

**Heterogeneity VS Homogeneity: Which is Compatible with Team Agency VS
Communion?**

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LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
BIC	Bayesian Information Criterion
BLRT	Bootstrap Likelihood Ratio Test
CFI	Comparative Fit Index
CI	Confidence Interval
ICC	Inter-class Correlation
LMX	Leader Member eXchange
LPA	Latent Profile Analysis
MCFA	Multilevel Confirmatory Factor Analysis
RMSEA	Root-Mean-Square Error of Approximation
SABIC	Sample-size Adjusted Bayesian Information Criterion
SD	Standard Deviation
SRMR	Standardized Root-Mean-square Residual
TLI	Tucker-Lewis Index

SUMMARY

Team personality composition is empirically demonstrated to be a salient antecedent of team functioning and effectiveness. However, researchers have reported inconsistent findings of the effect of team personality diversity on team outcomes. It is debatable whether homogeneity or heterogeneity is favorable for team personality. The present research aims to unravel the problem by exploring the favorable configuration for different types of team personality.

Integrating the agency-communion framework and socio-analytic theory, I suggest that team agency is compatible with a heterogeneous configuration while team communion is compatible with a homogeneous configuration. The magnitude and configural approaches are integrated to explore the optimal configuration for team agency and communion. In terms of magnitude, it is proposed that the effect of team agency is stronger at a high level of dispersion, while the effect of team communion is more pronounced at a low level of dispersion. In terms of the configural patterns, I posit that the effect of team agency is strongest in a fragmented configuration while the effect of team communion is strongest in a shared configuration.

The data were collected from 597 employees of 116 diverse teams across three waves. Path analysis results supported the mediation of team accomplishment striving between team agency and team performance and the mediation of team cohesion between team communion and team performance. The moderation of team dispersion on the indirect effect of team communion on team performance via team cohesion was supported, such that the indirect effect was stronger when team dispersion is lower than higher. However, the moderation of team dispersion on the effect of team agency was not supported. The testing of the indirect effects under different configurations suggested that the effect of team agency on accomplishment striving and its indirect effect on team performance via team

SUMMARY (continued)

accomplishment striving are strongest in the fragmented configuration and weakest in the bimodal configuration, whereas the effect of team communion on team cohesion and its indirect effect on team performance via team cohesion are strongest in a shared configuration and weakest in a bimodal configuration.

The research findings suggest that both the level and configurations of team dispersion play important roles in the effects of team agency and communion. Especially, the configural approach that focuses on the interaction patterns of subgroups in a team provides a new and solid approach to studying the complex team dynamics that underly team personality composition. In summary, the present research provides considerable implications for team and personality literature and map avenues for future research.

1. INTRODUCTION

1.1 **Background**

Organizations are increasingly relying on teams to maintain functioning, accomplish tasks, and promote creativity and innovation (Bell, 2007; Horwitz and Horwitz, 2007). Team composition (the configuration of members' attributes in a team; see Levine and Moreland, 1990 for a review) has been the interest of researchers and practitioners for decades (i.e., Joshi and Roh, 2009; Mathieu et al., 2019). Recently, team composition research has shifted attention from surface-level (i.e., demographics, such as age and gender) to deep-level (i.e., values and personality) composition (Bell, 2007; Roberson, 2019). Bell's (2007) meta-analysis suggests that deep-level team composition is proximal to and has a profound impact on team dynamics and performance. Team personality is one of the most studied deep-level team attributes and has witnessed surging research. A plethora of empirical research demonstrates that team personality composition (i.e., elevation, dispersion, and configuration) is a robust and consistent predictor of team functioning and performance (i.e., Barrick et al., 1998; Bradley et al., 2013; Gonzalez-Mulé et al., 2014; Halfhill et al., 2005; Roberson, 2019).

1.2 **Statement of the Problem**

In the past decades, researchers are intrigued by the question "Whether a homogeneous or heterogeneous configuration is favorable for team personality?" (Moynihan and Peterson, 2004). Some advocate for heterogeneous configuration (Jackson et al., 1995) as

people with different personality traits can play different roles necessary for team functioning and bring novel ideas and nonredundant information that inspire innovation (Joshi and Roh, 2009). Neuman et al. (1999) argue that teams work best when “each member contributes unique attributes to the team” (p. 29). However, other researchers are in favor of homogeneous configuration as it is critical to creating necessary commonalities for team coordination and functioning (Baer et al., 1991; Kozlowski and Bell, 2003). Extant research based on the Big-Five Model found support for the two perspectives in different personality traits (Moynihan and Peterson, 2004). For example, team extraversion dispersion or heterogeneity (calculated by standard deviation) is found to be consistently positively related to team interactions and performance, team agreeableness dispersion is consistently negatively related to team performance (Barrick et al., 1998; Bradley et al., 2013; Mohammed and Angell, 2003; Neuman et al., 1999; Peeters et al., 2006), and emotional stability dispersion is positively related to team effectiveness in some studies (Neuman et al., 1999; Peeters et al., 2006). As current team personality research mostly focuses on one single trait or studying several traits separately (Baer et al., 2008), it is difficult to derive a holistic view of the optimal configuration for a specific personality trait. We need a sound theoretical framework to differentiate personality traits in terms of their compatibility with a homogeneous versus heterogeneous configuration.

1.3 **Research Purpose**

The agency/communion framework is a robust high-order taxonomy of personality traits and is found to have higher generalizability/universality than the Big Five model (Abele and Bruckmüller, 2011; Paulhus and Trappnell, 2008). This framework divides personality traits into agentic and communal traits. Agentic traits are related to goal achievement and task functioning, such as strivings for mastery, power, achievement, and instrumental needs

(Abele, 2003; Abele and Wojciszke, 2014; Paulhus and Trapnell, 2008). Communal traits are related to relationship maintenance and social functioning (Wiggins, 1991), such as strivings for intimacy, friendship, affiliation, and belongingness (Abele and Wojciszke, 2014).

According to the socioanalytic theory (Hogan, 1991, 1996), in a team setting, a heterogeneous configuration is compatible with agentic traits (e.g., emotional stability) as agentic people value self-reliance and “getting ahead” and tend to repulse other members, while a homogeneous configuration is compatible with communal traits (e.g., agreeableness) as communal people value “getting along” with each other and are more attracted to similarly sociable members (Abele and Bruckmüller, 2011). In this sense, compared with the Big-Five model that underplays the commonality among the five traits, the agency-communion framework provides a simpler framework to understand team personality and enables us to get a full picture of the optimal configuration for different traits.

In the present research, agency and communion are theorized at the team level. As Kozlowski and Bell (2003) suggested, team-level attributes that are created by aggregation have more complexity than simply adding the individual attributes given the synergistic interaction between team members and between each team member and the situations. Similarly, team personality researchers agree that the way of conceptualizing a team composition/configuration plays a crucial role in exploring the impact of team personality (Barrick et al., 1998; DeRue et al., 2010; Neuman et al., 1999). A proper conceptualization can greatly facilitate the investigation into the optimal configurations for team agency and communion. The mainstream of extant literature is to combine elevation (mean/average) and dispersion conceptualizations to study team composition (Barrick et al., 1998; Neuman et al., 1999; Peeters et al., 2006). However, DeRue et al. (2010) pointed out that the conventional conceptualization of dispersion indicates the magnitude of difference but neglects potential differential distribution patterns of the difference. Then, they introduced a configural

approach and identifies different types of distribution patterns of dispersion (DeRue et al., 2010; Li and Liao, 2014), including shared configuration, minority configuration, bimodal configuration, and fragmented configuration (described in detail later). This newly emerging configural approach is found to reveal more sophisticated dynamics of team personality and explain extra variance beyond the conventional magnitude approach (Bezrukova et al., 2007; Li and Liao, 2014; Seo et al., 2018). This configural approach has the advantages of revealing different interaction patterns between subgroups in each configuration and how these interaction patterns shape team dynamics and effectiveness. Therefore, I attempt to combine the magnitude and configural approaches to team dispersion to explore when and how team personality configuration would affect the effect of team agency and communion on team performance.

Furthermore, the present research will delve into the pathways through which the compositions (mean, dispersion, and configuration) of team agency and communion affect team performance. Team personality researchers lament that the extant literature has overly focused the direct effect of team personality on team outcomes (Bell et al., 2007; Bradley et al., 2013), leaving a nuanced understanding of the underlying mechanisms much underdeveloped (Moynihan and Peterson, 2001). According to the socioanalytic theory (Hogan, 1991, 1996), agentic characteristics are associated with goal strivings, such as achievement and status striving, while communal characteristics are connected with social function, such as relationship maintenance and team unity and solidarity (Abele and Bruckmüller, 2011; Abele and Wojciszke, 2014; Fiske and Stevens, 1993). Based on the motivational (Barrick et al., 2002) and relational processes underlying personality and team dynamics, I identified team accomplishment striving as a task-oriented team process that mediates the effect of team agency on team performance, while team cohesion as a relationship-oriented team process that mediates the effect of team communion on team

performance (see Figure 1). In this connection, the current research aims to advance our standing of the mechanisms by which team personality composition influences team functioning and performance.

1.4 **Research Contributions**

In summary, the current study aims to advance extant literature in three ways. First, relying on the agency-communion framework, the present study intends to distinguish personality traits to explore the favorable configuration for different personality traits. The higher-order agency-communion personality taxonomy allows us to shift attention from a single personality trait and differentiate the different facets of team climate. Thereby, we can have a more theoretically grounded holistic view and a more nuanced understanding of *when* and *how* personality functions at the team level. Moreover, by elevating agency-communion research from the individual to team level, I hope to enrich the connotations and implications of the agency-communion framework and deepen our knowledge of how agentic and communal members interact and work with each other in a team setting. Second, by combining different conceptualizations (mean and dispersion) of team personality and integrating the magnitude and configural approach to dispersion, the present research attempts to capture the complexity of the composition of team agency and communion. It echoes Kolowski and Bell's (2001) claim "to identify the pattern or configuration of characteristics that create synergy in the team collective" (p. 365). Also, the current research is among the first to introduce the configural approach to team personality research and integrate it with the conventional magnitude approach. By doing so, the current research aims to elaborate on the current conceptualizations of team personality and provide new avenues for reconciling inconsistent findings revolving team personality. Third, the current research will further explore the mediation mechanisms linking team agency and communion to team

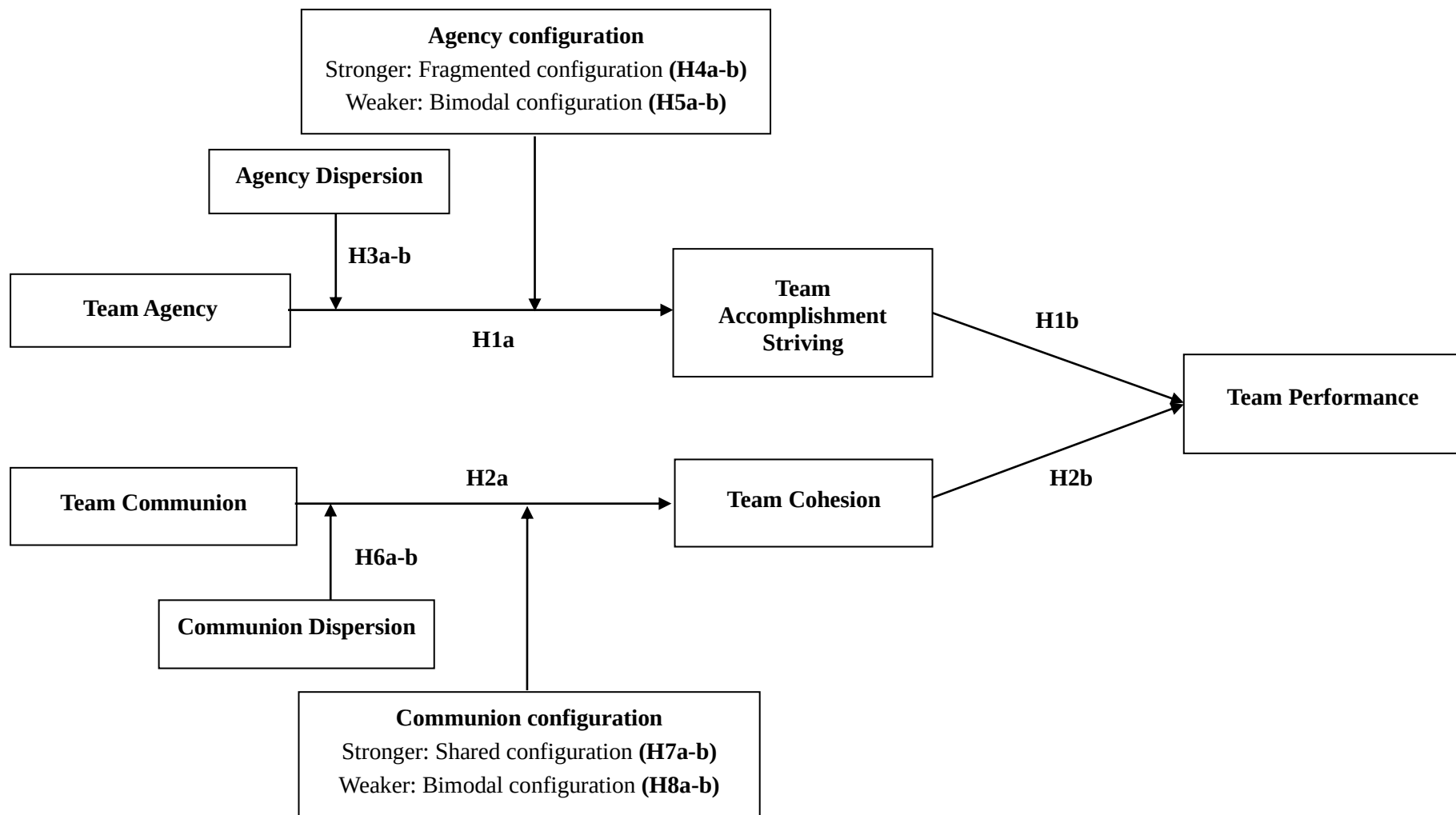


Figure 1. How team dispersion and configurations influence the impact of team agency and communion on team performance

performance. Thereby, the current research intends to expand our knowledge of the team dynamics underlying team agency and communion and elaborate on the configuration under which the mechanisms function.

2. LITERATURE REVIEW AND HYPOTHESES

2.1 Agentic and Communal Traits

In exploring the hierarchical structure of personality, researchers have found agency-communion taxonomy as a higher-order personality structure of the well-known Big Five traits (Paulhus and Trappnell, 2008). The agency-communion personality traits are often referred to as “Big Two” or “meta” personality traits (Abele and Wojciszke, 2007; Cuddy et al., 2008). Agentic traits are related to goal achievement and task functioning, such as strivings for mastery, power, achievement, and instrumental needs (Abele, 2003; Abele and Wojciszke, 2014; Paulhus and Trapnell, 2008). Agentic people who are ambitious, competent, aggressive, competitive, independent, assertive, decisive, and forceful (Abele, 2003; Abele and Bruckmüller, 2011; Fiske and Stevens, 1993) are driven by “getting ahead”. In contrast, communal traits are related to relationship maintenance and social functioning (Wiggins, 1991), such as strivings for intimacy, friendship, affiliation, and belongingness (Abele and Wojciszke, 2014). Communal people who are warm, friendly, helpful, sympathetic, and sensitive (Abele, 2003; Abele and Bruckmüller, 2011; Fiske and Stevens, 1993) are driven by “getting along” with others. Individual agentic and communal traits are demonstrated to significantly predict resilience (Gonzalez et al., 2012), health (Helgeson and Palladino, 2012), and career success (Abele, 2003; Ramsey, 2017).

According to Helgeson (1994), agency and communion reflect the duality or dual existence of human beings, self-reliance (agency), and dependence on the collective (communion). Abele and Wojciszke (2007) showed that a core distinction between agentic versus communal traits is their focus on self-interest (agency) versus other- interest (communion). Agency arises from “strivings to individuate and expand the self” (Abele and

Wojciszke, 2007, p. 751) and aims to gain instrumental goals, such as competence, efficiency, and dominance, while communion arises from “strivings to integrate the self in a larger social unit through caring for others” (Abele and Wojciszke, 2007, p. 751) and targets at collective expressive goals and others’ well-being. Based on the striving underlying agency and communion, researchers draw that agency is more related to accomplishment fulfilling while communion is more related to social relations (Abele, 2003; Abele et al., 2008). However, though agency underscores self-reliance, dependence, and autonomy, it also implies a connection with others, such as social comparison. For example, agentic people have an instinct to outperform and outcompete others by accomplishing tasks. The deep-root reason lies in the self-interest orientation of agency. The accomplishment striving underlying agency is a means to maximize individual instrumental gains and achieve superiority and dominance over others. The accomplishment striving and superiority striving are two inter-related elements that undergird agency. Nevertheless, agency does not explicitly contain social interactions with others.

Agency and communion have been frequently associated with paired concepts in multiple disciplines, such as social psychology and cross-cultural research (see TABLE I) (Abele and Wojciszke, 2014; Helgeson, 1994). Based on the dual existence of human beings, agency and communion are related to the independent/interdependent self-construal that reflects the individual belief in the importance of self-reliance and competence and that of relationship with others (Abele and Wojciszke, 2014). Also, agency and communion have been linked to gender-related concepts, such as social role expectation and masculinity/femininity, such that masculine people are relatively more agentic and value power, achievement, and competence while feminine people are more communal and value relationships and display more concerns and empathy for others (Rosette and Tost, 2010). However, agency and communion are broader in scope and have higher generalizability than

TABLE I AGENTIC AND COMMUNAL FRAMEWORK AND RELEVANT PAIRED CONCEPTS

Agentic content	Communal content
<i>Intellectually traits</i>	<i>Socially traits</i>
Traits associated with intellectual activities (skillful, determined, dull)	Traits associated with social activities (warm, sociable, popular)
<i>Masculinity</i>	<i>Femininity</i>
Traits related to the male gender role (decisive, dominant, achievement-oriented)	Traits related to the female gender role (agreeable, empathic, emotional)
<i>Independent self</i>	<i>Interdependent self</i>
Beliefs based on personal self-reliance, autonomy, and self-fulfillment (independent, unique)	Beliefs based on group membership and strivings for group solidarity and the common good (affiliative, cooperative)
<i>Individualistic</i>	<i>Collectivistic</i>
Traits characterized by egocentric, self-reliant, and autonomous	Traits characterized by sociocentric, collective, connected, and relational
<i>Initiating structure</i>	<i>Consideration</i>
Leadership activities related to role-defining and role-making, performance standard setting, and task assignment	Leadership activities related to concerns for the welfare of members of the group
<i>Instrumentality</i>	<i>Expressiveness</i>
Instrumental activities target at goal fulfillment and instrumental gains	Expressive activities are directed to achieve coherence, solidarity, and harmony within the group
<i>Competence</i>	<i>Morality</i>
Capabilities, skills, and efficiency in goal attainment	About how one's goal attainment is related to the welfare to others, the organization, and the society
<i>Dominance</i>	<i>Warmth</i>
Dominance versus submissiveness. "Getting ahead"	Nurturance versus coldheartedness. "Getting along"
<i>Power</i>	<i>Intimacy</i>
Influence, uniqueness, status, and standing	Closeness, relationship, bond, attachment

Note: Revised based on Abele and Wojciszke's (2014) table

the relevant paired terms. By virtue, agency and communion reflect universal and deep-level individual values and needs that developed and stabilized over human evolutionary history. They go beyond individual social role expectations (masculinity/femininity) and allocation between self and collective interest (individualism/collectivism and independent/interdependent construal) and have been applied to explain a variety of individual, organizational, and social phenomena (Abele and Wojciszke, 2014). For example, agency and communion have been applied to predict differences in individual goal strivings and work behaviors.

