

Abstract

In addition to risk-taking behavior, we propose that psychological safety also promotes prosocial behavior through cooperative goal interdependence. To differentiate these two types of effects, we contrasted the moderating effects of two interpersonal harmony motives. A survey in China supported the indirect effect of psychological safety on helping behavior through cooperative goal interdependence. This mediated relationship was moderated by harmony enhancement such that the mediated effect of psychological safety was weaker when harmony enhancement was high. Psychological safety was positively related to innovative behavior, and this relationship was moderated by disintegration avoidance such that it was weaker when disintegration avoidance was high. These results shed light on the different effects of psychological safety and their underlying mechanisms.

Keywords: psychological safety, cooperative goal interdependence, harmony enhancement, disintegration avoidance, helping behavior, innovative behavior

Beyond Risk-Taking: Effects of Psychological Safety on Cooperative Goal Interdependence and
Prosocial Behavior

A body of research on psychological safety has emerged (e.g., Brown & Leigh, 1996; Carmeli & Gittell, 2009; Edmondson, 1999; May, Gilson, & Harter, 2004) since Kahn's (1990) seminal work that established it as an antecedent of personal engagement. According to Kahn (1990, p. 708), psychological safety refers to the belief that a person is "able to show and employ one's self without fear of negative consequences to self-image, status, or career." The leading account of the effects of psychological safety is based on its tendency to encourage interpersonal risk-taking (Edmondson, 1999), and scholars have scrutinized the influence of psychological safety on behaviors that involve some degree of this risk, such as learning (Carmeli, 2007; Carmeli & Gittell, 2009; Edmondson, 1999). The impact of psychological safety on innovative behavior has also received considerable attention because the risk of failure is high (e.g., Baer & Frese, 2003; Kark & Carmeli, 2009).

Despite significant progress that has been made in research on psychological safety, we identify a major gap that limits theory development. Past research clusters around the effect of psychological safety on self-expressive behaviors involving interpersonal risk-taking (Edmondson, 2004). Recently, several researchers have commented on a different type of effect that is different from risk-taking, namely, the effect on interpersonal relationship. Carmeli and Gittell (2009, p. 711) were explicit about an interpersonal perspective on psychological safety because psychological safety involves "perceptions of vulnerability and making choices to minimize negative consequences in a relationship." Kahn (2007b, p. 280) posited that psychological safety enables people to "move more closely toward one another in a positive

way.” This new perspective suggests that the relational consequences of psychological safety may influence socially motivated behavior, such as prosocial behavior, which is conceptually distinct from risk-taking behavior (Edmondson, 2004). Although the relational consequences of psychological safety have been mentioned, systematic empirical investigation has yet to begin. Exploring and confirming these novel effects is important for developing a comprehensive theory. The first aim of this study is to expand the outcomes of psychological safety beyond risk-taking behavior to include interpersonal prosocial behavior.

To differentiate the two different types of effects of psychological safety, we seek to demonstrate the distinctness of the underlying mechanisms. There is considerable consensus on the mechanism underpinning the relationship between psychological safety and risk-taking behavior. Psychological safety lowers perceived interpersonal risk and encourages risk-taking behavior (Edmondson, 1999; Kahn, 1990), such as engagement in learning and innovative behavior (e.g., Baer & Frese, 2003; Carmeli, 2007). We include the risk-taking pathway in the present research to demonstrate the uniqueness of the relational effect of psychological safety.

We propose that the effect of psychological safety on prosocial behavior involves a different underlying mechanism. Psychological safety is conducive to positive interpersonal interactions (Kark & Carmeli, 2009), which in turn promote prosocial behavior (e.g., Konovsky & Pugh, 1994; Moorman, 1991; Organ, 1988). The underlying mechanism is that the positive interpersonal interactions transmit the effect of psychological safety on prosocial behavior. To capture a major consequence of these positive interactions, we draw upon Deutsch’s (1973) theory of goal interdependence and identify perceived cooperative goal interdependence (Tjosvold, 1988) as an appropriate mediator, which refers to an individual’s perception of his/her

goal relationship with others. This choice is justified because positive interpersonal interactions are typically characterized by mutuality and positive exchange (Stephens, Heaphy, & Dutton, 2012), which reinforce the perception that coworkers are working toward a common goal cooperatively. This perception is tapped by cooperative goal interdependence because it represents an alignment of interests and collaboration for goal achievement. We focus on perceived goal interdependence in our research, not objective or structural interdependence (Van der Vegt & Van de Vliert, 2002) because our analysis is at the individual level and structural effects are typically channeled through individual perceptions.

Our research provides discriminant validity for the argument that psychological safety promotes prosocial behavior through cooperative goal interdependence. Because the risk-taking effect of psychological safety entails reduction of interpersonal fear (Edmondson, 1999; Kahn, 1990), there is no compelling theoretical basis to predict that cooperative goal interdependence can channel the effect of psychological safety on innovative behavior, the risk-taking behavior examined in the present research. The mediating role of cooperative goal interdependence should be specific to the effect of psychological safety on prosocial behavior.

To lend further support to the proposition that psychological safety promotes prosocial and risk-taking behaviors through different mechanisms, we seek to demonstrate that different interpersonal orientations exert differential moderating influence on these two types of effects of psychological safety because different underlying mechanisms are involved. We identify two interpersonal harmony motives, namely, harmony enhancement and disintegration avoidance (Leung, 1997; Leung & Brew, 2009; Leung, Brew, Zhang, & Zhang, 2011; Leung, Koch, & Lu, 2002), as appropriate moderators. Our research is conducted in the Chinese culture, which places

an emphasis on interpersonal harmony (Hwang, 1987). The examination of these two constructs is particularly meaningful in this cultural context. Harmony enhancement refers to a genuine concern for interpersonal harmony and the tendency to engage in behavior that can strengthen an interpersonal relationship. In contrast, disintegration avoidance reflects a self-serving orientation associated with the tendency to avoid actions that may strain a relationship and hurt self-interest. These two harmony motives were identified in China and Australia (Leung et al., 2011), and in Singapore (Lim, 2009). Harmony enhancement was recently identified in a sample of European Americans (Wei, Su, Carrera, Lin, & Yi, 2013).

