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>> Version of Record - Jul 31, 2012

OnlineFirst Version of Record - Aug 10, 2010

What is This?

Unfolding the Proactive Process for Creativity: Integration of the Employee Proactivity, Information Exchange, and Psychological Safety Perspectives

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The authors integrate the employee proactivity, information exchange, and psychological safety perspectives to develop a model of individual creativity. Proactive employees prepare themselves with resources in anticipation of effecting changes. The authors propose that proactive employees seek informational resources through exchanging with others in the workplace. Information exchange, in turn, fosters the development of trust relationships that provide psychological safety for creative endeavors. The authors collected time-lagged data from a sample of 190 matched employee–manager pairs in a specialty retail chain. The results showed that proactive employees engaged in more information exchange and, by so doing, built stronger trust relationships with supervisors and colleagues. These trust relationships, in turn, increased

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employee creativity. The relationship between information exchange and employee creativity was fully mediated by trust. The authors discuss the implications of the findings for creativity theory and research.

Creativity, the generation of novel and useful ideas (Amabile, 1988), is critical for employee job performance (Gong, Huang, & Farh, 2009) and organizational competitiveness (Oldham & Cummings, 1996). Researchers have devoted much attention to examining the antecedents of creativity (see Anderson, De Dreu, & Nijstad, 2004; Shalley, Zhou, & Oldham, 2004; Zhou & Shalley, 2003, for reviews). Among other perspectives (e.g., job design and mood), researchers have utilized the information exchange and psychological safety perspectives. *Information exchange* refers to conscious and deliberate efforts to exchange work-related information, knowledge, and ideas (Bunderson & Sutcliffe, 2002; Johnson, Hollenbeck, Humphrey, Ilgen, Jundt, & Meyer, 2006). Information exchange enhances creativity because it provides cognitive resources for creativity (Amabile & Khaire, 2008). Some have used the term *knowledge sharing* to refer to the exchange of information and knowledge (e.g., Cummings, 2004). Others have used the term *communication* (e.g., Ancona & Caldwell, 1992), based on the assumption that "communication enables the sharing of information and ideas, which is a viable source of innovation" (Hülsheger, Anderson, & Salgado, 2009: 1132).[1] Because the term *communication* serves multiple functions, information exchange being only one of them (Scott & Mitchell, 1976), we opted for the concept of *information exchange* in this study.

The psychological safety perspective, on the other hand, suggests that employees are motivated to innovate when the interpersonal atmosphere is safe for risky creative endeavors (Edmondson, 1999). At the team level, some researchers have used the term *participative safety,* which encompasses information sharing and trust, among others (e.g., Anderson & West, 1998; Axtell, Holman, Unsworth, Wall, Waterson, & Harrington, 2000; West & Anderson, 1996). At the organizational level, Amabile and Conti (1999) developed a work environment instrument that combines trust and access to information to predict creativity. *Trust* refers to the willingness to accept vulnerability, based on positive expectations of the intentions or behaviors of another (Mayer, Davis, & Schoorman, 1995). McAllister (1995) referred to the emotional bonds between individuals as *affect-based trust*. It is useful to examine trust separately because it is conceptually distinct from information exchange and because a person's perception of psychological safety stems from interpersonal trust (Edmondson, 1999).

Research on information exchange has focused on the team level (e.g., Ancona & Caldwell, 1992; Cummings, 2004; Tiwana & McLean, 2005), with team performance as the major dependent variable of interest (e.g., Bunderson & Sutcliffe, 2002; Johnson et al., 2006; Keller, 2001; Mesmer-Magnus & DeChurch, 2009).[2] Despite the fact that creative ideas are generated by individuals and that team creativity begins with individual creativity (West & Anderson, 1996), the effect of information exchange on individual creativity has received little attention. A similar observation applies to psychological safety research (e.g., Amabile

& Conti, 1999; Anderson & West, 1998; Klimoski & Karol, 1976), albeit to a lesser extent (see Clegg, Unsworth, Epitropaki, & Parker, 2002; Madjar & Ortiz-Walters, 2008, for exceptions). Furthermore, psychological safety research has yet to examine trust with reference to specific workplace contacts, such as colleagues and supervisors, and disentangle its effect on individual creativity from that of information exchange.

While research on information exchange and psychological safety provides important insights into creativity, several questions remain to be answered. First, what type of individual is likely to exchange information and build trust relationships to benefit creativity? This question has largely been overlooked, perhaps due to the overwhelming focus on the team level in prior research. Research suggests that proactive personality, the disposition toward taking the initiative to influence one's environment and effect constructive changes (Bateman & Crant, 1993), increases individual creativity (Fuller & Marler, 2009). However, the theoretical mechanism underlying the effect of proactive personality has not been clearly articulated and empirically tested. Drawing upon the proactivity process perspective, which views proactivity as a dynamic process involving anticipation, preparation, and action directed toward future impact (Grant & Ashford, 2008), we propose that proactive individuals prepare for future events and engage in information exchange and trust building to accumulate resources in anticipation of effecting changes.

Second, how do information exchange and psychological safety relate to each other in the process leading to individual creativity? On the surface, the two perspectives highlight different factors—cognitive versus motivational—which may affect creativity independently. However, we suggest that two forms of interrelations may exist: (1) Information exchange breeds trust, which, in turn, increases creativity, and (2) trust stimulates information exchange, which, in turn, increases creativity. In this study, we examine the aforementioned interrelations between information exchange and trust in the process leading to individual creativity. Overall, we integrate the employee proactivity, information exchange, and psychological safety perspectives to examine (1) how proactive personality may affect information exchange and trust and (2) how information exchange and trust may relate to each other in shaping creativity.