With respect to the relationship between agency and communion, researchers have diverged (Abele and Wojciszke, 2014). Some researchers assert that “agency and communion are orthogonal dimensions of social cognition, as they reflect different domains of human functioning and their perceptions are based on separate cues” (Abele and Wojciszke, 2014, p. 235). The orthogonality of agency and communion, manifested by zero correlation coefficient statistically, has received certain support (Cislak and Wojciszke, 2008; Gerbasi and Prentice, 2013). Other researchers consider agency and communion as two related but distinct dimensions of meta-concept. Especially in personality traits research, scholars have noted that agentic traits and communal traits may overlap in the lexical descriptions (Abele and Wojciszke, 2014). This line of research finds the correlation coefficient between agency- and communion-related traits ranges from $-.87$ to $.62$ (Abele and Wojciszke, 2014; Kurt and Paulhus, 2008; Wojciszke et al., 2009). This wide range indicates that agentic and communal traits are not necessarily exclusive, and their correlation is highly contingent. Taken together, I concur that agency and communion are two separate and distinct meta-traits, rather than two poles of a continuum. Individual personality is comprehensively described by the two meta-traits. For example, Rosette and Tost (2010) were able to demonstrate that individuals could simultaneously be agentic and communal.

However, up to now, agency and communion (or agentic and communal traits) have been mostly studied at the individual level. Team-level agency and communion and *whether* and *how* they would affect team effectiveness are understudied. As argued earlier, team-level agency and communion are more complex given the involved complicated interpersonal interactions and team context. Team mean agency and communion indicates the average level of agency and communion of the team members, while team dispersion reflects the variation of agency and communion across the team members. Studying team-level agency and communion can deepen our knowledge of how agentic and communal people interact and work with each other in a team setting. Therefore, I will introduce the conceptualization and methodology in team personality research and then review research findings based on the Big-Five model (the lower-order facets of agentic and communal traits) to derive implications for aggregating agency and communion to the team level.

2.2 **Team Personality Research Under Big-Five Framework**

Team personality composition indicates the configuration of values, beliefs, and behavioral tendencies (Bradley et al., 2013; Neuman et al., 1999). This line of research is concerned about the distribution of personality traits among team members and how this distribution predicts team dynamics and effectiveness (Neuman et al., 1999). Before summarizing the existing findings of team personality, I will introduce the conceptualization of team personality composition.

2.2.1 **Team Personality Composition and Conceptualizations**

Conceptualization of team composition plays a crucial role in interpreting the connotations and effect of team personality (Barrick et al., 1998; Neuman et al., 1999). As Peeters et al. (2006) show in their meta-analytic study, central distribution is the main

conceptualization in the extant literature. Elevation, dispersion, and maximum/minimum are three common conceptualizations of team personality composition.

First, team personality elevation, or mean of team personality, describes the average tendency of the team members to display a certain personality trait (Barrick et al., 1998). For example, team mean agreeableness indicates members' general propensity to be helpful, trusting, and friendly (Barrick et al., 1998). Up to now, mean scores have been the most-used operationalization for team personality (Barrick et al., 1998; Neuman et al., 1999). Neuman et al. (1999) noted that high team personality elevation does not mean that all team members score high on this trait, but that some members score high and elevate the average of the whole team. Team personality elevation is found to significantly predict team interpersonal facilitation and cohesion (Barrick et al., 1998), team norms, and helping behavior (Bradley et al., 2013), and team performance (Neuman et al., 1999). However, Barrick et al. (1998) pointed out that this approach might be problematic as it disregards the complex distribution of personality traits among team members and neglects that individual characteristics "do not combine additively to form a collective resource pool" (p. 378).

Second, team dispersion/diversity of personality traits refers to the variability of personality traits across the team members (Barrick et al., 1998; Neuman et al., 1999). This approach intends to study the variance of members' traits in a team (e.g., Barry and Stewart, 1997) and provide insights on the fit among team members (e.g., Chatman, 1991; B. Schneider, 1987). Moynihan and Peterson (2003) pointed out that team personality "may be more complex than a simple mean level on a trait" (p. 336). Barrick et al. (1998) asserted that the team dispersion approach complements the mean approach by revealing the complex distribution and compositions of team personality. Previous studies support that the variability of team personality is significantly related to team conflict, cooperative norms, and performance (Barrick et al., 1998; Neuman et al., 1999). Gonzalez-Mulé et al. (2014)

emphasize that the dispersion/diversity conceptualization can “more fully capture the dynamics of team personality” (p. 991) and better our understanding of team processes and outcomes (Bell, 2007; Kozlowski and Klein, 2000).

Third, the maximum and minimum approach to team personality reflects the highest or lowest individual-trait score in the team (Barrick et al., 1998). The assumption is that a single employee may have a great impact on teamwork and team functioning (Kenrick and Funder, 1988). A few studies found evidence for the significant relationship between maximum and minimum of team personality and team processes and performance (Barrick et al., 1998; Peeters et al., 2006). For example, Barrick et al. (1998) noted that a disagreeable member could completely ruin the tranquility climate and cooperation in the whole team. Similarly, Peeters et al. (2006) argued that a highly conscientious member would carry the whole team on the shoulder and elevate the team performance. In some situations, the maximum and minimum of team personality may offer unique insights about how one person has an inordinate effect on team success.

2.2.2 **The Big-Five Model**

The Big-Five model is a well-established and most-cited framework of personality (McCrae and Costa, 2008). In the model, individual personality consists of five traits, conscientiousness (achievement-orientation, self-discipline, and meticulousness), agreeableness (warmth, friendliness, and cooperation), emotional stability (composure, calmness, and positive framing), extraversion (sociability, self-assurance, and confidence), and openness to experience (imagination, originality, and curiosity) (Barrick and Mount, 1991; Costa and McCrae, 1992; Costa et al., 1991). A plethora of empirical evidence has demonstrated the distinctiveness of the five dimensions and their differential effectiveness in predicting individual outcomes (Costa and McCrae, 1992; Hurtz and Donovan, 2000; Mount

et al., 2006). Conscientiousness and emotional stability are found to be the most stable and consistent predictor of individual task and contextual performance (Barrick and Mount, 1991; McCrae and Costa, 2008; Mount and Barrick, 1998). The predictive effectiveness of the other three traits is highly context-contingent (Costa and McCrae, 1992; Kluemper et al., 2015; Mount and Barrick, 1998).

Relying on extant findings, the Big Five traits can be mapped to the Big Two framework (Blackburn et al., 2004; Trapnell and Wiggins, 1990). In general, as TABLE II shows, some elements of conscientiousness, extraversion, and neuroticism are consistently related to agency, agreeableness is consistently related to communion. It suggests that each of the Big Five traits does not perfectly fall into either agency or communion category. Some traits, such as conscientiousness, extraversion, and neuroticism, are mixtures of agentic and communal elements. Synthesizing 14 studies, Digman (1997) found that some dimensions of emotional stability, agreeableness, and conscientiousness are related to individual aim “toward peer popularity” (Digman, 1997, p. 1251), while the other dimensions of emotional stability, extraversion, and openness to experience reflects individual aim “toward status” (Digman, 1997, p. 1251). The Big Two framework demonstrates higher generalizability across languages than the Big Five model (Saucier, 2009).

TABLE II ASSOCIATION BETWEEN BIG FIVE TRAITS AND BIG TWO

Big Two	Big Five
Communion	Agreeableness is consistently related to communion (Barrick et al., 2002; Ghaed and Gallo, 2006; Hurley, 1998; Ward et al., 2006) Extraversion facets including warmth and positive emotions (Hurley, 1998) Conscientiousness (Ghaed and Gallo, 2006; Ward et al., 2006) Emotional stability (Ward et al., 2006); Hostility subdimension of Neuroticism (Hurley, 1998)
Agency	Extraversion (Ward et al., 2006), Assertiveness of Extraversion (Hurley, 1998) Conscientiousness (Barrick et al., 2002; Ghaed and Gallo, 2006; Ward et al., 2006) Emotional stability (Ghaed and Gallo, 2006) Openness (Hurley, 1998; (Ward et al., 2006)

2.2.3 **Team Personality Research Findings**

In the extant literature, team mean personality has received substantial but inconsistent support for its relationship with team functioning and performance (Gonzalez-Mulé et al., 2014; Peeters et al., 2006) (see TABLE III). Among the five traits, team conscientious and agreeableness are most predictive of team performance and are found to be positively related to team performance (Barrick et al., 1998; Bell, 2007; Neuman et al., 1999; Peeters et al., 2006). In some situations, team emotional stability is positively related to team performance (Peeters et al., 2006).

However, team personality dispersion research shows more complexity. The extant literature suggests that team dispersion works via two pathways, complementary fit and supplementary fits (Gonzalez-Mulé et al., 2014; Neuman et al., 1999). When team members possess similar characteristics and the addition of a member supplements the existing characteristics (Kristof-Brown et al., 2005), supplementary fit occurs and enhances team functioning and performance through creating common ground and facilitating team coordination (Ehrhart and Naumann, 2004; Gonzalez-Mulé et al., 2014; Neuman et al., 1999).

Researchers argued that supplementary fit applies to personality traits that involve communal elements, such as agreeableness and conscientiousness (Gonzalez-Mulé et al., 2014).

Empirical evidence shows that team conscientiousness dispersion is negatively related to team performance (Barrick et al., 1998; Peeters et al., 2006) and team agreeableness dispersion is negative related to social cohesion (Barrick et al., 1998), team helping behavior (Bradley et al., 2013), and team performance (Mohammed and Angell, 2003; Peeters et al., 2006).

In contrast, when members possess heterogeneous characteristics and each adds new characteristics to the extant team environment by affording new insights, beliefs, skills, and abilities (Kristof-Brown et al., 2005), complementary fit occurs and is conducive to team effectiveness by harnessing the potential of diverse backgrounds, values, ideas, and skills (Kozlowski and Bell, 2003). Previous research reveals that complementary fit applies to agentic traits, such as extraversion and emotional stability/neuroticism (Barrick et al., 1998; Peeters et al., 2006). In support, team extraversion variance is found to be positively related to team helping behavior (Bradley et al., 2013) and team performance (Baer et al., 2008; Barrick et al., 1998; Neuman et al., 1999; Peeters et al., 2006).

The research findings hint at the possibility that communal traits, such as agreeableness (Barrick et al., 1999; Neuman et al., 1999), are more compatible with a homogeneous configuration, while agentic traits, such as extraversion and emotional stability (Barrick et al., 1999; Peeters et al., 2006), are more compatible with a heterogeneous configuration. However, up to now, this proposition lacks theoretical grounding and empirical support and warrants further exploration. Though the complementary/supplementary fit theory offers certain insights on the proposition, it is limited in two ways. First, the theory does not answer which traits apply to complementary fit and which traits apply to supplementary fit. It seems that researchers rely more on trait definition, personal experience,

and statistical evidence than a theoretical rationale to determine whether a certain trait applies to supplementary or complementary fit. We need a sound theoretical framework to differentiate personality traits in terms of their compatibility with a homogeneous versus heterogeneous configuration. Second, another limitation is that the complementary/supplementary fit framework lacks the necessary nuances to capture the complexity of team personality composition. There remains substantial ambiguity regarding “fit” in terms of team personality traits. Neuman et al. (1999) doubt “a supplementary model (homogeneous teams) or a complementary model (heterogeneous teams) best described team personality dispersion in high-performing work teams”. This fit approach, like the mainstream research, treats the magnitude of team dispersion as a whole but neglects potential different configurations of the dispersion. In this regard, I intend to combine the agency-communion framework and the refined configural approach to team composition to investigate the optimal team configuration for agentic and communal traits.

2.3 **Socioanalytic Theory**

The agency/communion typology of personality has its deep roots socioanalytic theory of personality (Hogan, 1991, 1996). Based on evolutionary psychology, socioanalytic theory states that “getting ahead” and “getting along” are two basic human motives (Hogan, 1991, 1996) that direct individual behaviors (R. Hogan and Blicke, 2013; Hogan and Holland, 2003). First, social nature determines that human beings who live in groups need to cooperate with others to survive and function. They have strong needs for social acceptance, affiliation, and companionship, and tend to get along with others in the group (Hogan, 1996). Second, as society and groups are inherently organized in a hierarchy, individuals’ hierarchical status is directly related to their resources, living, and security (Hogan, 1996). For individual success, people are innately motivated to compete with others for power and

TABLE III A SUMMARY OF TEAM PERSONALITY RESEARCH FINDINGS BASED ON BIG-FIVE MODEL

Traits	Conceptualization	Findings
Conscientiousness	Mean	Positively related to team performance (Barrick et al., 1998; Neuman et al., 1999; Peeters et al., 2006).
	Dispersion	Negatively related to team performance (Barrick et al., 1998; Peeres et al., 2006).
	Maximum	Negatively related to communication (Barrick et al., 1998).
	Minimum	Positively related to team performance, communication, workload sharing, and negatively related to team conflict (Barrick et al., 1998).
Agreeableness	Mean	Positively related to team performance (Neuman et al., 1999; Peeters et al., 2006), social cohesion, workload sharing, flexibility (Barrick et al., 1998), and cooperative group norm (Gonzalez-Mulé et al., 2014), and negatively related to team conflict (Barrick et al., 1998).
	Dispersion	Positively related to team conflict, and negatively related to team performance (Mohammed et al., 2007; Peeters et al., 2006), social cohesion, communication, workload sharing (Barrick et al., 1998), and cooperative group norm and group helping behavior (Gonzalez-Mulé et al., 2014).
	Maximum	Positively related to team conflict, and negatively related to social cohesion and communication (Barrick et al., 1998).
	Minimum	Positively related to team performance, social cohesion, communication, and workload sharing, and negatively related to team conflict (Barrick et al., 1998).
Extraversion	Mean	Positively related to team viability, social cohesion, flexibility, communication (Barrick et al., 1998), and cooperative group norm (Gonzalez-Mulé et al., 2014), and negatively related to team conflict (Barrick et al., 1998).
	Dispersion	Positively related to team performance (Barrick et al., 1998; Mohammed et al., 2007; Neuman et al., 1999) and cooperative group norm (Gonzalez-Mulé et al., 2014).
	Maximum	Positively related to social cohesion and flexibility (Barrick et al., 1998).
	Minimum	Positively related to team viability, team performance, social cohesion, flexibility, communication, and workload sharing, and negatively related to team conflicts (Barrick et al., 1998).
Emotional stability	Mean	Positively related to team viability, team performance, social cohesion, flexibility, communication, and workload sharing, and negatively related to team conflicts (Barrick et al., 1998).
	Dispersion	Positively related to team performance (Mohammed et al., 2007; Neuman et al., 1999).
	Minimum	Positively related to social cohesion, flexibility, communication and workload sharing, and negatively related to team conflicts (Barrick et al., 1998).
Openness to experience	Mean	Positively related to team performance (Neuman et al., 1999).

status (Hogan and Shelton, 1998). The seemingly paradoxical motives of “getting ahead” and “getting along” depict the intricacy of human life in groups (R. Hogan, 1996).

According to Hogan and Blicke (2018), social interaction profoundly shapes and poses constraints on individuals’ tendency to “get ahead” and “get along”. The core tenet is that individuals are more likely to express the tendency to “get ahead” or “get along” when the social environment allows and supports the expression. It coincides with the concept of “affordness” in the ecological perspective (Barrick, 2004), which defines the conditions and possibilities that the environment provides for certain actions (Gibson, 1979). In the group setting, this “affordness” is largely determined by what other people in the group provide and need (Barrick, 2004). Baron and Boudreau’s (1987) cite an example that “helpfulness requires a helper and a recipient, competition requires a rival, and dominance requires a subordinate” (p. 1223). Hence, agentic/communal traits are displayed when other people in the team or team structure/climate affords the expression of the traits.

Extant literature suggests that agency and communion each has its favorable structure or environment (Abele and Wojciszke, 2014; Wojciszke et al., 2011). For example, in a series of experiments, Wojciszke et al. (2011) found that individual agency functioned well in an agentic (task-oriented) situation while communion functioned better in a communal (relationship-related) situation. When it comes to agency and communion in gender- or social role-related research (Eagly and Karau, 2002), a wealth of empirical research has demonstrated that individual agentic and communal attributes only function when they are congruent with the correspondent social roles (expectations). The discrepancy between the agentic/communal attributes with the gender or social role-laden environment may cause individual dysfunction or maladaptability (Rosette and Tost, 2010). For example, a masculine (agentic) employee may feel pressure and less satisfied when working in a feminine (communal) occupation, like nursing or childcare, or vice versa. However, as mentioned

earlier, there is scarce research on team-level agency and communion. It means that we have little knowledge of the optimal team structure or composition for agentic or communal traits. Therefore, expanding on what is known regarding agentic and communal traits at the individual level, I will explore their impact on individual needs and interpersonal interactions in teams and their ideal composition pattern.