The core difference between harmony enhancement and disintegration avoidance makes the harmony framework particularly relevant for differentiating the two different effects of psychological safety. The genuine tendency for individuals high in harmony enhancement to promote an interpersonal relationship can reduce the criticality of cooperative goal interdependence in promoting prosocial behavior. In contrast, the tendency for individuals high in disintegration avoidance to avoid straining interpersonal relationships to protect self-interest can reduce the effectiveness of psychological safety in promoting risk-taking behavior. These two harmony motives target the different mechanisms underlying the different effects of psychological safety, resulting in specific moderating effects that provide discriminant validity for our theorizing.

In summary, the research contributes to the literature in two major ways. It helps broaden psychological safety theory by extending its effects beyond interpersonal risk-taking to prosocial behavior and identifying the distinct underlying mechanism. Second, our research clarifies the boundary conditions for the effects of psychological safety by examining how psychological

safety interacts with two harmony motives to affect the two types of behaviors it promotes. Our research provides nuanced knowledge about when and for whom psychological safety matters, which has important theoretical and practical implications.

Theory Development and Hypotheses

Two Types of Effects of Psychological Safety

Psychological safety promotes the perception of low interpersonal risk, but it also promotes a climate “characterized by interpersonal trust and mutual respect” (Edmondson, 1999, p. 354) and is therefore conducive to positive interpersonal interactions. Researchers have noted the role of psychological safety in promoting positive relationships in teams (e.g., Heifetz, 1994; Kahn, 2005). Because psychological safety facilitates attention, compassion, and concern for others in teams (Kahn, 2007b), it promotes close relationships among team members (Smith & Berg, 1987). Positive relationships are associated with a range of positive interpersonal outcomes, such as spontaneous interpersonal coordination (Gittell, 2003) and positive social exchange (Kahn, 1990), suggesting that psychological safety is conducive to prosocial behavior through the positive interpersonal dynamics it engenders.

To shed light on the mechanism that transmits the effect of psychological safety on prosocial behavior, we draw upon the theory of goal interdependence (Deutsch, 1949a, 1949b, 1973). The central tenet of this theory is that individuals are goal-directed, and the way they structure and perceive their goal relationship with others determines how they interact with them and the eventual outcomes. Cooperative goal interdependence involves a positive goal relationship between employees, meaning that one will move toward one’s goal attainment when others move toward theirs (Deutsch, 1973). Van der Vegt, Van de Vliert, and Oosterhof (2003)

conceptualized and measured goal interdependence from the perspective of the presence of group goals and availability of group feedback. The cooperative aspect of goal interdependence is less explicit in their conceptualization and measure than those for cooperative goal interdependence. Because our theorizing emphasizes the effect of psychological safety on cooperative behavior, cooperative goal interdependence based on the theory of Deutsch (1973) is more appropriate for our objectives.

Cooperative goal interdependence is conceptually distinct from task interdependence (Van der Vegt & Van de Vliert, 2002), as the former is about goals and the latter about tasks. Task interdependence shows a positive effect on helping behavior (e.g., Anderson & Williams, 1996; Van der Vegt & Van de Vliert, 2005), and a leading account of this effect is that task interdependence triggers felt responsibility for the outcomes of others, resulting in helping behavior (Pearce & Gregersen, 1991; Van der Vegt & Van de Vliert, 2005). It is interesting to explore whether cooperative goal interdependence also shows a positive effect on helping behavior.

How may psychological safety relate to cooperative goal interdependence? Tjosvold (1988) suggested that organizational culture and climate generally affect employee interdependence. Psychological safety encourages employees to focus on positive social exchange and open discussion of problems and issues (Edmondson, 1999, 2004; Edmondson & Roloff, 2009). It also provides a favorable environment for people to reconcile different goals and align their personal goals with those of the group (Brown & Leigh, 1996). More directly, psychological safety gives rise to positive interpersonal relationships, which promote a sense of community as well as identification with and psychological attachment to a group (Kahn, 2007a,

2007b). Both a sense of community and group identification can enhance cooperative goal interdependence. This analysis leads to the proposition that psychological safety is conducive to the perception of cooperative goal interdependence.

The theory of goal interdependence posits that cooperative goal interdependence is conducive to cooperative behavior because of the alignment of interests among individuals (Deutsch, 1949a, 1949b, 1973), and this proposition has received widespread support (e.g., Chen, Tang, & Wang, 2009; Chen & Tjosvold, 2008). This theorizing is applicable to prosocial behavior as it is a positive interpersonal behavior. In support of this reasoning, cooperative goal interdependence can motivate employees to display mutually supportive behaviors such as exchanging assistance (Tjosvold, 1988) and extra role performance (Tjosvold & Yu, 2004). Relevant theory and research suggest a positive effect of cooperative goal interdependence on prosocial behavior.

Prosocial behavior as a category includes different behaviors, and we focus on helping behavior to document the relational effect of psychological safety. Helping behavior is a major dimension of organization citizenship behavior (Organ, 1988) and is concerned with providing assistance to coworkers. As a type of interpersonally oriented prosocial behavior, helping behavior is frequently studied due to its crucial impact on individual and team performance (Very & Campbell, 2004). To summarize, our theoretical analysis suggests that psychological safety is positively related to cooperative goal interdependence, which in turn is positively related to helping behavior. The following mediation hypothesis is proposed:

Hypothesis 1: Cooperative goal interdependence mediates the positive relationship between psychological safety and helping behavior.

To demonstrate the uniqueness of the relational effect of psychological safety, we include a replication of the well-documented positive relationship between psychological safety and innovative behavior, a risk-taking behavior frequently studied as a consequence of psychological safety (e.g., Baer & Frese, 2003). There is no compelling theoretical argument to predict a significant relationship between cooperative goal interdependence and innovative behavior because cooperative goal interdependence is not directly related to risk-taking.

Hypothesis 2: Psychological safety is positively related to innovative behavior.