Last, but not least, it is unclear whether results from prior studies conducted in the West would hold in the Eastern context. We conduct the study in Taiwan, a society with relatively high power distance and collectivist values and where employees are vulnerable to the unequal power held by supervisors and susceptible to influences from colleagues (Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004). In such a cultural context, perceived psychological safety based on trust relationships is likely to be particularly important. Furthermore, information exchange may partially serve as a means to cultivate trust relationships. It, therefore, may enhance individual creativity because it fosters trust relationships with supervisors and colleagues.

We make several contributions with this study. First, we integrate the information exchange and the psychological safety perspectives to examine alternative forms of relationship between them. One interesting insight is that information exchange may affect individual creativity through the motivational mechanism, which is a valuable addition to the cognitive explanation in the literature. Second, we uncover the mechanism for the effect of proactive personality on individual creativity by showing information exchange and trust to

be mediators. Third, we extend the information exchange and psychological safety perspectives and associated research to the individual level. Such an extension is useful, as it can add to the parsimony and breadth of theories (Chen, Bliese, & Mathieu, 2005). We achieve these contributions using a time-lagged, multisource design so as to avoid the reliance found in prior studies on cross-sectional design (e.g., Ancona & Caldwell, 1992; Madjar & Ortiz-Walters, 2008), the same data source (e.g., Tiwana & McLean, 2005), or both (e.g., Clegg et al., 2002; Tiwana & McLean, 2005).

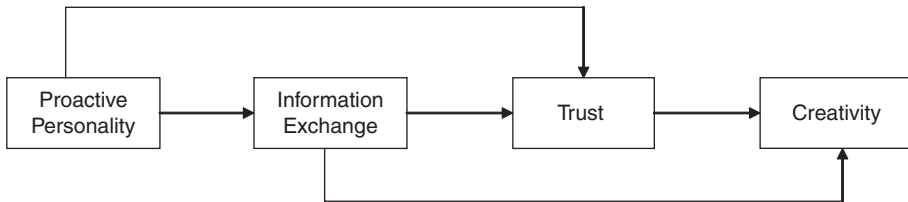# Model and Hypotheses

An Integrative Model

Proactive employees anticipate future outcomes or events, plan in advance, and take actions to accumulate resources for effecting constructive changes (Crant, 1995; Grant & Ashford, 2008). The resources (e.g., information and trust relationships) resulting from foresighted actions, in turn, facilitate creativity. Proactive employees accumulate informational resources through exchanges with others. They also develop or foster a socially supportive environment that is safe for risky creativity activities. Through interacting with others to exchange information, proactive employees may also build trust relationships, which, in turn, enhance creativity. The overall theoretical model is presented in Figure 1. In what follows, we elaborate how the relationship between proactive personality and individual creativity unfolds and how information exchange and trust relate to each other in shaping individual creativity.

Hypotheses Development

Conceptually, proactive personality captures an individual's natural inclination toward promoting constructive changes (Bateman & Crant, 1993; Crant, 1995). Proactive individuals are keen to "identify opportunities and act on them, show initiative, take action, and persevere until meaningful change occurs" (Crant, 2000: 439). Research suggests that proactive personality relates positively to a number of outcomes (e.g., job performance: Crant, 1995; newcomer adjustment: Kammeyer-Mueller & Wanberg, 2003; career success: Seibert, Kraimer, & Crant, 2001). Researchers have also examined, albeit to a lesser extent, the effect of proactive personality on individual creativity and have generally found a positive effect (Fuller & Marler, 2009). The process unfolding from proactive personality to creativity, however, remains a black box.

According to Kanfer and Heggestad (1997), stable individual differences are related to workplace performance through "relatively malleable, contextually situated . . . activity that involve[s] cognition, affect, and behavior" (p. 10). Following their logic, we suggest that proactive personality may relate to individual creativity through malleable states such as information exchange and trust. More specifically, Grant and Ashford (2008) developed a proactivity process perspective. They suggested that proactive individuals anticipate future events that are likely to occur. Such individuals are mindful of the effects of their actions

Figure 1
Proposed Integrative Model

and thus plan and act with foresight to seize opportunities and to promote desirable states and avoid undesirable ones so as to facilitate goal achievement. The forms that such foresighted actions may take include feedback seeking and interpersonal relationship building (Grant & Ashford, 2008). Other theorists (e.g., Aspinwall & Taylor, 1997) have proposed a similar process, namely, that proactive individuals undertake actions such as resource accumulation (e.g., information and social support) in advance in order to work with future events that may arise.

Proactive personality and information exchange. With the goal of effecting constructive changes (Frese & Fay, 2001), proactive employees may interact with others to exchange information in order to identify opportunities (Crant, 1995). Through exchange with others in their work units, they may also identify problems that provide opportunities for improvement (Frese & Fay, 2001). Different employees may have different information, knowledge, and perspectives regarding work issues. Through exchanges with others, proactive employees accumulate informational resources, improve their knowledge bases, develop new ideas, and refine and test these ideas for resolving problems or for tapping into identified opportunities (Grant & Ashford, 2008). They may also draw on this information to evaluate possible future events that may occur if they initiate changes and to plan accordingly for the realization of their goals.

Because proactive employees are less bounded by situational forces (Bateman & Crant, 1993) and have the motivation to learn (e.g., Major, Turner, & Fletcher, 2006), they may also seek out relationships and exchange information with people outside their own work units (Grant & Ashford, 2008). These exchanges may provide them with inspiration with regard to problems or opportunities that others in their own work units have not recognized. Proactive employees also need to define and shape the issues they bring up in ways that others can understand and buy into (Unsworth, 2001). They may use information exchange inside or outside their own units as a conduit for understanding how others think and react to those issues. Thus, we hypothesize:

Hypothesis 1: Proactive personality will be positively related to information exchange.

