Cognitive Style Diversity in Decision Making Teams: A Conceptual Framework

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ARTICLE INFO	ABSTRACT
	Team diversity scholars have called for examining cognitive variables (van Knippenberg & Schippers, 2007), such as cognitive style, in team dissimilarity research. However, due to the dearth of research on cognitive style diversity in teams, heeding these calls requires new theory. Therefore, we extended recent theoretical developments that suggested indirect relationships between diversity and performance by orienting cognitive style within the team diversity literature and by proposing cognitive style diversity's effects on team processes in decision making teams. We also integrated the moderating role of team member perspective taking into the framework. We presented arguments and propositions for the combined effects of cognitive style diversity and perspective taking on task conflict, affective conflict, and the development of schema congruence. We offer suggestions for testing the proposed relationships in future research regarding variable measurement and multi-level data. Implications for and contributions to practice are also addressed.

Introduction

The adage "two heads are better than one" sums up the notion that teams of individuals have the capacity to make higher quality decisions than individuals working alone. The adage is consistent with the information-decision making perspective on team diversity that suggests teams whose members possess deep-level task related differences contain the diversity of perspectives needed to make good decisions (Horwitz & Horwitz, 2007; Williams & O'Reilly, 1998). However, the adage has been called into question as research reveals mixed findings regarding relationships between the composition of team members' diverse capacities and team outcomes.For example, although cognitive diversity among team members is expected to promote decision making performance, it may also increase intra-team conflict (Priola, Smith, & Armstrong, 2004). Therefore, two (or more) *cognitively diverse* heads may be better than one head, but only sometimes.

Empirical evidence reveals cognitive diversity's effect on team processes and outcomes to be indirect and complex (Basadur & Head, 2001;Priola, et al., 2004; Volkema & Gorman, 1998) leading to calls for researchers to elaborate the boundary conditions under which cognitive diversity is beneficial by focusing on intra-team and inter-member processes (Hoever, van Knippenberg, van Ginkel, & Barkema, 2012).The primary purpose of this paper is to respond to these calls by presenting a model of cognitive style diversity in teams that articulates its effectsin relationship to a key moderating variable and its effects on intra-team process variablesthat lead to performance. Specifically, the present paper provides a framework to guide investigations of the combined effects of cognitive style diversity and perspective taking on task conflict, affective conflict, and schema congruence in decision-making teams. These specific team processes were selected because their relationships with performance outcomes are well-established (DeChurch & Mesmer-Magnus, 2010; de Wit, Greer, & Jehn, 2011) but have not been previously integrated into the study of cognitive diversity.In addition, we address cognitive style diversity measurement in response to van Knippenberg and Schippers's (2007) call for researchers to move beyond demographic diversity and toward cognitive types of diversity. We tackled four objectives. First, we position cognitive style diversity within the broader team diversity literature. We show how cognitive style diversity may affect teams in ways similar to other, analogous types of diversity. Second, we present a conceptual model addressing the effects of cognitive style diversity on team member conflict and a team's ability to develop cognitive congruence. Third, we integrate the moderating role of perspective taking into the model and present

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propositions outlining the expected directions of these relationships. Fourth, we provide information on measurement and research design to assist in empirical assessment of the propositions in future research. In addition, the paper's contributions to the literature include extending cognitive style research from the individual level of analysis to the team level of analysis and extending the investigation of intra-team focused intervening processes in the diversity-performance relationship (Hoever, et al., 2012).

Background

Cognitive Style

Cognitive style, a variable associated with how individual team members assess, process, and organize information (Allinson & Hayes, 1996), has been found to predict individual level outcomes (Kozhevnikov, 2007), but its predictive ability in team contexts as a diversity variable has not been fully examined. Cognitive style has received theoretical and empirical attention in the psychology and organizational literatures (Kozhevnikov, 2007). It has been found to influence turnover when a misfit between style and job demands exist (Chan, 1996). Differences in cognitive style have been related to leader-member exchange relationships (Allinson, Armstrong, & Hayes, 2001), team leader behavior (Armstrong & Priola, 2001), entrepreneurship characteristics (Kickul, Gundry, Barbosa, & Whitcanack, 2009), decisiveness (Hough & ogilvie, 2005), and risk assessment in decision making (Henderson & Nutt, 1980).

