of social and psychological responses to intergroup dialogue and mediation has always faced methodological and conceptual challenges including access to good data (Allen & Sharp, 2017; Reimann, 2004). Negotiation content and participants are usually secret, process documentation had second priority over confidentiality and other practical concerns. This implies a challenge for evaluation (Pruitt, 2011). The field would benefit from research that tracks responses to discourse processes as they naturally unfold, providing a continuous timeline of psychological processes; and comparing subjects’ thoughts and feelings via linguistic patterns. One such way is to analyze transcripts or detailed notes. This is an important issue, as we contend that a greater understanding of outcomes in terms of mental shifts of participants will lead to more explicit efforts regarding transfer activities. Measuring transfer directly is not straightforward, as there are many possible interferences (Fisher et al., 2023; Jones, 2020).

Conceptualizations on how to assess Track Two efforts have been developed over the last years by a small group of scholars (d’Estree et al., 2001; Bercovitch, 2007; Fisher, 1997; Jones, 2015; Shillings & Jones, 2021). Nevertheless, these suggestions have rarely been empirically tested (see as exception Fisher, 2007). Rouhana (2000) proposed that the evaluation of problem-solving workshops should distinguish the workshop’s impact on the immediate participants and the macro-goals, the impact on conflict dynamics at large. Prior approaches (d’Estree et al., 2001; Pettigrew, 1998) suggested assessing Track Two diplomacy at three levels: the micro level (relational and cognitive changes), the link between the micro level and the macro level (foundations for transfer), and the macro level (foundations for outcome). Kelman himself suggested a ‘Links-in-the-Chain-Model to evaluate IPS, empirically assessing the postulated impact of every conceptual step one by one. This includes the *nature of the participants*, their *engagement* in the process, *changes in interaction* over time,

*attitude changes*, and *positive outcomes* in terms of creative ideas for solutions or new conflict understanding (Kelman, 2008).

### **Outcome Antecedents – Linguistic Indicators of Psychological Skills**

It has been pointed out, that success in conflict management can be an elusive quest (Bercovitch, 2007; Jones, 2008). Third-party pre-negotiation evaluations often use case study designs, thus providing limited basis for rigorous workshop outcome evaluation (Fisher, 2007). Studies exist in the field of mediation impact (Bercovitch & Houston, 1996; Bercovitch & Gartner, 2006), but these often assume power equality amongst parties and low pre-negotiation conflict intensity. Both are not given within asymmetric protracted intergroup conflict. In many of the examined cases, mediation did not have lasting effects on participants (Pincock, 2013). Do we have to assume limited lasting efforts in the ‘uphill struggle’ of results transfer into societies in interactive problem solving as well?

Generally, Track Two participants should be open enough for the encounter but contrarian enough to enable open discourse. They should be politically influential or at least active, close enough to the political mainstream of each society, highly credible yet at the same time willing to not only ‘sit down with the enemy’ but also engage in joint thinking (Kelman, 1990; 2008). Engagement in the process should allow a certain depth of cognitive processing (Bar-Tal, 2011; Fisher & Kelman, 2011). Most importantly, we postulate that there should be some change in interaction over time, indicating a transformation of intergroup attitudes and appraisals despite confrontation (Fisher, 1994; Maoz, 2011) towards recategorization to a common group identity (Anastasio et al., 1997; Gaertner et al., 1993) *and mutual trust* (Ohanyan & Lewis, 2005). It is known for example from working groups that “the more time people spend with other people such as team members, the more our identity becomes fused with them, seeing ourselves as part of the same group” (Pennebaker, 2011). Accordingly, we might assume that emotional positivity overall increases during problem-solving, despite occasional fluctuations to balance optimal tension and acknowledge social justice concerns (Coleman, 2018).

Both indicators – engagement and interaction changes – should result in groups coming to a positive result, for example, a joint ‘white paper’ to be produced, but can we also conclude indications for positive longer-term attitude shifts in conflict understanding? Contact theory normally excludes the discussion of contentious topics, but this is thoroughly required within Track Two dialogue. Are the relational “insights that [the participants] carry away from their encounter” (Kelman, 2008) impactful enough to change destructive conflict-supporting attitudes (Deutsch, 1994; Saguy & Reifentagar, 2022) and severe psychosocial entrenchment in protracted intergroup conflict (Hameiri et al., 2014)? Creating – to myself and others – a different conflict story through learning and encounters is known to influence minds in other difficult settings. For example, participants recovering from trauma express more optimism, acknowledge negative events, over time construct a meaningful story of their experience, and have the ability to change perspective as they write or discuss (Pennebaker, 2011; Pennebaker & Evans, 2014). Equally, can looking at a complex problem such as protracted intergroup conflict from multiple perspectives generate similar change? Could changes in frequencies of words linked to the need for achievement, power, and affiliation, as well as changes in ‘I/we’ or emotional tone indicate such an outcome?

One important effect of structured intergroup contact for conflict transformation is reducing stereotyping as indicated in a detrimental conflict-supporting mindset (Saguy & Reifentagar, 2022). A meta-analysis with over 500 studies and more than 250,000 subjects demonstrated that intergroup contact typically reduces prejudice (mean  $r = -.21$ ) enabling attitude changes (Al Ramiah & Hewstone, 2013; Pettigrew et al., 2011), but these encounters normally do not include explicit discourse about

difficult core conflict topics and the trying task to find solutions. In one of the rare experimental studies on intergroup mediation effects, perspective-taking techniques increase *interpersonal* liking between group representatives, the effect was statistically mediated by interpersonal *empathy* and the sense of being heard. However, there was no effect on *intergroup* empathy and attitudes (Gutenbrunner & Wagner, 2016). Nevertheless, participants motivated enough for an encounter that entails discussing difficult issues should generate new ideas but also generalize mental shifts of participants (Fisher, 2007).

### The Israel-Palestine Conflict

The ongoing dispute between Israel and the Palestinians is an important protracted intergroup conflict (Bar-Tal & Halperin, 2013), with Israel having superior political, economic, and military power (Leshem & Halperin, 2023). For many years, the conflict has had a devastating impact on the daily lives of the Palestinians living under Israeli military rule. Palestinians experience widespread repression, ranging from movement restrictions, detention, and injury, to even death. Israelis also encounter considerable threats, for example through missile attacks or facing military reality in the Westbank. Decadelong efforts to facilitate dialogue within ongoing oppression, and the challenges of life under protracted conflict, allowed us to study the emotional cognitive-affective bases impacting conflict discourse among group members in an ongoing violent conflict. We focus on the seminal work of Herbert C. Kelman over several decades, applying Track Two processes to the Israel-Palestine conflict (Kelman 1990; 2008), arguably one of the most continuous and well-crafted third-party interventions in a major intergroup conflict (Fisher, 2007). The Kelman 'Interactive Problem Solving' approach was developed in the early 1980s to provide a forum for Israelis and Palestinians to engage in problem-solving and to help them explore ideas, options, and solutions that would meet the interests of both parties. Workshops involve a methodology where participants step back from their official positions and explore the underlying needs, interests, and deep-seated roots of the conflict (Jones, 2015).

While previous work has mostly focused on case study formats to explain the impact of Track Two on participants, recent technical advances and access to relevant data hold promise to describe the impact and change process in more detail. The study examines linguistic patterns of psychological change processes such as emotions and social cognitions from a crucial conflict timepoint, the 1999 setting before the start of the Second Intifada. This severe escalation involved suicide bombings and several thousand casualties including minors on both sides over almost a decade. Our study focuses on the analysis of *discourse process* and *outcomes* from Track Two interventions examining micro factors such as emotions and cognitions. Elaborating how this process impacts Israeli-Palestinian problem-solving, allows us to systematically investigate sequence details as indicated by language use. Quantitative measures that provide adequate psychometric properties – in our case natural language analysis – could enable inferences about immediate outcome effects, allowing the study of theoretical relationships and starting to develop scientific models (Fisher, 2007).

Case study formats have demonstrated that social psychology intergroup encounter principles are operational within Track Two. *We first hypothesize that cooperative interactions within dialogue will elicit empathy and trust while improving intergroup attitudes* (Malhotra & Liyanage, 2005; Ohanyan & Lewis, 2005), despite agonistic deliberations inherent to Track Two approaches (Ramsbotham, 2013), Hyp1. *We also hypothesized that factors such as increased knowledge and enhanced positive emotions have positive effects on pre-negotiation outcomes* (Pettigrew & Tropp, 2008), Hyp2. Reduction of negative outgroup attitudes, and particularly threat to the ingroup, are mediators that intergroup contact during unofficial dialogue alleviates (Pettigrew, 2011).

Following the conceptualizations above, several questions guided us during the inquiry:

- (a) How was the discourse process affected by people's emotional, cognitive, social, and attitudinal states, RQ1?
- (b) Were there any immediate process-related indications for longer-lasting effects, RQ2?
- (c) Which *topics* were frequently discussed, RQ3?
- (d) How do participants approach needs- as well as solution deliberations, which steps do participants propose (as indicated by content words), RQ4?

## Methods

### Dataset and Participants

The dataset we analyse in this study, a specific 1999 Track Two workshop, was selected because of its (1) prototypicality of workshop procedure and participants; (2) crucial conflict turning point, concretely the Palestinian disillusion with the Oslo process before the Second Intifada; (3) emotional diversity including strong tensions during the workshop. Taken together, these account for a diversity of individual and interactional process factors (Bercovitch, 2007). Participants include political and civil society leaders in a nonofficial function engaging in informal problem-solving, discussions, and pre-negotiations. The participants were high-ranking professionals, issue experts in various fields, and politically well connected.

Data represents 'Interactive Problem-Solving' work, capturing notes from participants, facilitators and third-party observers within the Israeli-Palestinian conflict carried out in May 1999 before the onset of the Second Intifada in 2000. Table 1 provides descriptive information about the corpus, workshop procedure, and data processing. Data analysis was based on detailed, mostly verbatim notes of the workshop discourse processes that were made by 'third-party observers' who documented the group sessions. The example selected for the current study contains approximately 47,350 words in total. The detailed material covers exceptionally well-documented workshop notes including third-party comments, and even at times descriptions of non- or para-verbal data of the participants. The note-takers changed every thirty minutes. Two separate protocols were created independently for each session. Both versions had to be unified afterward into one agreed account as the basis for this analysis, providing an indirect element of inter-observer reliability, supporting the accuracy of the measures.

### Data Processing and Analysis

Language analyses in general reflect the understanding that the words we use encode our attention, thoughts, emotions, and cognitions (Boyd & Schwartz, 2021). For the natural language processing analyses, we used the computerized text analysis program 'Linguistic Inquiry and Word Count' (LIWC 2022). LIWC is a transparent text analysis program that counts words in psychologically meaningful categories. LIWC has empirically demonstrated its ability to detect meaning in a wide variety of settings, including showing attentional focus, emotionality, social relationships, thinking styles, and individual differences (Tausczik & Pennebaker, 2010). LIWC checks each word of a document against an internal dictionary of more than 2,300 words and word stems. Words are assigned to specific linguistic categories, and the percentage of total words in each category is reported. For example, the word "*cried*" falls into four categories: sadness, negative emotion, overall



**Table 1**

Data corpus infrastructure 'Interactive Problem Solving' workshop 1999 and analysis methods.

**1) Participants**


- 4 Israelis (1910\* - 6900 w/sp)
- 4 Palestinians (1880 - 5730 w/sp)
- 3 Facilitators (915 - 6255 w/sp)
- Several 'Third Party' Observers (115 - 235 w/sp)

**2) Dialogue Steps & Data Structure**


Friday Evening	Saturday Morning	Saturday Afternoon	Sunday Morning	Sunday Afternoon
Intro, Situation Analysis	Major Needs, Fears, Concerns (I)	Major Needs, Fears, Concerns (P)	Visions & Solutions	Overcoming Constraints, Action, Feedback
(9670words/140convturns)	(7560w/220ct)	(10220w/240ct)	(10330w/160ct)	(9570w/190ct)

**3) Analysis - Methods**


**Closed Vocabulary NLP ('Linguistic Inquiry and WordCount' - LIWC )**



**Qualitative Thematic & Discourse Analysis**



**Open Vocabulary NLP (Meaning Extraction - LIWC/MEM, Topic Modeling via Latent Dirichlet Allocation - LDA)**



Note: 1) \*One Israeli participant is absent during Day#3 (wordcounts per speaker in brackets) 2) The infrastructure of IPS includes a pre-workshop for each group separately 1-2 weeks before, Saturday evening includes a dinner party with spouses both are not included in the analysis (wordcount/conversational turns per half day in brackets). 3) Visualization examples. Graphical representation of analysis output.

affect, and past tense verb. Our analysis focused on linguistic indicators such as emotional positivity, cognitive processing, social orientation, and psychological distancing (I/we-use). Findings concerning other linguistic variables are available in the online supplementary material.

In recent years, open-vocabulary methods from computer science, such as Latent Dirichlet Allocation (LDA) (Blei et al., 2003; Griffiths et al., 2007) have begun to augment social science language analyses. Rather than using theoretically derived dictionaries developed from psychology and sociology, these approaches are data-driven and bottom-up. For example, LDA identifies semantically related clusters of words based on co-occurrence across linguistic contexts. These model topics can then be used to better understand language patterns akin to data-driven "micro-dictionaries", and derive new hypotheses based on discursive patterns. Topics are often better suited than dictionaries for discovering patterns in "content words" – that is, among words that do not fall within the most frequently used categories of "function words" (such as pronouns and determiners, Eichstaedt et al. 2021).

**Language Variables**

Selection of the language variables follows the LIWC-22 setup, relying mostly on style words (Pennebaker, 2011). Complementing content words are utilized with topic modeling approaches (Berger & Packard, 2022; Eichstaedt et al., 2021).

**Pronouns.** Substantial information about self versus group versus other orientation can be learned from pronouns such as *I*, *we*, *you*, or *they*, especially in relation to each other or when considering changes in use over time (Pennebaker, 2011). LIWC summary variables such as analytic processes (Markowitz, 2023; Pennebaker et al., 2014), authenticity (Newman et al., 2003), and 'clout' as indicators for resolve and leadership language (Kacewicz et al., 2014) rely heavily on pronoun use.

**Emotional Tone.** The emotional-positivity index was calculated by the LIWC 2022 software as the difference between the LIWC scores for positive emotion words (e.g., *happy, good, hope*) and negative emotion words (e.g., *bad, hate, hurt, guilty*). Higher scores of emotional tone indicate greater overall positivity. *Positive* and *negative emotions* were also examined separately over time.

**Cognitive Processing.** The dictionary indicates how often participants used words such as *think, question, and because*. Psychologically, it reflects the extent to which participants were concerned with organizing and intellectually understanding the issues addressed in their discussions. This category also includes more specific linguistic subcategories for *insight, causation, certitude, or differentiation*.

**Social Orientation.** The social orientation dictionary includes prosociality words (such as *care, help, talk, share, or friends* and personal pronouns other than first-person singular) as well as conflict words such as *fight, killed, or attack*. Psychologically, it reflects how much participants referred to other people – in our case particularly the outgroup – positively or negatively. Motivational drives such as *affiliation* (e.g., *we, our, us, help*) or *power* (e.g., *own, order, allow, power*) are also included as subcategories.