Proactive personality and trust building. The proactivity perspective also suggests that proactive employees build interpersonal relationships and accumulate social resources

(i.e., social network building) in advance to facilitate their pursuit of goals (Grant & Ashford, 2008). They may build trust relationships with workplace contacts, an important social resource, through social interactions with others. When interpersonal relationships are characterized by trust, employees are more motivated to identify and respond to one another's needs (Dirks & Ferrin, 2002; McAllister, 1995) and to engage in interpersonal citizenship behaviors (e.g., helping and cooperation; Dirks & Ferrin, 2002; McAllister, 1995). As noted, proactive employees identify problems or opportunities that others may not recognize. When trust relationships exist, trusting partners "take on their partners' problems as their own" (McAllister, 1995: 31). In such a context, proactive employees may find it easier to "sell" the problems or opportunities that they have identified to others. Trust relationships also protect proactive employees from potential adversity (e.g., back-stabbing behaviors). They may find trust relationships useful in covering their backs when they encounter setbacks or failures in the pursuit of changes and in focusing their cognitive and attentional resources on task-related issues (Mayer & Gavin, 2005). We therefore expect proactive employees to engage in trust building and thus to enjoy trust relationships with workplace contacts. To summarize, we hypothesize:

Hypothesis 2: Proactive personality will be positively related to trust relationship.

How might proactive employees develop trust relationships? We argue that proactive employees develop trust relationships with others partially through information exchange. At the most basic level, information exchange, unlike unilateral information seeking, involves cooperative and mutually beneficial social interactions among employees. Interactions of this nature have been shown to foster positive attitudes (e.g., liking) toward each other (Allport, 1954; Pettigrew & Tropp, 2000). Information exchange provides a setting where exchange partners interpret and make attributions for the behavior of others and subsequently develop trust relationships. Based on the principle of reciprocity in social exchange theory (e.g., Blau, 1986), information exchange is likely to build trust (McAllister, 1995). The act of sharing information indicates to others the focal employee's trust that exchange partners will not take advantage of his or her disclosure of information. It also reveals the focal employee's initiative in attempting to help others and improve collective performance. In response to such trusting and helping behavior, the exchange partners are likely to reciprocate by giving information to the focal employee, and such reciprocity fosters trust relationships (Blau, 1986; McAllister, 1995).[3] To summarize, we hypothesize:

Hypothesis 3: The relationship between proactive personality and trust will be mediated by information exchange.

Information exchange and creativity. Are informational and social resources (e.g., trust relationships) critical to individual creativity? The componential model of creativity suggests that informational resources constitute an important building block of individual creativity (Amabile, 1988). If the informational resources "are already sufficiently rich to afford an ample set of possible pathways to explore during task engagement, the reactivation of this already-stored set of information and algorithms may be almost instantaneous" (Amabile, 1988: 139).

The accumulation of informational resources is thus critical for creativity and is considered to be a preparatory stage for the actual generation of responses.

Employees can accumulate informational resources through exchange with others in the workplace. From the information exchange perspective, the flow of resources among exchange partners facilitates creativity (Ancona & Caldwell, 1992; Perry-Smith, 2006). Information exchange involves both the giving and taking of information. It is clear that the acquisition of information provides the raw materials from which new responses can be generated through synthesis or recombination (Amabile, 1988; Simonton, 1999). Information exchange with others performing similar tasks increases one's job-relevant knowledge, which is critical for creativity (Amabile, 1988; Perry-Smith, 2006). By drawing on information and through interacting with others, employees can evaluate the usefulness of their new ideas and solutions. Information exchange may also increase one's creativity-relevant skills (e.g., divergent thinking). When employees exchange with others inside and outside their own units, they are exposed to different ideas and ways of thinking. This exposure may trigger the use of broader categories and the generation of more divergent solutions (Kanter, 1988). It is tempting to suggest that only the receipt of information matters for one's creativity. However, by using recipients as a sounding board, outward sharing can improve one's original idea. Research suggests that an interaction or exchange based on equal partnership, as opposed to fixed teacher–learner roles, enhances learning (Spurlin, Dansereau, Larson, & Brooks, 1984).

Hypothesis 4: Information exchange will be positively related to employee creativity.

Information exchange, trust, and creativity. How might information exchange and trust relate to each other in terms of fostering individual creativity? As we discussed for Hypothesis 3, information exchange facilitates the development of interpersonal trust. The psychological safety perspective (Anderson & West, 1998; Edmondson, 1999) suggests that trust relationships facilitate individual creativity. Thus, we expect that, in addition to its cognitive benefit, information exchange may enhance creativity by fostering trust. Trust is a valuable social resource for employees engaging in risk-taking behaviors in that "the amount of trust for the other party will affect how much risk a party will take" (Mayer et al., 1995: 725). In their meta-analysis, Colquitt, Scott, and LePine (2007) found that trust has a positive relationship with risk-taking behaviors. Researchers suggest that risk is inherent in creative endeavors (George & Zhou, 2007). First, the prospects for creative ideas are often uncertain because many of them fail. Second, novel ideas may be resisted or rejected, and employees with such ideas may be branded as deviants and ostracized from the group.

When trust relationships do not exist, employees may perceive that their workplace contacts are unsupportive and likely to exploit their vulnerability in the event of failure in creative endeavors. With trust relationships in place, they feel safe to engage in risky creative activities (Edmondson, 1999; Leana & Van Buren, 1999), based on the positive expectation that others will not exploit their vulnerability if they fail. They experience less fear and are thus better able to concentrate their cognitive and attentional resources on the production of ideas (Kanfer & Ackerman, 1989). Additionally, moods are considered a fundamental aspect of the experience of trust (Jones & George, 1998). Trust fosters positive moods (e.g., elation

and enthusiasm; Jones & George, 1998) that are conducive to creativity (Baas, De Dreu, & Nijstad, 2008). It also mitigates uncertainty and ambiguity in social interactions by fostering cooperation and reciprocal caring and concern (McAllister, 1995). This should reduce negative moods (e.g., fear and stress) that hinder creativity (Baas et al., 2008).