Kozhevnikov (2007) summarized the attempts to define cognitive style. Two popular conceptualizations of cognitive style dimensions include Adaptors-Innovators and Rational-Intuitive. The Adaptive style is compliant, cautious, systematic, and solution-driven whereas the Innovative style is undisciplined, risky, divergent-thinking, and discovery-oriented (Kirton, 1976). The Rational style is detailed, linear, compartmentalized, and prefers external data whereas the Intuitive style is big-picture, non-linear, holistic, and relies on internal feelings (Allinson & Hayes, 1996). The plentiful and nuanced definitions of cognitive style speak to its conceptual complexity. In general, most researchers agree that at the core of cognitive style is the relatively stable manner in which individuals acquire and process information. For example, Allinson and Hayes (1996) defined cognitive style as being a stable characteristic associated with how people process and organize information. Similarly, Rayner and Riding (1997) defined "…cognitive style as a person's typical or habitual mode of problem solving, thinking, perceiving and remembering" (p. 6). Ruble and Cosier (1990) noted, "the term 'cognitive styles' has been used in a generic sense to refer to individual differences in the way people process information to make decisions" (p. 283). Vance, Groves, Paik, and Kindler (2007) noted that cognitive style encompasses information gathering approaches in addition to information processing. Thus, cognitive style influences the type of data attended to and preferred. Leonard, Scholl, and Kowalski (1999) suggested that these cognitive differences also influence judgments and ultimately decision making behavior.

Scholars have conceptualized cognitive style as being stable within-person and described its influence as comprising nested or hierarchical levels. For example, Curry (1983) conceptualized "style" as consisting of several layers forming a style onion. The inner most layer of the style onion is characterized by high stability and each subsequent layer outward is characterized by decreasing stability. According to Curry, the innermost layer represents basic underlying core cognitive predispositions that cannot easily be altered. Beyond the core layer, is a layer of behavioral tendency that is susceptible to the influence of external demands, but stabilized by the core layer. The outer layer, preference, is more easily altered, but is anchored by the core layer. Echoing these ideas, in a content analysis of four cognitive style measures, Leonard et al. (1999) concluded, "… at least three levels surface in the models. The first is pure cognitive style, related to the way individuals process information. The second is decision making style which is indicative of individual preference for various decision processes… The third level is decision making behavior… the ways individuals actually approach decision situations" (p. 419). In a comprehensive overview of the cognitive style construct, Kozhevnikov (2007) concluded that cognitive style is structured in complex hierarchical levels reflected by individual differences in (1) perception, (2) decision making, and (3) executive cognitive functioning. Overall, there is consensus that cognitive style is stable within an individual and underlies preferences and behavior. Based on these ideas, we applied the following definition to develop the framework.

> *Cognitive style is an individual's typical manner of acquiring, organizing, and processing information. It is habitual, relatively stable across time and situations, influences preferences, and underlies behavior including decision making.*

Cognitive Style Diversity in Decision Making Teams
Research on dominant responses (well-learned and habitual actions or reactions) has shown that in the presence of other people,deeply held tendencies are particularly strong (Lambert, Payne, Jacoby, Shaffer, Chasteen, & Kahn, 2003), which implies that on a team, members will rely heavily on their cognitive styles when approaching the team task. Some research revealed high cognitive style diversity teams maysuffer interpersonally but mayoutperform homogenous teams. For example, Priola, et al. (2004) found relationships between cognitive style diversity, approach to the task, cohesion, satisfaction, and performance. In general, the homogenous cognitive style teams were more satisfied and cohesive than the diverse team, but had lower performance. Another study revealed higher dissatisfaction on cognitively diverse teams but more innovative outputs (Basadur & Head, 2001). Volkema and Gorman (1998) found no consistent effects of cognitive style diversity on decision making processes or outcomes. The scant and inconsistent results offer little guidance for proposing cognitive style diversity effects on decision making teams. Therefore, drawing on the abundant research investigating the effects of various other types of diversity on work teams (Horwitz & Horwitz, 2007; Webber & Donahue, 2001), we developed a framework to advance the cognitive style diversity research.