**Content Words.** Term frequency (TF) is the most basic technique here, consisting of the raw sum of the occurrence of each word found in the text. The “meaning extraction method” (MEM) within LIWC-22 generates lists of frequently and typically used content words, omitting words such as “*the*” or “*a*” but also unusual words used by one distinct speaker only. As relying on mere frequencies might be misleading (Eichstaedt et al., 2021), these lists are often completed by measures such as the TF/IDF-ratio, dividing each word in a document (e.g., in one half day, or one set of speakers) by the frequency of occurrence in the *whole* corpus (e.g., across all days, or all speakers). It compensates that some words appear more frequently in general such as stop-words or function words and determiners (Christian et al., 2016; Fortuna & Nunes, 2018). Also, using “differential language analysis” (Schwartz et al., 2013), word frequencies can be correlated with external variables, such as specific workshop phases to differentiate word use in an earlier phase (needs/concerns analysis) versus word use in a later phase of the workshop (solution/ideas generating) (Eichstaedt et al., 2021).

**Topic Modeling.** Topic modeling is an alternative for fine-grained language analysis (Ramage et al., 2009; Vayansky & Kumar, 2020). They have similarities to factor- or principal component analysis in that they identify underlying clusters with semantic similarities, but they are adapted for the specifics of language variables including the fact that many words have multiple senses. Latent Dirichlet Allocation (LDA) is a probabilistic clustering approach for topic modeling that groups words into coherent clusters based on co-occurrence in similar contexts (Blei et al., 2003; Eichstaedt et al., 2021; Griffiths et al., 2007). Topics are similar to micro-dictionaries in the closed-vocabulary approach but generated from the data, rather than from theoretically derived categories. Topic models have been used for text exploration within psychotherapy settings (Atkins et al., 2012; Miner et al., 2022) and to understand human traits (Schwartz et al., 2013; Eichstaedt et al., 2021), but to the best of our knowledge not within intergroup mediation or problem solving dialogue.

### Statistical Analysis

As we have generally the same speakers throughout the workshop, statistical measures include paired-sample t-tests comparing Friday evening – the start of the workshop – to the last session on Sunday afternoon as well as mixed-factors repeated measures analyses of variance (ANOVAs), examining different trends in the variables over time. Finally, open vocabulary techniques such as term frequencies, TF/IDF (term use in a given section in relation to total word numbers in the document corpus), word correlations with specific workshop phases (needs/concerns analysis phase versus solutions/idea generating phase) and topic modeling (LDA) were applied.

## Results

Data from the study were analyzed in four steps, combining quantitative natural language processing with critical qualitative thematic- and discourse analysis. Following Kelman's link in the chain model, we first examined the nature of the participants' motivation, their – mostly cognitive – discourse engagement, affective/emotional changes, and indications for attitude changes along the timeline Friday Evening – Saturday Afternoon – Sunday Afternoon. The different time periods approximately correspond to different parts of the IPS methodology.

### Background and Motivation of the Participants

To obtain an idea of the nature of the participants and their motivation to engage in the discourse, we analyzed entries from the presentation round in the beginning. Of the four Israeli participants, two were journalists, one a researcher, and one the Director of an NGO. On the Palestinian side, there was a finance manager, a political economist, a journalist, and a university professor. Two (out of four) Israeli participants and one (out of four) Palestinian are women. Although originally strictly confidential, we know now some details about their backgrounds (Kelman et al., 2018). The participant sample seems relatively typical for the overall workshop participants.

In terms of motivation to participate, most mention a certain peace activist background, such as *"involved in peace and feminist activities, pleased to be here and learn and hear others' stories"* or *"I'm involved in Israeli-Palestinian women's dialogue."* On the other hand, some are just curious and want to promote their interest. *"I want to see to which extent Israel goes with the peace process... it's important to live in dignity and freedom"* or *"interested in debate with Israelis"* or *"great respect for Herbert Kelman, it is good to promote interest in peace."* Despite most having a certain association with intergroup peace activities, they are no mere leftist 'doves.' For example, they include former political prisoners in the Palestinian delegation or participants having Israeli military-intelligence backgrounds *"I'm a former IDF colonel, having worked as governor in the West Bank [in fact in one well-known conflict hotspot] ... I'm an Arabist, speak Arabic."* As the IPS concept requires, the participants are well-informed beyond the average citizen, motivated, and influential in their respective societies.

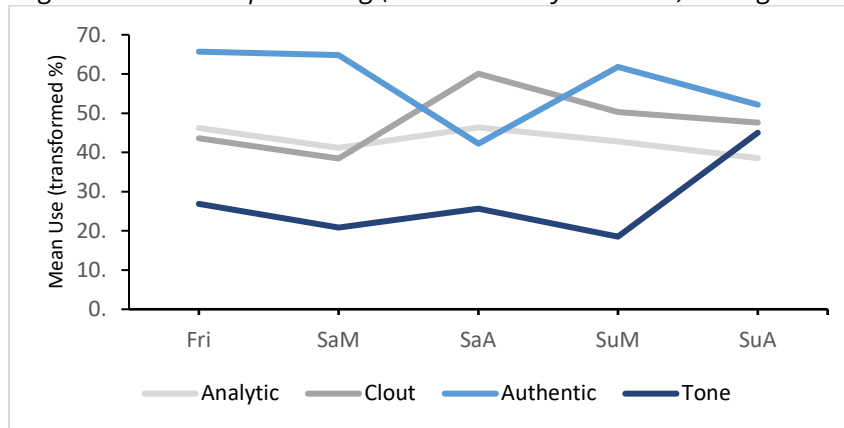
### Engagement in the Process

During the problem-solving discourse, the participants display cognitive engagement (words such as *think, because, but, if*;  $M = 40.03$ ,  $SD=6.29$  on a scale from 0-100), authenticity (an index score for perceived genuineness and vulnerability;  $M = 66.84$ ,  $SD=20.70$ ) as well as 'clout' (agentic resolve and leadership language;  $M=38.98$ ,  $SD=18.67$ ) in line with average writing samples (Boyd et al., 2022), for details see online supplementary material). Together, these indicate genuine active and authentic participation, in contrast to stalling or passively boycotting negotiation discourse. As can be seen in Figure 1, participants' increased expressions of clout on Saturday afternoon reflected greater control focus, while the authenticity index as an indicator for vulnerability dropped below baseline,  $F(2,28) = 4.78$ ,  $p = .016$ , indicating both factors developed differently between the time periods. Qualitative analysis of the data revealed that the participants had an enormous argument towards the end of the Saturday session over the Palestinian needs [Israeli participant *"I am mad... it is your own belligerence*

that brought you here..."], so discussion themes are difficult and agonistic. Nevertheless, emotional tone, increases significantly from Friday evening ( $M_{FriE}=18.52$ ,  $SD=14.53$ ) towards the end of the workshop ( $M_{SuA}=45.94$ ,  $SD=13.42$ ),  $t(6)=-4.26$ ,  $p = .005$  in a paired sample t-test. This indicates that indeed emotional factors associated with intergroup empathy and trust increase during conflict dialogue.

**Figure 1**

Cognitive-emotional processing (LIWC summary variables) throughout the workshop in %



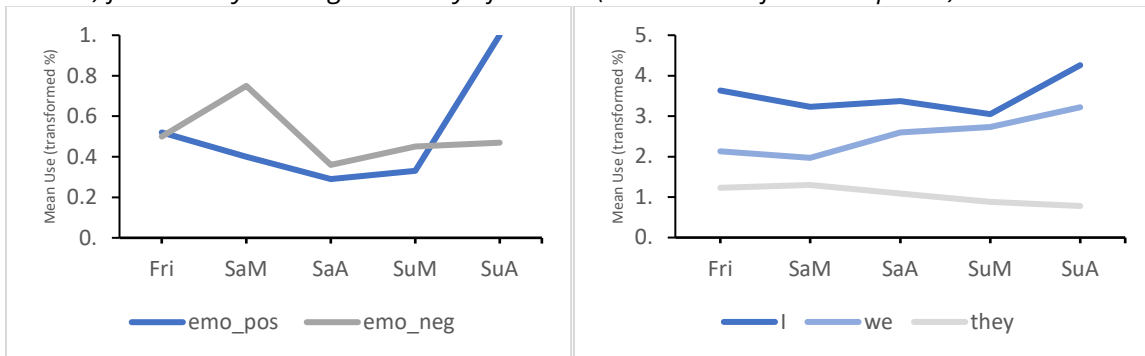
### Changes in Interaction over Time

To examine the relations between discourse and impact beyond emotional tone, we further examined positive/negative emotion language and the use of I/we-words. Overall, the discourse process heightened positive emotions among workshop participants in the end, which increased substantially from Friday evening ( $M_{FriE}=.25$ ,  $SD=.22$ ) to Sunday afternoon ( $M_{SuA}=1.08$ ,  $SD=.59$ ). Comparing Friday to Sunday, a paired sample t-test shows that positive emotions have significantly increased across time ( $t(6)=-3.32$ ,  $p = .016$ ) while there was no significant change of negative emotional word use (Figure 2). Comparing the emotions at both timepoints in a repeated measure ANOVA, there was a significant interaction between time and type of emotion,  $F(2,10) = 10.47$ ,  $p = .004$ , meaning both emotions developed in different magnitudes over time. The affective improvement of Sunday is noteworthy because we have included the whole afternoon working session, not only the feedback round when everyone is usually at their best and most polite behavior. Relying on nonverbal/paraverbal data, we have almost as many joking/teasing comments or laughter in the thirty-minute feedback round on Sunday (6) as in the whole workshop together (7).

Prior work has found that the longer people talk with others, the more they use we-words and the less they use I-words. In principle, the more time we spend with other people, the more our reference frame merges with theirs, and the more we are likely to see ourselves as part of a shared group (Pennebaker, 2011). These developments are indicated through a changed I/we-ratio over time. While this is the case for 'normal' interaction groups, for example in work contexts or relationships, it is mostly unclear if also evident in intergroup *conflict* settings, in which difficult, divisive, emotionally 'loaded' topics are discussed, as illustrated by the substantial disagreement described above. In Figure 2, we see indeed an increase in the use of the word 'we' from Friday evening ( $M_{FriE}=1.55$ ,  $SD=.64$ ) to Sunday afternoon ( $M_{SuA}=3.25$ ,  $SD=1.00$ ),  $t(6)=-5.35$ ,  $p=.002$ . There is no significant change in 'I' use and

**Figure 2**

Changes in interaction over time (positive versus negative emotions, development of I/we/they-use (LIWC dictionaries) from Friday evening to Sunday afternoon (start to end of workshop in %)



a significant decrease of 'they,'  $t(6)=2.69, p=.036$  (both measures use the LIWC-22 dictionary which contains not only *I* and *we* but also *my, mine, us, ours, them...*).

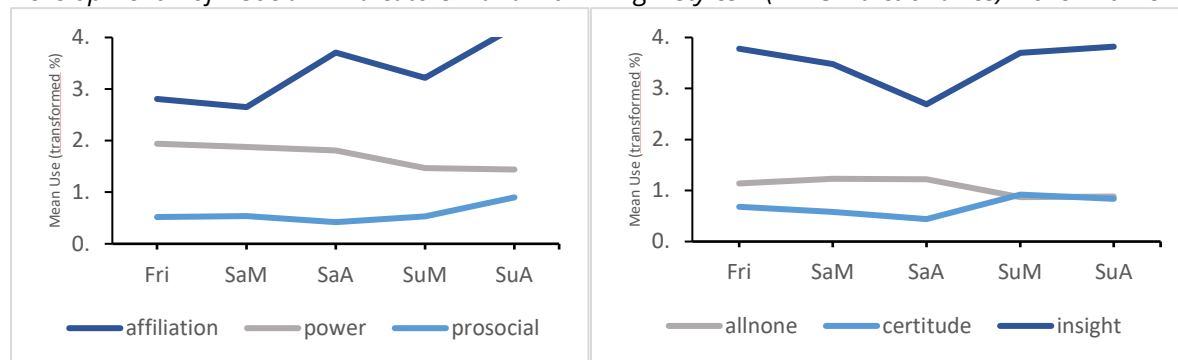
Taken together, our results confirm the initial indication above by showing that even in protracted intergroup conflict, discussing difficult topics in a constructive setting elicits positive emotions and an increasingly productive 'working-group' atmosphere. It seems a constructive atmosphere *while* facing difficult topics can still manifest in positive affective-emotional discourse. However, beyond the constructive situative atmosphere, is there evidence for potentially more durable changes, such as in attitudes?

**Attitude Changes – Social Orientation and Cognitive Styles**

Our dataset is limited to interactions and immediate outcomes. Can we still observe more 'durable' construct and attitude changes such as those described in the destructive conflict-supporting mindset (CSM) (Deutsch, 1994; Saguy & Reifem-Tagar, 2022)? Changes in interaction as indicated by function-words such as *I/we*, but also emotions may already suggest more durable effects, for example on negative outgroup beliefs and exclusionary attitudes. We additionally examined changes in personality trait-related social indicators such as prosociality and motivational drives such as needs for *achievement, power, and affiliation*. We further considered more detailed markers for cognitive style such as *all/none-thinking, insight, and certitude*.

**Figure 3**

Development of social indicators and thinking styles (LIWC dictionaries) over time in %



As displayed in Figure 3, the discourse increased motivational drives such as *affiliation* – indicated for example by *we, our, us* – while usage of *power* words such as *own, order, and allow* decreased. Compared to Friday evening ( $M_{FrE}=2.07, SD=.57$ ), affiliation word use almost doubles towards the end of the workshop on Sunday ( $M_{SuA}=4.07, SD=.97$ ), while ‘power’ indicating word use ( $M_{FrE}=2.32, SD=.47$ ) decreases ( $M_{SuA}=1.53, SD=.48$ ). Comparing Friday to Sunday, paired samples t-test shows that affiliation words have significantly increased across timepoints  $t(6)=-6.54, p = .001$ , while decreasing  $t(6)=3.31, p = .016$  for power words. Repeated measure ANOVA showed an interaction between affiliation and power over time,  $F(2,10) = -17.79, p = .001$ , confirming that both motivational drives developed in different slopes. Additionally, prosocial orientation patterns in people’s discussions – indicated by words such as *care, help, thank, please* – increased from Friday evening ( $M_{FrE}=.53, SD=.15$ ) to Sunday afternoon ( $M_{SuA}=.91, SD=.27$ ),  $t(6)=-2.94, p = .026$ . Combined, these indicators suggest that increasing affiliation reveals inclinations towards a common group identity.

The cognitive styles of the participants need to be examined in a differentiated way. No statistical changes were observed in more fine-grained measures of cognitive processing such as *all/none-thinking, insight, or certitude*, suggesting at first glance no changes in analytic processing throughout the discourse process. By the end of the study, group members’ cognitive processing was more or less at the same level, but trends show an interesting pattern. Repeated measure ANOVA showed an interaction between time and cognitive processes, all/none-thinking and insight at  $F(2,10) = 9.87, p = .004$ , meaning the cognitive processing styles developed in different slopes over time. Concretely, while all/none thinking declines from Friday to Sunday (although non-significantly), there is a sharper drop of insight in the middle of the workshop and then an increase again towards the end (same with certitude), indicating deconstruction and reconstruction of cognitive patterns.