Psychological safety facilitates learning behaviors, such as experimenting and making improvements, in that it alleviates excessive concerns about the negative reactions of others to such behaviors. The "sense of confidence that the team will not embarrass, reject, or punish someone for speaking up . . . stems from mutual respect and trust among team members" (Edmondson, 1999: 354). The perception of psychological safety thus stems from interpersonal trust, which has been included as an element in various concepts of a supportive work environment that enhances creativity (e.g., Amabile, Conti, Coon, Lazenby, & Herron, 1996; Anderson & West, 1998). To sum up, in anticipation of effecting changes, proactive employees act to build trust relationships as a social resource in order to manage the adversity associated with potential failures (Grant & Ashford, 2008). We summarize the expected relationships among information exchange, trust, and creativity as follows:

> *Hypothesis 5:* Trust will be positively related to employee creativity.
> *Hypothesis 6:* The relationship between information exchange and employee creativity will be mediated by trust.

Summary. Hypotheses 1 through 6 suggest that proactive personality enhances creativity through information exchange and trust. A critical question is how information exchange and trust may relate to each other in the proactive process of individual creativity. When information exchange and trust are examined independent of proactive personality, it is plausible that trust may also facilitate information exchange because the more people believe that their social contacts will not take advantage of their vulnerability, the less they fear sharing informational resources. However, we expect the reverse to be more likely, and this expectation is of particular relevance to the proactivity perspective. Proactive employees take actions directed toward future impact. Information exchange is an action to acquire resources for effecting changes. Conceptually, proactive employees should not automatically enjoy trust relationships with others. Trust, as a social resource, cannot develop from a vacuum; it is likely to be a result of foresighted actions such as information exchange. Overall, we posit that the proactive personality → information exchange → trust → creativity flow is more plausible. To sum up, we hypothesize:

> *Hypothesis 7:* The relationship between proactive personality and employee creativity will be mediated by information exchange and trust.

Method

We collected data from a chain store in Taiwan that specializes in women's and baby products. The company directly operates a chain of 174 specialty retail stores with 375 employees in total (excluding store managers). We examined the creativity of the employees (excluding store managers). Before the data collection began, the fourth author interviewed

a senior manager from the company. It was confirmed that employee creativity was welcomed; for example, the company welcomed creative ideas from employees regarding store activities (e.g., product promotions) that expanded its sources of customers.

With the endorsement of the company, the fourth author sent questionnaires to store employees and managers. The participants completed the questionnaires in their own time, and these were returned to the fourth author in preaddressed and stamped envelopes. The participants were informed that their responses would be used for research purposes only and kept strictly confidential. They were assured that no one in their company would have access to their responses. Each participant received a token gift for participation in the study.

We conducted three waves of surveys. In the first wave, we asked participants to complete a survey on their proactive personality, openness to experience, and demographics. Three months after the first wave, we asked participants to complete the second wave survey on information exchange and trust. In the third wave survey, which occurred four months after the first wave, we asked store managers to rate employee creativity. As each store had only one store manager, employee creativity ratings were nested within the store manager. We sent the questionnaires to all 375 store employees and received 201 matched responses, representing a 54% response rate. After removing cases with missing values, we had 190 matched employee–manager pairs.

Measurements

The measures were originally in English and then translated into Chinese using the translation and back translation procedure (Brislin, 1980). A management professor translated all of the scale items into Chinese. A bilingual doctoral student in management fluent in both English and Chinese then back translated them into English. Minor disagreements regarding translation were resolved through discussion. A bilingual management professor then compared the English and Chinese versions and found them to be highly comparable.

Proactive personality. We used the shortened version of Bateman and Crant's (1993) scale to measure proactive personality. The shortened 10-item scale was developed and validated by Seibert, Crant, and Kraimer (1999) and has been used in prior studies (e.g., Brown, Cober, Kane, Levey, & Shalhoop, 2006; Major et al., 2006). A sample item is, "No matter what the odds, if I believe in something I will make it happen" (1 = *not at all* to 7 = *always*). We averaged the items to obtain the score for proactive personality (α = .74).

Information exchange. We adapted the scale from Subramaniam and Youndt (2005) to measure information exchange. The four-item scale taps into information exchanges with people inside and outside one's unit within the organization. A sample item is, "I interact and exchange ideas with people from different units of the company" (1 = *strongly disagree* to 7 = *strongly agree*). We averaged the items to obtain a score for information exchange (α = .82).

Trust. There are two types of trust: cognition based and affect based (McAllister, 1995). Cognition-based trust is based on another party's ability to perform his or her job. Compared

to affect-based trust (i.e., concern and care for a subordinate), a supervisor's job ability has less to do with a subordinate's willingness to be vulnerable in creative endeavors. Furthermore, we took the social–relational perspective. Affect-based trust emphasizes the social exchange foundation of the trust relationship and the resulting inducement of positive affective states (Jones & George, 1998; McAllister, 1995). This exchange foundation precludes affect-based trust from influence outside directly experienced interpersonal relationships. Cognition-based trust, on the other hand, places less emphasis on mutual exchange relationships and greater emphasis on inferences drawn about another party's ability. Such inferences may be based on passive observations or on sources of indirect information (e.g., credentials and reputation). Therefore, we included only affect-based trust in this study.

Who then are the important workplace contacts with whom it is beneficial to have trust relationships? We posit that the focal employee will be concerned about the reactions of his or her supervisor and colleagues because the employee works with these people frequently and on a regular basis. We adapted the affect-based trust scale from McAllister (1995). We measured trust relationships with store manager and colleagues separately on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*). A sample item is, "My manager and I can freely share our ideas, feelings, and hopes."