Positioning Cognitive Style Diversity. Dissimilarity conceptualizations determine expected relationships between diversity and team processes and outcomes (Pelled, 1996; Williams & O'Reilly, 1998). Diversity has been conceptualized as "surface" or "deep" level (Pelled, 1996) referring to the extent to which a diversity variable is readily visible. Diversity has also been conceptualized based on the extent to which the type of diversity under consideration is pertinent to the team's task. The position of a diversity variable along the surface-deep and task relevance dimensions determines the applicable theory.

Social categorization theory is relevant when the type of diversity is more "surface" in nature (Horwitz & Horwitz, 2007) and less relevant to the team's task. According to social categorization theory, people judge others by placing them into groups depending on their characteristics. Using these groupings, people then evaluate the similarity of others to themselves (Horwitz & Horwitz, 2007; Williams & O'Reilly, 1998). In contrast, the *informational* perspective suggests that types of diversity that are deeper and more relevant to the task create a team with many resources from which to draw when making decisions (Horwitz & Horwitz, 2007; Williams & O'Reilly, 1998). Because cognitive style is a deep-level difference that cannot be readily detected, and it is task relevant in decision making, the informational diversity theoretical perspective isapplicable.

The primary tenant of the informational perspective is that diverse teams will outperform homogeneous teams because they possess a larger resource pool including various viewpoints, perspectives, and approaches to the task. As Hough and ogilvie (2005) stated, "...team member cognitions may interact ... to create a balance of complementary styles resulting in a more robust approach" (p.443). However, the cognitive style diversity researchproduced mixed empirical evidence for a cognitive style diversity – performance link. Conversely,consistent evidence supports diversity leading to negative feelings within teams (Basadur & Head, 2001; Priola, et al., 2004; Volkema & Gorman, 1998). Therefore, why some teams capitalize on their cognitive style diversity while others do not, is an unanswered question. We propose that teams with cognitive style diversity may be more likely to capitalize on their differences when the intervening processes of healthy conflict and the development of schema congruence enable them to create beneficial intra-team dynamics.

Recent meta-analytic findings showed that affective conflict had a negative impact, and task conflict, a positive impact on team performance (de Wit, Greer, & Jehn, 2011). The relationship between schema congruence and performance also is well-supported empirically (DeChurch & Mesmer-Magnus, 2010). Mechanisms through which schema congruence may facilitate high performance include increasing the teams' ability to communicate about the task and coordinate their actions to accomplish the task (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). The direct effects of cognitive similarity on team performance have also been demonstrated empirically (Mathieu, Heffner, Goodwin, Cannon-Bowers, & Salas, 2005) and across studies in a recent meta-analysis (DeChurch & Mesmer-Magnus, 2010). However, a uniform relationship between cognitive style diversity and these intervening processes is unlikely. Rather, we propose that it is primarily under conditions of high perspective taking that cognitive diversity can yieldconstructive conflict and congruent team cognition. Next, we offer propositions outlining how perspective taking can be expected to dampen or enhance the main cognitive diversity – process variable relationships. The overall model and propositions are summarized in Figure 1.