**Qualitative Considerations.** The quantitative outcomes in terms of impact on participants are as well underlined by qualitative data, mainly positive outcome feedback, and long-term cognitive learning. Participants describe new learning and increased knowledge outcomes such as *“this has been a very, very important learning experience... about the Palestinian experience”* or *“altogether I learned more about the other side than I had expected.”* Some of it came unexpected, for example, described as *“there were certainly surprises. Sometimes the complexity [of issues] was surprising.”* Notably, the learning has not been merely cognitive but includes affective relational aspects (*“There was a tremendous difference in the spirit but in some way, it is good news because it is good to know... There are a lot of difficulties I didn’t expect... I do think we all share the feeling that it should be continued... Before, I thought we could do [this] without dialogues, but I see the necessity now.”*) The improved relations are described in affective understanding such as *“I am not as disturbed as IA or IB... have expressed in the past day. I am encouraged... Thousands of victims and history and a lot of blood. I am encouraged. We can’t expect to solve it with no fights.”* To conclude this section with comments from both sides exemplifying the positive intergroup generalizations *“that we both survived this weekend, proves we’re strong nations”* as feedback from an Israeli participant. From the Palestinian side *“it’s still a long way to go, but if we can perpetuate respect on both sides, we will go a long way... I doubted that it would be helpful, but it was helpful because it gave me a chance to listen.”*

To summarize, participants undergo substantial change in terms of mutual understanding, emotions, and social cognition even about agonistic conflict topics. Creating – to myself and others – a different conflict story through learning and intergroup encounters indeed seems to initiate conflict-related attitude transformations.

How does this process help them to approach the second outcome of Track Two dialogue, i.e., how do *improved relations* and *mutual understanding* help with formulating ideas to be transferred into each society or the official policymaking processes? Beyond analysis through predetermined

dictionaries capturing mostly *style* differences, we next use open-vocabulary techniques to examine changes in the *content* of discourse.

**Topic Modeling – Understanding Needs and Developing Solutions**

After the initial session on Friday evening, the participants engage in listing non-negotiable needs, as well as ultimate fears and concerns on the next day. This can be a delicate process, as we have seen in the example of the fierce argument displayed in Figure 1 (Saturday afternoon). Here, the Palestinian participants basically ‘overplayed their hand’ regarding their ultimate needs, adding more and more, and thus increasing the pressure on the Israeli participants. Nevertheless, participants engaged again Sunday morning in joint thinking trying to find creative solutions. Table 2 displays the main content word frequencies – general and distinct word usage per workshop phase utilizing two different techniques.

**Table 2**  
 15 most likely words Saturday (needs/concerns) versus Sunday (solutions/ideas)

	Saturday: Needs/Concerns - Phase				Sunday: Solutions/Ideas - Phase						
	TF	TF/IDF	Word	Correlations	TF	TF/IDF	Word	Correlations			
Palestinians	128	?	.006	killed	-1.10	Palestinians	86	I	.017	practical	3.77
state	105	not	.006	fears	-0.54	state	76	we	.013	interested	3.54
palestinian	96	need	.004	lack	-0.52	people	72	are	.007	basis	3.47
Israel	80	Palestinians	.004	separation	-0.51	palestinian	71	have	.006	resolution	3.39
needs	69	they	.004	independence	-0.50	right	64	be	.005	spent	3.25
Israelis	64	want	.003	concerns	-0.49	side	61	on	.005	please	3.15
people	61	from	.003	society	-0.49	issue	53	this	.005	viable	2.96
right	52	Palestinian	.003	long-term	-0.47	Israel	51	think	.004	disagreement	2.95
Israeli	51	state	.003	cooperation	-0.45	said	48	about	.004	starting	2.77
peace	47	needs	.002	need	-0.44	things	47	can	.004	while	2.76
side	43	Israel	.002	million	-0.43	Israelis	47	do	.003	principle	2.51
land	42	up	.002	needs	-0.43	Israeli	47	very	.002	disagree	2.45
return	42	Jewish	.001	heard	-0.42	important	46	more	.002	rest	2.40
Jewish	41	victim	.001	under	-0.40	talk	45	has	.001	forward	2.35
Jerusalem	40	land	.001	greater	-0.40	agree	42	agree	.001	find	2.12

Note. TF shows Term Frequency. TF/IDF shows relative use in time period (Term Frequency) divided by total use across the workshop (Inverse Document Frequency). Word correlations obtained through correlation of the word frequency with a dummy variable for time period. As associated with Sunday, the ‘not Sunday’ associations show up as negative.

Looking at both term frequency columns, it is striking how much the Palestinian focus seems at the forefront. Although not contextualized by differences in word counts between both phases, the most frequent words in both phases are mostly “Palestinian.” Apparent Israeli words appear only at TF#4 (concerns phase) and TF#8 (solutions phase) in terms of total frequencies, a markedly Israeli need (“*security*”) comes up only at TF#19 on Saturday while a mostly Palestinian concern (“*state*”) features prominently on the second rank on *both* days. The low-power group apparently manages to steer discourse toward their own topics. It is also interesting that “*state*” is used twice as frequently as “*land*” – while land is more ‘binary’ as well as strongly national-religiously (“*Holy Land*”) loaded in this particular intractable conflict context, state seems more neutral and can have different characteristics





be paraphrased with “we look forward (both) sides make change, willing (to) share work (for) better future.” The second topic expresses the readiness to engage in further dialogue (“making another third-party workshop”) arguably referring to the positive “experience (of the) past three” days. While not surprising, the results are still remarkable given the broader climate defined by mutual “fears” and “disagreement” in never-ending cycles of confrontation. Of note, language about deeply divisive concerns such as “establishing responsibility” for past wrongdoings emerges while the participants refrain from using language about – arguably simplistic – territorial solutions, indicating that they avoid strategies that might not be sustainable in the light of these deep concerns. Instead, they opt for more process-oriented discursive peace/conflict approaches in consideration of past events.

Summarizing the open-vocabulary results, the needs/concerns phase is overall defined by the ‘meta-concern’ of taking responsibility for past wrongdoings as well as an inquisitive mindset indicated by the high number of questions. This phase seems to be influenced by mostly Palestinian – the disadvantaged group’s – discourse and is marked by agonistic elements, for example over the Palestinian needs. The idea/solutions phase on the other hand is marked by agentic positive mostly process-oriented ‘can-do’ language, indicating a forward-looking openness for change.

**Qualitative Considerations.** These quantitative linguistic open-vocabulary considerations can be enhanced by examining the final feedback session of the IPS using qualitative methods. Table 4 shows ideas for the process-oriented approach mentioned above alongside two broader themes – overcoming constraints and developing solutions.

**Table 4**

*Better understanding of overcoming constraints and developing creative solutions*

<b>Theme</b>	<b>Example Quotes</b>
<b>Overcoming Constraints</b>	<p><i>“There is a lot we can achieve but it will be much more difficult than we thought [...] I do think we all share the feeling that [this process] should be continued [...] Before I thought we could do without dialogues, but I see the necessity now.” [Israeli participant]</i></p> <p><i>“We can’t go for quick solutions. We should work on this more – more education, interaction. I think we need more dialogue.” [Palestinian participant]</i></p>
<b>Specific Solution Suggestion</b>	<p><i>“With regards to the question of Jerusalem, both sides should find some creative solution, some functional ‘sharing rule’ that would symbolically give each side something in the spiritual sense of what Jerusalem means. [...] This is more important than a geographical one.” [Israeli participant]</i></p> <p><i>“The beauty of this question is the fragility of the question [...] We need gestures of respect between leaders to be genuine, not condescending. Even before we remove the checkpoints, even before, we need to treat people with deference and respect [...] An atmosphere of good will and an atmosphere of equality, we should do things that make people empowered.” [Israeli participant]</i></p>

Commenting on the needs phase, it is important to underline that needs are ‘mutual’ – both parties have responsibilities and are dependent on each other’s ‘honest consideration.’ One Palestinian ‘disadvantaged-group’ participant expressed it “Something else that comes out in this seminar... the mighty Israelis, this nuclear power... still needs reassurance of Palestinians.” It is clearly

expressed by the participants that overcoming the given constraints is more complicated than anticipated – even by informed and resourceful people such as the participants – but dialogue such as the IPS is considered essential in the process. Regarding possible solutions, the importance of symbolism and “*gestures of [mutual] respect*” is underlined. Notably, the solutions include personal commitment, and participants expressing action tendencies such as “*We should work on this. We also have to work on creating awareness... On a personal level, I can start with... making workshops to talk about...*” Importantly, the solution- and action-finding process is a *joint* dialogue, with participants developing ideas further *between* groups, such as starting for example with **Israeli**: “*There are several right-wing internet websites that quote negative statements from Palestinian media that in turn makes the Israelis outrageous... There is no counterbalance to this propaganda on both sides...*” **Palestinian**: “*I think we should carry this idea to our leaders and communities.*”

## Discussion

Protracted intergroup conflict is devastating, and useful approaches to transform conflict need strengthening wherever possible. This study explores how the outcome of Track Two discourse, which provides an effective basis for individual conflict transformation, is shaped. Specifically, we examined linguistic interaction indicators, such as positive emotions and social cognition. Results confirm our initial hypotheses. Our study shows *how* IPS positively affects participants’ emotions and conflict-related attitudes, facilitates solution generation, and shows *which* discursive content topics are associated with these changes. We found that the usefulness of assessing Track Two dialogue is not only revealed in essential discourse topics (concerns and solutions) but in helpful *processes*, underlining the importance of engaging in interactions to increase mutual understanding.

As positively impacted participants will more likely and substantially engage in transfer activities compared to unaffected ones, we suggest that understanding and strengthening pre-negotiation *outcomes* through linguistic process analysis might be the most influenceable step in strengthening *transfer*. The documented changes over time support the nature of changes in the affective climate and interpersonal relations that are expected in successful IPS dialogue and are thus significant in supporting the IPS model. The more positive emotions at the end of the workshop are also indicative of the typical flow of theories and research relating to group development (Fisher, 1994; Kelman, 2008; Rouhana, 1995). Group dynamics might arguably be the crucial mechanism for IPS and similar third-party approaches. Changes in cognitive style over time and the *combination* of affective- as well as cognitive indicators with prosocial attitudes (increase of affiliation, decrease in power) might indeed capture the kinds of changes that are expected to occur in problem-solving dialogue, such as more receptivity to relational strategic thinking (Ramsbotham & Schiff, 2018; Rouhana, 1995; Slocum-Bradley, 2013). Finally, our study points to the value of combining qualitative methods with natural language processing, specifically including closed- *and* open-vocabulary approaches.

### Theoretical and Applied Contributions

In July 2000, about a year after this workshop, the Middle East Peace Summit at Camp David between United States President Bill Clinton, Israeli Prime Minister Ehud Barak, and Palestinian Authority Chairman Yasser Arafat failed, with both sides blaming each other. In September of the same year, the Second Intifada started. While exact proceedings are discussed elsewhere (Hanieh, 2001; Pressman, 2003), apparently there were four principal obstacles to an agreement – territory, Jerusalem and the Temple Mount, Palestinian refugees’ right of return, and Israeli security concerns.

All of these were already debated during the analysed workshop from a *process perspective*. Discussions included enhancing trust through gestures of mutual respect and empowerment, focusing on function and symbolism instead of specific concerns such as territorial matters.

The present study offers a glance at the broad theoretical and empirical potential that emerges from assessing conflict dialogue with open- and closed vocabulary natural language processing, integrating quantified linguistic patterns and qualitative discourse analysis. We offer insights about the important connection between substantive *content* and the *process* of how to achieve this content, a characteristic feature also known from retribution literature, where inclusion in the process can be as important as negotiated compensation (De Greiff, 2006; Moffett, 2017). The same theme emerges in discussions about the importance of ‘voice’ in conflict resolution (Cleven & Saul, 2021; d’Estree, 2006) and the focus on procedural rather than substantive advice in interpersonal mediation (Garcia, 2020). This study sheds light on how deep-seated agonistic issues – such as past wrongdoings – can be dealt with constructively through iterative dialogue that builds trust and facilitates clashes constructively. Notably, the topics most associated with the needs and solution phases, resemble the ‘problem actuation’ and ‘resource activation’ factors known from psychotherapy research (Gassmann & Grawe, 2006; Grawe, 1995) – arguably because of similar focus points over time and process.

As conceptualized, Track Two pre-negotiation generated essential concerns and creative solutions, including process-related ones. Our research provides a detailed qualitative and quantitative account of *how* this was achieved. This research advances the study of intergroup conflict discourse particularly under process considerations. It provides a framework of analysis for the nuanced connection between discourse processes and outcomes, and their association with the transformation of conflict-supporting attitudes (Bell & Song, 2005; Fisher, 2007) using natural language processing (Lin et al., 2016; Tauszik & Pennebaker, 2010). This has been rarely attempted in intergroup conflict dialogue, where the main focus was on transfer, bringing the outcome into each society (Çuhadar & Dayton, 2012; d’Estrée & Fox, 2020; Palmiano Federer, 2021). The study enhances insights into the association of emotional-cognitive processes and outcomes in the mediation- and (pre)negotiation literature (Adam & Brett, 2018; Van Kleef et al., 2008; Van Kleef & Coté, 2018). Up to now, examination of the relations between process and impact in Track Two diplomacy has received limited attention to detailed psycholinguistics perspectives, particularly using natural language processing.

### Limitations and Future Directions

The present research demonstrated how ‘Interactive Problem Solving’ supports conflict transformation through changing conflict-related emotions and cognitive attitudes as well as by foregrounding the topics facilitating these changes. While this study provides methodological insights into the interrelations between dialogue process and outcome using natural language processing in Track Two diplomacy, it is limited in a few respects. For example, regarding the closed-vocabulary approaches, the same pronouns may drive patterns in different categories, e.g., “good” is associated with *positive tone* and *positive emotions*, but also with the summary variable *emotional tone* (Hartmann et al., 2019, see also the supplementary information of Eichstaedt et al., 2021 for details). We have addressed this limitation by corroborating our LIWC results using transparent, topic, and word frequency analyses.

The specific historical contextual nature of the study is a further limitation. Future studies should examine these same relationships between discourse processes and outcomes in a variety of conflict contexts from different periods. In addition, analysis of further workshops should

systematically compare outcome quality, for example, using a ranking or other quantification of workshop results as it has been done in dialogue settings such as systems therapy (Atkins et al., 2012). This would enable examining the link between discourse and outcomes more consistently. Empirically establishing which discourse themes are most effective could facilitate uncovering 'common impact factors,' as has been done for example in psychotherapy process research (Atkins et al., 2012; Grawe, 1995; Miner et al., 2023). Particularly, examining how group formation plays out in successful IPS as one essential mechanism and how effective third-party facilitation is required to bring this about might offer further promising research streams. Finally, to establish impact more clearly, it would be desirable to include data on actual transfer behaviour (Kelman, 2008; Jones, 2015), although other areas of research routinely focus on action *tendencies*, for example in the collective action literature (Becker & Tausch, 2017; Van Zomeren et al., 2008).