Moderating Roles of Harmony Motives

The dualistic model of interpersonal harmony distinguishes two harmony motives, which predispose individuals to different behavioral tendencies in interpersonal interaction (Leung, 1997; Leung & Brew, 2009; Leung et al., 2002). Each harmony motive is relevant to one type of effect of psychological safety, and together they provide additional evidence to distinguish the relational and risk-taking effects of psychological safety. Our analysis focuses on the moderating roles of harmony motives on the effect of cooperative goal interdependence because of the relational nature of harmony motives. This contingent approach is consistent with the appeal to “treat interdependence as a variable rather than a constant” (Weick, 1974, p. 357), and with the suggestion that the influence of perceived goal relationship may vary across individuals (Johnson & Johnson, 2005).

Specifically, individuals with a harmony enhancement motive are intrinsically driven to “engage in behaviors presumed to strengthen the relationships among the interactants” (Leung, 1997, p. 644). In line with this characterization, people high in harmony enhancement are more likely to engage in problem solving in conflict management because this approach can promote a

positive relationship (Leung et al., 2011; Lim, 2009). We argue before that the effect of psychological safety on helping behavior is channeled through the positive interpersonal dynamics represented by cooperative goal interdependence. We reason that because individuals high in harmony enhancement have a natural tendency to pursue positive relationships out of a genuine affinity for interpersonal harmony, they would do so even if cooperative goal interdependence is low. Thus, the positive effect of psychological safety on prosocial behavior through cooperative goal interdependence should be less salient for people high in harmony enhancement. In other words, the effect of harmony enhancement parallels that of cooperative goal interdependence fostered by psychological safety, and high harmony enhancement can compensate for low cooperative goal interdependence. Harmony enhancement should weaken the role of cooperative goal interdependence in mediating the effect of psychological safety on helping behavior.

We further argue that the moderating effect of harmony enhancement is specific to the mediated relationship between psychological safety and helping behavior. Harmony enhancement as a proactive pursuit of positive relationships is not related to interpersonal risk, and there is no theoretical basis to expect harmony enhancement to play a role in moderating the relationship between psychological safety and innovative behavior.

Hypothesis 3: Harmony enhancement negatively moderates the mediated relationship between psychological safety and helping behavior via cooperative goal interdependence, such that the mediated relationship is weaker for employees with high harmony enhancement.

People endorsing a harmony motive of disintegration avoidance are sensitive about the negative consequences of strained relationships and avoid actions that may hurt interpersonal

relationships to protect self-interest (Leung et al., 2011). This tendency is supported by the positive relationship of disintegration avoidance with conflict avoidance because confrontation may lead to negative social exchange and self loss (Leung et al., 2011; Lim, 2009). People high in disintegration avoidance are cautious about interpersonal risk and vigilant in avoiding it. We therefore propose that the capacity for psychological safety to create a low-risk interpersonal environment is compromised by the tendency of disintegration avoidance to evoke worry about potential threats that may disrupt a relationship. Psychological safety “does not imply a cozy environment in which people are necessarily close friends, nor does it suggest an absence of pressure or problems” (Edmondson, 2004, pp. 241-242). Individuals high in disintegration avoidance may still worry about issues that may strain an interpersonal relationship in the presence of psychological safety. Because disintegration avoidance can counteract the effect of psychological safety, people high in disintegration avoidance benefit less from psychological safety and are less likely to feel encouraged by psychological safety to engage in innovative behavior. This reasoning suggests that disintegration avoidance can moderate the relationship between psychological safety and innovative behavior, such that the relationship is weaker for employees with high disintegration avoidance.

We further posit that the moderating effect of disintegration avoidance is specific to the relationship between psychological safety and innovative behavior. As disintegration avoidance is concerned with the avoidance of interpersonal risk, there is no theoretical basis to expect it to moderate the mediated relationship between psychological safety and helping behavior.

Hypothesis 4: Disintegration avoidance negatively moderates the relationship between psychological safety and innovative behavior, such that the positive relationship is weaker for

employees high in disintegration avoidance.

A graphical presentation of the model is given in Figure 1.

Insert Figure 1 about here

Method

Participants and Procedures

Three hundred full-time employees who were part-time MBA students of a large urban University in China participated on a voluntary basis. They were instructed to complete a questionnaire and ask their immediate supervisors to complete another questionnaire. To ensure confidentiality, each supervisor questionnaire was put in an envelope when given to supervisors by employees. Completed supervisor questionnaires were returned to employees with the envelopes sealed and signed by supervisors on the outside. Each supervisor evaluated only one employee, and there was no nested structure in the data. These participants worked in a variety of industries including manufacturing, trading, and information technology. This sample provided variation in psychological safety and other variables of interest, and avoided contextual influence associated with a particular organization or industry (Rousseau & Fried, 2001). A total of 273 sets of questionnaires were returned, and seven sets were excluded due to extensive missing data or irregular patterns, resulting in 266 valid sets, with a final response rate of 89%. Background information for the participants was as follows: 44% were male; most were relatively young (80% between 20-39); 17% had a tenure of less than 1 year, 34% 1-3 years, 23% 4-6 years, 8% 7-8 years, 3% 9-10 years, 1% more than 10 years, and 14% did not indicate their tenure; 27%

were from supporting services, 29% from research and development, 14% from marketing and sales, 30% from other functions; 17% had a lower than college degree, 55% a college degree, 16% a graduate degree, and 12% did not indicate their education level.

Measures

Except for the harmony scales, all items were originally developed in English and translated into Chinese with a back-translation procedure (Brislin, 1986). To avoid common method bias, supervisors assessed subordinates' helping behavior and innovative behavior, and subordinates reported on psychological safety, cooperative goal interdependence, harmony motives, and control variables. Unless otherwise indicated, responses were given on Likert-type scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Psychological safety. We measured psychological safety with seven items developed by Edmondson (1999). A sample item was "If you make a mistake on this team, it is often held against you." Cronbach's alpha was .76.

Cooperative goal interdependence. Tjosvold, Law, and Sun's (2003) five-item scale was used to measure cooperative goal interdependence. A sample item was "Our team members want each other to succeed." Cronbach's alpha was .75.