Figure 1. Summary of Propositions
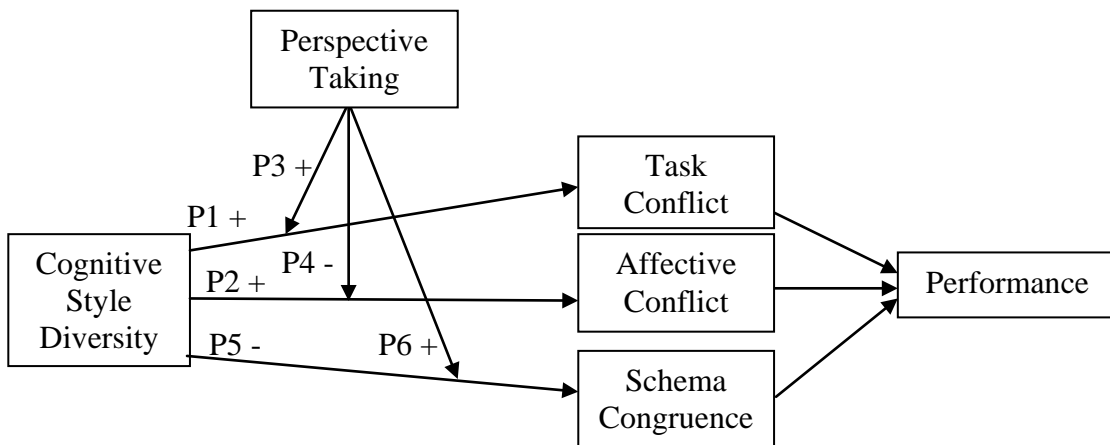
Cognitive Style Diversity and Conflict. At least two types of conflict are discussed in the team literature: affective and task (Jehn, 1995, 1997). Also called "relationship," "interpersonal," and "emotional" conflict, affective conflict reflects frustration with interpersonal compatibilities, irritation, annoyance, and/or general negative emotions toward teammates (Jehn, 1997). Empirical research has shown that the types of diversity that elicit social categorization effects lead to affective conflict (Jehn, Northcraft, & Neale, 1999; Pelled, Eisenhardt, & Xin, 1999). In contrast, the type of conflict posited to result from informational diversity is task conflict (Pelled, 1996). Whereas affective conflict emerges from interpersonal incompatibilities, task conflict is defined as disagreements with regard to viewpoints, opinions, and ideas about the task content (Jehn, 1995). Deep-level, task relevant types of diversity tend to produce task conflict. For example, in a sample of project teams, diversity in work experience and educational background was related to team-level conflict (Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008). Informational diversity, measured as a combination of educational background, functional background, and organizational level predicted task conflict in work units within a large organization (Jehn et al., 1999). Functional background also predicted task conflict in cross-functional project teams (Pelled et al., 1999).

Because cognitive style is task relevant for a decision making team and is also a deep-level characteristic, it should predict task conflict. A decision making team might experience task conflict related to how to approach or organize task information, evaluate the importance of information, or generate solutions or ideas. Diversity in cognitive style should cause team members to approach the task differently. For example, one member might want to thoroughly evaluate each piece of information while another member feels the solution is obvious. Members may place differential value on "thinking outside the box" versus focusing on the practicality of decision options. Cognitively diverse teammates may also disagree as to the optimal amount of time to spend on decision making or the usefulness of numerical data, for example. Therefore, we expect increased cognitive style diversity to be associated with increased conflict about how to approach the decision making task.

Proposition 1: Higher cognitive style diversity will be related to higher task conflict.
Although the diversity literature points to cognitive style diversity being primarily related to task conflict, distinctions between the two conflicts are not always clear. In many cases researchers have found that task and affective conflict are related. For example, Jehn et al. (1999) found that value diversity was related to both task and affective conflict. In a study by Pelled et al. (1999), although functional background diversity predicted task conflict and the demographic diversity variables (race and tenure) predicted affective conflict, there was a significant positive relationship between the two types of conflict. Therefore, although the two types can be statistically differentiated, a considerable interrelationship typically exists. De Drue and Weingart (2003) found an overall correlation of .54 between task and affective conflict in a meta-analysis of teams. It is suspected that the reciprocal relationship between conflict types is due to members' inability to mentally separate criticisms of ideas and approaches (task conflict) from personal criticisms (affective conflict). In summary, although surface-level, task irrelevant types of diversity primarily predict affective conflict and deep-level, task relevant types of diversity primarily predict task conflict, the two types have

been consistently positively related. Due to the high correlations found between task and affective conflict, we present Proposition 2.

Proposition 2: Higher cognitive style diversity will be associated with higher affective conflict
Although we expect diversity in cognitive styles to affect team conflict, team member perspective taking may also influence the diversity-conflict relationships. Perspective taking has been identified as a variable that can influence such team processes and outcomes as information exchange, understanding of others' information, communication, satisfaction, creativity, and conflict type (Falk & Johnson,1977; Hoever, et al., 2012; Johnson, 1977; Kemp & Smith, 1994; Park & Raile, 2010). "Perspective taking may be defined as the cognitive process of putting oneself in the place of another and understanding how the other thinks about a problem" (Falk & Johnson, 1977, p. 64). Perspective taking has been theorized to relate to non-egocentric behavior that subverts one's own desires to those of the greater group (Davis, 1983), which should lead to "smoother and more rewarding interpersonal relationships" (p. 115). Therefore, the role of perspective taking is considered in conjunction with cognitive style diversity in our framework.