2.4 **Configural Approach to Team Personality Composition**

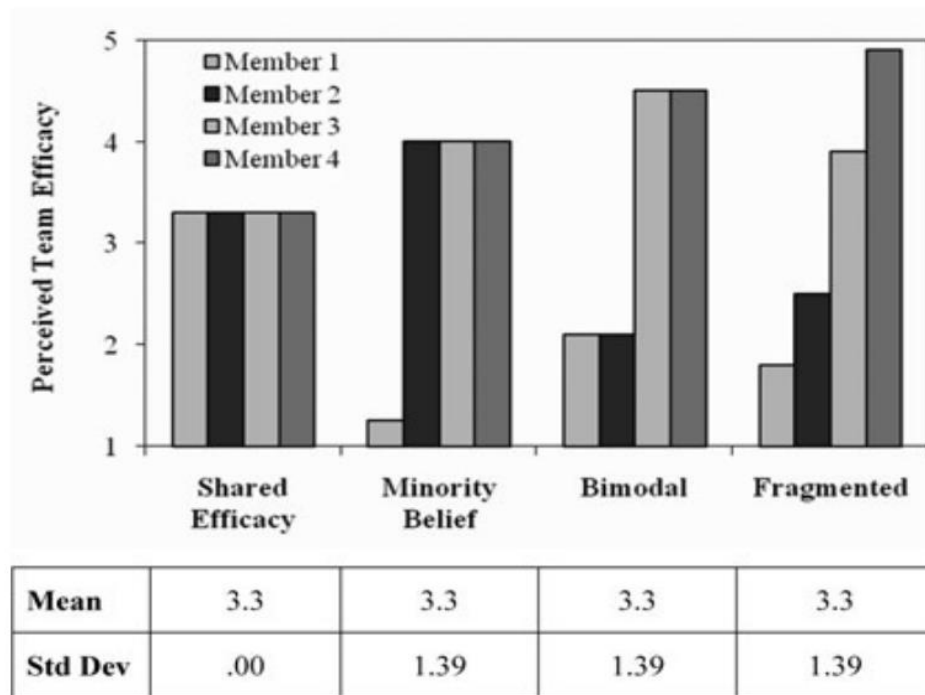
Team personality homogeneity/heterogeneity research is particularly important as “disagreement is natural in group contexts” (DeRue et al., 2010, p. 10). Studying the dispersion of team characteristics is crucial to understand team dynamics and functioning. However, DeRue et al. (2010) pointed out that extant literature does not address how patterns of team dispersion “shape team functioning through the emergence of individual-level psychological processes at the team level” (p. 2). In Kozlowski and Klein’s (2000) typology, personality diversity is created by a discontinuous compilation that “represents a shift in conceptual focus, from the content of the phenomenon to the nature of emergence itself” (p. 72). Considering the inconsistent findings of the team personality diversity, Neuman et al. (1999) highlighted that examining the configuration patterns can contribute to team personality diversity research beyond the degree/magnitude. Moynihan and Peterson (2001) proposed a configural approach that elaborates on the distribution of a mix of team personality traits. They assert that this configuration perspective can advance our understanding of team personality and the underlying dynamics both in breadth and depth.

2.4.1 **Dominant Framework**

In their salient research, DeRue et al. (2010) elaborated on the configuration of team traits. Taking team self-efficacy as an example, they proposed a taxonomy of four team

configurations, including shared configuration, minority configuration, bimodal configuration, and fragmented configuration. The shared configuration presents a high level of consensus indicated by r_{wg} higher than .70, such that the characteristics are shared among team members. The minority configuration describes a situation where a small number of team members deviate meaningfully from the average level of team characteristics. Seo et al. (2018) further distinguished a solo-status high from a solo-status low minority configuration, wherein the minority members are higher or lower than the team average. The bimodal configuration depicts a situation where the level of team member's traits distributes along two subgroups with equal size. It presents a sizable diversity among team members and creates competitions between the two camps. Li and Liao (2014) highlighted that the bimodal configuration of leader-member exchange (LMX) among team members harmed the team role engagement and cohesion the most. The fragmented configuration describes a situation there are significant differences between team members, therefore producing a high degree of heterogeneity in the team. Figure 2 copied from DeRue et al. (2010) shows that even with the same level of mean and deviance, minority configuration, bimodal configuration, and fragmented configuration represent different distribution patterns that may explain team phenomena beyond mean and deviance magnitude.

In DeRue et al.'s (2010) configural approach, team mean or dispersion of team attributes interacts with the patterns of dispersion to understand how team composition shapes team functioning and performance. The configurations become meaningless without considering the absolute level of the individual (Li and Liao, 2014) and team dispersion (Seo et al., 2018) of characteristics. According to Li and Liao's (2014) and Seo et al's (2018) research findings, the number and types of configurations of a team attribute may vary across studies. Therefore, the present research does not hypothesize the number of configurations for team agency or communion but focuses on the types of configurations that have theoretical



Note. Each graph in this figure represents a four-person team. The y-axis of each graph represent team members' team efficacy beliefs on a 5-point Likert scale (1 = *low*; 5 = *high*).

Figure 2. Four configurations of team dispersion

^a The figure is excerpted from DeRue et al. (2010)

relevance to the effect of team agency and communion.

2.5 **Hypotheses**

2.5.1 **Team Agency, Team Accomplishment Striving, and Performance**

Goal striving lies at the heart of agency (Bakan, 1966). According to the definition, agency is more task-related and agentic people strive to gain instrumental returns and superiority over others by accomplishing tasks (Abele, 2003; Abele and Bruckmüller, 2011). Though agency is assumed to involve task accomplishment and social repulsion/competition, Abele and Bruckmüller (2011) were able to find that individual agency is more closely related to accomplishment striving than status striving. Thus, *team accomplishment striving* is identified as the mediating process between team agency and team performance. According to Barrick et al. (2002), accomplishment striving “reflects an individual’s intention to accomplish work tasks and is characterized by a high task motivation” (p. 44). It fits with the purpose of the current study to investigate the task orientation aspect of team agency. At the team level, team accomplishment striving indicates a general task orientation and the average tendency to accomplish tasks among members. According to the selection-attraction-attrition model (Joyce and Slocum, 1984), people who have similar attributes are likely to develop similar motivational tendencies in the same circumstance after the team socialization processes. It justifies that team accomplishment striving develops when members have similar traits and are exposed to the same team practices and environment.

I assume that the team average agency is positively related to team accomplishment striving. By definition, agentic people have an inner need for mastery, competence, and accomplishment (Abele, 2003) and strive to obtain instrumental gains through accomplishing tasks (Abele and Wojciszke, 2014). In the organization, task accomplishment is the basis of a team’s performance and influence (Kozlowski and Klein, 2000). Teams with a high average

agency will likely place great weight on task accomplishment as means to outcompete other teams. On the other hand, agentic people are driven to “get ahead” of others through task accomplishment and are afraid of lagging (Bakan, 1966). In teams with a high average agency, when members are pervasively striving to get ahead, the competition to “stand out” from other members is greatly intensified. Members feel more pressure to make more task effort and to ensure their team standing through task accomplishment. In this sense, team mean agency orientates and pressures members to strive for task accomplishment (Gonzalez-Mulé et al., 2014).

Hypothesis 1a: Team agency is positively related to team accomplishment striving.

Team accomplishment striving indicates a highly motivational state wherein people desire to accomplish assigned tasks and achieve relevant goals (Barrick et al., 2002). It represents a team motivation that fuels members with a dedication to task accomplishment. Team motivation has been well-acknowledged to be a team process that significantly accounts for team effectiveness (Hu and Liden, 2015). In teams with high mean accomplishment striving, members are pervasively motivated by task accomplishment and are committed to shared task goals (Abele and Bruckmüller, 2011). Behaviorally, they engage in a series of goal-oriented behaviors, such as deliberate plans and timelines, make a great effort, and persist in difficulty (Rogelberg et al., 2006), that navigate them toward task accomplishment. As a result, teams high in accomplishment striving would have higher task performance. In empirical support, researchers demonstrate that accomplishment striving is positively related to task performance (Barrick et al., 2002; Rogelberg et al., 2006) and team motivation is predictive of team performance (Hu and Judge, 2017). Taken together, it is hypothesized that team mean agency affects team performance via eliciting accomplishment striving among the members.

Hypothesis 1b: Team accomplishment striving positively mediates the relationship

between team agency and team performance.

2.5.2 **Team Communion, Team Coordination, and Performance**

Team cohesion is an important relational team process to understand team functioning and performance (Evans and Dion, 2012; Webber and Donahue, 2001). Team cohesion is defined as “the solidarity or unity of a group resulting from the development of strong and mutual interpersonal bonds among members and group-level forces that unify the group, such as shared commitment to group goals and esprit de corps” (Forsyth, 2018, p. 15). It mainly involves three elements, 1) social integration that indicates team members identify with team goals and value their team membership, 2) relational bonds that closely-knit team members and reduce potential conflicts, 3) affective experience that makes people feel attached to the team and team members and are unwilling to leave (Forsyth, 2018). Harrison et al. (1998) showed that team deep-level diversity is a salient predictor of team cohesion.

Team communion is assumed to be positively related to team cohesion. According to Abele and Wojciszke (2014), communal values are rooted in interdependent self-construal, believing that people depend on others and the community to maintain and boost self-interest. In teams with high average communion, members prevalently value relationship, harmony, and unity in the team (Abele and Bruckmüller, 2011). They are more likely to identify with team values and goals and assimilate team values into their identity (Abele and Bruckmüller, 2011). It facilitates their social integration as team members and builds their bonds to the team (Dion, 2000). On the other hand, communal people feel attracted to those who are similar to them (Abele and Wojciszke, 2014). Forsyth (2018) stressed that personal like and attraction provide conditions for building close and harmonious relationships between team members. In addition, communal people are highly conflict-avoidant and generally have high positive emotions (Bakan, 1966). When facing interpersonal conflicts, communal members

often show great patience in resolving the conflicts (Rosette and Tost, 2010). Thus, communal members are more likely to maintain good relationships with and have an affective attachment to each other.

Hypotheses 2a: Team communion is positively related to team cohesion.

Team cohesion is a well-established predictor of team performance (i.e., Beal et al., 2003; Evans and Dion, 2012; Forsyth, 2018; Kozlowski and Bell, 2003). According to the definition, team cohesion indicates the integrity, solidarity, social integration, and unity of a team (Forsyth, 2018). Kozlowski and Bell (2003) emphasized that a team needs a certain level of unity to integrate its members and maintain its functions. In general, team cohesion influences team functioning and performance in two ways. First, team cohesion establishes shared identity and a sense of common fate among team members (Beal et al., 2003; Gully et al., 1995). This sense of sharedness leads team members to show a high commitment to team goals and units them to make a concerted effort to achieve these goals. Second, team cohesion serves as a glue that holds people together and helps build close-knit relationships between team members (Forsyth, 2018). Members in cohesive teams often have frequent interactions, open communications, and close relationships (Mathieu et al., 2015). They tend to share their experiences and exchange their ideas on different issues. There will be less misunderstanding and tension between the team members (Beal et al., 2003; Evans and Dion, 2012). Mullen and Copper (1994) cohesion can “minimizes the friction due to the human ‘grit’ in the system” (p. 213). Third, team cohesion builds a friendly climate and positive affective tone in the team. In cohesive teams, people have an affective attachment to each other and tend to respond to each other in a positive manner (Forsyth, 2018). It gives rise to positive affect in the team and facilitates collaborative working between the team members. A handful of meta-analysis demonstrates that team cohesion is negatively related to relationship conflicts and is positively related to team performance (Beal et al., 2003; Evans and Dion,

1991, 2012; Gully et al., 1995; Mullen and Copper, 1994; Webber and Donahue, 2001).

Taken together, high average team communion could facilitate team performance by enhancing team cohesion.

Hypothesis 2b: Team cohesion positively mediates the relationship between team communion and team performance.

2.5.3 **The Moderation of Team Agency Dispersion Magnitude**

According to the dual existence underlying agentic/communion meta-concepts (Abele and Wojciszke, 2014; Paulhus and Trapnell, 2008), agentic people are driven by the need for competence, achievement, status, and uniqueness. Bakan (1966) put it that “agency manifests itself in isolation, alienation, and aloneness” (p. 14). The needs hidden behind the agentic traits drive people to outperform and outshine their coworkers to demonstrate their competence and gain a competitive edge (Abele and Wojciszke, 2014; Deci and Ryan, 2000). They have the instinct to “get ahead” and excel within the team. As Locke (2003) noted, agentic people often refer to a “self-other” social comparison to maintain their superiority and positive self-evaluations. Similarly, Abele and Wojciszke (2014) emphasized that agency is essentially self-focused and agentic people strive to achieve personal high relative standing through demonstrating competence and accomplishing instrumental goals. It determines that agentic people have a natural repulsion to similarly agentic coworkers and feel more comfortable working with less agentic persons (e.g., Tracey et al., 2001). It implies that team agency dispersion may strengthen the effect of team mean agency on team accomplishment striving.

As argued in Hypothesis 1, agentic team members generally have higher accomplishment striving and are motivated to demonstrate competence and superiority by accomplishing tasks. As Welbourne et al. (1998) suggested, team task accomplishment

requires members to fulfill different role expectations. Role differentiation is acknowledged to be integral to team functioning and effectiveness (Eguíluz et al., 2005). For example, Benne and Sheats (1948) identified multiple team roles, such as leader, follower, information seeker, information giver, and compromiser. Ensuring that members have the necessary motivation, ability, and opportunity to fulfill the diverse role is a precondition of successful team task accomplishment (Katz and Kahn, 1978; Welbourne et al., 1998). In teams with high dispersion of agency, members differ in their agency, that is, their motivation and competence to accomplish tasks. When they pervasively have agentic traits, they would proactively search and take roles that fit their motivation and competency as these roles allow them to maximize their agency to achieve instrumental goals (R. Hogan and Shelton, 1998). For example, more agentic people take leader roles (Grijalva et al., 2015) while the less agentic people take the coordinator and follower roles. It eliminates unnecessary competition for some roles and avoids vacancy in other roles, and greatly increases the possibility that people are assigned to roles that match their agency. In this situation, agentic team members are motivated to exert their agency through fulfilling task roles and meanwhile optimize their relative standing in the team through maximizing their agency. Thereby, high dispersion helps channel high team average agency to team accomplishment striving.

In contrast, low dispersion (high homogeneity) may weaken the effect of team agency. A high average agency with low dispersion indicates that team members are similar in their tendency to be competent, competitive, independent, and assertive (Abele, 2003; Abele and Bruckmüller, 2011; DeRue et al, 2010). They are homogeneously driven by “getting ahead” by outperforming their peers. Members in these teams prioritize self-relevant goals and believe in self-reliance and independence to achieve instrumental goals, such as task performance, status, and power (Bakan, 1966; Helgeson, 1994). In contrast, they are less concerned about the team goals and are less likely to dedicate effort to working together with

team members to accomplish team tasks. Research shows that agentic people are often self-centered and show little concern for other-interest (Abele and Wojciszke, 2014; Wojciszke, 2005). Moreover, a homogeneous tendency to outcompete and superordinate others would create intense competition among the team members. It would give rise to unnecessary interpersonal conflicts (Barrick et al., 1998; Neuman et al., 1999) and prevent the team from developing positive problem solutions (Grijalva et al., 2019). Thus, in teams with high average agency combined with low dispersion, members are motivated to concentrate their agency on realizing self-relevant goals and competing with their members, which undermines a concerted striving to accomplish team tasks.

Hypothesis 3a: Team agency dispersion positively moderates the relationship between team agency and team accomplishment striving, such that the positive relationship is stronger when team agency dispersion is higher than lower.

Combining Hypothesis 3a with Hypothesis 1b, the moderation of team agency dispersion is expanded to the mediation of team accomplishment striving between team agency and team performance. I hypothesize that when team agency dispersion is high, team mean agency engenders higher team accomplishment striving in the team and consequently yields higher team performance.

Hypothesis 3b: Team agency dispersion positively moderates the indirect effect of team agency on team performance via team accomplishment striving, such that the indirect effect is stronger when team agency dispersion is higher than lower.

2.5.4 **The Moderation of Team Agency Fragmented Configuration**

DeRue et al. (2010) noted that the same degree of dispersion can be manifested in different configurations. Different configurations reveal more complexity of team dynamics and explain extra variance in team performance than a mere degree of dispersion (Li and Liao,

2014; Seo et al., 2018). I assume that the fragmented configuration is compatible with team agency, while the bimodal configuration is incompatible with team agency. As argued earlier, team agency may be curbed in a shared configuration or a minority configuration. For example, in a minority configuration, DeRue et al. (2010) the minority team members have “three behavioral options: withdraw from the situation, challenge and attempt to change the majority belief, or conform to the majority belief” (DeRue et al., 2010, p. 12). When agentic members are the majority, in combination with a high team agency, they would naturally dominate the decision-making, resource allocation, and interpersonal interactions (Grijalva et al., 2015). The less agentic minority is likely to be marginalized as not to be able to function in their team roles. It curbs their potentials to exert the fullest agency and play a lubricating role in the agency-dominating team. Bakan (1966) warned that “unmitigated agency” would turn agentic characteristics to arrogance, cynicism, narcissism (Buss, 1990) that lead to dysfunction and maladaptability (Helgeson, 1994). When agentic members are the minority, driven by the need for achievement and superiority to others, they would rather challenge than conform to the majority subgroup. However, the minority status restricts their influence in decision-making and resource allocation and would dampen their striving to accomplish tasks.

In the fragmented configuration, when there is a high team average agency, members are on average high but meaningfully dissimilar in goal striving, assertiveness, competitiveness, and confidence. Driven by self-interest and individual agency, they opt to take the roles that have the best fit with their need, goal, and competence and are fully committed to capitalizing on their agency to fulfill their role. In this situation, it is more likely that these team members can satisfy their needs for competence and self-worthiness in taking differential roles in teamwork (Katz and Kahn, 1978; Welbourne et al., 1998). It alleviates the concerns about intense competition created by role overlap or redundancy and facilitates role

differentiation. As argued earlier, in teams with a high average agency, role differentiation that fits with each member's agency helps channel team agency into high team accomplishment striving.

Hypothesis 4a: Team agency configuration moderates the relationship between team agency and team accomplishment striving, such that the positive relationship is strongest in a fragmented configuration.

The moderation of team agency configuration is further expanded to the indirect effect of team agency on team performance via team accomplishment striving.

Hypothesis 4b: Team agency configuration moderates the indirect effect of team agency on team performance via team accomplishment striving, such that the indirect effect is strongest in a fragmented configuration.