Harmony motives. Harmony scales developed by Leung et al. (2011) were used to measure harmony, which is recently applied in a work setting (Wang, Leung, & Zhou, 2014). Harmony enhancement was assessed by 12 items, and a sample item was "Maintaining interpersonal harmony is an important goal in life." Disintegration avoidance was assessed by 6 items, and a sample item was "When people are in a more powerful position than you, you should treat them in an accommodating manner." Responses were given on Likert-type scales

ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). One item was deleted from harmony enhancement to improve the reliability, and Cronbach's alphas for harmony enhancement and disintegration avoidance were .69 and .71, respectively.

Helping behavior. We adapted Podsakoff, Ahearne, and MacKenzie's (1997) seven-item scale for our research context, and a sample item was "Help someone out if he/she falls behind in his/her work." Cronbach's alpha was .77.

Innovative behavior. Janssen's (2001) 9-item scale was used to measure innovative behavior on 7-point Likert scales ranging from 1 (*never*) to 7 (*frequently*). A sample item was "This employee creates new ideas for improvements." Cronbach's alpha was .87.

Control variables. Because the two genders may differ in interpersonally-oriented prosocial behavior (Eagly, 2009), we controlled for gender when testing the hypotheses related to prosocial behavior. We also included gender as a control variable in the analyses involving innovative behavior because gender may be related to creativity (e.g., Furnham & Nederstrom, 2010). In addition, two conflict management styles, *integrating* and *avoiding* (Rahim, 1983), were included as control variables. Integrating refers to a problem-solving, or win-win approach to a conflict, and avoiding refers to the avoidance of confrontation and active handling of a conflict. Integrating and avoidance are conceptually and empirically related to harmony enhancement and disintegration avoidance, respectively (Leung et al., 2011). The inclusion of these two conflict styles provides evidence for the unique effects of the two harmony motives. These two conflict styles were measured by 7 and 6 items respectively adopted from Rahim (1983) on 5-point Likert-type scales ranging from 1 (*rarely*) to 5 (*very often*). Cronbach's alphas were .81 for integrating and .71 for avoiding.

Data Analyses

We tested our hypotheses regarding helping behavior with the approaches developed by Preachers and his colleagues (Preacher & Hayes, 2008; Preacher, Rucker, & Hayes, 2007). First, we examined the main effects and a simple mediation model. Hypothesis 1 states that the relationship of psychological safety with helping behavior is mediated by cooperative goal interdependence. To explore the indirect effect of psychological safety on helping behavior, the widely adopted approach of Preacher and Hayes (2008) based on bootstrapping was used. Second, to test the moderated mediation effect, we followed the integrative procedure developed by Preacher et al. (2007). First, the mediator was regressed on the independent variable. Second, the dependent variable was predicted by the mediator, the moderator, the independent variable, and the interaction between the moderator and the mediator (Preacher et al., 2007). The interaction effect should be statistically significant to support a moderation hypothesis. The third step tested the conditional indirect effect of the independent variable on the dependent variable via the mediator as a function of the moderator. Bootstrapping was conducted to evaluate the significance of the conditional indirect effects (Preacher et al., 2007). Finally, to test the hypotheses regarding innovative behavior (H2 and H4), hierarchical regression was utilized.

Results

Preliminary Analyses

Means, standard deviations, correlations, and reliabilities for all the variables are presented in Table 1. Gender showed a significant correlation with helping behavior, but because gender affects helping behavior through a process different from that underlying the effect of psychological safety on helping behavior, the inclusion of gender as a control variable did not

change the effects obtained in subsequent analyses.

Insert Table 1 about here

Several confirmatory factor analyses were conducted to evaluate the factor structure and discriminant validity of the constructs. We tested the measurement model by creating three parcels for each construct to reduce the complexity of the model and maintain a reasonable subject-to-item ratio (e.g., Bandalos & Finney, 2001). The hypothesized eight-factor model (six constructs from the research model and two control variables) yielded a significant chi-square statistic, but we followed the standard practice to evaluate model fit based on several indexes, which as a whole suggested that the hypothesized model showed an acceptable fit ($\chi^2 = 377.71, p < .01, df = 224, CFI = .92, TLI = .91, RMSEA = .05$). This model was significantly better than a seven-factor model combining harmony enhancement and integrating ($\Delta\chi^2 = 154.78, \Delta df = 7, p < .01, CFI = .85, TLI = .82, RMSEA = .07$), a seven-factor model combining disintegration avoidance and avoiding ($\Delta\chi^2 = 119.38, \Delta df = 7, p < .01, CFI = .87, TLI = .84, RMSEA = .07$), a five-factor model combining harmony enhancement, disintegration avoidance, integrating, and avoiding ($\Delta\chi^2 = 581.17, \Delta df = 18, p < .01, CFI = .64, TLI = .59, RMSEA = .11$), a four-factor model with the combination of harmony enhancement, cooperative goal interdependence, integrating, disintegration avoidance, and avoiding ($\Delta\chi^2 = 513.42, \Delta df = 18, p < .01, CFI = .68, TLI = .63, RMSEA = .10$), and a two-factor model in which the six employee-reported constructs (psychological safety, cooperative goal interdependence, harmony enhancement, disintegration avoidance, integrating, and avoiding) loaded on a single factor, and the two supervisor-reported

constructs (helping behavior and innovative behavior) loaded on a second factor ($\Delta\chi^2 = 1193.67$, $\Delta df = 27$, $p < .01$, CFI = .34, TLI = .28, RMSEA = .14).

Tests of Main and Mediation Effects

Hypothesis 1 predicts that the effect of psychological safety on helping behavior is mediated by cooperative goal interdependence. In support of this hypothesis, psychological safety was positively related to cooperative goal interdependence, $B = .15$, $t = 2.63$, $p < .01$. The positive relationship between cooperative goal interdependence and helping behavior was also significant, $B = .21$, $t = 4.15$, $p < .01$. The bootstrapping results showed that the indirect effect was significant (indirect effect = .03), with a 95% confidence interval (CI) not containing zero (.01, .07) (See Table 2). We also note a significant gender effect, in that female employees showed more helping behavior than male employees.