### Conclusion

This study can support conflict scholars and practitioners by shedding light on the discourse processes that impact emotions and social cognition for the promotion of conflict transformation, reduce the activation of conflict-enhancing attitudes, and facilitate the development of solutions. We hope insights from this study will help guide the efforts of those who engage in the difficult task of striving to transform intergroup conflict and help to establish sustainable peace in places where it is genuinely needed.

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# Can Confidence Influence Persuasiveness in Disagreements by Conveying Competence versus Dominance? The Moderating Role of Competitiveness

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## Keywords

Confidence, Competence, Competitiveness, Dominance, Persuasiveness

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[doi.org/10.34891/y2w2-qy05](https://doi.org/10.34891/y2w2-qy05)

## Abstract

Research has demonstrated that confident individuals gain social influence because their confidence signals competence rather than dominance in settings in which they do not experience a disagreement with others. We extend this research by exploring felt competitiveness, as reflected by perceptions of goal opposition between perceivers and others. In settings where people experience a disagreement, we explore the impact of felt competitiveness on the association between expressed confidence and social perceptions of the expresser's competence and dominance, and how these shape persuasiveness. We conducted a field study examining dyadic interactions between coworkers (Study 1) and two experiments manipulating competitiveness and confidence (Studies 2-3). Results showed that high competitiveness neutralizes the positive association between expressed confidence and perceived competence, thus eliminating the positive indirect effect of expressed confidence on persuasiveness. Results also demonstrated a stronger positive association between expressed confidence and perceived dominance when competitiveness is higher. However, perceived dominance did not consistently predict persuasiveness, suggesting that the dominance results should be interpreted with caution. Overall, our findings offer novel implications regarding how the social influence processes of confidence expressions are shaped by felt competitiveness.

## Data Availability Statement

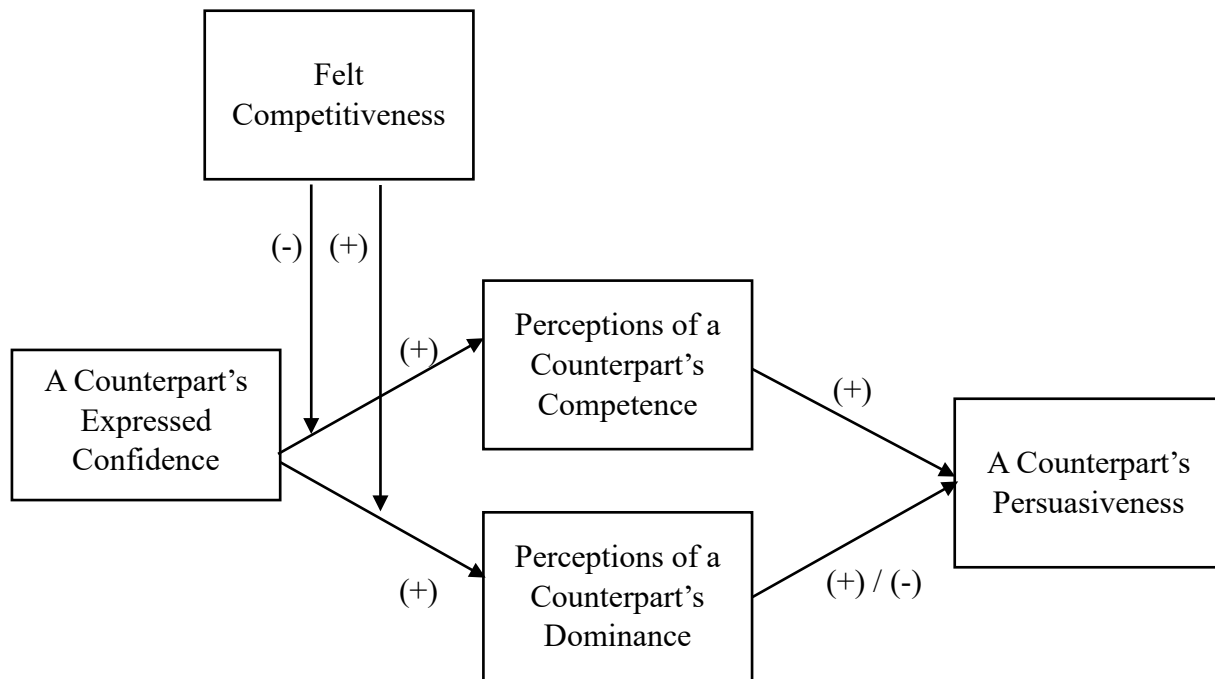
All data are at [https://osf.io/qmtw8/?view\\_only=d6ab6c5722d048d1b7774c14be3cebad](https://osf.io/qmtw8/?view_only=d6ab6c5722d048d1b7774c14be3cebad). Pre-registrations can be found at [https://aspredicted.org/blind.php?x=GFE\\_EKW](https://aspredicted.org/blind.php?x=GFE_EKW) (Study 2) and <https://aspredicted.org/blind.php?x=2mw5eg> (Study 3). Study 1 was not pre-registered.

## Introduction

Expressed confidence, or the extent to which people display *certainty* regarding their favorable attitudes toward their ideas regarding task issues (Owens, 1993), creates different social perceptions that may persuade perceivers to make specific decisions. Prior research has shown that expressed confidence can signal task-relevant competence (Anderson et al., 2012) and create an impression of dominance (Kimble & Seidel, 1991). Research has also examined whether a speaker's expressed confidence persuades participants to make a specific choice by conveying the speaker's competence and dominance (Van Zant & Berger, 2020). Specifically, Van Zant and Berger (2020) found that expressed confidence increased persuasiveness via perceptions of competence rather than dominance. Importantly, these authors explore expressed confidence and perceptions of competence and dominance in a context in which individuals did not form preferences or disagree with the expresser's proposal before making choices. In contrast, when people have conflict with one another, they tend to affirm their distinct opinions and question others' competence (Langfred, 2007). Thus, when people experience disagreements in which they have already formed opinions, individuals may view others' expressed confidence as a tool to dominate others rather than as a cue of competence.

To examine social perceptions of confidence in conflict situations, we investigate the contingent links between a counterpart's expressed confidence and perceptions of the counterpart's competence and dominance during disagreements regarding task-relevant issues. By "counterpart" we refer to a coworker or a co-decider for a task. Specifically, we explore the moderating effects of felt competitiveness on the relationships between expressed confidence and perceptions of competence and dominance during a task disagreement. Felt competitiveness describes situations in which perceivers experience that their goals are in opposition to a counterpart's goals; they are more likely to succeed when the counterpart fails (Tjosvold et al., 2022). Tjosvold and colleagues (2022) also distinguish competitiveness from conflict (e.g., task-relevant or interpersonal disagreement); these authors regard competitiveness as a separate factor that influences interactions in conflict situations. Thus, we consider felt competitiveness as a moderator that differs from our study context of task-relevant disagreement.

Moreover, we expect that higher competitiveness will lead perceivers to view expressed confidence both as a signal of less competence and as a signal of more dominance because people tend to discount a perceived competitor's knowledge (Menon & Blount, 2003) and focus on actions conveying self-interest motives in a competitive climate (Tjosvold et al., 2022). Therefore, we examine the indirect interaction effects of confidence expressions and felt competitiveness on persuasiveness via perceived competence and dominance. Persuasiveness indicates the extent to which a counterpart influences the perceivers who initially have dissenting opinions with the counterpart (Chang et al., 2018). Overall, our investigation provides theoretical and practical implications for how people can display confidence to convey social perceptions and optimize their persuasiveness. Figure 1 presents the model tested across studies.

**Figure 1.** Conceptual Model

Note: We use the sign “(-)” or “(+)” to indicate the weakening or strengthening effect of felt competitiveness. Specifically, it weakens the positive association between a counterpart’s confidence expression and perceived counterpart competence. Moreover, it strengthens the positive association between a counterpart’s confidence expression and perceived counterpart dominance.

Our work contributes to research on confidence and its social influence processes in two aspects. First, we examine whether a counterpart’s confidence expression signals competence and dominance and thus shapes persuasiveness in a novel context (i.e., during task-relevant disagreements). Existing research has investigated the interpersonal impacts of confidence only in a “non-disagreement” context (e.g., Anderson et al., 2012; Kennedy et al., 2013), whereas our studies add contextual nuance to the interpersonal effects of confidence. Our investigation also differs from most existing work that has examined the benefits of improving self-confidence in a conflict context without investigating perceptions of another’s confidence (e.g., Brown & Baer, 2011; Martin & Phillips, 2017). Second, we explore the moderating effects of felt competitiveness on the relationships between expressed confidence and interpersonal perceptions of expressers. In non-disagreement contexts, research has commonly shown the positive effects of expressed confidence on perceived competence and interpersonal influence (e.g., Anderson et al., 2012; Kennedy et al., 2013), and has found inconsistent links between expressed confidence and perceived dominance, including significant positive relationships (Kimble & Seidel, 1991) and non-significant relationships (Van Zant & Berger, 2020). However, we propose different conditional relationships between expressed confidence and perception outcomes during disagreements, depending on the level of felt competitiveness. That is, we anticipate a weaker relationship between expressed confidence and perceived competence and a stronger link between expressed confidence and perceived dominance when felt competitiveness is higher. In turn, we expect these relationships to affect persuasiveness.

### **Effects of Expressed Confidence on Perceived Competence and Dominance**

Expressed confidence may create perceptions of both competence and dominance. Expressed confidence often signals relevant expertise (Van Zant & Berger, 2020), thus enhancing competence perceptions, or evaluations of productiveness and effectiveness at work or with a task (Tsai et al., 2020). Empirical evidence also supports positive associations between confident claims and competence perceptions. That is, individuals who express more confidence in their ideas are rated as more competent by others (Anderson et al., 2012). Relatedly, when advisors display more confidence in their recommendations, they receive higher competence ratings from others (Sniezek & Van Swol, 2001).

In contrast, expressed confidence may also foster dominance perceptions because confident individuals focus on their interests and undermine others' suggestions, such as discounting others' advice (See et al., 2011) and preventing others from participating in a task (Locke & Anderson, 2015). Dominance perceptions describe assessments of a person's assertiveness and forcefulness over others (Anderson & Kilduff, 2009). These perceptions differ from confidence because dominance perceptions involve overall assessments of a trait and do not contain task-related cues, whereas expressing confidence indicates task-relevant information (Locke & Anderson, 2015). Prior work does suggest connections between confidence and dominance: more confident people who speak with greater intensity are perceived as conveying higher levels of assertiveness (Kimble & Seidel, 1991), and speakers who read arguments involving confident phrases (e.g., "obviously") aloud are rated as more dominant than those who read the same arguments with doubtful phrases (e.g., "I don't know"; Scherer et al., 1973). Further, individuals who receive confidence training are perceived as more dominant than those without training (Li et al., 2020). However, other work has demonstrated a non-significant association between perceptions of a speaker's confidence and dominance (Van Zant & Berger, 2020). Some researchers also argue that confidence does not necessarily convey a desire to control others and thus is differentiated from dominance (Locke & Anderson, 2015). Therefore, based on prior research, expressed confidence effectively signals competence and inconsistently conveys dominance in non-disagreement contexts.

### **Competitiveness Weakens the Effect of Expressed Confidence on Perceived Competence**

We propose that felt competitiveness weakens the positive association between confidence expressions and perceived competence. As discussed previously, expressed confidence enhances perceived competence because this expression signals task-relevant knowledge (Van Zant & Berger, 2020). However, according to the relational model of knowledge valuation (Menon & Blount, 2003), a confident competitor's knowledge may be underestimated. This model predicts that perceivers will discount an internal group member's knowledge (e.g., a work colleague's expertise) because they fear a loss of their status if the member's ideas are used instead of their own (Menon & Pfeffer, 2003). When the perceivers' proposals are less valuable than the member's proposals, perceivers experience negative feelings that motivate them to defend their ideas (Menon & Blount, 2003). Research has also shown that people feel reluctant to use a rival colleague's knowledge due to concerns about poor self-image, such as having a lack of originality and independence (Menon et al., 2006). Thus, we expect that a counterpart's expressed confidence will less effectively convey competence under high competitiveness because perceivers may discount the confident counterpart's knowledge.

*H1.: The positive relationship between a counterpart's expressed confidence and perceptions of the counterpart's competence during a disagreement will be moderated by felt competitiveness, such that the positive relationship will be weaker when competitiveness is higher.*

### **Competitiveness Enhances the Effect of Expressed Confidence on Perceived Dominance**

We propose that felt competitiveness strengthens the positive association between expressed confidence and perceived dominance. As noted above, expressed confidence can convey dominance because confident people may be seen as focusing on their own interests rather than others' (See et al., 2011). Such self-interest is more salient for perceivers under higher competitiveness and thus encourages the pursuit of personal gain at the expense of others (Tjosvold et al., 2004). For example, competitiveness has been shown to motivate people to impede others' objectives, such as through disseminating deceptive information and creating hindrances to others' work, because individuals anticipate that these actions will increase the likelihood of achieving their individual goals (Tjosvold et al., 2022). Individuals also continually compare their achievements with others' accomplishments to maintain their positive standing in a competitive climate (Mohd. Shamsudin et al., 2023). Consequently, perceivers are likely to view a confident individual as more self-interested when competitiveness is higher, thus enhancing the association between expressed confidence and perceived dominance.