2.5.5 **The Moderation of Team Agency Bimodal Configuration**

Consistent with Hypotheses 3a and 3b, I posit that a shared configuration and a minority configuration is detrimental to the positive effect of team agency on team accomplishment striving and its indirect effect on team performance via team accomplishment striving. As argued earlier, teams with low agency dispersion are likely to suffer from intense task competition and interpersonal conflicts as members are concerned more about individual outstanding performance than about the team coordination and collaboration (Abele and Wojciszke, 2014; Peeters, 1992; Rosenberg et al., 1968; Wojciszke, 2005). A shared configuration means all team members are unanimous in and a minority configuration means the majority of team members are similar in their agentic strivings and tendencies, both indicating low levels of dispersion. Thus, the effects of team agency may be attenuated in a shared configuration and a minority configuration.

Comparatively, the bimodal configuration is more detrimental to team

accomplishment striving even than a shared configuration or a minority configuration. In teams with the bimodal configuration of agentic traits, members are split up into two subgroups of equal size. One subgroup is high in agentic characteristics, such as confidence, goal-striving, ambition, and decisiveness (Abele, 2003; Fiske and Stevens, 1993), while the other subgroup is low in these agentic characteristics. Concerning the variance components of agentic traits in this configuration, the within-group variance in each of the two subgroups is low, but the variance between the two subgroups is high. According to the faultlines theory (Carton and Cummings, 2012), in a bimodal configuration, a faultline is created between the two subgroups such that members are amenable to their in-groups but see members from the other subgroup as rivalries (Li and Liao, 2014). It creates an “us-versus-them mentality” (Earley and Mosakowski, 2000, p. 35) and great division and competition between the two subgroups. Researchers argued that the presence of external competitive pressure forces the in-group members to stick to shared interests and unite to make a concerted effort (McLauchlin and Pearlman, 2012), and thereby intensifies the tension between the two subgroups. Li and Liao (2014) found that LMX differentiation has the strongest negative relationship with team role engagement in bimodal configuration, compared with shared, minority, and fragmented configuration. Thus, bimodal configuration pressures subgroups in teams with an average high agency to compete for the in-group interest and to gain dominance in decision-making, task assignment, and resource allocation (Grijalva et al, 2015). This leads the subgroups to leverage their goal striving and competency to achieve in-group task accomplishment and superiority and withdraw from team task accomplishment. Researchers found that the strong faultlines between subgroups hinder team goal alignment (Hornsey and Hogg, 2000) and accomplishment.

Hypothesis 5a: Team agency configuration moderates the relationship between team agency and accomplishment striving, such that the positive relationship is weakest in the

bimodal configuration.

Similarly, I expand the moderation of team agency configuration to the indirect effect of team agency on team performance via team accomplishment striving.

Hypothesis 5b: Team agency configuration moderates the indirect effect of team agency on team performance via team accomplishment striving, such that the indirect effect is weakest in the bimodal configuration.

2.5.6 **The Moderation of Team Communion Dispersion Magnitude**

According to Abele and Wojciszke (2007, 2014), communal people are driven by the need for relatedness, affiliation, and belongingness. They have a strong motive to reach out to build connections and maintain harmony with others (Abele, 2003; Abele and Bruckmüller, 2011; Fiske and Stevens, 1993). These people strive to “get along” well with others and avoid any conflict or tension that may harm their relationship with others (Abele and Wojciszke, 2014). Locke (2003) emphasized that communal people refer to “ingroup-outgroup” social comparison, that is the distinctiveness or advantages over outgroup, to maintain their self-definition and self-worthiness. In grouping with others, communal people place greater weight on relational communion over achievement (Abele and Bruckmüller, 2011; Abele and Wojciszke, 2014). They are attracted by similarly communal people (Locke and Heller, 2017) and tend to exclude less communal people (Gonzalez-Mulé et al., 2014). This implies that homogeneity may be favorable for communal traits.

Thus, I assume that a high level of sharedness would strengthen the positive effect of team communion on team cohesion. In teams with shared communal traits, members are similar in communal characteristics, such as caring, friendly, and cooperative. According to Abele and Wojciszke (2014), communal people feel secure to develop a good rapport with similarly communal ones. It helps them to establish familiarity at the formation stage and lay

the foundation for developing shared identity, mindset, and working style over time (Tuckman and Jensen, 1977). In this way, low dispersion (high sharedness) creates commonalities for average highly communal members to identify shared goals, build relationships with each other, and develop affective bonds with the team, which indicates high team cohesion (Forsyth, 2018; Gully et al., 1995; Kozlowski and Bell, 2003). In this sense, low dispersion (high sharedness) represents a strong situation that would amplify the effect of team communion on team cohesion (Judge and Zapata, 2015). In support, previous research shows that teams perform better when members possess similar communal traits (Gonzalez-Mulé et al., 2014).

High dispersion is assumed to weaken the effect of team communion on team cohesion. When members significantly differ in their value of relational harmony, union, and solidarity, and vary in their tendency to be sociable, friendly, and cooperative (DeRue et al., 2010), it poses a great hindrance to the transformation of team communion into coordination. First, the dispersion of communion makes it difficult to develop common ground for shared goals and norms (Van Knippenberg et al., 2004). The less communal members show a lower tendency to cooperate and compromise in team discussions, which makes it difficult to reach a team-level consensus. Second, there is a lack of solidarity in teams with high dispersion of communion. It is widely agreed that a single less communal member would ruin the harmony and cohesion in the group (Barrick et al., 1998; Gonzalez-Mulé et al., 2014; Neuman et al., 1999). When communal members make efforts to integrate their relationship and effort as their less communal coworkers refuse to compromise and cooperate, the communal members are faced with great vulnerability to social undermining. It undermines solidarity and mutual trust between members. Empirical research consistently shows that agreeableness diversity hinders group interpersonal facilitation and group performance but gives rise to group interpersonal and task conflicts (Barrick et al., 1998; Neuman et al., 1999; Perees et al., 2006).

Under this circumstance, a high dispersion will lead a team with high average communion to divide into smaller groups. As a result, team members tend to divert their attention from the team to the subgroup interests and attend to maintaining harmony with in-group members (Hogg, 2001). It undermines the common ground and relational cohesiveness needed for developing team cohesion. All these concerns hold communal people from uniting team members and maintain solidarity in the team.

Hypothesis 6a: Team communion dispersion negatively moderates the relationship between team mean communion and team cohesion, such that the positive relationship is stronger when team communion dispersion is lower than higher.

Combining Hypothesis 6a with Hypothesis 2b, I hypothesized that when team communion dispersion is low, team communion enhances cohesion in the team and consequently enhances team performance.

Hypothesis 6b: Team communion dispersion negatively moderates the indirect effect of team communion on team performance via team cohesion, such that the indirect effect is stronger when team communion dispersion is lower than higher.

2.5.7 **The Moderation of Team Communion Shared Configuration**

Drawing from Hypothesis 4a, a shared configuration is favorable for team communion and would amplify the positive effect of team communion on team coordination by creating commonality for coordinating goals, tasks, and work paces among team members (Kozlowski and Ilgen, 2006). The deep-level reasons lie in that team communion is based on similarity and sharedness (Locke and Heller, 2017). Division and imbalance that jeopardize the similarity and sharedness would undermine the function of team communion. For example, in solo-status high minority configuration, communal members dominate the team with a small number of disagreeable and uncooperative members deviate. Despite their

greater saying in decision-making about goals and resources, the communal majority are like to compromise to the dissents to avoid conflict and maintain unity in the whole team. In some situations, it also compromises the effect of team communion in team coordination. Even worse, in a solo-status low minority configuration, the team is dominated by a less communal subgroup that is low in helpfulness, warmth, and sympathy (Abele, 2003; Fiske and Stevens, 1993). The communal minority are conflict-avoidant and submissive and tend to show obedience to the majority (Bakan, 1966; Fiske and Stevens, 1993) rather than challenge the status quo. It marginalizes the influence of the communal minority and prevents them from playing a role in uniting the team. Taken together, I propose that a shared configuration strengthens the relationship between team communion and team coordination.

Hypothesis 7a: Team communion configuration moderates the relationship between team communion and team cohesion, such that the positive relationship is strongest in the shared configuration.

The moderation of team communion configuration is further expanded to the indirect effect of team communion on team performance via team cohesion.

Hypothesis 7b: Team communion configuration moderates the indirect effect of team communion on team performance via team cohesion, such that the indirect effect is strongest in the shared configuration.

2.5.8 **The Moderation of Team Communion Bimodal Configuration**

As argued above, team communion effectuates when member share or are similar in the communal tendencies. A fragmented configuration is detrimental to team communion. In teams with a fragmented configuration of communal traits, members are meaningfully dissimilar in their endorsement of common interest and collective solidarity, as well as in their tendency to be sociable, friendly, and cooperative (DeRue et al., 2010). They lack the

commonality to develop shared goals and mutually beneficial relationships (Van Knippenberg et al., 2004). Instead, as less communal members are self-centered, disagreeable, and uncooperative in interpersonal interactions, the more communal members fear being vulnerable to interpersonal undermining and mistreatment from their coworkers. The fragmentation in team communion prevents communal members from helping and uniting team members and serve the common interests. Thus, team communion may be dysfunctional in a fragmented configuration.

However, a bimodal configuration is even more detrimental to team communion. As argued earlier, the bimodal configuration produces the greatest division and competition between subgroups (DeRue et al., 2010; Li and Liao, 2014). It is the same case for the bimodal configuration of communal traits. Though the communal subgroup is willing to gesture good-will to and break the ice with the less communal subgroup, the less agreeable, friendly, and cooperative subgroup would reject the invitation. As the two subgroups are equal in size, the less communal subgroup feels little pressure to yield to the communal subgroup. Instead, they vie with the communal subgroup to maximize their in-group interest. According to the faultline theory (Li and Hambrick, 2005; Thatcher and Patel, 2012), this opposing situation creates an impermeable boundary and widens the division between the two subgroups. When there is high average communion in the team, according to social categorization theory (Hogg, 2001), the division and even antagonization created by the bimodal configuration lead members to be amiable and sociable to their in-groups and less empathetic and friendly to the out-groups (Li and Liao, 2014). It intensifies the tension between the subgroups and breaks the unity and solidarity of the whole team. Therefore, I argue that the effect of team communion on team cohesion may be attenuated in the bimodal configuration.

Hypothesis 8a: Team communion configuration moderates the relationship between

team communion and team cohesion, such that the positive relationship is weakest in the bimodal configuration.

Similarly, the moderation of team communion configuration is further expanded to the indirect effect of team communion on team performance via team cohesion.

Hypothesis 8b: Team communion configuration moderates the indirect effect of team communion on team performance via team cohesion, such that the indirect effect is weakest in the bimodal configuration.

3. METHOD

3.1 **Participants and Procedures**

The data collection was administered in three companies from China across three waves. Company A is a large-scale joint venture located in Hubei province. The areas of products and services include automobiles, telecommunications, industrial devices, and amusement/home appliances. The company has more than 5000 employees and more than 20 facilities in the region. Company B is a medical technology company located in Shandong province that integrates research and development, manufacturing, installation, service, and is dedicated to improving indoor air quality. The company has more than 2000 employees and the targeted teams include R & D teams, marketing teams, quality management teams, and middle-level managerial teams. It has strong R & D teams composed of senior engineers, technical personnel, and specialists who have been engaged in the manufacture of cleaning and sterilizing products for many years. Company C is a national high-tech enterprise and a listed company. The company has 25 branches and more than 7000 employees. It designs, develops, and manufactures instruments and machines for pharmaceutical industry and provides consulting and after-sales services. At present, the company has 25 branches and more than 7000 employees. The targeted teams are R & D teams, other professional teams, and managerial teams.

To collect information about team leader assignment, work type, task characteristics, interactions, and fluidity in the organizations, the author interviewed middle-level managers, team leaders, and front-line employees (25 in total, 10 from Company A, 5 from Company B, and 10 from Company C) before the data collection. Teams were invited to participate in the current research if they have 1) formally assigned leaders who have the full authority to make

decisions in the team, 2) both long-term and short-term goals, and the correspondent annual and quarterly (monthly or bimonthly in some facilities) performance reviews, 3) frequent communications and interactions between members, 4) team tenure longer than 3 months, and 5) a low turnover rate during the survey administration timeline.

Team size is argued to influence the identification of team attribute configurations. However, there is no rule of thumb in deciding the optimal team size. In Li and Liao's (2014) study, the average team size of the initial sample was 5.28 and the final (after data collection and cleaning) team size is 4.57 per team (375 employees from 82 teams). In Seo et al.'s (2018) study, the average team size of the initial sample was 5.22 (ranging from 3 to 14 members per supervisor) and the final team size is 3.91 (375 subordinates in 96 groups). The team size ranges from 3 to 6 members. Li and Liao (2014), using the r_{wg} approach, and Seo et al. (2018), conducting the latent profile analysis (LPA), were able to identify different, fragmented, bimodal, majority, and shared, configurations of LMX. This indicates that the identification of team configurations is not necessarily constrained by team size. As Li and Liao (2014, p. 851) put it, "we do not constrain the number of members needed to constitute a subgroup because we agree with the view that subgroup identity is a psychological experience of an individual." But to ensure a team size adequate for the complex analysis and avoid overwhelming the team leaders, I set the average team size at 6 (range from 5 to 7) for the initial sample.

To ensure effects to be tested in the current research are sufficiently powered, priori power analysis was conducted to determine the sample size at the team level. With regard to the effect size, I referred to Peeters et al. (2006) meta-analytic study. In their study, the effect size of significant relationships between team personality compositions and team performance ranges from .20 to .24. The priori power analysis suggested that a sample size larger than 57 is required at the team level. Given the anticipated participant attribution across

three waves, I recruited 720 employees from 120 teams with variety in function, tenure, and background, 270 employees of 45 teams from Company A, 210 employees of 35 teams from company B, and 240 employees of 40 teams from Company C. In each team, the members and their immediate supervisor were invited to participate in the survey.

I sent an email to all team members and supervisors, introducing the survey purpose and procedures, and policies of confidentiality, and asking their willingness to participate. After getting the employees' consent, I administered a series of online survey to collect the data. A one-month interval was scheduled in-between three waves of data collection and weekly reminders were sent to increase the response rate. At Time 1 (T1), employees reported their demographics and individual-level agentic and communal traits. One month later, at T2 employees reported team accomplishment striving and team cohesion. Another month later, at T3 team leaders rated team performance.

I received 676 employee questionnaires from 120 teams at T1, 612 employee questionnaires from 118 teams at T2, and questionnaires from all 120 team leaders at T3. Following Li and Liao (2014), a team response rate of 75% was used to screen the final data. After removing missing and unmatched responses, the final sample included 597 matched employee questionnaires from 116 teams with 116 supervisor questionnaires, yielding a response rate of 82.92% for employees and 96.67% for leaders. There are 246 employees of 44 teams from Company A, 169 employees of 34 teams from Company B, and 182 employees of 38 teams from Company C. Of the employees, 54.5% were male, 43.8% were female, and 1.7% chose not to report, and 51.9% had at least a bachelor's degree; 41.9% of them held entry-level positions, 34.5% middle-level positions, and 23.3% senior positions. Their average age was 30.54 years (*S.D.* = 5.19). On average, they have worked in the current organization for 5.78 years (*S.D.* = 4.64) and with the current leader for 3.70 years (*S.D.* = 2.86). Of the leaders, 68.1% were male and 31.9% were female and 59.2% had at least a

bachelor's degree. Their average age was 37.72 years ($S.D. = 5.96$). On average, they have worked in the current organization for 15.31 years ($S.D. = 6.50$) and on the current leader position for 5.47 years ($S.D. = 4.01$).

3.2 **Measures**

The instruments in the current study were originally developed in English. Standard “translation-back translation” procedures (Brislin, 1980) were employed to create the Chinese version. Two proficient bilingual researchers were invited to conduct the translation, and five employees were asked to comment on any ambiguously worded item. Adjustments were made according to their comments. All the instruments are anchored on a seven-point Likert scale ranging from (1) “strongly disagree” to (7) “strongly agree.”

Agentic and Communal Traits (T1). Agentic traits were measured with Abele's (2003) seven items, including (I am) *self-confident, feel superior, can make decisions easily, very active, very independent, stand up very well under pressure, never give up easily*. The communal traits were measured with Abele's (2003) eight items, including (I am) *very kind, very helpful to others, very emotional, able to devote self completely to others, very warm in relations to others, very understanding, aware of feelings of others, very gentle*. The measures show good psychometric validity in previous research (i.e., Abele, 2003; Abele and Wojciszke, 2014). In the current research, Cronbach's alpha of the agentic traits scale is .85, and that for the communal traits scale is .91. Team agency and team communion were calculated by the means of individual agency and communion of the team members, respectively.

Team Agency and Communion Dispersion and Configuration (T1). Following previous research, team agency and communion dispersion were calculated by the standard deviation (SD) of team agency and communion among team members (Wang et al., 2017).

Following Seo et al.'s (2018) procedures, I use mean, SD, skewness, and kurtosis as four indicators and conduct LPA to operationalize differing configurations of team agency and communion. All the configurations were dummy coded as categorical variables before entering in the multilevel analysis. As the configurations are categorical and mutually exclusive, each moderator will be tested separately. The method approach and analytic strategies are described in detail later.

Accomplishment Striving (T2). Barrick et al.'s (2002) 11-item Accomplishment Striving Scale was used to assess employees' striving to accomplish tasks. The item referent will be shifted to the team level. A sample item includes "Our team focuses attention on completing work assignments". The measure demonstrates good psychometric validity in previous research (Barrick et al., 2002; Ng and Lucianetti, 2016). In the current research, Cronbach's alpha of the scale is .95.

Team Cohesion (T2). Team cohesion was measured using Mathieu's (1991) 6-item cohesion scale. Sample items include "There is a feeling of unity and cohesion in my team." In the current research, Cronbach's alpha of the scale is .97.

Team performance (T3). To make sure that the performance indicators reflect the specific team personality, I measured team task performance (the extent to which the team accomplishes tasks) for team agency and team role performance (the extent to which members fulfill their team roles) for team communion. Team leaders were invited to rate the two performance indicators using the task and team role performance subdimensions of Welbourne et al.'s (1998) role-based team performance scale. Each subdimension contains 4 items. A sample item for job-based team performance is "The team finishes the quantity of work output" and a sample item for team-based team performance is "Team members work well as part of a team." Moreover, team viability was measured to test how team agency and communion can predict long-term oriented team goal accomplishment. Aube and Rousseau's

(2005) 4-item scale was used. A sample item includes “The members of this team could work a long time together.” In the current research, Cronbach’s alpha of the scale for team task performance is .92, .85 for team role performance, and .89 for team viability.