In support of Hypothesis 2, which posits that psychological safety is positively related to innovative behavior, the regression results showed that this relationship was significant, $B = .14$, $t = 2.61$, $p < .01$. We also tested whether cooperative goal interdependence mediated the relationship between psychological safety and innovative behavior. The relationship between cooperative goal interdependence and innovative behavior was not statistically significant, $B = .07$, $t = 1.20$, *ns*. Nor was the indirect effect of psychological safety on innovative behavior via cooperative goal interdependence based on bootstrapping, with a 95% CI containing zero (-.01, .05). Cooperative goal interdependence only significantly mediated the relationship between psychological safety and helping behavior.

Insert Table 2 about here

Tests of Moderation and Moderated Mediation Effects

Hypothesis 3 posits that the indirect effect of psychological safety on helping behavior through cooperative goal interdependence is weaker when harmony enhancement is higher. To support this moderated mediation hypothesis (Preacher et al., 2007), the interaction effect between cooperative goal interdependence and harmony enhancement should be significant, and the indirect effects of psychological safety on helping behavior via cooperative goal interdependence should differ across low and high levels of harmony enhancement. Note that in these analyses, we controlled for the effects of integrating and disintegration avoidance to show the unique effect of harmony enhancement. Table 3 shows that the interaction effect between cooperative goal interdependence and harmony enhancement was significant, $B = -.27$, $t = -2.29$, $p < .05$. To explore the nature of this interaction, we plotted the simple slopes in Figure 2, with high and low levels of harmony enhancement at one standard deviation above and below the mean (Aiken & West, 1991). The results showed that when harmony enhancement was high, the relationship between cooperative goal interdependence and helping behavior was not significant, simple slope = $.07$, $t = .80$, *ns*. However, when harmony enhancement was low, this relationship was significant, simple slope = $.34$, $t = 5.73$, $p < .01$.

Insert Table 3 and Figure 2 about here

Consistent with the prediction, bootstrap CIs showed that when harmony enhancement was low, the indirect effect was significant, Boot $B = .05$, Boot $z = 1.85$, Boot $p = .06$

(significant based on a one-tailed test). When harmony enhancement was high, however, the indirect effect was not significant, Boot $B = .01$, Boot $z = .86$, *ns*. Hypothesis 3 was supported.

To test if the moderating effect of harmony enhancement was specific to the mediated relationship between psychological safety and helping behavior through cooperative goal interdependence, we examined the interaction between psychological safety and harmony enhancement on innovative behavior. This effect was not significant, $B = -.10$, $t = .11$, *ns*, and harmony enhancement did not significantly moderate the effect of psychological safety on innovative behavior.

Hypothesis 4 posits the negative moderation effect of disintegration avoidance on the association of psychological safety with innovative behavior. In support of this hypothesis, Table 4 shows that the interaction effect between disintegration avoidance and psychological safety was significant, $B = -.17$, $t = -2.08$, $p < .05$. Again, we controlled for avoiding and harmony enhancement to demonstrate the unique influence of disintegration avoidance. The interaction effect was plotted at one standard deviation below and above the mean of disintegration avoidance (see Figure 3). As expected, when disintegration avoidance was low, the relationship between psychological safety and innovative behavior was significant, simple slope = $.24$, $t = 3.00$, $p < .01$; when disintegration avoidance was high, however, the relationship was not significant, simple slope = $.04$, $t = .67$, *ns*.

Similarly, to explore whether the moderating effect of disintegration avoidance was specific to the relationship between psychological safety and innovative behavior, we examined the moderating effect of disintegration avoidance on the mediated relationship between psychological safety and helping behavior through cooperative goal interdependence. The

interaction between cooperative goal interdependence and disintegration avoidance on helping behavior was not significant, $B = .03$, $t = .46$, *ns*. Thus, disintegration avoidance did not significantly moderate the relationship between psychological safety and helping behavior through cooperative goal interdependence.

Insert Table 4 and Figure 3 about here

Discussion

From an interpersonal perspective, this paper examines the effect of psychological safety in the domain of prosocial behavior. The research supports the interpersonal consequences of psychological safety, which have been discussed but ignored in previous empirical research. Based on theories of psychological safety, goal interdependence, and helping behavior, we predict and confirm that the effect of psychological safety on helping behavior is channeled by cooperative goal interdependence and moderated by harmony enhancement in our sample. Furthermore, the risk-taking effect of psychological safety is confirmed by its relationship with innovative behavior, and this relationship is moderated by disintegration avoidance. The distinctness of the two mechanisms of psychological safety is further supported by the finding that the indirect effect of psychological safety on innovative behavior through cooperative goal interdependence is not statistically significant. The moderating effects of the two harmony motives are also specific. Disintegration avoidance does not significantly moderate the indirect relationship between psychological safety and helping behavior through cooperative goal interdependence. Harmony enhancement does not significantly moderate the relationship

between psychological safety and innovative behavior.

Theoretical Implications for Psychological Safety

Because of the obvious association with interpersonal risk, psychological safety has traditionally been linked to outcome variables reflecting self-expressive, interpersonal risk-taking behaviors (Edmondson, 2004). This focus is common in climate research as Kuenzi and Schminke (2009) concluded, after a thorough literature review, that climate research is limited by the tendency to relate a facet-specific climate (e.g., ethical climate) to outcome variables explicitly targeted by such a climate (e.g., ethical behaviors). To enrich climate theories, Kuenzi and Schminke encouraged researchers to probe diverse consequences of facet-specific climates. Our study heeds their advice by relating psychological safety to prosocial behavior, a type of behavior that is not related to risk-taking, thus expanding the nomological network of psychological safety.

The results support an integrative model in which the indirect effect of psychological safety on prosocial behavior through cooperative goal interdependence is moderated by harmony enhancement, while the effect of psychological safety on innovative behavior is moderated by disintegration avoidance. Cooperative goal interdependence serves well the purpose of demonstrating the relational effect of psychological safety, but it may not be the most important mediator and clearly not the only mediator that transmits the effect of psychological safety on prosocial behavior. Future research should explore other mediators, and one possibility is team-member exchange (TMX), which describes the positive exchange relationship between team members (Seers, 1989). TMX may be a very important mediator that transmits the relational effect of psychological safety because it directly captures the reciprocity among team members, a

proximal cause of prosocial behavior. TMX is related to a wide range of outcome variables (Seers, Petty, & Cashman, 1995), and the connection between psychological safety and TMX can open up a new set of outcome variables for psychological safety.