Perspective Taking as a Moderator of Cognitive Style Diversity and Conflict. Perspective taking has been studied with respect to conflict style and type of conflict (e.g., Falk & Johnson, 1977). In a study of conflict style, Rizkalla, Wertheim, and Hodgson (2008) found the ability to take another's perspective was associated with positive styles of conflict management. Specifically, high perspective takers, more often than low perspective takers, elected to use conflict styles that focused on finding mutually satisfying solutions rather than focusing solely on their own interests. Perspective taking and conflict has also been studied in work teams. Higher perspective taking in nursing teams was related to perceptions of conflict as task-oriented rather than as relationship-oriented (Sessa, 1996). Thus, perspective taking may alter the relationships between cognitive style diversity and task and affective conflict. Furthermore, task and affective conflict have different effects on team outcomes. Task conflict may have a positive effect on team performance and affective conflict, a negative effect, particularly in teams where members were able to mentally separate task from affective conflict (De Dreu & West, 2001; de Wit, et al., 2011). Taken together, this evidence suggests that the willingness and ability to take another team member's perspective might heighten the benefits of task conflict while minimizing the damage that may be caused by affective conflict.

Because perspective taking has been shown to alter conflict styles it would be expected to enhance conflict that is beneficial to team outcomes (task conflict) and decrease conflict which may be detrimental to team outcomes (affective conflict). Specifically, the ability to see the task from others' perspectives should increase discussions of various viewpoints and reasons behind differences of opinion, and generally assist members in exposing their task-related conflicts. At the same time, perspective taking should allow members to perceive disagreements as purely task-oriented and not as interpersonal attacks (Sessa, 1996). Thus, perspective taking should increase the positive effect of cognitive style diversity on task conflict and decrease the positive effect of cognitive style diversity on affective conflict. We forward the following propositions.

Proposition 3: Perspective taking will moderate the relationship between cognitive style diversity and task conflict. The positive relationship will be stronger under conditions of high perspective taking than it will be under conditions of low perspective taking.
Proposition 4: Perspective taking will moderate the relationship between cognitive style diversity and affective conflict. The positive relationship will be weaker under conditions of high perspective taking than it will be under conditions of low perspective taking.

Cognitive Style Diversity and Schema Congruence. Schemas are mental representations of information and ideas. Similarity or *congruence* can be said to exist among team members when there is substantial overlap in the content and organization of these mental representations (Rentsch & Hall, 1994). It has been suggested that types of diversity which apply to the informational perspective impede team members' ability to develop congruence in the way they understand the task and task information. Clark, Anand, and Roberson (2000) stated, "…the same diversity that enriches the availability of multiple viewpoints may create difficulties in arriving at shared meanings" (p. 212). Cronin and Weingart (2007) suggested that dissimilarity in such deep-level variables as knowledge, values, or norms, cause team members to hold differing views of how to approach the same problem. Due to such differences, team members may attend to and encode different aspects or pieces of information regarding the problem. Empirical research has supported these notions. Deep-level, task relevant diversity variables such as diversity in educational

background (Rentsch & Klimoski, 2001) and mental ability (Edwards, Day, Arthur, & Bell, 2006) have been found to be related to lower schema congruence.

In general, the informational perspective on diversity suggests that differences in deep-level, taskrelevant variables will ultimately be positive for the team's performance by bringing a variety of unique views to the decision. However, it appears that these differences in viewpoint also cause difficulty communicating and integrating information to solve problems (Millikan & Martins, 1996). For example, Dose and Klimoski's (1999) work on value diversity suggested teams with differing values will have more difficulty reaching consensus due to decreased desire to incorporate other's information and views into their own interpretation of the decision. Gebert, Boerner, and Kearney (2006) suggested functional diversity will impede team members from engaging in "synergistic communication" defined as the extent to which members' diverging positions are specified and recombined into new solutions. Empirical results follow from these theories. For example, differences in knowledge and experience created difficulty between team members in communication and understanding each other, and were related to low amounts of information sharing within the team (Bunderson & Sutcliffe, 2002). Educational background diversity had a negative linear relationship with the team's ability to integrate task information (Dahlin, Weingart, & Hinds, 2005).