Control variables. Following previous team research, team demographics (gender, age, education, and tenure) diversity, team size and team tenure (Barrick et al., 2002; Bell, 2007; Bradley et al., 2013; Neuman et al., 1999) were controlled at the team level. Moreover, leader characteristics are assumed to play an important role in determining a team’s capacities for managing team diversity. Thus, I controlled for leader gender and leader agentic and communal traits at the team level. Leader agentic and communal traits were self-rated by the supervisors using Abele’s (2003) scales. In the current research, Cronbach’s alpha of the scale for leader agentic traits is .85, and that for leader communal traits is .91.

Aggregation. In the current study, team personality compositions (team agency and team communion means, differentiations, and configurations), team accomplishment striving, and team cohesion were created from their individual-level counterparts. According to Chan’s (1998) typology, team-level constructs can be created from the individual-level counterparts through *composition* and *compilation* approaches. The *composition* approach assumes that team-level constructs are isomorphic to their individual-level counterparts (Chan, 1998) and creates team-level constructs through averaging or totaling the individual-level measures of the team members. In contrast, the *compilation* approach assumes that team-level constructs are aggregated from their individual-level counterparts in a complex and non-additive manner (Chan, 1998). In the current research, team personality compositions should be created via a *composition* approach, while team accomplishment striving and team cohesion should be aggregated from the correspondent individual measures via a *compilation* approach. Three indices, r_{wg} , ICC(Interclass correlation)1, and ICC2, were used to evaluate the aggregation of team accomplishment striving and team cohesion. It was found that the average r_{wg} of team

accomplishment striving is .94 and .96 for team cohesion, ICC1 of team accomplishment striving is .16 and that for team cohesion is .22, and ICC2 of team accomplishment striving is .68 and for team cohesion is .76.

3.3 **Team Configuration Identification**

DeRue et al. (2010) proposed two approaches to the operationalization of team dispersion configurations. One approach creatively uses the r_{wg} statistic to operationalize team dispersion configuration. The r_{wg} statistic examines the variance of an observed distribution relative to the expected variance of some null distribution. The basic formula for r_{wg} equals $1 - [\text{variance of an observed distribution} \div \text{the expected variance of a null distribution}]$ (James et al., 1984; James et al., 1993). As the uniform distribution is often used as the expected null distribution, the variance of the observed distribution is compared with the variance of the null uniform distribution. When the variance of the observed distribution is less than the variance of the null uniform distribution, it justifies a sufficient agreement among team members. The lower the r_{wg} value is, the more neatly the observed distribution matches the null distribution. One advantage of the r_{wg} statistic is that “the observed distribution can be compared to a variety of null distributions” (DeRue et al., 2010, p. 32). They suggested creating a null distribution for each form of distribution and examining how well an observed distribution matches each of those null distributions. Based on the definition of the four forms of team configuration, they stated that a uniform distribution best represents a fragmented configuration, a positively or negatively skewed distribution represents a minority configuration, and a bimodal null distribution matches the bimodal configuration. Shared configuration is indicated by a high r_{wg} value ($>.70$) for the observed distribution when compared to each of the proposed null distributions. Following DeRue’s (2010) guidelines, Li and Liao (2014) used r_{wg} statistics to operationalize the four configurations.

The expected variance was calculated by employing the definitional equations for discrete random variables (cf. Mood et al., 1974). Taking a 7-point Likert scale as an example, for the bimodal distribution, the expected variance is given by $E([X - E(X)]^2)$, which is equal to $(1 - 4)^2(0.1) + (2 - 4)^2(0.3) + (3 - 4)^2(0.1) + (4 - 4)^2(0.0) + (5 - 4)^2(0.1) + (6 - 4)^2(0.3) + (7 - 4)^2(0.1) = 4.4$. Following LeBreton and Senter's (2008) recommendation, Li and Liao (2014) used 1.39 for a heavily skewed distribution to indicate the expected variance of minority distribution. They used 2.9 in LeBreton and Senter's (2008) Expected Error Variance Table (p. 832) as the cutoff value for the fragmented configuration. However, this r_{wg} approach does not include a *priori* theory for the cutoff values for the four configurations, which means the cutoff values are identical for all measures with the same scale-point. As such, this approach fails to reflect theoretical differences in the configurations of different team constructs. As such, this approach will not be used as the primary operationalization of agency/communion configurations. Instead, the LPA technique described next will be utilized.

The other is the latent profile analysis (LPA) approach that uses the four indices of the distribution, mean, variance, skewness, and kurtosis. LPA is a statistical method that serves to identify qualitatively distinct subgroups using *observed continuous variables* (Gibson, 1959; Lazarsfeld and Henry, 1968; Muthén, 2002). According to Mokros et al. (2015), LPA is a variant of latent class analysis that is based on categorical variables (Clogg and Goodman, 1984). LPA defines classes via maximum likelihood (ML) estimation and model fit indices (Vermunt and Magidson, 2006). It estimates the probability that an individual is categorized into the best-fitting class simultaneously with the fit of the overall model into the data (Hill et al., 2006). Consequently, LPA is a probabilistic and model-based clustering approach (Vermunt and Magidson, 2006) compared with conventional clustering analysis. In the modeling, classes/profiles will be added iteratively to determine the model that has the best fit for the data. In all, LPA is "superior to cluster analysis in that LPA confirms the

probabilistic model of the subgroups by assessing similar patterns while cluster analysis simply identifies subgroups based on the distance of observed variables” (Seo et al., 2018, p. 484).

When using LPA to detect team configurations, as for a specific team variable, the mean score indicates the level of the team variable, variance indicates the magnitude of the dispersion, skewness indicates the asymmetry of the probability distribution, and kurtosis indicates tailedness of the probability distribution. Seo et al. (2018) elaborated that a minority configuration could be best indicated by a skewness, such that a positive skewness indicates a solo-status high minority configuration and a negative skewness indicates a solo-status low minority configuration. Fragmented and bimodal configuration are best detected by measures of kurtosis (Chissom, 1970; DeRue et al., 2010), such that a kurtosis value of -2 indicates a bimodal configuration, whereas a kurtosis value of -1.2 indicates a fragmented configuration (Chissom, 1970). Seo et al. (2018) pointed out that the LPA approach allows for the consideration of a priori theoretical predictions and reflects the fit of goodness between the proposed configurations and the data (Marsh et al., 2009). Compared with the r_{wg} approach, the LPA approach strikes a balance between theories and statistics (Seo et al., 2018). Seo et al. (2018) recommended selecting the optimal profile model based on theoretical priori and interpretation of goodness-of-fit indices. The APPENDIX 1 presents a comparison between the distribution indices and r_{wg} statistics for operationalizing team dispersion configurations.

3.4 **Hypothesis Testing Strategy**

Multilevel path analysis was conducted in Mplus (Muthén and Muthén, 2000) to test the mediation and moderated mediation hypotheses. After identifying team agency/communion configurations by LPA, I dummy coded the configurations to test the moderation of team agency/communion on the relationship between team agency and

accomplishment striving and that between team communion and team coordination.

Following Seo et al.'s (2018) procedures, I included $n - 1$ dummy codes and treat one configuration as the reference group (coded as 1) when testing the moderation of the correspondent configuration. The moderated mediation hypotheses were tested by examining the significance of the indirect effects and a comparison of the indirect effects at the high and low levels of the moderators. Furthermore, 20,000 bootstrap sampling in Monte Carlo was used to calculate 95% confidence intervals (CIs) for the indirect effects and conditional indirect effects.

4. RESULTS

4.1 Discriminatory Validity

In the current study, agentic traits, communal traits, accomplishment striving, and team cohesion were all self-rated by the employees. Multilevel Confirmatory factor analysis (MCFA) was conducted to test the discriminatory validity of the variables following Dyer et al.'s (2005) approach. Results showed that the hypothesized four-factor model composed of agentic traits, communal traits, accomplishment striving, and team cohesion fits the data well ($\chi^2 (96) = 291.98, p < .001$, root-mean-square error of approximation (RMSEA) = .048, comparative fit index (CFI) = .97, Tucker-Lewis index (TLI) = .96, standardized root-mean-square residual [$SRMR_{(within-group)}$] = .04, $SRMR_{(between-group)}$ = .06), and better than the three-factor model with agentic traits and accomplishment striving combined into one factor ($\Delta\chi^2 (6) = 868.45, p < .001$, RMSEA = .13, CFI = .83, TLI = .77, $SRMR_{(within-group)}$ = .18, $SRMR_{(between-group)}$ = .21), the two-factor model with agentic traits and accomplishment striving combined into one factor and communal traits and team cohesion combined into one factor ($\Delta\chi^2 (4) = 934.19, p < .001$, RMSEA = .18, CFI = .67, TLI = .59, $SRMR_{(within-group)}$ = .22, $SRMR_{(between-group)}$ = .26), and one-factor model with all four variables combined into one factor ($\Delta\chi^2 (2) = 949.86, p < .001$, RMSEA = .20, CFI = .59, TLI = .50, $SRMR_{(within-group)}$ = .22, $SRMR_{(between-group)}$ = .33).

Additionally, I conducted CFA for the three team performance indicators, team task performance, team role performance, and team viability. The results revealed that the three-factor model fits into the data ($\chi^2/df = 2.51$, TLI = .92, CFI = .94, RMSEA = .08, $SRMR = .04$) better than the two-factor model with team task performance and team viability combined into one factor ($\chi^2/df = 4.45$, TLI = .81, CFI = .86, RMSEA = .15, $SRMR = .07$),

and one-factor model with all variables combined into one factor ($\chi^2/df = 5.03$, TLI = .78, CFI = .82, RMSEA = .16, SRMR = .08).

4.2 **Descriptive Information**

The means, standard deviations, and correlations of the variables at the individual- and team-level are represented in TABLE IV. The results suggest that, at the team level, team agency is positively related to team accomplishment striving ($r = .32, p < .001$). Team accomplishment striving is positively related to team task performance ($r = .19, p < .05$) and team viability ($r = .20, p < .05$). Team communion is positively related to team cohesion ($r = .32, p < .001$). Team cohesion is positively related to team role performance ($r = .20, p < .05$) and team viability ($r = .23, p < .05$).

4.3 **Team Agency and Team Communion Configurations**

Following Seo et al. (2018), I ran multiple configuration models ranging from a 1-configuration model to a 7-configuration model to select the profile-model that best fits the data. The model selection is based on priori theory, the goodness-of-fit indices, and figure of representative groups from the configurations (Marsh et al., 2009). Four indices, including Bayesian Information Criterion (BIC), lower Sample-size adjusted BIC (SABIC), entropy, and Bootstrap Likelihood Ratio Test (BLRT) were used to evaluate the goodness-of-fit of all models. In specific, to indicate a good fit, a low value for BIC or SABIC indicate is desirable, entropy should be exceeding 0.80 (Muthén, 2004), and BLRT should be significant ($p < .05$).

TABLE IV MEANS, STANDARD DEVIATIONS, AND CORRELATIONS

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Individual-level (n=597)																			
1. Employee agentic traits	5.03	1.02																	
2. Employee communal traits	5.53	.98	.60***																
3. Accomplishment striving	5.70	1.00	.19**	.24**															
4. Team cohesion	5.85	1.07	.15**	.22**	.78***														
Team-level (n=116)																			
1. Team size	5.15	0.85																	
2. Team Tenure	5.47	4.01	.19*																
3. Leader gender	1.32	0.47	.06	-.09															
4. Leader agentic traits	5.35	0.72	-.17	.00	.04														
5. Leader communal traits	5.69	0.79	-.10	-.10	.07	.45***													
6. Team gender diversity	0.42	0.19	.15	.03	-.06	.17	.07												
7. Team age diversity	3.95	1.68	.08	.07	-.21*	.04	.15	.03											
8. Team tenure diversity	2.92	1.92	.30**	.34***	-.20*	-.21*	-.05	-.13	.46***										
9. Team education diversity	0.54	0.24	-.05	-.11	-.07	-.10	-.08	-.02	.09	-.07									
10. Team agency	5.04	0.58	-.16	-.24**	-.09	.15	.17	.01	.09	-.22*	.07								
11. Team communion	5.53	0.49	.00	-.05	-.08	.06	.08	.11	.10	.04	-.02	.66***							

12. Team agency dispersion	0.89	0.33	-.07	.20*	-.15	-.06	.00	-.21*	.04	.18	.00	-.12	-.05					
13. Team communion dispersion	0.88	0.35	.07	.00	-.17	-.12	.08	-.09	.04	.01	-.07	-.12	-.33***	.40***				
14. Team accomplishment striving	5.70	0.55	.00	-.07	-.12	.06	.12	.14	.09	.01	.05	.32***	.36***	.03	-.13			
15. Team cohesion	5.84	0.55	-.05	-.05	.08	.03	-.02	.06	-.04	.01	-.07	.23*	.32***	.01	-.27**	.81***		
16. Team task performance	5.94	1.00	-.15	.20*	-.10	.07	.09	-.02	.06	.13	-.15	-.01	-.08	.05	-.04	.19*	.24*	
17. Team role performance	5.76	0.95	-.03	.29**	-.20*	.11	.13	.11	.12	.16	-.15	-.03	-.05	.11	.01	.21*	.20*	.70***
18. Team viability	6.13	0.83	-.11	.14	-.17	.11	.23*	.03	.09	.07	-.19*	.03	-.04	.06	.01	.20*	.23*	.68*** .73***

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < .001$.
. 2-tailed

TABLE V presents the model fit indices of the multiple profile-models for team agency configurations. The BLRT test indicated that a 2, 3, or 5-configuration model was a better fit than the 4, 6, or 7-configuration model. The goodness of fit indices also supported that a 5-profile model (lower BIC and lower SABIC) fits better than the 2-profile model or a 3-profile model. Thus, I reviewed the nature of the 5-profile configuration and found that two types of fragmented configuration were identified. I will further look at the indices to see if the two fragmented configurations are valid. The entropy value of the 5-profile model is higher than .80, suggesting distinct and clear profiles.

Furthermore, following Seo et al. (2018), I conducted one-way analysis of variance (ANOVA) to test if the identified team agency configuration profiles vary significantly on the four criteria, mean, SD, kurtosis, and skewness. This procedure is necessary to assess the interpretability of each profile in case of any statistical artifacts resulting from a nonnormal distribution (Muthén, 2006). TABLE VII shows descriptive information for each configuration (mean, SD, kurtosis, and skewness). One-way ANOVA show that group mean ($F(4, 115) = 0.89, ns$), SD, $F(4, 115) = 0.90, ns$, and kurtosis, $F(4, 115) = 1.109, ns$ did not significantly differ across the five configurations, and skewness, $F(4, 115) = 247.59, p < .001$ statistically differed across the five configurations. As shown in Table 7, according to Seo et al. (2018), Profile 1 indicates a solo-status low configuration given a positive kurtosis (3.19) and a negative skewness (-1.72), Profile 3 indicates bimodal configuration given the negative kurtosis (-2.01), while Profile 5 indicates a solo-status high configuration with a positive kurtosis (2.97) and a positive skewness (1.60). Representative teams for agency configurations were presented in Figure 3. It shows that Fragmented 1 and Fragmented 2 did represent two differential fragmented configurations.

TABLE V FIT INDICES FOR LATENT PROFILE ANALYSES (LPA) OF TEAM AGENCY CONFIGURATIONS

LPA models	BIC	SABIC	Entropy	BLRT
1-Profile				
2-Profiles	1114.77	1073.67	.85	-543.73***
3-Profiles	1076.86	1019.97	.85	-526.48***
4-Profiles	1092.72	1020.02	.84	-495.65
5-Profiles	1071.54	983.03	.89	-484.84***
6-Profiles	1078.04	973.73	.90	-469.22
7-Profiles	1090.24	970.13	.88	-463.38

Note. BIC = Bayesian information criterion; SABIC = sample-adjusted Bayesian information criterion. SABIC is a predictive fit index used to select the model that has the best fit and fewer parameters. BLRT = Bootstrap Likelihood Ratio Test, a parametric LRT test by adopting resampling methods. Significance test shows that $k-1$ profiles should be rejected as k profiles model has a better fit.

*** $p < .001$.

TABLE VI AVERAGE POSTERIOR PROBABILITIES ASSOCIATED WITH THE 5-PROFILES
MODEL OF TEAM AGENCY

LPA models	n	1	2	3	4	5
1. Profile 1	15	.97	.03	.00	.00	.00
2. Profile 2	21	.03	.87	.08	.02	.00
3. Profile 3	42	.00	.03	.92	.05	.00
4. Profile 4	28	.00	.01	.03	.95	.01
5. Profile 5	10	.00	.00	.00	.01	.99

^a Posterior probabilities are the probability that a group belongs to the assigned profile. The average posterior probabilities (bold values) associated with the profiles to which groups were assigned.

TABLE VII DESCRIPTIVE STATISTICS FOR TEAM AGENCY CONFIGURATIONS

LPA models	n	Mean	<i>SD</i>	Kurtosis	Skewness
Profile 1 (Solo-status low)	15	4.87 (.32)	.95 (.10)	3.19 (.84)	-1.72 (.10)
Profile 2 (Fragmented 1)	21	4.96 (.32)	.94 (.16)	.36 (.84)	-.83 (.10)
Profile 3 (Bimodal)	42	5.16 (.32)	.91 (.10)	-2.01 (.84)	-.03 (.10)
Profile 4 (Fragmented 2)	28	5.09 (.32)	.84 (.10)	.47 (.84)	.68 (.10)
Profile 5 (Solo-status high)	10	4.87 (.32)	.75 (.10)	2.97 (.84)	1.60 (.10)
<i>F</i>		.89	.90	1.02	247.59***

^a All configurations differ from one another on *SD*, kurtosis, and skewness.