The differential moderating effects of the two harmony motives provides further support to the postulation that prosocial and risk-taking behaviors are distinct consequences of psychological safety. An interesting future direction is to examine other moderators that impact the effects of relational and risk-taking processes, as they may exhibit differential moderating effects on the influence of psychological safety that are similar to those of the two harmony motives. We have examined two individual difference moderators, and it is useful to consider contextual moderators to broaden the understanding of the boundary conditions for psychological safety.

Theoretical Implications for Cooperative Goal Interdependence and Helping Behavior

Identifying new antecedents of goal interdependence has important theoretical and practical implications (Deutsch, 1973), and the present research suggests psychological safety as a novel antecedent. We theorize that psychological safety promotes cooperative goal interdependence, which opens up the possibility that other climates with implications for positive social interaction may boost cooperative goal interdependence as well.

Equally important, the study contributes to the literature on goal interdependence by specifying the boundary conditions for its effects. Weick (1974) and Cheng (1983) called attention to the interactive relationships between interdependence and other relevant variables. Researchers also suggest that the influence of cooperative goal interdependence may vary across individuals (e.g., Johnson & Johnson, 2005). Our research pushes this research direction forward

by demonstrating a weaker relationship between cooperative goal interdependence and helping behavior for those high in harmony enhancement. Furthermore, the indirect effect of psychological safety on helping behavior through cooperative goal interdependence is weaker when harmony enhancement is high. These findings offer some interesting insight about how relational concerns play out in the realm of prosocial behavior, i.e., the positive effect of cooperative goal interdependence on helping behavior is substitutable by harmony enhancement. It is interesting to explore whether the “substitutive” relationship between harmony enhancement and cooperative goal interdependence may extend to other cooperative interpersonal behaviors.

We focus on helping behavior to represent prosocial behavior, which as a broad category includes other types of behaviors. The framework of organizational citizenship behavior includes several dimensions: Altruism, conscientiousness, sportsmanship, and courtesy (Organ, 1988), and suggests that prosocial behaviors other than helping, such as commitment to a team task, may be under the influence of psychological safety. In addition, previous research has documented the positive effects of cooperative goal interdependence on a range of outcome variables that reflect a cooperative orientation (e.g., Chen & Tjosvold, 2008; Johnson, Johnson, & Maruyama, 1983; Malone & Crowston, 1994). Psychological safety may be conducive to many cooperatively oriented behaviors through cooperative goal interdependence. For instance, the impact of psychological safety may extend to knowledge sharing, which refers to the willingness to share job-relevant information and knowledge with coworkers (Srivastava, Bartol, & Locke, 2006).

Managerial Implications

Since prosocial behavior is critical for organizational success (Podsakoff & Mackenzie,

1994, 1997), our study has several major implications for practice. The findings highlight the importance of creating a psychologically safe climate to foster prosocial behavior, such as helping behavior. Leadership plays an important role in promoting psychological safety (Kahn, 1990). For example, inclusive leadership, characterized by openness, accessibility, and availability in interactions with followers (Nembhard & Edmondson, 2006), can promote psychological safety (Carmeli, Reiter-Palmon, & Ziv, 2010). Managers may also promote psychological safety through the display of ethical leadership behaviors, such as honesty (Walumbwa & Schaubroeck, 2009). In addition, organizational practices that promote a general supportive context characterized by trust and respect are conducive to psychological safety. Incentives that reward resilience can encourage employees to persist in important endeavors, which create a sense of safety for those whose effort cannot generate immediate positive outcomes. Managers may lack the skills to implement these managerial practices, and organizations should offer relevant training to them, such as in how to formulate clear guidelines about what areas allow blue-sky exploration, and what areas do not allow mistakes. Managers also need to acquire effective communication skills to facilitate the understanding and acceptance of these guidelines by their subordinates.

Our results confirm the importance of cooperative goal interdependence in promoting prosocial behavior, and an effective way to encourage prosocial behavior is to strengthen the perception of cooperative goal interdependence. To do so, interdependent tasks can be assigned to employees, and managers can help employees understand and appreciate their interdependence with each other. The use of team rewards can increase the perception of cooperative goal interdependence, and frequent communication about common fate can also

accentuate its salience. Team building activities, such as off-site activity-based training that provides first-hand experience of the importance of teamwork, are effective in promoting attachment and commitment to a team, and may contribute to the perception of cooperative goal interdependence.

Limitations and Future Research Directions

Despite the meaningful results obtained, this study is not without limitations. We discuss these limitations in the context of identifying fruitful topics for future research. First, the data were collected at a single time, which cannot provide evidence for causality. We argue that psychological safety promotes cooperative goal interdependence, but cooperative goal interdependence may enhance psychological safety because it leads people to reflect on both positive and negative experiences in their teams (Chen & Tjosvold, 2012). To evaluate this possibility, we tested a mediation model in which cooperative goal interdependence influences helping behavior through psychological safety. This reverse causal model is significant and cannot be ruled out. The causal directions implied in our research model are based on well-established theorizing and findings, and there is strong theoretical basis to hypothesize that psychological safety as a psychological climate is an antecedent of positive interpersonal dynamics (e.g., Kahn, 2007a), and that cooperative goal interdependence promotes prosocial behavior (e.g., Chen & Tjosvold, 2008). However, our data cannot rule out the reverse causal order and suggest that the relationship between psychological safety and cooperative goal interdependence may be bidirectional. This possibility should be evaluated in future research employing longitudinal or experimental designs.

Second, our sample includes some respondents with a short tenure, and these respondents

may not be able to assess psychological safety reliably. Future research should consider how the length of tenure affects the assessment of psychological safety.

Third, following a common practice (e.g., Sun, Aryee, & Law, 2007), we measured helping behavior with supervisory ratings. Peer assessment may provide a different perspective on helping behavior and should be included in future research.