In summary, dissimilarity with respect to deep-level, task relevant variables such as knowledge, values, or cognitive style, impedes a team's processes such as sharing and integrating information, and ultimately, impedes the ability of members to develop congruent schemas. When members differ in the way they assess, organize, and process information (cognitive style), they will differ in their interpretation of that information. They may differ in what they see as important or relevant, and how they cognitively categorize the information. This will create difficulty in communicating about the task and inhibit team members' ability to relate similarly to the information and decision.

Proposition 5: Higher cognitive style diversity will be associated with lower levels of schema congruence.

Perspective Taking as a Moderator of Cognitive Style Diversity and Schema congruence. Perspective taking has also been found to influence information exchange and understanding of others' information. For example, perspective taking was found to increase performance in negotiation tasks where full disclosure of information was crucial to achieving high joint profits (Kemp & Smith, 1994). Falk and Johnson (1977) found that higher proportions of perspective taking behaviors in groups led to higher quality interactions about task information and increased cooperation between members. Similarly, Johnson (1977) found that teams instructed in perspective taking created higher quality problem solutions and viewed their teams' information exchange more favorably than did teams using other interaction styles. Furthermore, Johnson found that people in the perspective taking condition perceived their team as more helpful in presenting information, as more accurately understanding their information, and as valuing their information and views more than did members of other conditions. Hoever et al. (2012) found that higher perspective taking was associated with increased information elaboration including acknowledgement of other's different ideas and attempts to integrate differing suggestions. Perspective taking behaviors such as inquiring about the reasoning for others' preferences, accepting others' viewpoints as legitimate, and incorporating others' perspectives into one's own interpretation, have been found to increase cognitive congruence in diverse perspective teams (Mohammed & Ringseis, 2001). Because it has been shown to influence understanding of another's information and ideas, perspective taking is expected to reduce the negative effect of cognitive style diversity on the development of schema congruence.

Proposition 6: Perspective taking will moderate the relationship between cognitive style diversity and schema congruence. The negative relationship will be weaker under conditions of high perspective taking than it will be under conditions of low perspective taking.

Discussion

This framework contributes to the research literature by providing needed theoretical guidance for investigations of the pathways through which cognitively diverse teams may realize the expectations of higher performance. Specifically, the framework represents the integrated effects of cognitive style diversity and perspective taking on conflict and schema congruence which have known relationships with performance. The framework can be tested with teams in a variety of situations and contexts. Below, we

address considerations for empirical research, measurement options, composition issues in moving constructs from the individual level to the team level of analysis, potential variations on the proposed relationships, and contributions to practice.

Operationalizing Cognitive Style and Perspective Taking

A variety of methods have been used to measure cognitive style (Kozhevnikov, 2007) including physiologicaland behavioral measures. However, self-reported measures are most common. Although self-report data have been criticized as being fakeable, lacking reliability, and producing invalid estimates of relationships with other variables, Chan (2009) stated that self-report is acceptable under certain conditions. According to Chan, self-report measures are useful when a construct is unlikely to be faked purposefully and when a different method would not necessarily assess it more accurately. These conditions apply to cognitive style making self-report a suitable method for assessing it.

Many researchers have attempted to create self-report paper-and-pencil measures with straight-forward scoring systems to assess cognitive style. Examples of these instruments designed or used to measure cognitive style are: the Linear Nonlinear Thinking Styles Profile (LNTSP; Vance et al., 2007), the Judgment and Perceptions scales of the Myers-Briggs Type Indicator (e.g., Hough & ogilvie, 2005; Ruble & Cosier, 1990), General Decision-Making Style instrument (GDMS, Scott & Bruce, 1995), Kirton's Adaptation-Innovation scale (Kirton, 1976; Chan, 1996), and in an attempt to integrate previous work and to develop a measure that could be used in a managerial context, Allinson and Hayes's (1996) Cognitive Styles Index (CSI). Several researchers have examined the construct validity evidence for the measures (Allinson & Hayes, 1996; Tepper, Tetrault, Braun, & Romero, 1993; Vance et al., 2007). Some studies have shown that the measures intercorrelated as hypothesized(Vance et al., 2007). However, other studies have found mixed support for hypothesized relationships (Tepper et al., 1993). Differences between the measures on such features as context specified in the directions and response format may be partially responsible for the lack of stronger interrelationships between measures. One conclusion from this research is that researchers shouldselect measures appropriate to their samples.