We subjected information exchange, trust relationship with supervisor, and trust relationship with colleagues—the mediating variables—to confirmatory factor analyses. Compared to the two-factor model, which combined the trust variables as one factor ($\chi^2 = 512.47$, $p = .00$; normed fit index [NFI] = .89, non-normed fit index [NNFI] = .90, comparative fit index [CFI] = .90, standardized root mean square residual [SRMR] = .09), and the one-factor model ($\chi^2 = 709.51$, $p = .00$; NFI = .85, NNFI = .84, CFI = .86, SRMR = .12), the three-factor model fitted the data better ($\chi^2 = 242.70$, $p = .00$; NFI = .95, NNFI = .96, CFI = .96, SRMR = .05). These results supported the distinctiveness of the information exchange and trust measures. Due to the high correlation between the two trust measures, which led to the multicollinearity problem ($r = .68$, $p < .01$), we averaged the two trust measures to obtain an overall score for trust ($\alpha = .95$).

Employee creativity. We measured employee creativity using the 13-item scale from George and Zhou (2001). This scale is one of the commonly used creativity measures for field studies (Zhou & Shalley, 2003) and has been shown to be valid and reliable in prior studies (e.g., George & Zhou, 2001, 2007; Shin & Zhou, 2003; Zhang & Bartol, 2010). A sample item is, "Comes up with new and practical ideas to improve performance" (1 = *strongly disagree* to 7 = *strongly agree*). We averaged the items to obtain the score for employee creativity ($\alpha = .96$).

Control variables. Similar to prior research (e.g., George & Zhou, 2007; Perry-Smith, 2006; Shalley, Gilson, & Blum, 2000), we controlled for employee age, education, tenure, rank, time with store manager, and openness. Rank may be related to involvement in creative activities and the generation of creative ideas (Ibarra, 1993). Education and rank were dummy coded. There were two categories for education (0 = *college or university*; 1 = *high school*) and three categories for rank (superintendent, store assistant, and salesperson). We also controlled for time with store manager, as this may have had an effect on the creativity

rating given by the manager. Finally, we included openness to experience, which captures a person's range of interests and fascination with novelty. Openness has been shown to be related to creativity (Feist, 1998; Shalley et al., 2004). We measured openness using items from Costa and McCrae (1992). All of the store employees were female, and the average employee age was 29.6 years. Sixty-three percent of the employees had a high school education, and 37% had a college or university education. On average, the employees had worked for the company and store managers for 3.6 and 1.64 years, respectively.

Analytic Strategy

In this study, employee creativity ratings were nested within store managers. To evaluate the potential nested effect in the creativity ratings, we conducted a one-way random-factor ANOVA, with store managers being the independent variable and employees' creativity ratings being the dependent variable. This analysis showed that the intraclass correlation coefficient (1) was .66 and significant for creativity ratings: $F(106, 83) = 1.75$, $p < .01$. There was therefore a significant nested effect in the creativity ratings. As such, we conducted multilevel modeling using the Mplus 5.2 software package (Muthén & Muthén, 2007) to account for the resulting nonindependence and to directly and simultaneously evaluate the direct and indirect effects between variables.

Specifically, we accounted for the nesting effect by allowing random intercepts for Level 1 dependent variables. The hypothesized mediation effects were directly evaluated with Sobel tests (Chen, Kirkman, Kanfer, Allen, & Rosen, 2007) because, due to the complexity related to resampling nested data structure, a bootstrapping approach is not yet available for evaluating mediation in multilevel modeling. Given that random effects (i.e., random intercepts) were modeled, traditional fit indices (e.g., goodness-of-fit index, CFI, root mean square error of approximation) for evaluating structural equation models were not appropriate. We therefore relied on comparing information criteria, such as Akaike information criterion, Bayesian information criterion (BIC), and sample-size adjusted BIC, to evaluate the fit of the models tested (Wang, 2007). Smaller information criteria indicated a better fit of the model to the data. Furthermore, when two multilevel models were nested with each other, we statistically compared them by using the asymptotic-restricted chi-square test (Wang, 2007). When using this approach, the asymptotic-restricted chi-square statistic equals the –2 log likelihood of the simpler model minus the –2 log likelihood of the more complex model, and the degrees of freedom equals the number of free parameters estimated in the more complex model minus the number of free parameters estimated in the simpler model.

Results

Table 1 presents the means, standard deviations, and correlations for all variables.[4] The simple correlations should be interpreted with caution because they do not account for the nesting effect in this study (Chen & Bliese, 2002). An analytic procedure (e.g., multilevel modeling) that accounts for the nesting effect is required to reveal the true magnitude of the relationships.

Table 1
Means, Standard Deviations, and Correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Age	29.61	6.28	–										
2. Education[a]	0.63	0.48	.24	–									
3. Rank: salesperson	0.49	0.50	-.18	-.23	–								
4. Rank: store assistant	0.41	0.49	.04	.13	-.82	–							
5. Tenure	44.00	48.78	.43	.27	-.59	.25	–						
6. Openness	4.71	0.78	.12	-.12	.08	-.10	-.01	–					
7. Time with store manager	19.67	21.55	.26	.23	-.39	.27	.48	-.06	–				
8. Proactive personality	5.18	0.78	.19	.00	-.04	-.03	.13	.40	.05	–			
9. Information exchange	5.33	0.86	.20	-.14	-.06	-.02	.22	.23	.08	.37	–		
10. Trust	5.80	0.90	.05	-.11	.01	-.04	.07	.12	.22	.29	.51	–	
11. Employee creativity	4.90	1.03	-.02	.06	-.26	.16	.16	-.08	.22	.13	.07	.23	–

Note: $N = 190$ (listwise). A correlation $\geq |.15|$ is significant at the $p < .05$ level; a correlation $\geq |.18|$ is significant at the $p < .01$ level.
a. 0 = college or university, 1 = high school.