****p* < .001.

	Mean	SD	Kurtosis	Skewedness
Solo-status low	5.46	0.51	4.02	-1.93
Fragmented 1	5.23	1.55	-0.29	-0.61
Bimodal	5.14	1.95	-4.51	-0.18
Fragmented 2	4.89	1.58	1.35	0.13
Solo-status high	4.37	1.38	3.15	1.75

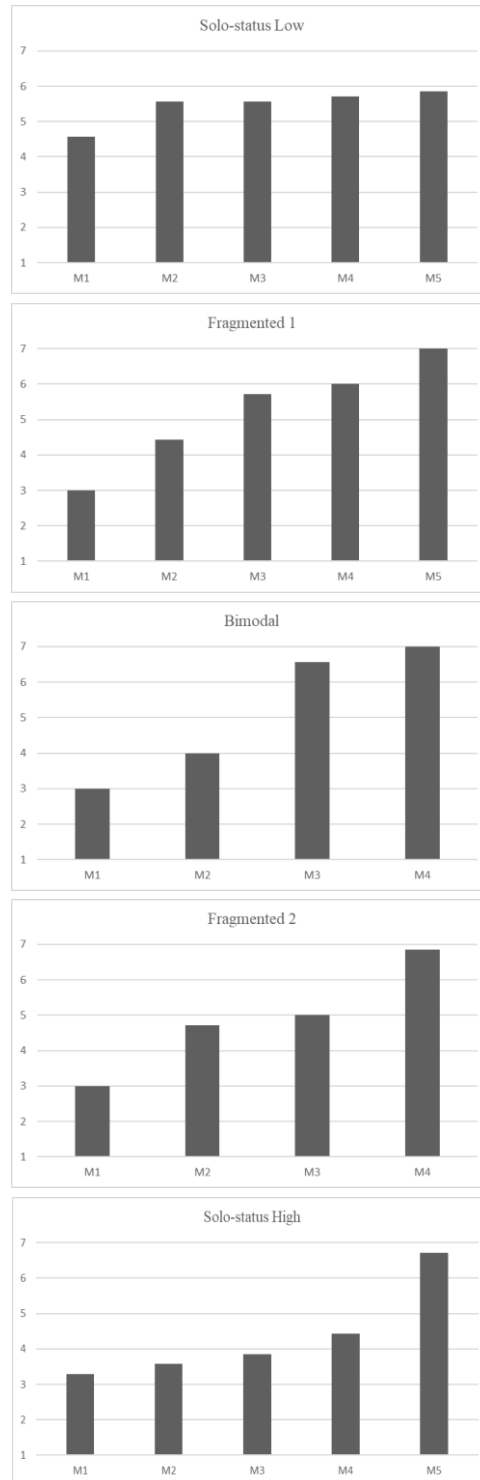


Figure 3. Representative teams for agency configurations

I further ran LPA for team communion. TABLE VIII provides the goodness of fit indices for the various profiles. The BLRT test indicated that a 2, 4, or 5-configuration model was a better fit than the 3, 6, or 7-configuration model. The goodness of fit indices also supported that a 4-profile model (lower BIC and lower SABIC) fits better than the 2-profile model (lower BIC) or a 5-profile model (lower BIC). Thus, I reviewed the nature of the 4-profile configuration and found that it supported the expected configurations. The entropy value of the 4-profile model is higher than .80, suggesting distinct and clear profiles.

Furthermore, ANOVA was conducted to test if the configuration profiles vary in mean, SD, kurtosis, and skewness. TABLE X shows descriptive statistics for each configuration (group-mean, SD, kurtosis, and skewness). One-way ANOVA show that kurtosis, $F(3, 115) = 0.84$, *ns*, is not statistically different across the three configurations, but group mean ($F(3, 115) = 5.15$, $p < .01$), SD, $F(3, 115) = 15.40$, $p < .001$, and skewness, $F(3, 115) = 98.17$, $p < .001$ statistically differed across the four configurations. The results confirm that SD, kurtosis, and skewness each may provide valuable information about team configurations. As shown in Table X, according to Seo et al. (2018), Profile 1 indicates a solo-status high team communion configuration with a positive kurtosis (1.98) and a positive skewness (1.31), Profile 2 indicates a bimodal configuration given the negative kurtosis (-1.21), Profile 3 indicates a solo-status low configuration given a positive kurtosis (2.45) and a negative skewness (-1.46), and Profile 4 indicates a solo-status low configuration given a positive kurtosis (3.53) and a negative skewness (-1.81). After comparing Profile 3 and Profile 4, I found that teams in Profile 3 have a much lower SD than those in Profile 4. Then, I calculated the average r_{wg} of teams in Profile 3 ($=.97$) in terms of team communion, indicating a high level of consensus. Thus, I labeled Profile 3 as a shared configuration. Representative teams for communion were presented in Figure 4. It supports the even distribution of communal traits among team members in teams of Profile 3.

TABLE VIII FIT INDICES FOR LATENT PROFILE ANALYSES (LPA) OF TEAM COMMUNION CONFIGURATIONS

LPA models	BIC	SABIC	Entropy	BLRT
1-Profile				
2-Profiles	1104.67	1063.58	.81	-546.88***
3-Profiles	1116.10	1059.20	.77	-521.43
4-Profiles	1050.15	977.44	.91	-506.16***
5-Profiles	1073.91	985.41	.92	-487.16*
6-Profiles	1066.02	961.71	.90	-470.40
7-Profiles	1089.79	969.68	.90	-454.58

^a BIC = Bayesian information criterion; SABIC = sample-adjusted Bayesian information criterion. SABIC is a predictive fit index used to select the model that has the best fit and fewer parameters. BLRT = Bootstrap Likelihood Ratio Test, a parametric LRT test by adopting resampling methods. Significance test shows that $k-1$ profiles should be rejected as k profiles model has a better fit.

* $p < .05$, *** $p < .001$.

TABLE IX AVERAGE POSTERIOR PROBABILITIES ASSOCIATED WITH THE 4-PROFILES
MODEL OF TEAM COMMUNION

LPA models	n	1	2	3	4
1. Profile 1	15	.96	.00	.04	.00
2. Profile 2	29	.00	.96	.04	.01
3. Profile 3	66	.01	.00	.94	.00
4. Profile 4	6	.00	.04	.00	.96

^a Posterior probabilities are the probability that a group belongs to the assigned profile. The average posterior probabilities (bold values) associated with the profiles to which groups were assigned.

TABLE X DESCRIPTIVE STATISTICS FOR TEAM COMMUNION CONFIGURATIONS

LPA models	n	Mean	<i>SD</i>	Kurtosis	Skewness
Profile 1 (Solo-status high)	15	5.35 (.21)	.76 (.08)	1.98 (1.73)	1.32 (.21)
Profile 2 (Bimodal)	29	5.53 (.21)	.86 (.08)	-1.26 (1.73)	-.10 (.21)
Profile 3 (Shared)	66	5.73 (.21)	.83 (.08)	2.45 (1.73)	-1.46 (.21)
Profile 4 (Solo-status low)	6	5.08(.21)	1.78 (.08)	3.53 (1.73)	-1.81 (.21)
<i>F</i>		5.25**	15.40***	.84	98.17***

^a All configurations differ from one another on *SD*, kurtosis, and skewness.

** $p < .01$, *** $p < .001$.

	Mean	SD	Kurtosis	Skewedness
Solo-status high	5.43	0.97	1.84	1.33
Bimodal	5.43	1.59	-2.97	-0.34
Shared	6.00	0.57	4.52	-2.10
Solo-status low	5.23	1.62	4.41	-2.06

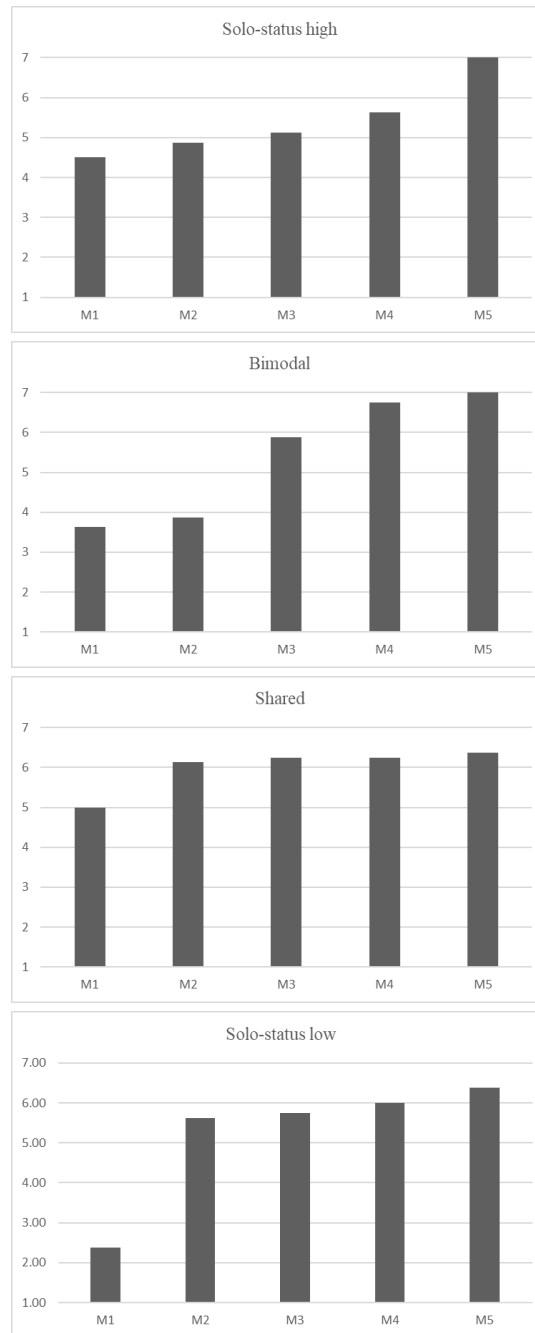


Figure 4. Representative teams for communion configurations

4.4 **Hypothesis Testing**

Hypothesis 1a states that team agency is positively related to team accomplishment striving and Hypothesis 1b states that team accomplishment striving positively mediates the relationship between team agency and team performance. As Figure 5 and TABLE XI show, team agency is positively related to team accomplishment striving ($B = .32, SE = .09, p < .01$), and team accomplishment striving is positively related to team task performance ($B = .40, SE = .18, p < .05$) and team viability ($B = .32, SE = .13, p < .01$). Bootstrapping results suggest that the indirect effect of team agency on team task performance via team accomplishment striving is $.13, p < .05, 95\% CI = [.01, .25]$, excluding zero and that its indirect effect on team viability via team accomplishment striving is $.10, p < .05, 95\% CI = [.02, .18]$. Hypothesis 1a and Hypothesis 1b both were supported.

Hypotheses 2a posits that team communion is positively related to team cohesion and Hypothesis 2b hypothesizes that team cohesion positively mediates the relationship between team communion and team performance. As Figure 5 and TABLE XI show, team communion is positively related to team cohesion ($B = .34, SE = .09, p < .001$), and team cohesion is positively related to team role performance ($B = .36, SE = .16, p < .05$) and team viability ($B = .36, SE = .11, p < .01$). Bootstrapping results suggest that the indirect effect of team communion on team role performance via team cohesion is $.12, p < .05, 95\% CI = [.01, .23]$, excluding zero and that its indirect effect on team viability via team cohesion is $.12, p < .01, 95\% CI = [.03, .22]$. Hypothesis 2a and Hypothesis 2b both were supported.

Hypothesis 3a states that team agency dispersion positively moderates the relationship between team agency and team accomplishment striving, such that the positive relationship is stronger when team agency dispersion is higher than lower. Figure 5 shows that the interaction term “Team agency $\times$ Team agency dispersion” was not significantly related to team accomplishment striving ($B = -.28, SE = .39, ns$). Thus, Hypothesis 3a was not

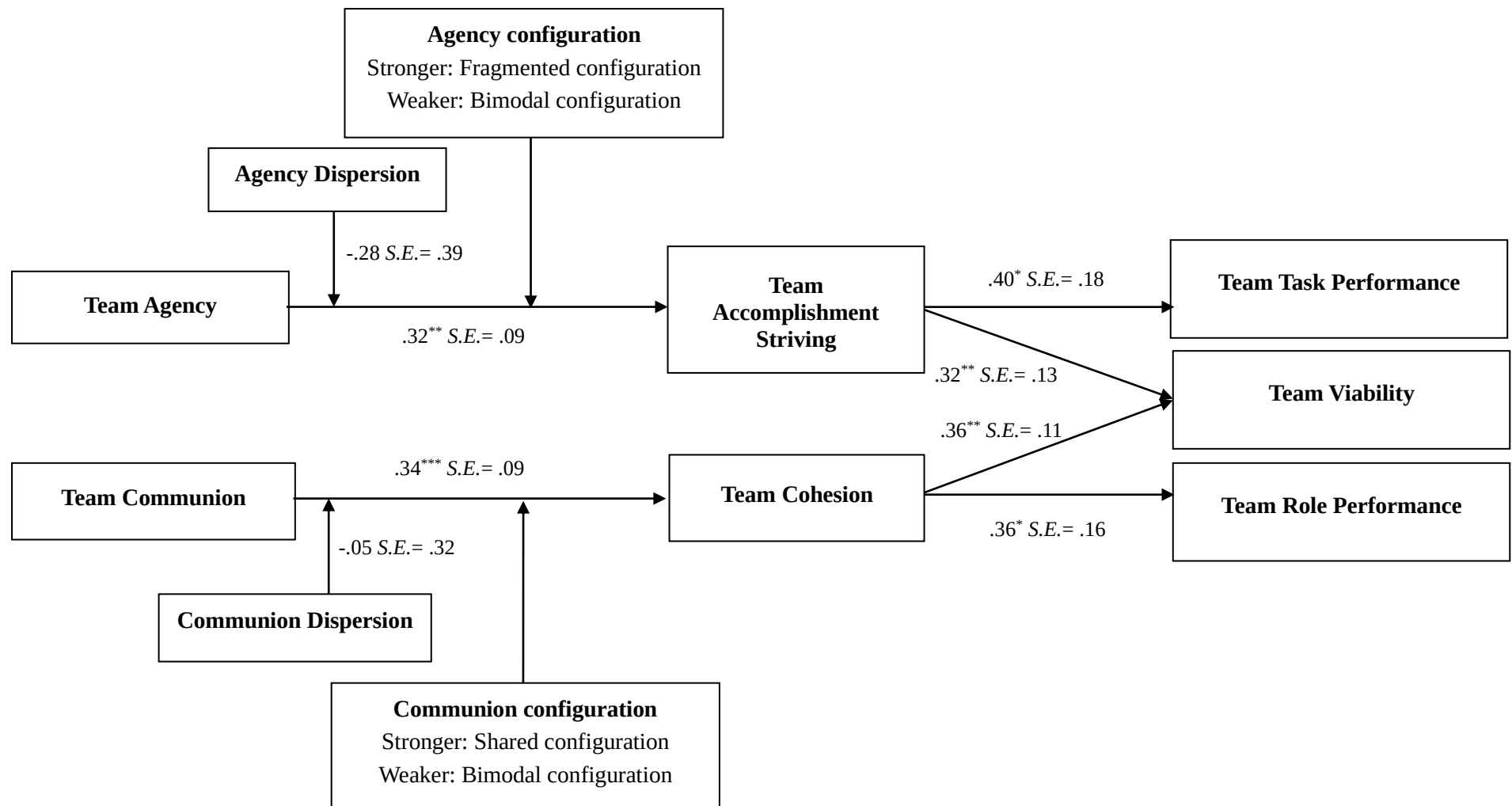


Figure 5. Hypotheses testing results

TABLE XI THE INDIRECT EFFECTS OF TEAM AGENCY AND TEAM COMMUNION

Variables	Direct Effect		Indirect Effect	95% CI
	Stage 1	Stage 2		
Team agency→ Team accomplishment striving→ Team task performance	.32**	.40*	.13*	[.01, .25]
Team agency→ Team accomplishment striving→ Team viability	.32**	.32*	.10*	[.02, .18]
Team communion→ Team cohesion→ Team role performance	.34***	.36*	.12*	[.01, .23]
Team communion→ Team cohesion→ Team viability	.34***	.36**	.12**	[.03, .22]

^a * $p < .05$, ** $p < .01$, *** $p < .001$.

supported.

Hypothesis 3b states that team agency dispersion positively moderates the indirect effect of team agency on team performance via team accomplishment striving, such that the indirect effect is stronger when team agency dispersion is higher than lower. Then, I tested the conditional indirect of team agency on team task performance and team viability via team accomplishment striving at high and low levels of team agency dispersion. Results in TABLE XII show that the indirect effect of team agency on team task performance via team accomplishment striving is not significant at either high .09, *ns*, 95% CI = [-.15, .22] or low .16, *ns*, 95% CI = [-.02, .33] level of team agency dispersion. However, the indirect effect on team viability via team accomplishment striving is not significant .07, *ns*, 95% CI = [-.04, .18] at high level of team agency dispersion but it is significant .12, $p < .05$, 95% CI = [.002, .24] at low level of team agency dispersion. Hypothesis 3b was not supported.

Hypothesis 4a and Hypothesis 4b state that team agency configuration moderates the relationship between team agency and team accomplishment striving and the indirect effect of team agency on team performance via team accomplishment striving, such that the positive relationship and the indirect effect are strongest in a fragmented configuration. Hypothesis 5a and Hypothesis 5b state that team agency configuration moderates the relationship between team agency and team accomplishment striving and the indirect effect of team agency on team performance via team accomplishment striving, such that the positive relationship and the indirect effect are weakest in a bimodal configuration. As the results in TABLE XIII show, team agency is positively related to team accomplishment striving in a fragmented configuration ($B = .50$, $SE = .20$, $p < .05$), whereas the relationship turns nonsignificant in a bimodal configuration ($B = .27$, $SE = .14$, *ns*). Thus, Hypothesis 4a was supported but Hypothesis 5a was not supported. Moreover, the indirect effect of team agency on team task performance via team accomplishment striving was not significant in either a fragmented

TABLE XII CONDITIONAL INDIRECT EFFECTS OF TEAM AGENCY AND COMMUNION

Indirect Effect	Effect Size	95% CI
Team agency→ Team accomplishment striving→ Team task performance		
Team agency dispersion		
High	.09	[-.15, .22]
Low	.16	[-.02, .33]
Team agency→ Team accomplishment striving→ Team viability		
Team agency dispersion		
High	.07	[-.04, .18]
Low	.12*	[.002, .24]
Team communion→ Team cohesion→ Team role performance		
Team communion dispersion		
High	.09	[-.05, .22]
Low	.10	[-.01, .21]
Team communion→ Team cohesion→ Team viability		
Team communion dispersion		
High	.09	[-.05, .23]
Low	.10*	[.003, .20]

^a * $p < .05$.