Researchers have used several approaches to assess perspective taking. One approach is an objective measure that requires participants to predict a partner's intended future actions (e.g., Reimer, 2001). Typically, one participant is provided information about another person (sometimes a confederate) and the two engage in an activity with a series of steps or actions. One partner must guess or estimate the next move that the other partner would make. Higher accuracy about the partner's next move is used as the measure of the ability to take another's perspective. In a similarly designed objective measure, Wu and Keysar (2007) used an object-moving task where the participant could see all objects but were shown that the partner could see only some of the objects. The partner then asked the participant to move an object by description (e.g., "move the block") that had two possible correct objects – one that the partner could not see and therefore could not be referencing. The number of objects moved by the participant that were objects the partner could not see demonstrated lower ability to take the partner's perspective.

Two other commonly used approaches for measuring perspective taking are self-report and other-report. Arguably the most widely used self-report measure is the perspective taking subscale of Davis's (1983) Interpersonal Reactivity Index. This is a seven-item scale with acceptable reported reliability estimates and validity evidence (Rizkalla et al., 2008). Although this measure has been used in research for several decades, its accuracy has been recently called into question in favor of the other-report method. In a study of co-worker dyads, Park and Raile (2010) assessed perspective taking using the self-report method and co-worker ratings of the other's perspective taking ability. They found no correlation between the two measures and only the other-rated perspective taking measure demonstrated a relationship with the outcome variable. Therefore, it seems that people may not be accurate judges of their own ability to take perspective. This finding supports the use of one of objective measures of perspective taking or the use of other-ratings.

Moving from the Individual to Team Level Constructs

One theoretical contribution of the present framework is that it outlines the movement of the cognitive style construct from the individual level of analysis to the team level. When employing a level-of-analysis move, researchers must maintain congruence between the measure and the aggregate as to not distort the construct across the levels. According to Chan (1998), these would be an *elemental* composition, one in which data from a lower level (e.g., individual cognitive style) is used as a basis for a higher level construct

(e.g., cognitive style diversity). Five forms of composition exist and selecting the correct form is critical to correctly hypothesizing relationships, operationalizing measures, and interpreting findings (Chan, 1998). Cognitive style measured on a scale where members report on their own style and subsequently this is compiled to the team level as diversity could be attained using the dispersion model. In this model, rather than variance in teammate scores being viewed as error (as is true of shared unit properties such as perceptions of team-level conflict), it is precisely the variance in observed scores that is of interest. That is, this variance *is* the diversity. According to Harrison and Klein (2007) cognitive style measured in this manner would represent separation diversity. Separation diversity is indicated for a variable when observations fall along a continuum (e.g., Rational-Intuitive). "Such differences reflect … horizontal distance along a single continuum representing dissimilarity in a particular attitude or value, for example" (Harrison & Klein, 2007, p. 1200). The conceptualization of cognitive style diversity as separation diversity is best indexed by a measure of distances between pairs of team members on the cognitive style measure. Appropriate indices include within team standard deviation and average Euclidean distances.

In addition to measuring cognitive style directly and aggregating it, one could measure it as a perceptual variable. Harrison and Klein (2007) suggested that perceived diversity may have more explanatory power than actual diversity because perceptions of the social environment are often better predictors of behavior than the objective environment. Therefore, measures could be created that assess the extent to which team members perceive they have different cognitive styles. As one can see, there are several options for measuring the main variables of interest in this paper and also various issues relevant to multi-level research.

Future Researchand Contributions

Future research could test the propositions advanced in this paper in myriad teamwork contexts and could use this framework as a starting point to extend theory in other directions. The framework is deliberately general so that it can be adapted to address many unanswered research questions. The propositions could be tested in a laboratory setting with student teams, in an organizational setting, in a classroom context, or with executive MBA students as part of an experiential simulation, for example. These propositions could also be extended beyond decision making to other team task types such as a generating, choosing, or negotiation. One possible avenue is the study of teams in new venture creation (West, 2007). Cognitive style has also been associated with differences in the assessment of risk in decision making (Henderson & Nutt, 1980) and in the quantity and quality of strategic business decisions (Hough & ogilvie, 2005). Cognitive style has been associated with entrepreneurial self-efficacy and showed that different cognitive style orientations contribute differently to the various functions (e.g., identifying opportunities, marshaling resources) of the new venture process (Kickul et al., 2009). This may suggest that a complementary blend of styles is necessary to cover all aspects of the process and that when coupled with high perspective taking, higher diversity might ultimately increase new venture success.