Multilevel Modeling

Although a significant direct effect of proactive personality on employee creativity is not required for testing mediation (e.g., Mackinnon, Fairchild, & Fritz, 2007; Mackinnon, Lockwood, Hoffman, West, & Sheets, 2002; Mackinnon, Lockwood, & Williams, 2004; Shrout & Bolger, 2002), we examined the direct relationship prior to hypotheses testing in the multilevel modeling. Similar to prior studies (e.g., $\beta = .18$, $p < .05$; Seibert et al., 2001), we found a significant relationship between proactive personality and employee creativity ($\gamma = .17$, $p < .05$), after controlling for employee age, education, tenure, rank, time with store manager, openness, and the nested effect of store managers. Proactive personality accounted for 2.2% of the variance in creativity above and beyond the control variables. The question is therefore whether the relationship is mediated by information exchange and trust, as we proposed.

To test the hypotheses, we examined a series of multilevel models. Our baseline model is presented as the first model (Model 1), which estimated all of the hypothesized relationships between the current variables. Specifically, we included the direct paths from (1) proactive personality to information exchange and trust, (2) information exchange to trust, and (3) information exchange and trust to creativity. (Please refer to Table 2 for an illustration of the model and the model information criteria.) Table 3 presents the unstandardized coefficients for the structural paths estimated in the model. It can be seen that proactive personality was positively related to both information exchange (Hypothesis 1; $\gamma = .31$, $p < .01$) and trust (Hypothesis 2; $\gamma = .19$, $p < .05$), and information exchange was positively related to trust ($\gamma = .50$, $p < .01$). A Sobel test suggested that there was a significant indirect effect from proactive personality to trust via information exchange (Hypothesis 3; indirect effect = .15, $p < .01$). Information exchange was not significantly related to creativity; thus, Hypothesis 4 was not supported. Trust, however, was positively related to creativity (Hypothesis 5; $\gamma = .23$, $p < .05$). A Sobel test suggested that there was a significant indirect effect from information exchange to creativity via trust (Hypothesis 6; indirect effect = .12, $p < .05$). Finally, the indirect effect from proactive personality to creativity through information exchange and then through trust was also significant (Hypothesis 7; indirect effect = .04, $p < .05$).

We then evaluated a second model (Model 2) to assess whether information exchange was a partial or full mediator of the relationship between proactive personality and trust by eliminating the direct path from proactive personality to trust from Model 1 (i.e., testing a full mediation model). This second model (Model 2) had a poorer fit to the data than Model 1, $\chi^2(df = 1) = 5.4$, $p < .01$, and yielded larger information criteria (see Table 2), suggesting that the full mediation relationship between proactive personality and trust was not sufficient to account for the total relationship between these two variables. As such, information exchange was a partial mediator of the relationship between proactive personality and trust (Hypothesis 3). Next, we assessed whether information exchange and trust were independent from each other in affecting creativity. We did so by removing the direct path from information exchange to trust from Model 1. This third model (Model 3) also had a poorer fit to the data than Model 1, as evidenced by the result from the chi-square test, $\chi^2(df = 1) = 43.15$, $p < .01$, and the larger information criteria (see Table 2).
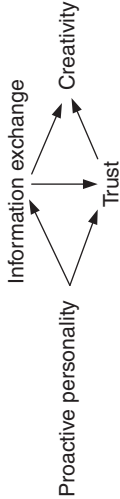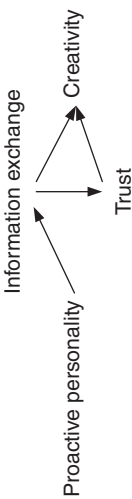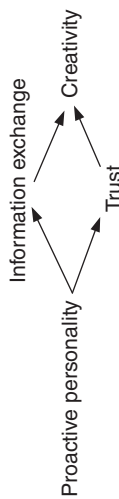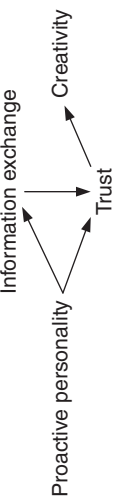
Table 2
Multilevel Model Comparisons

Model	Structure	−2 Log Likelihood	Number of Free Parameters	Akaike Information Criterion	Bayesian Information Criterion (BIC)	Sample-Size Adjusted BIC
1	Information exchange → Creativity; Trust; Proactive personality	1,345.16	38	1,421.16	1,543.95	1,423.58
2	Information exchange → Creativity; Trust; Proactive personality	1,350.64	37	1,424.64	1,544.19	1,427.00
3	Information exchange → Creativity; Trust; Proactive personality	1,388.31	37	1,462.31	1,587.87	1,464.67
4	Information exchange → Creativity; Trust; Proactive personality	1,345.96	37	1,419.96	1,539.51	1,422.31

Table 3
Unstandardized Path Coefficients and Indirect Effects in Multilevel Models

Structural Path	Unstandardized Path Coefficients			
	Model 1	Model 2	Model 3	Model 4
Proactive personality → information exchange	.31**	.31**	.30**	.31**
Proactive personality → trust	.19*	–	.35**	.19*
Information exchange → trust	.50**	.55**	–	.50**
Information exchange → creativity	−.09	−.09	−.09	–
Trust → creativity	.23*	.23*	.23*	.19*
	Indirect Effects			
Proactive personality → information exchange → trust	.15**	.17**	–	.15**
Information exchange → trust → creativity	.12*	.13*	–	.10*
Proactive personality → information exchange → trust → creativity	.04*	.04*	–	.03*

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

Thus far, the results had shown that the baseline model (Model 1) had a better model fit than the alternative models (Model 2 and Model 3). The results from this model supported the positive relationships that proactive personality has with both information exchange (Hypothesis 1) and trust (Hypothesis 2), as well as the partial mediating effect of information exchange on the proactive personality–trust relationship (Hypothesis 3). Hypothesis 4 was not supported because the path coefficients on the link between information exchange and creativity from Model 1, Model 2, and Model 3 were all nonsignificant (see Table 3). The results supported the positive relationship between trust and creativity (Hypothesis 5). Taken together, these results provided support for Hypothesis 6, in that we found that trust fully mediates the relationship between information exchange and creativity.