TABLE XIII EFFECTS OF TEAM AGENCY AND COMMUNION UNDER DIFFERENT CONFIGURATIONS

Effect	Stage 1	Effect Size	95% CI
Team agency→ Team accomplishment striving→ Team task performance			
Solo-status low	.48**	.19 [†]	[-.01, .39]
Fragmented 1	.50*	.20	[-.04, .44]
Bimodal	.27 [†]	.11	[-.04, .25]
Fragmented 2	.20	.08	[-.10, .26]
Solo-status high	.06	.02	[-.23, .24]
Team agency→ Team accomplishment striving→ Team viability			
Solo-status low	.48**	.15*	[.01, .30]
Fragmented 1	.50*	.16 [†]	[-.02, .34]
Bimodal	.27 [†]	.09	[-.03, .20]
Fragmented 2	.20	.06	[-.09, .22]
Solo-status high	.06	.02	[-.18, .22]
Team communion→ Team cohesion→ Team role performance			
Solo-status high	.32	.11	[-.07, .30]
Bimodal	.27*	.09 [†]	[-.01, .19]
Shared	.45*	.17 [†]	[-.002, .34]
Solo-status low	2.07	.74	[-.48, 1.95]
Team communion→ Team cohesion→ Team viability			
Solo-status high	.32	.12	[-.06, .29]
Bimodal	.27*	.11*	[.001, .21]
Shared	.45*	.17*	[.004, .33]
Solo-status low	2.07	.75	[-.48, 1.98]

^a [†] $p < .1$, * $p < .05$, ** $p < .01$.

configuration .20, *ns*, 95% CI = [-.04, .44] or a bimodal configuration .11, *ns*, 95% CI = [-.04, .25]. Also, the indirect effect on team viability via team accomplishment striving was neither significant in a fragmented configuration .16, *ns*, 95% CI = [-.02, .34], nor in a bimodal configuration .09, *ns*, 95% CI = [-.03, .20]. Neither Hypothesis 4b nor Hypothesis 5b was supported.

Hypothesis 6a proposes that team communion dispersion negatively moderates the relationship between team mean communion and team cohesion, such that the positive relationship is stronger when team communion dispersion is lower than higher. Figure 5 shows that the interaction term “Team communion × Team communion dispersion” was not significantly related to team cohesion ($B = -.05$, $SE = .32$, *ns*). Hypothesis 6a was not supported.

Hypothesis 6b posits that team communion dispersion negatively moderates the indirect effect of team communion on team performance via team cohesion, such that the indirect effect is stronger when team communion dispersion is lower than higher. Results in TABLE XII show that the indirect effect of team communion on team role performance via team cohesion is not significant at either high .09, *ns*, 95% CI = [-.05, .22] or low .10, *ns*, 95% CI = [-.01, .21] level of team communion dispersion. However, the indirect effect on team viability via team cohesion is not significant .09, *ns*, 95% CI = [-.05, .23] at high level of team communion dispersion but it is significant .11, $p < .05$, 95% CI = [.007, .20] at low level of team communion dispersion. Hypothesis 6b was partially supported.

Hypothesis 7a and Hypothesis 7b state that team communion configuration moderates the relationship between team communion and team cohesion and the indirect effect of team agency on team performance via team cohesion, such that the positive relationship and the indirect effect are strongest in a shared configuration. Hypothesis 8a and Hypothesis 8b state that team communion configuration moderates the relationship between team communion

and team cohesion and the indirect effect of team communion on team performance via team communion, such that the positive relationship and the indirect effect are weakest in a bimodal configuration. As the results in TABLE XIII show, team communion is positively related to team cohesion in a shared configuration ($B = .45$, $SE = .19$, $p < .05$), whereas the relationship is also significant but weaker in a bimodal configuration ($B = .27$, $SE = .12$, $p < .05$). Thus, Hypothesis 7a and Hypothesis 8a were supported. Moreover, the indirect effect of team communion on team role performance via team cohesion was not significant in a shared configuration $.17$, ns , $95\% \text{ CI} = [-.002, .34]$ or a bimodal configuration $.09$, ns , $95\% \text{ CI} = [-.01, .19]$. However, the indirect effect on team viability via team cohesion was significant in a shared configuration $.17$, $p < .05$, $95\% \text{ CI} = [.004, .33]$, and in a bimodal configuration $.11$, $p < .05$, $95\% \text{ CI} = [.001, .21]$. Therefore, Hypothesis 7b and Hypothesis 8b were partially supported.

4.5 **Post Hoc Analysis**

4.5.1 **Big Five and Big Two Personality Traits**

The association and the distinction between the Big Two and Big Five personality typologies have great relevance to the current research question. In the current study, the Big Five personality traits were measure with the 60-item NEWO-International Personality Item Pool (NEO-IPIP) (Goldberg et al., 2006). A sample item for conscientiousness is “I pay attention to details”, for agreeableness is “I make people feel at ease”, for extraversion is “I feel comfortable around people”, for neuroticism is “I have frequent mood swings”, and for openness to experience is “I enjoy hearing new ideas”. In the current study, the Cronbach’s alpha for conscientiousness is $.71$, for agreeableness is $.82$, for extraversion is $.73$, for neuroticism is $.83$, and for openness to experience is $.78$. The correlations between Big Five and Big Two are presented in TABLE XIV. It is shown that team neuroticism is more strongly

TABLE XIV MEANS, STANDARD DEVIATIONS, AND CORRELATIONS OF BIG TWO AND BIG FIVE TRAITS

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
Individual-level (n=597)															
1. Agentic traits	5.03	1.02													
2. Communal traits	5.53	0.98	.60***												
3. Neuroticism	3.27	1.00	-.51***	-.33***											
4. Agreeableness	4.36	0.94	.49***	.40***	-.55***										
5. Openness to experience	4.82	0.84	.19***	.24***	-.29***	.39***									
6. Extraversion	5.00	0.83	.29***	.36***	-.47***	.47***	.41***								
7. Conscientiousness	4.78	0.76	.46***	.36***	-.51***	.49***	.38***	.50***							
Team-level (n=116)															
1. Team agency	5.04	0.58													
2. Team communion	5.53	0.49	.66***												
3. Team neuroticism	3.26	0.53	-.61***	-.40***											
4. Team agreeableness	4.37	0.45	.62***	.43***	-.69***										
5. Team openness to experience	4.82	0.39	.20*	.23*	-.40***	.34***									
6. Team extraversion	5.01	0.42	.45***	.40***	-.56***	.48***	.44***								
7. Team conscientiousness	4.79	0.39	.62***	.49***	-.67***	.62***	.54***	.66***							
8. Team agency dispersion	0.89	0.33	-.12	-.05	.22*	-.17	-.13	-.20*	-.21*						

9. Team communion dispersion	0.88	0.35	-.12	-.32***	.08	-.14	-.02	-.21*	-.14	.40***					
10. Team neuroticism dispersion	0.90	0.32	.12	.11	-.14	.17	.29**	.21*	.22*	.10	.01				
11. Team agreeableness dispersion	0.83	0.34	.00	.16	-.13	.20*	.20*	.16	.08	.20*	.07	.27**			
12. Team openness to experience dispersion	0.78	0.29	.18	.12	-.15	.14	.38***	.14	.14	.10	.31**	.13	.32***		
13. Team extraversion dispersion	0.75	0.27	.10	.08	-.17	.27**	.12	.07	.15	.12	.16	.21*	.40***	.39***	
14. Team conscientiousness dispersion	0.68	0.27	.20*	.14	-.15	.23*	.15	.09	.08	.21*	.15	.31**	.21*	.31**	.24**

^a * $p < 0.05$, ** $p < 0.01$, *** $p < .001$.

related to team agency ($r = -.61, p < .001$) than to team communion ($r = -.40, p < .001$), $z = -4.92, p < .001$. Team agreeableness is more strongly related to team agency ($r = .62, p < .001$) than to team communion ($r = .43, p < .001$), $z = 4.57, p < .001$. Team conscientiousness is more strongly related to team agency ($r = .65, p < .001$) than to team communion ($r = .49, p < .001$), $z = 4.12, p < .001$. Team openness to experience is almost equally related to team communion ($r = .23, p < .05$) and to team agency ($r = .20, p < .05$), $z = 0.54, ns$. Team extraversion is almost equally related to team agency ($r = .45, p < .001$) and to team communion ($r = .40, p < .001$), $z = 1.05, ns$. Furthermore, I conducted MCFA to test the discriminatory validity between the Big Two and Big Five personality traits. Results showed that the hypothesized seven-factor model composed of agentic traits, communal traits, conscientiousness, agreeableness, extraversion, neuroticism, and openness to experience fits the data well, $\chi^2(597) = 832.92, p < .01$, RMSEA = .047, CFI = .96, TLI = .95, SRMR_(within-group) = .05, SRMR_(between-group) = .06.

4.5.2 **Alternative Mediation Pathways**

Based on the definition and the connotations of the agentic and communal traits, I proposed that the task-oriented team agency better predicts team task-related process (team accomplishment striving) than relationship-related process (team cohesion), while the relationship-oriented team communion better predicts team relationship-related process (team cohesion) than task-related process (team accomplishment striving). Path analysis was further conducted to test alternative mediators between team agency and team communion and team performance. The results in TABLE XV show an indirect effect of team agency on team task performance via team cohesion is .12, $p < .05$, 95% CI = [.01, .23] and an indirect effect of team agency on team viability via team cohesion is .09, $p < .05$, 95% CI = [.02, .17]. Also, we found that the indirect effect of team agency on team role performance via team

TABLE XV ALTERNATIVE MEDIATING PATHWAYS OF TEAM AGENCY AND COMMUNION

Variables	Direct Effect		Indirect Effect	95% CI
	Stage 1	Stage 2		
Team agency→ Team cohesion→ Team task performance	.26**	.47**	.12*	[.01, .23]
Team agency→ Team cohesion→ Team viability	.26**	.36**	.09*	[.02, .17]
Team agency→ Team accomplishment striving→ Team role performance	.32**	.38*	.12*	[.01, .24]
Team agency→ Team cohesion→ Team role performance	.26**	.36*	.09	[-.01, .19]
Team communion→ Team accomplishment striving→ Team role performance	.37***	.38*	.14*	[.02, .26]
Team communion→ Team accomplishment striving→ Team viability	.37***	.32*	.12*	[.02, .22]
Team communion→ Team cohesion→ Team task performance	.34***	.47**	.16*	[.03, .29]
Team communion→ Team accomplishment striving→ Team task performance	.37***	.40*	.15*	[.02, .28]

^a * $p < .05$, ** $p < .01$, *** $p < .001$.

accomplishment striving is .12, $p < .05$, 95% CI = [.01, .24] and the indirect effect via team cohesion is .09, *ns*, 95% CI = [-.01, .19]. As for team communion, the indirect effect of team communion on team role performance via team accomplishment striving is .14, $p < .05$, 95% CI = [.02, .26], and the indirect effect of team communion on team viability via team accomplishment striving is .12, $p < .05$, 95% CI = [.02, .22]. The indirect effect of team communion on team task performance via team cohesion is .16, $p < .05$, 95% CI = [.03, .29] and that via team accomplishment striving is .15, $p < .05$, 95% CI = [.02, .28]. The results suggested that team agency and team communion influence team performance through both task- and relationship-related processes.

I further tested the indirect effects of the alternative pathways at high and low levels of team dispersion and under different configurations. TABLE XVI showed that as for team agency, the indirect effect of team agency on team task performance via team cohesion was not significant at either a high .14, *ns*, 95% CI = [-.01, .28] or low .11, *ns*, 95% CI = [-.03, .25] level of team dispersion. Similarly, the indirect effect of team agency on team viability via team cohesion was not significant at either a high .11, *ns*, 95% CI = [-.002, .21] or low .09, *ns*, 95% CI = [-.02, .19] level of team dispersion. Moreover, TABLE XVII showed that the indirect effect of team agency on team task performance via team cohesion was significant neither in a fragmented configuration .24, $p < .1$, 95% CI = [-.03, .50] and nor in a bimodal configuration .10, *ns*, 95% CI = [-.03, .23]. Similarly, the indirect effect on team viability via team cohesion was significant neither in a fragmented configuration .18, $p < .1$, 95% CI = [-.02, .38] and nor in a bimodal configuration .08, $p < .1$, 95% CI = [-.01, .17].

As for team communion, the indirect effect of team communion on team role performance via team accomplishment striving was not significant at a high level of team dispersion .04, *ns*, 95% CI = [-.11, .19], but it was significant at a low level of team dispersion .19, $p < .05$, 95% CI = [.02, .36]. Similarly, the indirect effect of team communion

TABLE XVI CONDITIONAL INDIRECT EFFECTS OF THE ALTERNATIVE PATHWAYS OF TEAM AGENCY AND COMMUNION

Indirect Effect	Effect Size	95% CI
Team agency→ Team cohesion→ Team task performance		
Team agency dispersion		
High	.14	[-.01, .28]
Low	.11	[-.03, .25]
Team agency→ Team cohesion→ Team viability		
Team agency dispersion		
High	.11	[-.002, .21]
Low	.09	[-.02, .19]
Team communion→ Team accomplishment striving→ Team role performance		
Team communion dispersion		
High	.04	[-.11, .19]
Low	.19*	[.02, .36]
Team communion→ Team accomplishment striving→ Team viability		
Team communion dispersion		
High	.03	[-.09, .16]
Low	.16*	[.01, .31]

^a * $p < .05$.

TABLE XVII INDIRECT EFFECTS OF THE ALTERNATIVE PATHWAYS OF TEAM AGENCY AND COMMUNION UNDER DIFFERENT CONFIGURATIONS

Effect	Stage 1	Effect Size	95% CI
Team agency→ Team cohesion→ Team task performance			
Solo-status low	.30	.14	[-.05, .33]
Fragmented 1	.50*	.24 [†]	[-.03, .50]
Bimodal	.22 [†]	.10	[-.03, .23]
Fragmented 2	.32	.15	[-.07, .36]
Solo-status high	-.29	-.14	[-.41, .14]
Team agency→ Team cohesion→ Team viability			
Solo-status low	.30	.11	[-.03, .25]
Fragmented 1	.50*	.18 [†]	[-.02, .38]
Bimodal	.22 [†]	.08 [†]	[-.01, .17]
Fragmented 2	.32	.11	[-.06, .29]
Solo-status high	-.29	-.11	[-.32, .11]
Team communion→ Team accomplishment striving→ Team role performance			
Solo-status high	.25	.10	[-.10, .29]
Bimodal	.37**	.15*	[.01, .28]
Shared	.55*	.22*	[.002, .43]
Solo-status low	2.33	.95	[-.10, 1.99]
Team communion→ Team accomplishment striving→ Team viability			
Solo-status high	.28	.09	[-.08, .26]
Bimodal	.37**	.12*	[.01, .23]
Shared	.55*	.18 [†]	[-.01, .37]
Solo-status low	2.33	.73	[-.15, 1.61]

^a [†] $p < .1$, * $p < .05$, ** $p < .01$.

on team viability via team accomplishment striving was not significant at a high level of team dispersion .03, *ns*, 95% CI = [-.09, .16], but it was significant at a low level of team dispersion .16, $p < .05$, 95% CI = [.01, .31]. Additionally, the indirect effect of team communion on team role performance via team accomplishment striving was significant in a shared configuration .22, $p < .05$, 95% CI = [.002, .43], and in a bimodal configuration .15, $p < .05$, 95% CI = [.01, .28]. The indirect effect on team viability via team accomplishment striving was not significant in a shared configuration .18, $p < .10$, 95% CI = [-.01, .37], but it is significant in a bimodal configuration .12, $p < .05$, 95% CI = [.01, .23].

5. DISCUSSION

Team personality composition is a salient predictor of team functioning and performance (i.e., Barrick et al., 1998; Bradley et al., 2013; Gonzalez-Mulé et al., 2014; Halfhill et al., 2005; Roberson, 2019) and has been the interest of both researchers and practitioners for decades. However, there are increasing inconsistent findings regarding the effect of team personality diversity, indicated by the positive, negative, and null relationship between team personality differentiation and team performance (Barrick et al., 1998; Bradley et al., 2013; Mohammed and Angell, 2003; Neuman et al., 1999; Peeters et al., 2006). This calls into question “Whether a homogeneous or heterogeneous configuration is favorable for team personality?” (Moynihan and Peterson, 2004). To reconcile the inconsistent findings, the current research aimed to explore the compatibility between homogeneous and heterogeneous configurations with different personality traits through 1) relying on the agency-communion typology to identify personality traits, 2) exploring the task- and relationship-related processes between team agency and communion and team performance, 3) examining the moderation of team agency and communion dispersion on the direct and indirect effects of team agency and communion, and 4) explore the level of dispersion and configurations of team agency and communion and their moderating effect on team agency and communion, respectively. In a three-wave and multi-source sample of 597 employees from 116 teams, I tested the hypotheses using path analysis and found support for some hypotheses (see TABLE XVIII).

5.1 **Research Findings**

First, the current research substantiated the predictive effectiveness of the Big Two typology at the team level. The results showed that team-level agentic and communal

TABLE XVIII A SUMMARY OF HYPOTHESES TESTING RESULTS

Hypotheses Tested	Supported or Not
Hypothesis 1a: Team agency is positively related to team accomplishment striving.	Yes
Hypothesis 1b: Team accomplishment striving positively mediates the relationship between team mean agency and team performance.	Yes
Hypotheses 2a: Team communion is positively related to team cohesion.	Yes
Hypothesis 2b: Team cohesion positively mediates the relationship between team mean communion and team performance.	Yes
Hypothesis 3a: Team agency dispersion positively moderates the relationship between team agency and team accomplishment striving, such that the positive relationship is stronger when team agency dispersion is higher than lower.	No
Hypothesis 3b: Team agency dispersion positively moderates the indirect effect of team agency on team performance via team accomplishment striving, such that the indirect effect is stronger when team agency dispersion is higher than lower.	No
Hypothesis 4a: Team agency configuration moderates the relationship between team agency and team accomplishment striving, such that the positive relationship is strongest in a fragmented configuration.	Yes
Hypothesis 4b: Team agency configuration moderates the indirect effect of team agency on team performance via team accomplishment striving, such that the indirect effect is strongest in a fragmented configuration.	No
Hypothesis 5a: Team agency configuration moderates the relationship between team agency and accomplishment striving, such that the positive relationship is weakest in the bimodal configuration.	No
Hypothesis 5b: Team agency configuration moderates the indirect effect of team agency on team performance via team accomplishment striving, such that the indirect effect is weakest in the bimodal configuration.	No
Hypothesis 6a: Team communion dispersion negatively moderates the relationship between team mean communion and team cohesion, such that the positive relationship is stronger when team communion dispersion is lower than higher.	No
Hypothesis 6b: Team communion dispersion negatively moderates the indirect effect of team communion on team performance via team cohesion, such that the indirect effect is stronger when team communion dispersion is lower than higher.	Partial
Hypothesis 7a: Team communion configuration moderates the relationship between team communion and team cohesion, such that the positive relationship is strongest in the shared configuration.	Yes
Hypothesis 7b: Team communion configuration moderates the indirect effect of team communion on team performance via team cohesion, such that the indirect effect is strongest in the shared configuration.	Partial
Hypothesis 8a: Team communion configuration moderates the relationship between team communion and team cohesion, such that the positive relationship is weakest in the bimodal configuration.	Yes

Hypothesis 8b: Team communion configuration moderates the indirect effect of team communion on team performance via team cohesion, such that the indirect effect is weakest in the bimodal configuration.	Partial
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personality compositions significantly predicted team task- and relationship-processes and the resulting team performance. The findings lend support for the agency/communion framework as a sound framework to study team-level personality traits. Furthermore, in the supplementary analysis, I found that all team-level Big Five traits are simultaneously related to team agency and team communion. Team neuroticism, team agreeableness, and team conscientiousness are more agentic, while team extraversion and team openness to experience are balanced. The multilevel CFA suggested that agentic and communal traits are distinct from the Big Five personality traits at both the individual and team levels. Taken together, the current research supported the Big Two as an alternative framework to the Big Five framework to understand team personality composition and its effectiveness in predicting team processes and the ultimate performance.