*H2.: The positive relationship between a counterpart's expressed confidence and perceptions of the counterpart's dominance during a disagreement will be moderated by felt competitiveness, such that the positive relationship will be stronger when competitiveness is higher.*

### **The Positive Association between Competence and Persuasiveness**

Our model further proposes a positive association between perceptions of a counterpart's competence and the counterpart's persuasiveness because perceptions of competence reflect assumptions about the expresser's likely beneficial contributions to the task (Berger et al., 1980). Moreover, when individuals are perceived as more competent, they are more likely to influence others, as perceivers recognize this competence can help the whole group succeed (Berger et al., 1972). Supporting the positive link between perceived competence and influence, research has shown that perceptions of others' competence are positively related to perceivers' acceptance of the others' dissenting opinions (Dooley & Fryxell, 1999), advice-taking (Sniezek & Van Swol, 2001), and perceivers' willingness to follow a partner's leadership (Ho et al., 2012). Therefore, perceived competence should positively predict persuasiveness. Taken together, we propose:

*H3.: A counterpart's expressed confidence has a weaker positive indirect effect on the counterpart's persuasiveness via perceptions of the counterpart's competence during a disagreement when felt competitiveness is higher.*

### **The Positive or Negative Association between Dominance and Persuasiveness**

Finally, our model posits that perceptions of a counterpart's dominance may be positively or negatively associated with the counterpart's persuasiveness during disagreements. A positive association may be due to a sense of urgency or pressure created by dominance (Van Zant & Berger, 2020), which can compel perceivers to give in to the dominant person. To this point, research has demonstrated that dominance prompts concessions from a more submissive party (Cheng et al., 2013). Relatedly, people with higher levels of trait dominance have been shown to influence others in various joint tasks, such as performing mechanical assignments (Smith & Foti, 1998) and distributing

resources to workers in a hypothetical organization (Anderson & Berdahl, 2002). However, perceived dominance may reduce persuasiveness because dominance elicits negative reactions (Driskell et al., 1993). Supporting this reasoning, research has demonstrated that when people exhibit more dominance, they are less likely to achieve agreements (Brett et al., 2007) and more likely to create interpersonal conflicts (Strayer & Strayer, 1976). Thus, perceived dominance may positively or negatively predict persuasiveness. Jointly, we examine the mediating effects of perceived dominance based on the two competing hypotheses:

**H4a.:** *A counterpart's expressed confidence has a stronger positive indirect effect on the counterpart's persuasiveness via perceptions of the counterpart's dominance during a disagreement when felt competitiveness is higher.*

**H4b.:** *A counterpart's expressed confidence has a stronger negative indirect effect on the counterpart's persuasiveness via perceptions of the person's dominance during a disagreement when felt competitiveness is higher.*

## Overview of the Studies

To test our hypotheses, we conducted three studies that captured interpersonal processes between coworkers (Study 1) and with a preprogrammed counterpart (Studies 2 and 3; experiments) in disagreement situations. The experiments were designed to replicate and extend Study 1 by including a behavioral measure of persuasiveness rather than relying on self-report, and by manipulating confidence expression and felt competitiveness. Studies 2 and 3 also tested the generalizability of the findings in a student sample (Study 2) and in a sample of adults from the general population (Study 3). Additionally, our studies build on one another by examining the cross-cultural generalizability of the findings across Asian (Taiwan in Study 1) and North American (Canada in Study 2, the US in Study 3) samples. Finally, given that social influence has been shown to decrease with age (e.g., Knoll et al., 2015), we also targeted samples that differed in age (mid-to-late 30s for Studies 1 and 3, early 20s for Study 2) to examine the robustness of our results.

To promote transparency and openness, all study materials, data, information on key analysis syntax, codes, and software used, and additional supplemental analyses are available at [https://osf.io/qmtw8/?view\\_only=d6ab6c5722d048d1b7774c14be3cebad](https://osf.io/qmtw8/?view_only=d6ab6c5722d048d1b7774c14be3cebad). Pre-registrations for Studies 2 and 3 can be found at [https://aspredicted.org/blind.php?x=GFE\\_EKW](https://aspredicted.org/blind.php?x=GFE_EKW) (Study 2) and <https://aspredicted.org/blind.php?x=2mw5eg> (Study 3). Study 1 was not pre-registered. Sample sizes were determined by the maximum number of available participants in the organization (Study 1) and the rate of voluntary signups in the university study pool (Study 2). The Study 3 sample size was predetermined based on available resources. All analyses were conducted only after study completion.

## Study 1: Three-wave Field Surveys with Coworker Dyads

### Study Setting, Participants, Procedures, and Design

The top executive in a biotechnology business group in Taiwan (incorporated in 1945) accepted our request to collect data from employees in two of the pharmaceutical firms within the business group. Employees responded to the survey questions based on their observations regarding their interactions with their assigned coworker. Managers provided a list of 125 coworker dyads in which the two employees make joint decisions. Managers were asked to create these dyads manually based on appropriate pairings given what they knew about the work roles and decision processes. To

avoid unintentional demand effects, participants were told a coworker's name was randomly assigned to them. They were informed to answer the survey questions regarding one specific coworker (participants saw the same name for each wave). Please see the supplemental materials for the list of survey questions. Participants were assured that all responses were confidential and neither managers nor any coworkers would have access to their responses. Study administrators scheduled multiple company visits to complete data collection. All employees agreed to complete the three-wave survey (25.60% male, 69.60% female, 4.8% other<sup>1</sup>: those who did not identify within the gender binary or preferred not to disclose gender information;  $M_{age} = 38.46$  years,  $SD_{age} = 10.12$  years;  $M_{time\ worked\ with\ coworkers} = 3.40$  years,  $SD_{time\ worked\ with\ coworkers} = 4.07$  years;  $M_{tenure} = 7.42$  years,  $SD_{tenure} = 8.45$  years).

We used two weeks as the interval between survey waves because an interval of at least two weeks effectively reduces inflated relationships between constructs (Johnson et al., 2011). Paper surveys were administered in meeting rooms of the pharmaceutical firms with sufficient distance between participants so they could not read others' responses. To facilitate compiling responses across waves and mitigate potential social desirability concerns, each participant used a unique pseudonym. Study administrators also informed participants that responses would be reviewed only by the research team and any personally identifying information would be removed after the data were compiled. The survey items were presented using the official language in Taiwan (i.e., Mandarin Chinese). We followed Brislin's (1986) protocol for translating survey instruments. We first developed and/or selected scales in English from existing research. Next, following the procedure used in prior work (Farmer et al., 2003), one bilingual author engaged in translation and another performed back-translation for all survey instructions and items, repeating the process until convergence was reached. The first wave of the survey included scales of a coworker's confidence (other-ratings as well as self-ratings as a control variable), competitiveness between participants and their coworkers, and participants' demographics. The second wave included scales of the coworker's competence and dominance. The third wave included a scale of the coworker's persuasiveness.

## Measures

**Perceived coworker confidence (other-ratings).** Participants rated four statements (1 = not at all; 7 = extremely,  $\alpha = 0.95$ ): "When my coworker and I disagree, my coworker is confident/self-assured/sure/certain about his/her dissenting opinions." These adjectives were included from existing confidence scales (e.g., Kleitman & Stankov, 2007; Martin Allwood et al., 2008; Sander & Sanders, 2009) and were cross-checked as synonyms of the word "confident" in a dictionary.

**Competitiveness.** Participants evaluated five statements regarding felt competitiveness with their coworkers (1 = strongly disagree; 7 = strongly agree,  $\alpha = 0.87$ ), adapted from Tjosvold et al. (2003) by replacing "team members" with "we" and "the other person" to fit our study context. Sample items are: "We structure things in ways that favor our individual goals rather than the other person's goals," and "We have a 'win-lose' relationship."<sup>2</sup>

<sup>1</sup> The results of ANOVA demonstrated that neither participants' genders nor coworkers' genders were significantly associated with any outcome variables. We also did not find any significant association between the length of time participants had worked with coworkers and any outcome variables. Thus, we did not include gender-related variables or length of time as control variables in subsequent analyses.

<sup>2</sup> Similar to other research that focused on individual perceptions of competitiveness (e.g., Tjosvold, 1988b), we did not find shared perceptions of competitiveness within a coworker dyad (intra-class



**Coworker competence and dominance.** Participants responded to a three-item competence scale (1 = not at all; 7 = very much so,  $\alpha = 0.97$ ) that was adapted from Tsai et al. (2020) by adding a disagreement stem (“When...disagree”) and using the term coworker rather than partner: “When my coworker and I are working on a task together about which we disagree, my coworker is competent/effective/productive at the task.” The three-item dominance scale (1 = strongly disagree; 7 = strongly agree,  $\alpha = 0.86$ ) was similarly adapted from Anderson and Kilduff (2009): “When my coworker and I are working on a task together about which we disagree, my coworker is dominant/assertive/ forceful.”

**Coworker persuasiveness.** Participants rated four statements (1 = strongly disagree; 7 = strongly agree,  $\alpha = 0.92$ ) adapted from Chang et al. (2018) by replacing their original stem (regarding Facebook posts) with our disagreement stem: “When my coworker and I are working on a task together about which we disagree, my coworker’s opinions are persuasive/compelling/logical/plausible.”

**Control variable: coworker felt confidence (self-ratings).** We also measured self-ratings of confidence as a control variable. Participants’ coworkers indicated their own confidence using a four-item scale (1 = not at all; 7 = extremely,  $\alpha = 0.96$ ). Items for self-rated confidence were: “When my coworker and I disagree, I am confident/self-assured/sure/certain about my dissenting opinions.”

## Results and Discussion

Table 1 shows descriptive statistics and correlations for the major variables in Study 1.<sup>3</sup>

**Distinguishing measures.** We conducted comparative confirmatory factor analyses (CFAs) to examine discriminant validity. We used the following standards from Kline (2011): a comparative fit index of at least .90 (i.e.,  $CFI \geq .90$ ) and a standardized root mean square residual of less than .10 (i.e.,  $SRMR < .10$ ). Fit statistics met acceptable standards for the six-factor model:  $\chi^2 = 537.70$ ,  $df = 215$ ,  $p < .001$ ,  $CFI = .94$ ,  $SRMR = 0.06$ . The results of chi-squared difference tests confirmed that the six-factor model achieved a significantly better fit than did other alternative models (i.e., five-, four-, three-, two-, and one-factor models), all  $ps < .001$ .<sup>4</sup>

**Hypothesis testing.** We conducted multiple mixed-effects regression analyses with a maximum likelihood approach and utilized dyad identification numbers as a random intercept to

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correlation = 0.00,  $p = .728$ ), which suggests individuals within the same dyad can and do perceive the competitiveness between them independently. This result aligns with related findings on reciprocity and meta-perceptions of competitiveness in coworker dyads (Eisenkraft, Eifenbein, & Kopelman, 2017). That is, these perceptions do not necessarily align between dyad members but depend on how each person views the relationship.

<sup>3</sup> We investigated but did not find any evidence for common method variance (CMV). Please see related analyses and results in the section titled “An Investigation on Common Method Variance in Study 1” in the supplemental materials.

<sup>4</sup> Please see the detailed results of chi-squared difference tests in the section titled “Results of Confirmatory Factor Analyses and Chi-squared Difference Tests in Study 1” in the supplemental materials.

control for any dyad differences (see Table 2).<sup>5</sup> For comprehensiveness, we first examined the effects of confidence and competitiveness on persuasiveness. Model 1 results showed confidence was positively associated with persuasiveness ( $B = 0.54$ ,  $SE = 0.05$ ,  $p < .001$ ).<sup>6</sup> Model 2 results showed a non-significant interaction between confidence and competitiveness on persuasiveness ( $B = -0.05$ ,  $SE = 0.03$ ,  $p = .084$ ).

We also found significant main effects of confidence and competitiveness in addition to our hypothesis testing. Model 3 results demonstrated that perceived coworker confidence was positively associated with perceived coworker competence ( $B = 0.40$ ,  $SE = 0.06$ ,  $p < .001$ ). Hypothesis 1 proposed competitiveness as a moderator to the confidence-competence link, specifically, weakening the positive link at higher levels of competitiveness. To test Hypothesis 1, Model 4 showed a significant interaction effect between coworker confidence and competitiveness on coworker competence ( $B = -0.09$ ,  $SE = 0.04$ ,  $p = .011$ ). To probe the interaction effect, we used a margin estimation method (Williams, 2012), which allows for simple slope analyses in the full range of a moderator measure. Given that participants' average competitiveness scale scores ranged from 1 to 7 and participants indicated ratings from 1 to 7 for each competitiveness item, we performed simple slope analyses (i.e., the conditional effects of confidence) based on the scores of competitiveness from 1 to 7. Other researchers have also similarly used participants' responses to a moderator questionnaire, such as age in years (Piszczek & Pimputkar, 2020), to determine the cutoff points of simple slope analyses. Table 3 demonstrates the pattern of the interaction effect. The results demonstrated that when competitiveness was higher than the scale midpoint (4), the positive associations between coworker confidence and coworker competence became non-significant (all  $ps > .10$ ). Thus, these results supported Hypothesis 1.

Hypothesis 2 proposed competitiveness as a moderator to the confidence-dominance link, specifically, strengthening the positive link at higher levels of competitiveness. Model 5 demonstrated that confidence was positively related to dominance ( $B = 0.22$ ,  $SE = 0.07$ ,  $p < .001$ ). Competitiveness was also positively associated with dominance ( $B = 0.23$ ,  $SE = 0.07$ ,  $p < .001$ ). To test Hypothesis 2, Model 6 showed a significant interaction effect between confidence and competitiveness on dominance ( $B = 0.09$ ,  $SE = 0.04$ ,  $p = .039$ ). Specifically, when perceived competition was the lowest score (1), the positive association between coworker confidence and coworker dominance became non-significant (see the results in Table 3;  $B = 0.09$ ,  $SE = 0.09$ ,  $p = .317$ ). Overall, these results supported Hypothesis 2.

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<sup>5</sup> We also calculated intra-class correlations (ICCs) for the outcome variables to evaluate the effects of dyad differences. The results demonstrated that dyad differences did not significantly influence the analyses involving coworker competence ( $ICC = .00$ ;  $p = .873$ ), coworker dominance ( $ICC = .00$ ;  $p = .894$ ), or coworker persuasiveness ( $ICC = .00$ ;  $p = .949$ ).

<sup>6</sup> To be consistent with our theoretical predictions, we used perceived (i.e., other-rated) coworker confidence in the regression analyses in the manuscript. However, as noted in the measures section, we conducted separate analyses using coworkers' self-rated confidence as an additional predictor (control variable) for the regression analyses reported in the manuscript. We found that the inclusion of this variable did not significantly change the results. Coworkers' self-rated confidence did not significantly predict coworker competence or persuasiveness. Please see the relevant results of these additional regression analyses in the section titled "Regression Analyses in Study 1 with Coworker Felt Confidence as a Control" in the supplemental materials.

**Table 1.** Means, Standard Deviations, and Correlations of Focal Variables in Study 1

Variables	Mean	SD	1.	2.	3.	4.	5.
1. Coworker felt confidence	4.52	1.36					
2. Coworker confidence	4.84	1.42	0.16*				
3. Felt competitiveness	2.57	1.39	-0.11	-0.19**			
4. Coworker competence	5.19	1.45	0.01	0.38***	-0.03		
5. Coworker dominance	3.69	1.55	0.06	0.17**	0.17**	0.15*	
6. Coworker persuasiveness	4.81	1.37	0.04	0.55***	-0.11	0.64***	0.23***

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Coworker felt confidence is measured as a self-rating (i.e., from the expresser's, or target's, perspective), all other measures are perceiver-ratings (i.e., the perceiver's judgments of the target and the competitiveness between them felt by the perceiver).

**Table 2.** Regression Analyses in Study 1

Variables	Model 1 DV: Coworker persuasiveness	Model 2 DV: Coworker persuasiveness	Model 3 DV: Coworker competence	Model 4 DV: Coworker competence	Model 5 DV: Coworker dominance	Model 6 DV: Coworker dominance	Model 7 DV: Coworker persuasiveness
<b>Predictors</b>							
Coworker confidence	0.54*** (0.05)	0.68*** (0.10)	0.40*** (0.06)	0.64*** (0.11)	0.22*** (0.07)	0.01 (0.12)	0.38*** (0.08)
Competitiveness	0.00 (0.05)	0.26 (0.16)	0.05 (0.06)	0.50** (0.19)	0.23*** (0.07)	-0.18 (0.21)	0.05 (0.14)
Coworker confidence × Competitiveness		-0.05 (0.03)		-0.09* (0.04)		0.09* (0.04)	-0.02 (0.03)
Coworker competence							0.46*** (0.05)
Coworker dominance							0.09* (0.04)
$R^2$	.31	.31	.15	.17	.07	.08	.53
Wald $\chi^2$	110.88***	115.69***	44.00***	51.66***	18.27***	22.86***	287.85***

Notes: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . All measures are perceiver-ratings of a target coworker (expresser). All regression coefficients are unstandardized. Numbers in parentheses represent standard errors. DV is used to indicate dependent variable. We used the R-squared value created by Rabe-Hesketh and Skrondal (2008) for mixed-effects regression models.