Another avenue for future research is in testing the relationship between cognitive style diversity, perspective taking, and types of team cognition other than schema congruence. Teams may develop many forms of cognition about their work together and these forms of cognition can be about different types of content (Rentsch, Small, & Hanges, 2008). For example, Mathieu, et al. (2000) suggested that in addition to a cognitive model about the task at hand, teams can also form a teamwork model containing content about interaction, roles, responsibilities, and each other's knowledge and skills. Rentsch, Delise, and Hutchison (2010) also discussed various forms of congruence such as similarity and complementary forms. Future research could investigate the relationship between cognitive style diversity, perspective taking, and other forms, content, and/or categories of team cognition.

The present paper makes several contributions to the literature. Previous work relied on proxy measures of cognitive diversity which were easily obtained such as demographic information. We outline numerous minimally intrusive yet accurate methods for directly assessing cognitive diversity and perspective taking. Therefore, this paper addressed specific calls in the team diversity literature to progress beyond proxy measures to directly assess cognitive types of diversity (van Knippenberg & Schippers, 2007). It also employed current teams theory by incorporating intra-team process variables to extend theory on the complex path from cognitive diversity to performance. Our outline for organizing the team diversity literature to advance propositions for a construct about which little was known could be used to address other types of diversity where scant research is available. This paper also extended the cognitive style construct beyond the individual level to the team level of analysis and provided guidelines for properly

employing such a move in research. Additionally, we offered concrete assistance in testing these propositions with several future research directions.

If the propositions presented in this paper hold true then there are several ways in which these would contribute to practice. If perspective taking in fact moderates the relationships in the proposed ways, it might be possible to manipulate people's perspective taking willingness or ability. Research on perspective taking has found the strongest relationships with outcomes when participants were either trained in perspective taking behaviors or perspective taking was made salient to participants as an important skill that they should use during the study (Falk & Johnson, 1977; Hoever, et al., 2012; Johnson, 1977; Sessa, 1996). Along these same lines, organizations could train members of decision making teams in perspective taking skills or otherwise explain to members of cognitively diverse teams that attempting to see the decision scenario from each other's point of view is beneficial to the process. This could reduce negative emotional conflict, increase positive task conflict, and assist teammates to mentally separate the two types of conflict (Sessa, 1996). Under conditions of training-induced or high natural perspective taking ability, organizational teams charged with decision making tasks could be comprised specifically to maximize diversity in cognitive style. Although in reality, organizational constraints might prevent this, there are some situations such as in the appointment of specific committees or boards where this type of deliberate placement could be possible.

Conclusion

Cognitive style varies between individuals and can therefore create diversity within a team. The primary tenant of the informational perspective of diversity is that such dissimilarities provide a team with valuable differences in perspectives and approaches in decision making situations that may ultimately allow them to reach high performance objectives. However, it is unclear how the diversity – performance relationship unfolds because it is often fraught with negative interpersonal issues. Because cognitive style has traditionally been studied at the individual level of analysis, there was limited literature to draw upon in formulating expectations for the effects of cognitive style diversity in teams. However, a large body of research has accumulated on a host of other types of diversity in teams. By drawing on several established typologies and overarching theories (Pelled, 1996; Williams & O'Reilly, 1998) a review of the literature on comparable types of diversity allowed us to extrapolate propositions about cognitive style diversity's effects. It was posited that diversity in team member cognitive styles would affect task conflict, affective conflict, and the development of schema congruence. More importantly, perspective taking was anticipated to moderate these relationships by enhancing the positive intra-team processes and dampening the ones detrimental to team outcomes. It is in this way that we suggest cognitively diverse teams are able to capitalize on their differences to realize high performance. We discussed ideas for testing the propositions including available measurement techniques and instruments for testing the main variables. We outlined several considerations for changing levels of analysis in research. We also offered specific ideas for utilizing our framework to advance empirical research. It is our hope that the ideas presented in this paper stimulate a productive line of future inquiry on cognitive style diversity in teams.

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