Fourth, although the hypothesized eight-factor model is the best-fitting model in the confirmatory factor analysis and shows acceptable model fit based on a holistic consideration of several fit indexes, the chi-square test is statistically significant. Despite the fact that the chi-square test tends to be very sensitive to sample size (Brown, 2006), our measurement model should be evaluated in future research.

Fifth, we note that female employees showed more helping behavior than male employees, which is consistent with gender role theory (Kidder, 2002). Gender differences in helping behavior are complex, involving different types of helping behaviors and the influence of the characteristics of the recipients (Eagly & Crowley, 1986; Kidder, 2002). For instance, gender may affect the perception of the helping behavior of a subordinate by his/her supervisor. It is beyond the scope of the present research to explore such complex issues, which should be investigated in future research.

Sixth, our research considers two harmony motives as moderators, and personality traits and other individual difference variables may also function as moderators, an interesting topic for future research. We do not consider the influence of contextual variables, such as task structure, that are related to goal interdependence (Van der Vegt & Van de Vliert, 2002). Future research needs to investigate this type of contextual factors as moderators of the effect of

psychological safety. This research direction calls for a team-level approach as team members are immersed in the same context. Psychological safety and cooperative goal interdependence are conceptualized at the individual level in the present research, and these constructs can be studied at the team level (e.g., Carmeli, 2007; Edmondson, 1999). Although conceptualizing these two constructs as individual level perceptions is valid and appropriate (Deutsch, 1973; James, Hartman, Stebbins, & Jones, 1977), it is valuable to explore how these two constructs conceptualized at the team level may influence individual-level outcome variables in future research.

Seventh, like most studies, the research was conducted in a single nation. However, our theorizing is not tied to any cultural processes, and we expect our findings to generalize to other cultural contexts. Nonetheless, societal culture may influence the magnitude of some relationships. For example, *mianzi*, or face, is salient in Chinese societies (Hwang, 1987), and is associated with the eagerness to maintain a positive public image (Hwang & Han, 2010).

Chinese may be more sensitive to psychological safety than their Western counterparts because it can protect them from loss of face. Another possibility is that Chinese culture emphasizes harmony (Hwang, 1987), and the moderating effects of the two harmony motives may be more salient in Chinese culture than in the West. These intriguing possibilities should be evaluated in future research.

To conclude, our study opens up a new line of research on psychological safety by demonstrating its impact on an interpersonally oriented behavior and introducing cooperative goal interdependence as a mediator of this effect of psychological safety. The research also highlights the boundary conditions for the effects of psychological safety on prosocial and

innovative behaviors based on two harmony motives. Our theorizing and findings suggest many interesting topics for future research.

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Table 1

Means, Standard Deviations, Correlations, and Reliabilities

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Gender ^a	—	—	—								
2. Integrating	3.88	0.65	-.06	(.81)							
3. Avoiding	2.99	0.70	-.00	-.02	(.71)						
4. Psychological safety	3.96	1.05	.09	.08	-.01	(.76)					
5. Cooperative goal interdependence	4.77	0.93	.02	.07	.10	.18**	(.75)				
6. Harnomy enhancement	3.76	0.48	-.08	.30**	.05	.16**	-.01	(.69)			
7. Disintegration avoidance	3.20	0.59	.06	-.04	.35**	-.02	.04	.23**	(.71)		
8. Helping behavior	4.83	0.75	-.13*	.10	-.01	.23**	.29**	.15*	.05	(.77)	
9. Innovative behavior	4.54	0.84	.07	.05	.06	.14*	.13*	.04	.03	.37**	(.87)

Note. Reliabilities are in parentheses.

^a Female - 0, Male - 1.

* $p < .05$, ** $p < .01$.

Table 2

Mediating Effect of Cooperative Goal Interdependence for Helping Behavior

Variable	B	SE	<i>t</i>	<i>p</i>
Mediator variable model with cooperative goal interdependence as dependent variable				
Psychological safety	.15	.06	2.63	<.01
Dependent variable model with helping behavior as dependent variable				
Gender ^a	-.23	.09	-2.44	<.05
Psychological safety	.16	.04	3.43	<.01
Cooperative goal interdependence	.21	.05	4.15	<.01
Bootstrap results for indirect effect ^b	Value	SE	LL 95% CI	UL 95% CI
	.03	.02	.01	.07

Note. Unstandardized beta coefficients are shown.

^a Female - 0, Male - 1.

^b 5,000 bootstrap samples. LL - lower limit; UL - upper limit; CI - confidence interval.

Table 3

Moderated Mediation Analyses for Helping Behavior

Variable	B	SE	<i>t</i>	<i>p</i>
Mediator variable model with cooperative goal interdependence as dependent variable				
Constant	-.28	.38	-.73	<i>ns</i>
Psychological safety	.15	.06	2.53	<.05
Dependent variable model with helping behavior as dependent variable				
Constant	5.64	.30	15.52	<.01
Gender ^a	-.20	.09	-2.12	<.05
Integrating	.07	.07	.94	<i>ns</i>
Disintegration avoidance	.01	.07	.11	<i>ns</i>
Psychological safety	.14	.05	3.08	<.01
Cooperative goal interdependence	.20	.05	4.07	<.01
Harmony enhancement	.07	.10	.72	<i>ns</i>
Cooperative goal interdependence × Harmony enhancement	-.27	.12	-2.29	<.05
Conditional indirect effect as a function of harmony enhancement ^b				
Value of harmony enhancement	Indirect effect	Boot SE	Boot <i>z</i>	Boot <i>p</i>
-1 SD (-.50)	.05	.03	1.85	.06
1 SD (.50)	.01	.01	.86	<i>ns</i>

Note. Unstandardized beta coefficients are shown.

^a Female - 0, Male - 1.

^b 5,000 bootstrap samples.

Table 4

Hierarchical Regression Analysis for Innovative Behavior

Variable	Innovative behavior					
	Step 1			Step 2		
	B	SE	<i>t</i>	B	SE	<i>t</i>
Constant	4.51**	.78	57.61	4.20**	.26	16.16
Gender ^a	.09	.11	.77	.10	.11	.85
Psychological safety	.14**	.05	2.61	.14**	.05	2.68
Avoiding				.10	.08	1.19
Harmony enhancement				.08	.12	.72
Disintegration avoidance				-.06	.09	-.64
Psychological safety × Disintegration avoidance				-.17*	.08	-2.08
R^2			.03			.06
ΔR^2						.03

Note. Unstandardized beta coefficients are shown.