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5. Coworker dominance	3.69	1.55	0.06	0.17**	0.17**	0.15*	
6. Coworker persuasiveness	4.81	1.37	0.04	0.55***	-0.11	0.64***	0.23***

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Coworker felt confidence is measured as a self-rating (i.e., from the expresser's, or target's, perspective), all other measures are perceiver-ratings (i.e., the perceiver's judgments of the target and the competitiveness between them felt by the perceiver).

**Table 2.** Regression Analyses in Study 1

Variables	Model 1 DV: Coworker persuasiveness	Model 2 DV: Coworker persuasiveness	Model 3 DV: Coworker competence	Model 4 DV: Coworker competence	Model 5 DV: Coworker dominance	Model 6 DV: Coworker dominance	Model 7 DV: Coworker persuasiveness
<b>Predictors</b>							
Coworker confidence	0.54*** (0.05)	0.68*** (0.10)	0.40*** (0.06)	0.64*** (0.11)	0.22*** (0.07)	0.01 (0.12)	0.38*** (0.08)
Competitiveness	0.00 (0.05)	0.26 (0.16)	0.05 (0.06)	0.50** (0.19)	0.23*** (0.07)	-0.18 (0.21)	0.05 (0.14)
Coworker confidence × Competitiveness		-0.05 (0.03)		-0.09* (0.04)		0.09* (0.04)	-0.02 (0.03)
Coworker competence							0.46*** (0.05)
Coworker dominance							0.09* (0.04)
$R^2$	.31	.31	.15	.17	.07	.08	.53
Wald $\chi^2$	110.88***	115.69***	44.00***	51.66***	18.27***	22.86***	287.85***

Notes: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . All measures are perceiver-ratings of a target coworker (expresser). All regression coefficients are unstandardized. Numbers in parentheses represent standard errors. DV is used to indicate dependent variable. We used the R-squared value created by Rabe-Hesketh and Skrondal (2008) for mixed-effects regression models.

To examine the associations between the mediators and persuasiveness, Model 7 showed that competence ( $B = 0.46$ ,  $SE = 0.05$ ,  $p < .001$ ) and dominance ( $B = 0.09$ ,  $SE = 0.04$ ,  $p = .018$ ) were both positively associated with persuasiveness. To test Hypothesis 3, which specifies a weaker positive indirect effect of confidence on persuasiveness via competence in situations with higher competitiveness, we used the regression coefficients and standard errors from the previous results and computed confidence intervals (CIs) based on Tofghi and MacKinnon (2011). Supporting Hypothesis 3, the results demonstrated a significant indirect interaction effect of confidence and competitiveness on persuasiveness via competence ( $B = -0.04$ ,  $SE = 0.02$ , 95% CI = [-0.08, -0.01]). Table 4 presents the pattern of the effects. Specifically, when competitiveness was higher than the midpoint (4), the indirect positive effects of confidence on persuasiveness via competence became non-significant.

Hypotheses 4a and 4b specify a stronger positive (4a) or negative (4b) indirect effect of confidence on persuasiveness via dominance in situations with higher competitiveness. Supporting neither Hypothesis 4a nor 4b, the results demonstrated a non-significant indirect interaction of confidence and competitiveness on persuasiveness via dominance ( $B = 0.00$ ,  $SE = 0.01$ , 95% CI = [-0.01, 0.02]). In summary, higher competitiveness weakened the association between confidence and competence but strengthened the association between confidence and dominance. However, the interaction of confidence and competitiveness indirectly influenced persuasiveness via competence but not dominance. We also did not include a task-relevant disagreement as the specific context in our instructions for the competitiveness scale and therefore used experiments in Studies 2 and 3 to create a context of task-relevant disagreement.

## Studies 2 and 3: Experiments with a Decision-making Task

### Participants and Design

Study 2 and 3 consisted of 599 and 501 adults, respectively (S2/S3<sup>7</sup>: 42/58% male, 57/41% female, 1/1% other: those who did not identify within the gender binary or preferred not to disclose gender information,  $M_{age} = 19.42/33.57$  years,  $SD_{age} = 1.21/10.46$  years), in our final samples. We initially recruited 666 university students who participated in Study 2 for course credit. In Study 3, we recruited an initial sample of 552 adults by giving monetary compensation of £1.88 to participants on Prolific Academic (the currency used by Prolific.co; Palan & Schitter, 2018).<sup>8</sup> We removed 67 participants in Study 2 and 51 participants in Study 3 before analysis based on pre-registered criteria (incomplete responses for focal variables, inappropriate responses to open-ended questions, suspicion of whether the task co-decider was real, or issues hearing the video clips of the co-decider). Both studies used a two-by-two factorial design with a neutral condition. Participants were randomly assigned to a low confidence/low competitiveness, low confidence/high competitiveness, high confidence/low competitiveness, high confidence/high competitiveness, or neutral condition. In each study, each condition included at least 94 participants.

<sup>7</sup> “S2” and “S3” are used throughout the analyses to indicate Study 2 and Study 3, respectively.

<sup>8</sup> In Study 3, two additional participants than the 550 indicated in the pre-registration were included due to technical issues.

**Table 3.** *The Effects of Coworker Confidence at Different Levels of Felt Competitiveness in Study 1*

Competitiveness Scale point	The association between coworker confidence and competence		The association between coworker confidence and dominance	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
1	0.55***	0.08	0.09	0.09
2	0.45***	0.06	0.18*	0.07
3	0.36***	0.06	0.26***	0.07
4	0.27**	0.08	0.35***	0.09
5	0.17	0.11	0.44***	0.12
6	0.08	0.14	0.52**	0.16
7	-0.02	0.17	0.61**	0.20

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Table 4.** *The Indirect Effects of Coworker Confidence via Competence at Different Levels of Felt Competitiveness in Study 1*

Competitiveness Scale point	The indirect association between coworker confidence and persuasiveness via competence		95% Confidence Interval
	<i>B</i>	<i>SE</i>	
1	0.25	0.05	[0.17, 0.34]
2	0.21	0.04	[0.14, 0.28]
3	0.16	0.03	[0.10, 0.23]
4	0.12	0.04	[0.05, 0.20]
5	0.08	0.05	[-0.02, 0.18]
6	0.04	0.07	[-0.09, 0.16]
7	-0.01	0.08	[-0.17, 0.15]

## Procedure

In Studies 2 and 3, participants completed an online study and followed the same procedure. All study stimuli were presented to participants via Qualtrics. To promote engagement and motivation, participants were first asked to indicate whether they would commit to providing their best answers (Tsai et al., 2019; all participants in the final sample responded affirmatively). Next, participants read a detailed scenario (modified from Fischer et al., 2005) in which they were instructed to imagine themselves as a hiring officer for the corporate headquarters of a conglomeration of boutique fashion houses. Participants were presented with a corporate decision involving what the frequency of performance reviews and the length of a contract renewal period should be for a company executive of one of the conglomerate companies, Mr. Stanley. Participants read information about both advantages and disadvantages of a high versus low frequency of performance reviews and a long versus short duration for the contract renewal period.

Next, participants read that they would be paired with another participant to discuss and reach agreements on these two issues. They also entered their initials and read a message that participants should refer to each other using their initials for the remainder of the study. Subsequently, to manipulate participants' felt competitiveness, participants in the high (low) competitiveness condition were requested to describe how they would work competitively (non-competitively) with their assigned co-decider. We used the content of the competitiveness scale in Study 1 to develop the instructions. To reinforce the differentiation in felt competitiveness across the conditions, we presented the task as a negotiation in the high competitiveness condition and a discussion in the low competitiveness or neutral condition because negotiations make opposing interests or competitiveness more salient than discussions (Straus, 1999). Participants in the neutral condition did not receive instructions regarding competitiveness, but read: "To help you prepare for the task, please describe below how you will work with your counterpart on the scenario regarding Mr. Stanley."

Subsequently, participants indicated their initial preferences regarding the two task issues (review frequency and contract duration) on a scale of 0 (monthly review; five-year renewal) to 100 (annual review; one-year renewal) for each issue and provided reasons for each preference. They also read that their preferences and reasons would be shared with their co-decider. To increase the realism of the assigned co-decider, participants were compelled to wait to be paired with their co-decider. They were then informed they had been paired with "KA" and were given a chance to send a text message to KA. They also read that their co-decider would send them a message in randomly-assigned text/written or video/recorded format (all participants were actually shown a video, as described below). They were then asked to wait while KA responded.

Afterward, participants received a different video message from KA based on condition. All clips were pre-recorded using an actor (e.g., Carli et al., 1995; Kopelman et al., 2006) to ensure consistency across conditions except for the intended verbal and nonverbal differences in expressed confidence and competitiveness. The same female actor, clothing, and setting were used in all clips. The actor was trained in how to express low/high confidence nonverbally through multiple channels, including appropriate facial and body movements and tone of voice. We followed prior research demonstrating that confidence can be conveyed by seeming surer of oneself, including having a straight posture, direct eye gaze, lifted chin, using a comfortably loud rather than soft volume, and displaying an appearance of strength (Ko et al., 2015; Locke & Anderson, 2015).

To increase the realism of the co-decider's message, the video began by including an "accidental" partial revelation of KA's full name: "Hi, I'm...Ki...I mean, KA. I read your response to Mr. Stanley's situation." In the second part of the message, the verbal content differed by condition to appropriately convey confidence and competitiveness regarding whose solution should be chosen. In

the neutral condition, the message conveyed the initial opinion disagreement: “My thoughts are different from yours.” This disagreement message was also used in other conditions. However, the message was not designed to include cues related to confidence or competitiveness. In contrast, the (high)/(low) confidence and high competitiveness condition stated: “My thinking is different from yours. But I (feel pretty confident)/(don’t feel totally confident) we should use my idea as the solution.” Moreover, the messages in the (high)/(low) confidence and low competitiveness condition were: “My thinking is different from yours. But I (feel pretty confident)/(don’t feel totally confident) we can consider my idea as one of our possible solutions.”

To ensure that participants could view the video properly and to reinforce the manipulation, they were requested to type the content of KA’s message before moving on. They then indicated their perceptions of KA’s competence and dominance. Afterward, they received an opposing preference from KA on each issue. For instance, if a participant initially submitted scores of 80 for performance review (indicating stronger preference for annual rather than monthly frequency) and 20 for contract length (stronger preference for five- rather than one-year renewal), KA’s response indicated scores of 11 (preference for monthly) and 89 (preference for one-year renewal), respectively. To standardize the co-decider’s responses across participant variations in preference, we consistently presented scores of either 11 or 89 for each issue, depending on which would most oppose the participant’s initial preference on that issue. Participants also received corresponding reasons for KA’s preferences that were aligned with KA’s numerical selection for that issue (11 or 89). We pre-tested plausible reasons in a separate pilot study to ensure KA’s reasons were consistently persuasive regardless of the selection ( $p > .05$  for each comparison between reasons included in our final study design). Example reasons provided by KA included “higher performance review frequency will provide a more accurate evaluation of Mr. Stanley’s performance” versus “lower performance review frequency because it will decrease Mr. Stanley’s anxiety and stress due to performance evaluations.” Participants then indicated their revised preferences and reasons for the two issues and their evaluation of KA’s persuasiveness. Next, they completed manipulation check scales regarding KA’s confidence and the competitiveness between themselves and KA and were probed for any suspicion regarding KA and their motivation to complete the study. Finally, participants were debriefed (including a disclosure that the interaction was simulated) and received compensation.

## Measures

**Co-decider competence and dominance.** We adapted the same scales as in Study 1 for co-decider competence (1 = not at all; 7 = very much so,  $S2/S3: \alpha = 0.93/0.95$ ; e.g., “While working on the task together, KA seems competent at the task.”) and dominance (1 = strongly disagree; 7 = strongly agree,  $S2/S3: \alpha = 0.94/0.91$ ; e.g., “While working on the task together, KA seems dominant.”).

**Co-decider persuasiveness.** Persuasiveness was measured in two ways. First, we adapted the same scale as in Study 1 to assess co-decider persuasiveness (1 = strongly disagree; 7 = strongly agree,  $S2/S3: \alpha = 0.89/0.91$ ; e.g., “In deciding how to revise my response, KA’s opinions were persuasive.”). Second, similar to prior research on social influence (e.g., Adam et al., 2010; Driskell et al., 1993; Tsai & Li, 2020), we used participants’ preference changes on the two task issues (i.e., review frequency and contract length) as a behavioral measure of persuasiveness. This method of measuring persuasiveness provided a more fine-grained means to examine exactly how much individuals would be willing to move toward their disagreeing co-decider. For example, if a participant initially indicated preferences of 80 (lower frequency) and 70 (shorter renewal), they would receive KA’s response of 11 (higher frequency) and 11 (longer renewal). If the participant’s revised preference selections were 20 and 15, the participant’s total change score—that is, how much their preferences moved toward KA’s—



would be:  $(80-20) + (70-15) = 115$  (we also allowed for negative change scores, if the participant's revised preferences moved farther away from KA's preferences; see similar methodology in Driskell et al., 1993). In this way, movement indicated both the degree and direction that a persuasion attempt influenced the recipient. The correlation between the self-report and behavioral measures of persuasiveness was significantly positive (S2/S3:  $r = 0.48/0.42, p < .001$ ).

**Manipulation checks.** We adapted the same scales of confidence and competitiveness as Study 1. Participants rated four statements about the co-decider's confidence (1 = not at all; 7 = extremely, S2/S3:  $\alpha = 0.98/0.98$ ; e.g., KA seems... "confident about his/her dissenting opinions," "certain about his/her dissenting opinions") and five statements regarding competitiveness between themselves and the co-decider (1 = strongly disagree; 7 = strongly agree, S2/S3:  $\alpha = 0.88/0.90$ ; e.g., "We are structuring things in ways that favor our individual goals rather than the other person's goals.")<sup>9</sup>

## Results and Discussion

Table 5 presents descriptive statistics and correlations of major variables in Studies 2-3.