To further examine the results concerning Hypothesis 6, we tested a fourth model (Model 4) by eliminating the direct path from information exchange to creativity from Model 1. Model 4 was not significantly different from Model 1, $\chi^2(df = 1) = .80$, $p > .10$, and yielded smaller information criteria (see Table 2). Model 4 was preferred based on the principle of model parsimony. A Sobel test suggested that Model 4 yielded a significant indirect effect from information exchange to creativity via trust (indirect effect = .10, $p < .05$). Again, the result indicated that trust fully mediates the information exchange–creativity relationship (Hypothesis 6). In addition, Sobel tests suggested that Model 4 yielded significant indirect effects from proactive personality to trust via information exchange (Hypothesis 3; indirect effect = .15, $p < .01$) and from proactive personality to creativity through information exchange and then through trust (Hypothesis 7; indirect effect = .03, $p < .05$).

Supplementary Analyses

To examine the potential reverse causality between information exchange and trust, we evaluated Model 1, Model 2, and Model 4 with the alternative path from trust to information

exchange. Each of these models yielded larger information criteria than its corresponding model with the path from information exchange to trust. Therefore, the concern regarding reverse causality between information exchange and trust was alleviated. For the purpose of brevity, the detailed results of this supplementary analysis are not presented here but are available from the authors upon request.

Discussion

Summary of Findings

Our objective was to integrate the employee proactivity, information exchange, and psychological safety perspectives in order to understand how proactive personality affects individual creativity and how information exchange and trust relate to each other in the process leading to creativity. Our results indicated that (1) proactive employees engage in more information exchange, (2) proactive employees build trust relationships and do so partially through information exchange, (3) trust relationships are conducive to creativity, and (4) information exchange enhances creativity through fostering trust relationships. Finally, a comparison of alternative forms of relationship between information exchange and trust supported the following chain of relationship: proactive personality → information exchange → trust → creativity.

Implications for Theory and Research

This study suggests that a proactive personality is an important individual characteristic antecedent to resource accumulation for creativity. Moreover, as the first study to identify and examine the mechanism underlying the effect of proactive personality, it suggests that information exchange and trust are part of a more complex process leading from proactive personality to individual creativity. The mediating roles of information exchange and trust support the idea that stable personality trait relates to individual outcomes through malleable states such as behaviors and affect-based trust. They also support the idea that, in the pursuit of effecting change, proactive individuals act with foresight to seize opportunities and to promote favorable conditions (Grant & Ashford, 2008). This study reveals one such foresighted action (i.e., information exchange) that facilitates the development of social resources (i.e., trust relationships) critical for creativity.

Second, this study represents the first attempt at integrating the information exchange and the psychological safety perspectives to study individual creativity and offers important implications for theory development. The information exchange perspective emphasizes the value of information exchange in the acquisition of cognitive resources (e.g., ideas, information, and knowledge) for team performance or creativity. The psychological safety perspective highlights the value of interpersonal trust in motivating individuals to experiment and to speak up. Conceptually, information exchange and trust are distinct in their primary focus (i.e., cognitive vs. motivational). This study empirically demonstrates their distinctiveness.

The implication is that combining the two into one single concept (e.g., participative safety) may not be sufficiently justified. This study contributes to our understanding of the distinction between information exchange and trust and of how they relate to each other in shaping individual creativity.

In particular, we found that information exchange enhances creativity fully through trust. One implication of this is that information exchange, by itself, may not necessarily benefit individual creativity. It may be more effective in facilitating individual creativity by serving as a conduit through which employees develop social resources (e.g., trust relationships) critical to their engagement in risky creative endeavors. This study thus reveals an important motivational mechanism for the effect of information exchange. The theoretical implication is that the information exchange perspective should be extended by explicitly including the motivational dimension of its effect.

The above theoretical implication, however, must be viewed with the study's context in mind. We conducted the study in the collectivistic and high power distance culture of Taiwan. Employees in high power distance cultures are more dependent on, and thus more vulnerable to, the authorities than those in low power distance cultures. They are also more vulnerable to sanctions from colleagues (e.g., being ostracized) than those in individualistic cultures. In such a cultural context, employees may find trust relationships to be a particularly important social resource that helps them to seize potential opportunities (e.g., selling problems to others who have not recognized them) or safeguards them from possible failures or interpersonal risks in the creative endeavors. Information exchange may enhance creativity to the extent that it builds trust relationships. The participants in this study may have used information exchange as a way to cultivate trust relationships.

Contrary to the information exchange perspective, we found no direct effect of information exchange on creativity. To explore this issue further, we conducted field interviews. With no knowledge of our empirical findings, the store managers were asked whether information exchange is critical for store employee creativity, and why or why not. One manager commented,

> Retail sale jobs are not complex. Although some store employees are able to demonstrate creativity, information exchange is not particularly necessary [for creativity]. Even if an employee exchanges information with colleagues, it won't help creativity much. After store employees have worked [in the store] for some time, they are aware of what the work entails. Some employees do actively exchange with others, but they don't gain much in terms of a deeper understanding of job contents or sales methods. Creativity is not likely to increase much.

A manager from a different store made similar comments. These comments suggest that retail store jobs are not knowledge intensive, and thus information exchanges with colleagues may not benefit employee creativity significantly. The pattern of our findings and the interviewees' comments point to potential conditions under which information exchange (i.e., the cognitive aspect) is likely to be more or less important than the motivational aspect based on trust. Information exchange may be more influential when jobs are complex and/or when the cultural context is characterized by low power distance and collectivism; for example,

information exchange may have a significant impact in R&D jobs (see Perry-Smith, 2006, for some indirect evidence).