^a Female - 0, Male - 1.

* $p < .05$, ** $p < .01$.

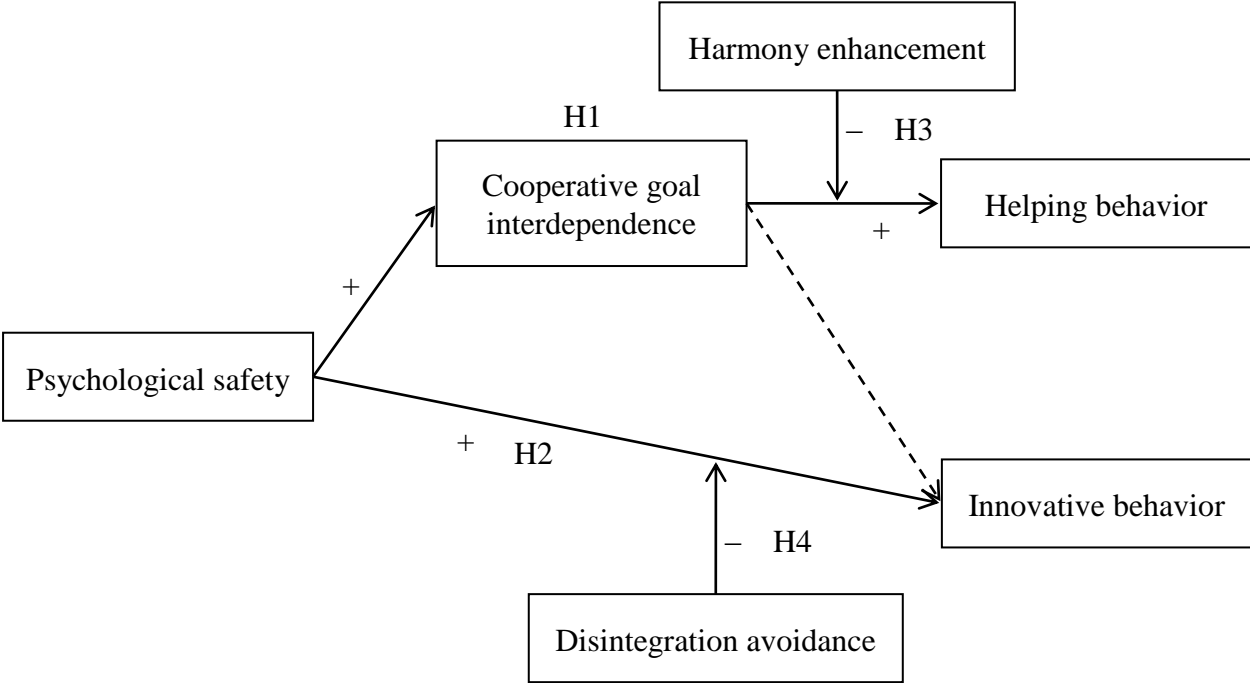


Figure 1. The proposed research model.

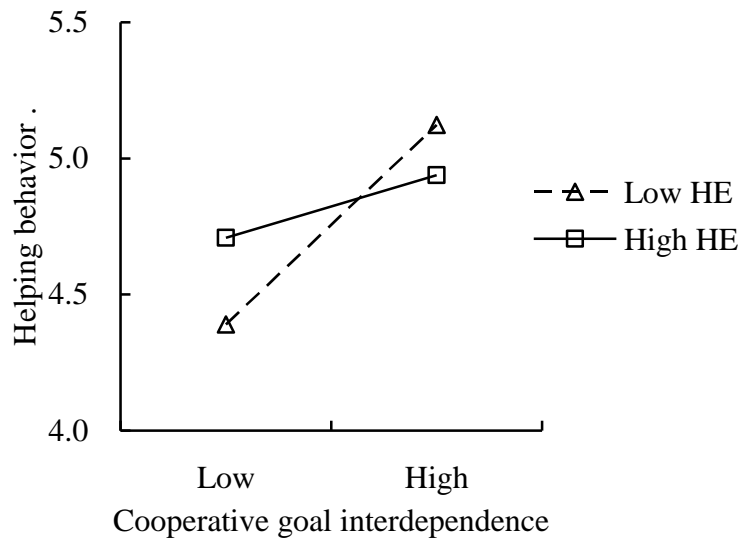


Figure 2. Interaction effect of cooperative goal interdependence and harmony enhancement (HE) on helping behavior.

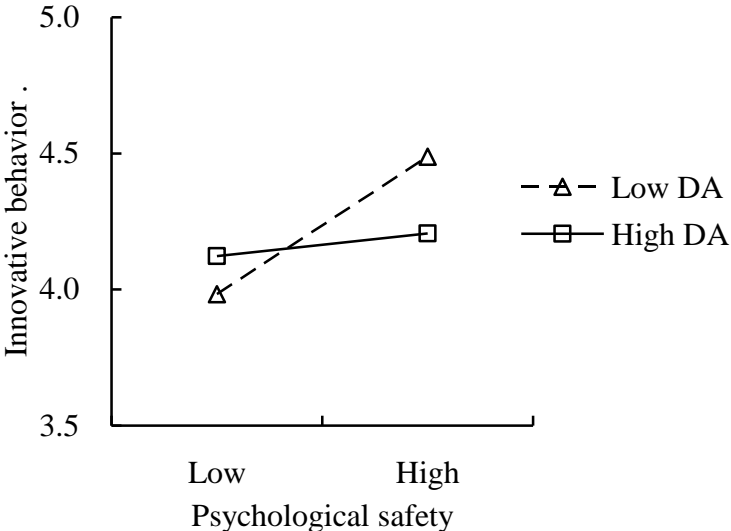


Figure 3. Interaction effect of psychological safety and disintegration avoidance (DA) on innovative behavior.