**Manipulation checks.** We used ANOVAs and tests of planned contrasts to examine the effectiveness of the manipulations. For confidence, the results demonstrated a significant difference among the low, high, and neutral conditions in the expected direction (S2/S3:  $F = 613.63/239.45, p < .001/< .001$ ). Specifically, participants in the low confidence condition (S2/S3:  $M = 2.46/3.00, SD = 1.35/1.59$ ) perceived their co-deciders as less confident than those in the high confidence (S2/S3:  $M = 5.90/5.72, SD = 0.93/1.03; t = -33.54/-20.55, p < .001/< .001$ ) and neutral conditions (S2/S3:  $M = 5.38/5.47, SD = 1.01/1.25; t = -22.84/-15.36, p < .001/< .001$ ), which indicates the confidence manipulation was effective. Additionally, we did not find a consistent significant difference between the high confidence and neutral conditions (S2/S3:  $t = -4.05/-1.53, p = <.001/= .127$ ), which suggested that, as a baseline, participants may perceive a co-decider as confident without cues to indicate otherwise. For perceived competitiveness, we found a significant difference among the low, high, and neutral conditions (S2/S3:  $F = 35.50/36.39, p < .001/< .001$ ). Specifically, participants in the low competitiveness condition (S2/S3:  $M = 2.89/2.80, SD = 1.35/1.48$ ) perceived the interaction as less competitive than those in the high competitiveness condition (S2/S3:  $M = 3.91/4.05, SD = 1.40/1.43; t = -8.27/-8.42, p < .001/<.001$ ). Participants in the neutral condition (S2/S3:  $M = 3.18/3.62, SD = 1.26/1.54$ ) perceived less competitiveness than those in the high competitiveness condition (S2/S3:  $t = -4.76/-2.37, p < .001/= .018$ ). We also found that participants in the low competitiveness condition perceived less competitiveness than in the neutral condition, but this difference was not consistently significant (S2/S3:  $t = -1.88/-4.58, p = .060/< .001$ ). These findings suggested that participants may perceive their interactions with a co-decider as non-competitive during situations with either no competition cues or with explicit non-competition cues. Given the significant differentiation of high versus low

<sup>9</sup> We also conducted comparable CFAs for all the scales with multiple items in Study 2, and the results supported that these measures are separate constructs. Please see the detailed results in the section titled "Results of Confirmatory Factor Analyses and Chi-squared Difference Tests in Study 2" in the supplemental materials.

confidence and competition and the fact that these were our main focal variables, we focused on the four conditions without the neutral condition in our subsequent analyses.<sup>10</sup>

**Hypothesis testing.** We next conducted ordinary least squares regressions comparing the four conditions of interest to test our model: low (coding = 0) and high (coding = 1) confidence and competitiveness (see Tables 6 and 7). We include all analyses for comprehensiveness. Models 1 and 2 showed that competitiveness decreased co-decider persuasiveness for both (1) self-report and (2) behavioral measures (S2/S3: persuasiveness 1:  $B = -0.50/-0.44$ ,  $SE = 0.11/0.14$ ,  $p < .001/= .002$ ; persuasiveness 2:  $B = -17.01/-12.36$ ,  $SE = 3.51/4.94$ ,  $p < .001/= .013$ ). Models 3 and 4 did not consistently show significant interaction effects between confidence and competitiveness on persuasiveness (S2/S3: persuasiveness 1:  $B = -0.48/-0.31$ ,  $SE = 0.23/0.28$ ,  $p = .037/= .268$ ; persuasiveness 2:  $B = 0.22/-17.01$ ,  $SE = 7.03/9.85$ ,  $p = .975/= .085$ ). A significant interaction effect was found only from the self-reported persuasiveness measure in Study 2, which showed a stronger negative association between confidence and persuasiveness in higher competitiveness (lower competitiveness:  $B = 0.05$ ,  $SE = 0.16$ ,  $p = .777$ ; higher competitiveness:  $B = -0.43$ ,  $SE = 0.16$ ,  $p = .007$ ). However, this significant effect may be unreliable because we did not find similar significant effects in the other four tests across the three studies.

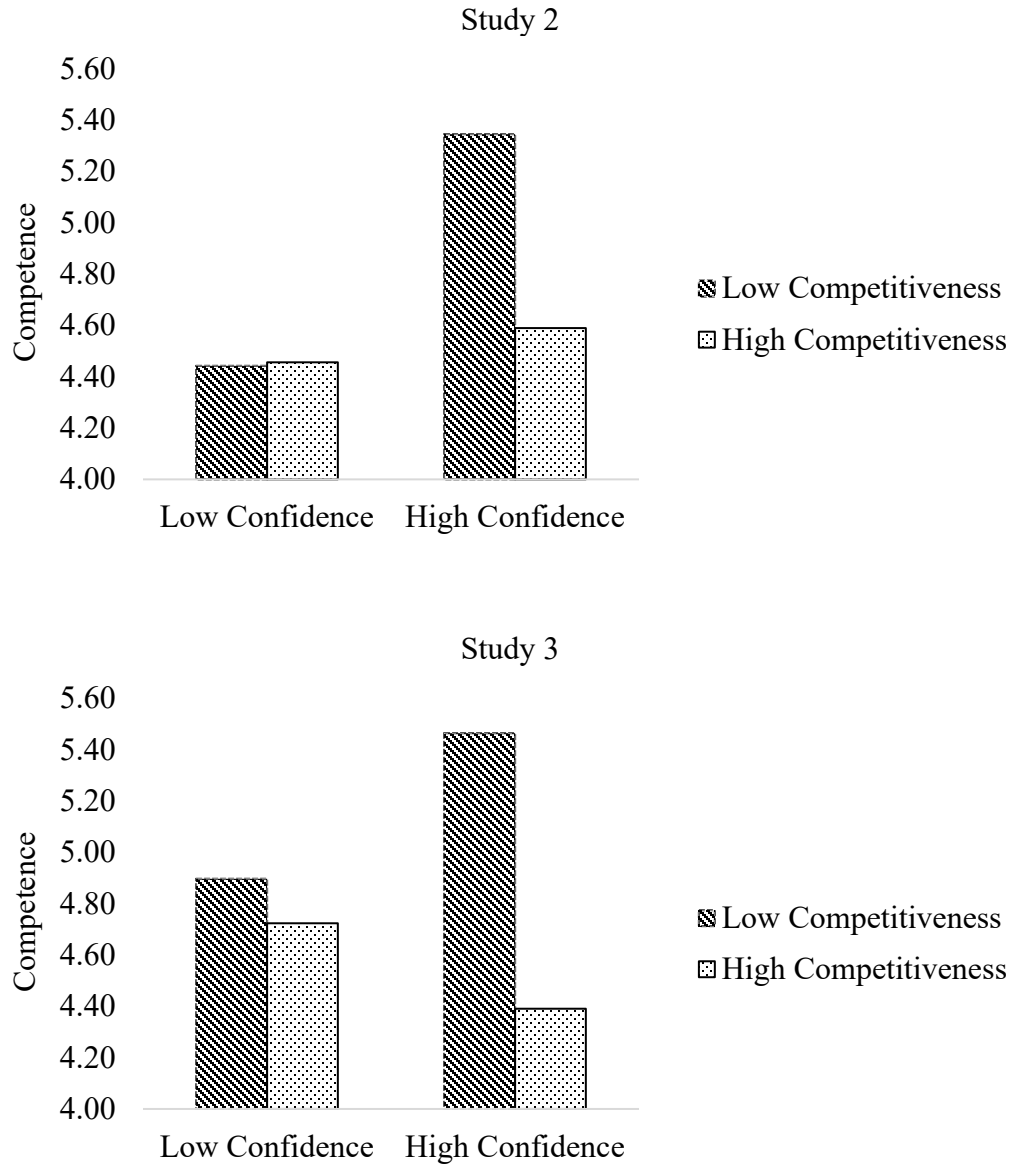
Moreover, Model 5 showed that competitiveness consistently and significantly decreased perceptions of competence (S2/S3:  $B = -0.38/-0.63$ ,  $SE = 0.12/0.14$ ,  $p = .002/< .001$ ), although the effect of confidence was not consistent (S2/S3:  $B = 0.51/0.14$ ,  $SE = 0.12/0.14$ ,  $p < .001/= .304$ ). Model 6 also showed a significant interaction effect between perceived confidence and competitiveness on perceived competence (S2/S3:  $B = -0.77/-0.90$ ,  $SE = 0.24/0.27$ ,  $p = .001/< .001$ ). Specifically, the results of simple slope analyses showed that when competitiveness was higher, the effect of confidence on competence became non-significant (S2/S3: lower competitiveness:  $B = 0.90/0.57$ ,  $SE = 0.17/0.19$ ,  $p < .001/= .003$ ; higher competitiveness:  $B = 0.13/-0.33$ ,  $SE = 0.17/0.20$ ,  $p = .425/= .091$ ), supporting Hypothesis 1. Figure 2 demonstrates the pattern of this interaction effect.

We next examined perceived dominance as a dependent variable. Model 7 showed that confidence was positively related to dominance (S2/S3:  $B = 2.78/2.10$ ,  $SE = 0.12/0.15$ ,  $p < .001/< .001$ ), although competitiveness was not significantly related (S2/S3:  $B = 0.22/0.21$ ,  $SE = 0.12/0.15$ ,  $p = .065/= .150$ ). Model 8 showed a significant interaction effect between confidence and competitiveness on dominance (S2/S3:  $B = 1.05/1.57$ ,  $SE = 0.24/0.29$ ,  $p < .001/< .001$ ). Specifically, simple slope analyses demonstrated that when competitiveness was higher, the positive association between co-decider confidence and co-decider dominance became stronger (S2/S3: higher competitiveness:  $B = 3.30/2.93$ ,  $SE = 0.17/0.21$ ,  $p < .001/< .001$ ; lower competitiveness:  $B = 2.25/1.36$ ,  $SE = 0.17/0.20$ ,  $p < .001/< .001$ ), supporting Hypothesis 2. Figure 3 demonstrates the pattern of this interaction effect. Consistent with the findings of Study 1, Models 9 and 10 showed that competence was positively associated with persuasiveness (S2/S3: persuasiveness 1:  $B = 0.34/0.38$ ,  $SE = 0.04/0.05$ ,  $p < .001/< .001$ ; persuasiveness 2:  $B = 6.19/5.11$ ,  $SE = 1.34/1.81$ ,  $p < .001/= .005$ ). However, dominance was not consistently significantly associated with persuasiveness (S2/S3: persuasiveness 1:  $B = -$

<sup>10</sup> Although the results of the neutral condition were less relevant to our hypotheses, for comprehensiveness, we examined additional differences in the focal variables. Please see the section titled “Differences Across Conditions in Study 2” in the supplemental materials.

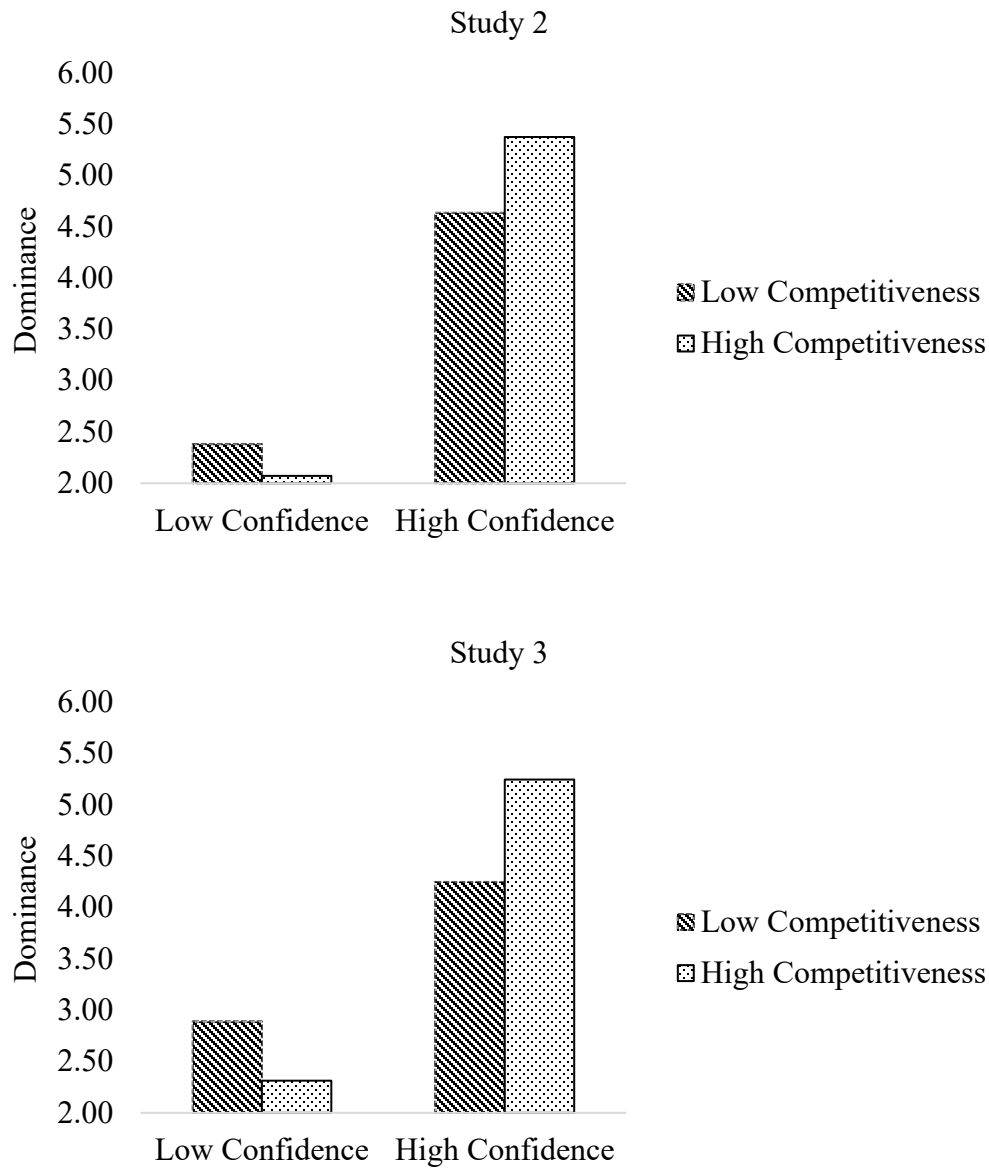
0.01/0.04,  $SE = 0.04/0.05$ ,  $p = .756/= .358$ ; persuasiveness 2:  $B = -0.72/-3.72$ ,  $SE = 1.35/1.71$ ,  $p = .593/= .030$ , so these results should be interpreted with caution.<sup>11</sup>

**Figure 2.** The Interaction Effect of Confidence and Competitiveness on Competence in Studies 2 and 3



<sup>11</sup> Additionally, analyses showed competence was more positively associated with persuasiveness than dominance in both studies. Please see “Differential Predictability of Competence and Dominance” in the supplemental materials.

**Figure 3.** The Interaction Effect of Confidence and Competitiveness on Dominance in Studies 2 and 3



To test Hypothesis 3, we computed CIs using the previous regression results and bootstrapping with 10,000 repetitions (Hayes, 2013). We found significant indirect interaction effects of confidence and competitiveness for both persuasiveness measures via competence (S2/S3: persuasiveness 1:  $B = -0.26/-0.34$ ,  $SE = 0.09/0.11$ , 95% CI = [-0.45, -0.10]/[-0.59, -0.14]; persuasiveness 2:  $B = -4.79/-4.60$ ,  $SE = 1.91/2.24$ , 95% CI = [-9.02, -1.57]/[-10.26, -1.16]). Specifically, when competitiveness was higher, the indirect positive association between confidence and persuasiveness via competence became non-significant (S2/S3: persuasiveness 1 lower competitiveness:  $B = 0.31/0.22$ ,  $SE = 0.07/0.07$ , 95% CI = [0.18, 0.45]/[0.09, 0.38]; persuasiveness 2 lower competitiveness:  $B = 5.58/2.90$ ,  $SE = 1.72/1.43$ , 95% CI = [2.55, 9.29]/[0.71, 6.43]; persuasiveness 1 higher competitiveness:  $B = 0.04/-0.13$ ,  $SE =$

0.06/0.08, 95% CI = [-0.07, 0.17]/ [-0.30, 0.03]; persuasiveness 2<sub>higher competitiveness</sub>:  $B = 0.80/-1.70$ ,  $SE = 1.16/1.31$ , 95% CI = [-1.42, 3.24]/[-5.21, 0.12]), supporting Hypothesis 3.