Finally, this study contributes to the psychological safety perspective. While trust has been included as a basis of psychological safety in team-level research, it has received less attention in individual creativity research. The finding that the workplace trust relationship relates positively to individual creativity supports the psychological safety perspective at the individual level. Furthermore, it extends the research of both Clegg et al. (2002) and Madjar and Ortiz-Walters (2008) by examining trust relationships with specific workplace contacts (i.e., colleagues and direct managers) rather than with customers or organizations in general. This study therefore refines the psychological safety perspective by delineating the dimensions of workplace trust relationships that matter for creativity.

Practical Implications

The finding relating to the indirect effect of proactive personality on employee creativity has practical implications. As proactive personality is a relatively stable trait, organizations can enhance creativity by selecting individuals based on their proactive personality in addition to other important criteria. As proactive individuals engage in more information exchange, and thus develop trust relationships, selecting such individuals should enhance other work outcomes, such as cooperation and information flow.

Selection as a practical tool does not apply to incumbent employees. The creativity of incumbent employees can be boosted by building trust relationships. Information exchange may help to the extent that such social interactions foster trust. With trust building in mind, organizations, particularly those in a high power distance and collectivistic cultural context, could provide platforms for employees to engage in information exchange.

As trust relationships can be developed in different ways, the finding related to trust opens up a range of avenues for increasing creativity; for example, managers can develop trust by avoiding any backstabbing behaviors in relation to failed creative efforts. Managers can also respond constructively and with care when employees run into problems in the creative process. A case in point is the reaction of Robert Johnson II, the former chairman of Johnson & Johnson, to James Burke, then chief of a new-products division, when one product line failed. Before the meeting, Burke feared that he would be fired. To his surprise, Johnson congratulated him on his attempt to create the new product line. Johnson remarked, "What business is all about is making decisions, and you don't make decisions without making mistakes. Now, don't ever make that mistake again, but please make sure you make other mistakes" (Tedlow & Smith, 2005: 9). If managers consistently follow Johnson's example, employees will feel that managers can be trusted and will thus be willing to take risks in order to be creative.

Limitations and Future Research Directions

The strength of this study is that it utilized a time-lagged design and obtained data from two different sources. However, the study is not without limitations. Our findings should be

interpreted with the following limitations in mind. First and foremost, we did not collect repeated measures for better examining the proposed unfolding processes. Second, we did not fully establish the causality between information exchange and trust. Our supplementary analysis results showed that the reverse relationship is less likely. This may have been due to the fact that we included proactive personality as the antecedent in the model. Conceptually, trust relationship is more likely to be a result of foresighted actions such as information exchange arising from proactive personality. Similarly, we were not able to fully establish that the causality runs from trust to creativity. Conceptually, however, there is no strong reason to believe that employee creativity at an earlier point would affect trust relationships with others at a later point. Empirically, trust was measured before creativity. Based on the above conceptual and empirical reasons, the trust → creativity relationship seems to be more plausible.

Third, we limited trust relationships to colleagues and supervisors. We focused on creativity in the workplace, and our theoretical argument hinges on an employee's willingness to take risks in order to be creative. In this case, the most critical contacts to have trust relationships with are colleagues and one's direct manager. To give a more accurate estimate of the effect of trust relationships with colleagues and supervisors, future research should control for trust relationships with other contacts. We recognize that each employee has many diverse outside contacts, and it may be difficult practically to ask respondents to rate trust relationships with these different outside contacts.

Finally, we conducted the study in Taiwan, where power distance and collectivism are relatively high. Our findings regarding information exchange and trust may be specific to this cultural context. It is necessary to replicate the study in other cultures. Also, we conducted the study using relatively simple jobs. Future research may examine the relative importance of information exchange and trust under other conditions (e.g., in highly complex jobs). This will help identify potential boundary conditions and inform theory development.

Conclusions

This study integrated the employee proactivity, information exchange, and psychological safety perspectives in order to examine the proactive process for individual creativity. It advances our understanding of personality antecedents to the development of resources critical for creativity. Proactive employees are more creative partly because they accumulate resources to seize future opportunities or to prepare for potential challenges. Thus, this study also advances our understanding of how a proactive personality enhances individual creativity. Moreover, information exchange can be a means to develop trust relationships that facilitate creativity. This study therefore reveals the motivational mechanism through which information exchange enhances individual creativity.

Notes

1. It is generally agreed in the literature that *creativity* refers to idea generation, whereas *innovation* includes both idea generation and implementation (Anderson, De Dreu, & Nijstad, 2004).

2. Hülsheger, Anderson, and Salgado (2009) included internal and external communication as the predictors of innovation. However, because communication serves multiple functions (i.e., control, motivation, emotional

expression, and information exchange; Scott & Mitchell, 1976), the specific effect of information exchange remains unclear.

3. Proactive individuals may develop trust relationships through other means, such as engaging in citizenship behaviors (Mayer, Davis, & Schoorman, 1995; McAllister, 1995), forming alliances, and using influence tactics. We thank an anonymous reviewer for this insight.

4. The magnitude of the relationship between proactive personality and creativity in this study ($r = .13$) is smaller than that in studies using self-rated creativity (e.g., $r = .36$; Kim, Hon, & Crant, 2009) but comparable to that in studies using supervisor rating (e.g., $r = .15$; Seibert, Kraimer, & Crant, 2001). This observation is consistent with the meta-analytic finding that the magnitude of the relationship is smaller when creativity is rated by other sources ($r = .13$, $p < .05$) than when it is self-reported ($r = .47$, $p < .01$; Fuller & Marler, 2009). Research using self-reported creativity may inflate its relationship with proactivity personality.

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