However, in testing dominance as a mediator, we did not find a consistent significant indirect interaction effect (S2/S3: persuasiveness 1:  $B = -0.01/0.07$ ,  $SE = 0.04/0.08$ , 95% CI = [-0.10, 0.07]/[-0.08, 0.23]), persuasiveness 2:  $B = -0.75/-5.86$ ,  $SE = 1.73/3.31$ , 95% CI = [-4.22, 2.72]/[-13.44, -0.30]), which did not consistently support Hypothesis 4a or 4b. The only significant interaction indirect effect appeared in the behavioral persuasiveness measure in Study 3. Specifically, when competitiveness was higher, the indirect association between confidence and the behavioral persuasiveness measure via dominance became more negative (S3: persuasiveness 2<sub>lower competitiveness</sub>:  $B = -5.06$ ,  $SE = 2.61$ , 95% CI = [-10.70, -0.34]; persuasiveness 2<sub>higher competitiveness</sub>:  $B = -10.92$ ,  $SE = 5.60$ , 95% CI = [-22.43, -0.39]). Thus, we did not find consistent support for Hypothesis 4a or 4b. Together, the findings of Studies 2 and 3 replicated those of Study 1 and provided evidence for the interactive causal effects of confidence and competitiveness by showing that competitiveness eliminated the positive effect of confidence on persuasiveness via competence. However, the findings of Studies 1-3 also demonstrated inconsistent associations between dominance and persuasiveness, suggesting that dominance may have an unreliable, and potentially harmful, influence on persuasiveness.

## General Discussion

Across three studies, we consistently find that higher competitiveness eliminates the positive impact of expressed confidence on perceived competence but enhances the positive effect of expressed confidence on perceived dominance. Subsequently, the relationship between competence and persuasiveness is more positive than the relationship between dominance and persuasiveness, demonstrating that competence rather than dominance is a more reliable, positive mechanism whereby persuasiveness is increased in disagreement settings. The findings are consistent across a diverse range of samples, including a multi-wave field survey of coworker dyads and two experiments. Importantly, we also find the pattern of results remains consistent across samples from different cultures, supporting the overall generalizability of the findings. Together, these results suggest that confidence expressions in low (versus high) levels of felt competitiveness maximize perceived competence and minimize perceived dominance during disagreements. In such situations, expressers enhance their persuasiveness by conveying competence rather than dominance.

### Theoretical Implications

Our research contributes to the literature on social cognition. Although previous research has demonstrated that competitiveness is negatively associated with warmth perceptions such as tolerance and good nature, but not significantly associated with competence perceptions (Fiske et al., 2002), our research suggests that competitiveness is relevant for competence perceptions. That is, high competitiveness eliminates the positive association between expressed confidence and perceived competence, which suggests a tendency to discount a confident competitor's knowledge under higher competitiveness. Furthermore, existing research shows that competence and dominance are two dimensions of agency (i.e., qualities related to goal-attainment, Abele et al., 2016), which suggests similarity between them. However, our investigation demonstrates that felt competitiveness helps differentiate between perceptions of competence and dominance. Specifically, high competitiveness weakens the positive association between expressed confidence and perceived competence but strengthens the positive relationship between expressed confidence and perceived

dominance. These findings suggest that under higher competitiveness, expressed confidence may be viewed more strongly as a self-interested tool to dominate others rather than as a cue of expertise.

Moreover, our interpersonal approach diverges from extant research on confidence and conflict management that has largely emphasized the importance of self-confidence (e.g., training programs to improve negotiators' self-confidence; Taylor et al., 2008). This stream of research suggests that self-perceived confidence promotes effective conflict resolution, for example, by motivating people to seek solutions to satisfy all parties in a conflict (Corcoran & Mallinckrodt, 2000). In contrast, our findings show that self-perceptions of confidence are less predictive than are perceivers' evaluations of a target's confidence. Importantly, our findings suggest that a combination of higher expressed confidence and lower competitiveness translates into a higher perception of a counterpart's competence, which subsequently predicts the counterpart's higher persuasiveness during disagreements.

Our examination also helps clarify the association between expressed confidence and perceived dominance. Previous research has found inconsistent links between confidence expressions and perceived dominance, including a significant positive relationship (Scherer et al., 1973) and a non-significant association (Van Zant & Berger, 2020), in non-disagreement contexts. Our research adds to this growing body of findings, showing a significant positive relationship between confidence expressions and perceived dominance during a task-relevant disagreement. This relationship is also strengthened when competitiveness is higher. Taken together, our results and prior work suggest that task-relevant disagreement and competitiveness may influence the link between expressed confidence and perceived dominance.

Our studies also demonstrate that perceptions of a counterpart's competence are more positively associated with the counterpart's persuasiveness than are perceptions of a counterpart's dominance. Specifically, we did not find a consistent association between perceived dominance and persuasiveness (i.e., a significantly positive association in Study 1 and a non-significant and/or significantly negative association in Studies 2 and 3), which suggests these results should be interpreted with caution. However, given the consistent findings for competence, for persuaders, these studies underscore the value of expressing task-relevant rather than dominance cues (Driskell et al., 1993). Supporting this argument, prior work has posited that dominant people may have insufficient task-relevant skills and thus cannot effectively exert significant influence or lead others to achieve task goals (Bai, 2017). Our investigation confirms that perceived competence creates greater social influence than does perceived dominance.

### **Practical Implications and Future Research Directions**

Our research offers practical suggestions for how people can express confidence to create social perceptions and enhance persuasiveness during disagreements, depending on competitiveness. Specifically, our findings suggest that when perceivers' felt competitiveness is lower, expressed confidence becomes more effective for signaling competence, thereby increasing persuasiveness. Moreover, lower competitiveness reduces the association between expressed confidence and perceived dominance. Perceived dominance also does not consistently predict persuasiveness. Thus, individuals can express higher levels of confidence to signal their competence and thus enhance their persuasiveness when others' felt competitiveness is lower. Managers can help establish non-competitive climates for joint tasks to create more conducive spaces for employees to express their confidence. One way for managers to mitigate competitiveness is by emphasizing that each employee is working toward the same goals, and implementing incentives that reward joint work rather than individual employees (Beersma et al., 2003). Doing so may facilitate effective persuasion

processes during disagreements by bolstering associations between expressed confidence and perceptions of competence rather than perceptions of dominance.

The limitations of our studies offer several promising opportunities for future research. First, future research can examine whether the frequency of interactions will influence the joint effect of expressed confidence and felt competitiveness on persuasiveness because we only found this significant joint effect in a limited interaction scenario (i.e., Study 2) rather than in a working relationship with repeated interactions (i.e., Study 1). Second, we did not directly compare in the same study how impressions in the moment versus well-established impressions may influence persuasiveness via perceived dominance. More specifically, future work should explore whether people are less resistant to another's dominance when they are used to the other's behavior. Finally, our research primarily compared expressions of high and low confidence, but people may use other expressions to convey belief in their ideas. For example, a lack of confidence could also be perceived as doubt (Samuels et al., 2017) or ambivalence (e.g., feeling both positive and negative about one's idea; Rothman et al., 2017), which are likely to have divergent effects on persuasiveness. Future research would benefit from exploring the effects of different confidence-related expressions.

## Conclusion

Prior research on the effectiveness of confidence in disagreements has focused on the effects of self-confidence rather than perceptions of a counterpart's confidence, and on situations in which individuals have common interests. We extend this research by exploring how felt competitiveness and expressed confidence interact to influence perceptions of the counterpart's competence and dominance during disagreement, thus affecting persuasiveness. Overall, our results suggest that individuals can optimize their persuasiveness by expressing high confidence only when others' felt competitiveness is low. Furthermore, when people express less confidence in their ideas under higher competitiveness, they are less likely to signal dominance, thereby preventing the potential negative effects of dominance on persuasiveness. Together, this research provides a useful guide for expressing confidence that can enhance competence perceptions and thus optimize persuasiveness.

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**Table 5.** Means, Standard Deviations, and Correlations of Focal Variables in Studies 2 and 3

Study 2 Variables	Mean	SD	1.	2.	3.	4.	5.
1. Co-decider confidence	0.01	0.90					
2. Competitiveness	0.01	0.90	0.01				
3. Co-decider competence	4.69	1.34	0.17***	-0.12**			
4. Co-decider dominance	3.79	1.85	0.68***	0.06	0.16***		
5. Co-decider persuasiveness 1	4.65	1.24	-0.07	-0.18***	0.36***	-0.05	
6. Co-decider persuasiveness 2	47.89	38.86	-0.01	-0.20***	0.20***	-0.02	0.48***
Study 3 Variables	Mean	SD	1.	2.	3.	4.	5.
1. Co-decider confidence	0.01	0.89					
2. Competitiveness	-0.04	0.89	-0.01				
3. Co-decider competence	4.88	1.42	0.05	-0.20***			
4. Co-decider dominance	3.79	1.76	0.53***	0.05	0.00		
5. Co-decider persuasiveness 1	4.69	1.44	0.02	-0.13**	0.40***	0.01	
6. Co-decider persuasiveness 2	48.96	49.42	0.07	-0.11*	0.14**	-0.05	0.42***

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Co-decider confidence and competitiveness are manipulated variables (by condition) and are each coded as -1 = low condition, 0 = neutral condition, and 1 = high condition. Co-decider persuasiveness 1 and 2 indicate different measures of persuasiveness; persuasiveness 1 (self-report) refers to participants' assessment of the co-decider's persuasiveness based on the persuasiveness scale, whereas persuasiveness 2 (behavioral) reflects participants' behavioral preference changes in the decision task.

**Table 6. Regression Analyses in Study 2**

Variables	Model 1 DV: Co-decider persuasiveness 1	Model 2 DV: Co-decider persuasiveness 2	Model 3 DV: Co-decider persuasiveness 1	Model 4 DV: Co-decider persuasiveness 2	Model 5 DV: Co-decider competence
<b>Predictors</b>					
Co-decider confidence	-0.20 (0.11)	-0.49 (3.51)	0.05 (0.16)	-0.60 (4.99)	0.51*** (0.12)
Competitiveness	-0.50*** (0.11)	-17.01*** (3.51)	-0.26 (0.16)	-17.12*** (5.01)	-0.37** (0.12)
Co-decider confidence × Competitiveness			-0.48* (0.23)	0.22 (7.03)	
<i>R</i> <sup>2</sup>	.04	.05	.05	.05	.06
<i>F</i>	11.25***	11.75***	9.02***	7.81***	14.09***
Variables	Model 6 DV: Co-decider competence	Model 7 DV: Co-decider dominance	Model 8 DV: Co-decider dominance	Model 9 DV: Co-decider persuasiveness 1	Model 10 DV: Co-decider persuasiveness 2
<b>Predictors</b>					
Co-decider confidence	0.90*** (0.17)	2.78*** (0.12)	2.25*** (0.17)	-0.23 (0.18)	-4.57 (5.79)
Competitiveness	0.01 (0.17)	0.22 (0.12)	-0.31 (0.17)	-0.27 (0.15)	-17.45*** (4.93)
Co-decider confidence × Competitiveness	-0.77** (0.24)		1.05*** (0.24)	-0.20 (0.22)	5.75 (7.14)
Co-decider competence				0.34*** (0.04)	6.19*** (1.34)
Co-decider dominance				-0.01 (0.04)	-0.72 (1.34)
<i>R</i> <sup>2</sup>	.08	.53	.55	.17	.09
<i>F</i>	13.13***	269.11***	192.93***	19.40***	9.11***

Notes: \**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001. All regression coefficients are unstandardized. Numbers in parentheses represent standard errors. DV is used to indicate the dependent variable. Co-decider confidence and competitiveness are each coded as 0 = low condition and 1 = high condition. Co-decider persuasiveness 1 and 2 indicate different measures of persuasiveness; persuasiveness 1 (self-report) refers to participants' assessment of the co-decider's persuasiveness based on the self-report persuasiveness scale whereas persuasiveness 2 reflects participants' behavioral preference changes in the decision task.

**Table 7. Regression Analyses in Study 3**

Variables	Model 1 DV: Co-decider persuasiveness 1	Model 2 DV: Co-decider persuasiveness 2	Model 3 DV: Co-decider persuasiveness 1	Model 4 DV: Co-decider persuasiveness 2	Model 5 DV: Co-decider competence
<b>Predictors</b>					
Co-decider confidence	0.05 (0.14)	7.04 (4.93)	0.20 (0.19)	15.10* (6.78)	0.14 (0.14)
Competitiveness	-0.44** (0.14)	-12.36* (4.94)	-0.28 (0.20)	-3.81 (6.98)	-0.63*** (0.14)
Co-decider confidence × Competitiveness			-0.31 (0.28)	-17.01 (9.85)	
<i>R</i> <sup>2</sup>	.02	.02	.03	.03	.05
<i>F</i>	4.98**	4.20*	3.73*	3.81*	11.01***
Variables	Model 6 DV: Co-decider competence	Model 7 DV: Co-decider dominance	Model 8 DV: Co-decider dominance	Model 9 DV: Co-decider persuasiveness 1	Model 10 DV: Co-decider persuasiveness 2
<b>Predictors</b>					
Co-decider confidence	0.57** (0.19)	2.10*** (0.15)	1.36*** (0.20)	-0.08 (0.19)	17.26* (7.14)
Competitiveness	-0.17 (0.19)	0.21 (0.15)	-0.58** (0.20)	-0.19 (0.19)	-5.07 (6.97)
Co-decider confidence × Competitiveness	-0.90*** (0.27)		1.57*** (0.29)	-0.03 (0.27)	-6.55 (10.25)
Co-decider competence				0.38*** (0.05)	5.11** (1.81)
Co-decider dominance				0.04 (0.05)	-3.72* (1.71)
<i>R</i> <sup>2</sup>	.08	.34	.39	.17	.06
<i>F</i>	11.20***	101.87***	83.00***	15.70***	4.72***

Notes: \**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001. All regression coefficients are unstandardized. Numbers in parentheses represent standard errors. DV is used to indicate dependent variable. Co-decider confidence and competitiveness are each coded as 0 = low condition and 1 = high condition. Co-decider persuasiveness 1 and 2 indicate different measures of persuasiveness; persuasiveness 1 (self-report) refers to participants' assessment of the co-decider's persuasiveness based on the self-report persuasiveness scale whereas persuasiveness 2 reflects participants' behavioral preference changes in the decision task.