Second, the present research corroborated the task-related process between team agency and team performance and the relationship-related process between team communion and team performance. The research results supported the mediation of team accomplishment striving between team agency and team task performance and team viability and the mediation of team cohesion between team communion and team role performance and team viability. The findings provide evidence for the claim that more task-related team agency enhances task performance and viability via aspiring members to accomplish task and achieve performance goals, while the relationship-related team communion contributes to team functioning and viability through nurturing cohesion and solidarity among team members. Through combining the different team performance outcomes, the current research was able to lend sound support for the predictive power of team agency and communion. However, the supplementary analysis showed that team cohesion significantly mediates the relationship between team agency and team task performance and team viability, while team accomplishment striving significantly mediates the relationship between team communion

and team role performance and team viability. The results indicate that both team agency and team communion involve task and relational processes and promotes team performance via task- and relationship-related processes simultaneously, which does not support the notion that team agency is exclusively relevant to task-related team processes while team communion is exclusively relevant to relationship-related team processes.

Third, this research provides partial support for the negative moderation of team dispersion on the effect of team communion, but not for the positive moderation of team dispersion on the effect of team agency. The path analysis results suggested that team dispersion did not moderate the direct effect of team communion on team cohesion but significantly and negatively moderated the indirect effect of team communion on team viability via team cohesion, such that the direct and indirect effects are stronger when team communion dispersion is lower than higher. The findings are consistent with my proposition that for team communion, a high level of dispersion weakens the positive effect of team communion in creating affective bonds and solidarity between members by undermining the common ground and a sense of common fate, while a high level of consensus (low dispersion) can magnify the effect of team communion through strengthening the sense of familiarity and common fate between team members. However, the analysis did not support the positive moderation of team dispersion on the effect of team agency on task accomplishment striving but showed that the indirect effect of team agency on team viability is stronger when team agency dispersion is lower than higher. The results seemingly counter my proposition that a high level of team dispersion is favorable for team agency by facilitating task differentiation that creates conditions and motivates members to unleash their potential to the most. Interestingly, the result hints that a high level of team dispersion undermines the positive effect of team agency. It concurs with the observation that an overly high level of dispersion in team agency increases the diffusion of responsibility for the team but shifts individual

member's focus to self-interest, weakening the positive effect of team agency on team accomplishment striving. Taken together, the research findings provide preliminary evidence for the compatibility between team communion and homogeneity but not for the compatibility between team agency and heterogeneity.

Fourth, the current research corroborated that the effects of team agency and team communion on team processes and team performance varied under different configurations. The results revealed that the effect of team agency on team accomplishment striving is strongest in a fragmented configuration and weakest in a bimodal configuration, whereas the effect of team communion on team cohesion and its indirect effect on team performance via team cohesion are strongest in a shared configuration and weakest in a bimodal configuration. Consistent with my hypotheses, the findings suggest that a fragmented configuration in which team members differ meaningfully in their team agency is conducive to the development of team accomplishment while a shared configuration in which there is a high similarity in the tendency to value and maintain harmony and solidarity among team members contributes to nurturing team cohesion. The results of supplementary three-way interaction analysis further showed that the effect of team agency is significant and strongest when the team has a low level of dispersion and a fragmented configuration. Combining these findings, it can be drawn that agentic members can best translate their agency into accomplishment striving and team performance when they are similar in their level of but meaningfully dissimilar in their type of agency. However, a bimodal configuration that creates impermeable boundaries and irreconcilable conflicts between subgroups in a team is detrimental to either team agency or team communion. Taken together with the results of the moderation of the team dispersion magnitude of team agency and team communion, the findings speak to the fact that magnitude alone is not sufficient to capture the complexity of team personality composition, and the configural approach does explain extra variance beyond the magnitude approach.

5.2 **Theoretical Implications**

The current research findings provide rich implications for both team research and personality literature. First, by substantiating the predictive effectiveness of team agency and communion, this research provides an alternative, the Big Two, typology to study team personality and its composition. As stated earlier, the majority of extant research has exclusively relied on the Big Five Model and focuses one or two of the five traits to study how team personality composition can predict team processes and team performance (Barrick et al., 1998; Moynihan and Peterson, 2004; Peeters et al., 2006). Due to a lack of convergence between the five personality traits, there are inconsistent findings regarding the favorability of team personality dispersion. The dispersion of some personality traits is found to be positively related to team interactions and performance, while the dispersion of other personality traits is demonstrated to be negatively related to team performance (Barrick et al., 1998; Bradley et al., 2013; Mohammed and Angell, 2003; Neuman et al., 1999; Peeters et al., 2006). This calls for an integrative typology of personality traits to explore the compatibility between personality traits and team homogeneous or heterogeneous configuration. In this regard, the current research confirms that the agentic/communal framework does offer an alternative typology to distinguish personality traits (Abele and Bruckmüller, 2011; Paulhus and Trappnell, 2008) and study team composition of personality traits. The higher-order personality taxonomy enables us to shift attention from a single personality trait and investigate the optimal configuration for different personality traits from a holistic view. Moreover, the current research is among the first to study agentic and communal traits at the team level. It substantiates the predictive power of team-level agency and communion and reveals how the configurations of agentic and communal traits may shape team task- and relationship-related processes and resulting team performance.

Second, the current research corroborated the task- and relationship-related processes

between team agency and communion and team performance and enriches our understanding of mediation mechanisms linking team personality to team performance. As Bradley et al. (2013) pointed out, relative to the plethora of evidence of the main effect of team personality composition (i.e., mean, *SD*, maximum, and minimum), we have only a limited knowledge of the pathways through which team personality influences team processes and team performance. The present research supported the mediation of team accomplishment striving between team agency and team performance, as well as the mediation of team cohesion between team communion and team performance. It concurs with the well-established notion that teams comprised of agentic people are more likely to have better performance as they set higher goals and strive to make great and persistent efforts, while communal teams perform better as team members share the endorsement of harmonious relationship and solidarity and have the necessary common grounds to make decisions (Bradley et al., 2013; Gonzalez-Mulé et al., 2014). The supplementary analysis results shed light on the complexity of the team dynamics underlying team agency and communion by revealing that the two team personality traits shape both team task- and relationship-related processes. In all, this study expands and deepens our knowledge of the mechanisms by which team agency and communion and provides new avenues for future research.

Third, through examining the moderation of team dispersion level and the configurations of team dispersion on team agency and team communion, the present research tentatively answers the question “Is team agency more compatible with a heterogeneous configuration while team communion compatible with a homogeneous configuration?” Surprisingly, the results suggest both team agency and communion favor homogeneity in terms of magnitude. Even for team agency that emphasizes self-reliance and uniqueness and calls for autonomy and personalized treatment (Abele and Wojciszke, 2014; Paulhus and Trapnell, 2008), a high level of dispersion is detrimental and inhibits agentic members to

develop shared accomplishment striving. The findings are consistent with the notion that a certain level of consensus is necessary for team members to form shared values and working styles and make decisions on and develop solutions to problems concerning the common interest (Baer et al., 2008; Bettenhausen, 1991; Kozlowski and Bell, 2003). However, when it comes to the patterns of team dispersion, the research findings confirmed my proposition that team agency favors a configuration in which members meaningfully differ in their disposition to outperform others, while team communion fits with a configuration wherein members share their disposition to connect and cooperate with others. Taken together, the results suggest that the configural approach complements the conventional magnitude approach to unfolding the impact of team dispersion (DeRue et al., 2010; Li and Liao, 2014; Seo et al., 2018), makes it possible to explore the nuances of team personality composition, and helps pinpoint a favorable configuration for a specific team personality trait. As the first attempt to introduce the configural approach to team personality research, the current study provides firm evidence to the advantages of the configural approach over the simplified magnitude approach in identifying “the pattern or configuration of characteristics that create synergy in the team collective” (Kozlowski and Bell, 2001, p. 365). Hopefully, this research can serve as an impetus to stimulate more efforts to elaborate the configurations of team personality traits and explore the optimal configuration for different personality traits.

Fourth, the present research extends socio-analytic theory both in breadth and depth. Up to now, socio-analytic theory in personality research has been widely employed to explain individuals’ values, attitudes, and behaviors in the individual, group, and organizational contexts (Hogan, 1991, 1996; Kluemper et al., 2015). The theoretical framework is particularly useful to understand individual agentic and communal tendencies from an evolutionary perspective. However, the theory has seldom been applied to explain the task and relational interactions of agentic and communal people. The current research has

broadened the breadth of socio-analytic theory by expanding it to the team level to explore how aggregated agency and communion can influence team processes and performance. More importantly, a core tenet of socio-analytic theory is that the expression of agency or communion is dependent on the extent to which the environment allows or affords the expression (Barrick, 2004). This tenet, though lies at the heart of research on optimal configuration for team personality, has seldom been explicitly examined. The current research findings help crystalize the environmental “affordness” for team personality expression by showing that a fragmented configuration is compatible with team agency while a shared configuration is compatible with team communion. They explicate that team agency favors an environment that allows diversity in individual goal striving and task orientation, while team communion functions better when members are unanimously amiable and collaborative. Thereby, this study contributes to a nuanced understanding of the environment that supports and affords team agency and communion.

5.3 **Practical Implications**

The research findings provide considerable managerial implications. First, as team agency and communion are both predictive of team performance, managers are recommended to take measures to nurture agency and communion in the team according to their team goals. In employee selection, managers who pursue task performance should make agentic traits that value self-reliance, accomplishment, and high performance the selection standards, while managers who seek to maintain team functioning should make communal traits that emphasize team solidarity and relational harmony the selection standards. In onboarding, they can organize team-based training and activities to facilitate team interactions and nurture affective bonds between team members. These activities can help the teams develop shared accomplishment striving and team cohesion and consequently function and perform well.

Second, as the effects of team agency and communion vary under different team configurations, team leaders should optimize team configuration for team agency and communion to function. For leaders that attempt to foster team functioning through team communion, they should select members who are similar in their tendency to interact and cooperate with others and value team solidarity. This consensus can bind the communal members and bolster the familiarity and closeness between them, which is crucial to team functioning. For leaders that aim to enhance task performance through team agency, they need to take due considerations when shaping the team agency configurations. As a high level of dispersion undermines but a fragmented configuration facilitates team agency, team leaders can select members with differential task striving orientations that fit with the team task demands and place them in the right positions while ensuring the variability among the team members is at a reasonable level.

5.4 **Limitations and Future Directions**

The current research inevitably has some limitations that need to be addressed in the future. First, the small team size of some configurations is a limitation of the current study. As shown in TABLE VII and X, team size for solo-status high ($N_{\text{Team}} = 10$) and solo-status low ($N_{\text{Team}} = 10$) configurations of team agency and that for the solo-status low ($N_{\text{Team}} = 6$) configuration of team communion are relatively small. Similar things occurred in Li and Liao's (2014) study, in which the team size of the bimodal configuration for LMX is 11 and that for the fragmented configuration is 4. Though they reported interpretable results, small team size is a still concern as it might undermine the power of the reported effect sizes. Also, given the relatively small initial team size ($N_{\text{Mean}} = 6$), even missing one member or two may make the team underrepresented. However, the disproportionate distribution of the numbers of teams across different configurations is inevitable given the exploratory nature of the team

configuration identification. Though the current research does have a decent team size ($N = 116$), it is still encouraged that future research increase the team size to ensure they have adequate teams to analyze and power the hypothesized configurations.

Second, the current research did not integrate the agentic and communal facets to depict a full picture of team personality. An assumption of the agency-communion typology is that the two facets jointly delineate a full picture of personality. However, in the current research, team agency and team communion and their configurations were investigated separately, which makes it impossible to know how the two facets jointly depict team personality and shapes team processes and performance. Team personality is assumed to have both agentic and communal facets and can be better depicted by incorporating the two facets simultaneously. On the one hand, future research can examine the interaction of team agency and communion compositions to explore whether different combinations of team agency and communion composition will produce different team performance outcomes. On the other hand, researchers can explore the team-level personality profiles through integrating the facets of agency and communion and examine whether different team personality profiles exert differential impacts on team outcomes. In this way, researchers can advance team personality research by elaborating on the holistic team personality configurations and the mechanisms by which they affect team performance.

Third, the antecedents of team agency and communion configurations merit more research attention. The current research focused on the effects of and mechanisms underlying team agency and communion, neglecting the antecedents of the configurations. As DeRue et al. (2010) pointed out, the formation of team attributes configurations is critical to understand their effects. As for the current study, the configurations of team agency and communion is first shaped by team leaders who set standards for a functional team, select team members, and drop those who do not fit the team values and culture, and then shaped by repeated

task-based and relational interactions between the team members. The development of team personality configuration is highly path-dependent and is a self-selective process. Teams tend to develop their unique configurations of team agency and communion that work best for them over time. Studying the antecedents can expand our knowledge of the formation and effectiveness of team personality configurations. Future research can explore how factors, such as organizational culture and structure, team leadership, and task characteristics, shapes the development of team agency and communion configurations.

Fourth, a longitudinal research design is recommended to extend this study in the future. Using a time-lagged research design, the present research was able to greatly alleviate the concern of common method bias and increase the confidence in the research findings. However, the current research design cannot exclude the possibility of reciprocal or dynamic relationships between the variables of interest. For example, as stated above, team task- and relationship-based processes play an important role in the development of team agency and communion configurations (DeRue et al., 2010). Even team performance may reversely shape the formation of team agency and communion configurations. Researchers find that successful teams tend to become more rigid and homogeneous in the long-run (Bunderson et al., 2014; Hodgkinson and Wright, 2002). In the future, a longitudinal research design is necessary to unravel the complex and dynamic relationships between team personality configurations, team task-related and relational processes, and team performance.

Fifth, experiments can be introduced to extend the current research. The current study was conducted in real-world organizations has the advantages in revealing the complexity of organizational context. Experimental research can provide benefits for advancing the current research in several aspects. First, different configurations of team agency and communion can be designed or manipulated in experimental research. In this case, it is possible to test the causal relationship between team agency and communion configurations and team

performance. Second, experimental research allows for controlling and examining conditions that may interfere with the effect of team agency and communion configurations. For example, researchers can assign teams to different interdependent situations, such as task-, relationship-, and outcome-interdependence, to test which situations fit with a certain team agency or communion configuration.

6. CONCLUSION

After decades of research, it remains an unanswered question “Whether and when a homogeneous or heterogeneous configuration is favorable for team personality?” Relying on the agency/communion framework and integrating magnitude and configural approaches, the present research shows that team agency positive predicts team performance through enhancing team accomplishment striving while team communion positively relates to team performance through facilitating team cohesion. The effect of team agency is strongest when team members differ meaningfully in their agentic tendencies and weakest when members divide into two antagonistic camps in terms of their agentic tendencies, while the effect of team communion is strongest when team members share their communal traits and weakest when members split into a more communal subgroup and a less communal subgroup. The research findings suggest that both the level and configurations of team dispersion play important roles in the effects of team agency and communion. Especially, the configural approach that focuses on the interaction patterns of subgroups in a team provides a new and solid approach to studying the complex team dynamics that underly team personality composition. In summary, the present research provides considerable implications for team and personality literature and map avenues for future research.

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APPENDIX

APPENDIX 1.

TWO APPROACHES TO TEAM CONFIGURATION IDENTIFICATION

Category	Four Distribution Indices	r_{wg} Statistics
Indices	Mean, standard deviance, skewness, and kurtosis	$r_{wg} = 1 - [\text{variance of an observed distribution divided by the expected variance of a null distribution}]$
Rationale	Mean score indicates the level of the team variable, variance indicates the magnitude of the dispersion, and kurtosis and skewness indicate the form of the dispersion.	The observed distribution is compared with the expected null distribution. A low r_{wg} indicates that the observed distribution matches the expected null distribution.
Statistics	Using the four indices as indicators, latent profile analysis is used to identify different types of team configurations.	The observed distribution is compared with the expected null distribution of each of the four distribution to see whether it matches or refutes the expected null distribution. A configuration is justified when the results refute the difference between the observed distribution and the expected null distribution. For measures using Likert scale, the expected variance of the null distribution is calculated with the scale point.
Indices for each configuration		Shared configuration: $r_{wg} > .70$ for all distribution
	Minority configuration: A significant skewness	Minority configuration: cutoff value = 1.39.
	Bimodal configuration: Negative kurtosis	Bimodal configuration: cutoff value = 4.4.
	Fragmented configuration: Negative kurtosis higher than the bimodal configuration	Fragmented configuration: cutoff value = 2.9.

Application	Larger teams	Smaller teams
Advantage	▪ It confirms the probabilistic model of the subgroups by assessing similar patterns. ▪ LPA considers both a priori theoretical predictions and goodness of fit indices to determine the number of classified groups.	▪ The observed distribution can be compared to a variety of null distributions.

APPENDIX 2

MEASURES

T1

Agentic traits

I (am)...

1. self-confident
2. feel superior
3. can make decisions easily
4. very active
5. very independent
6. stand up very well under pressure
7. never give up easily.

Communal traits

I (am)...

1. very kind
2. very helpful to others
3. very emotional
4. able to devote self completely to others
5. very warm in relations to others
6. very understanding
7. aware of feelings of others,
8. very gentle

T2

Team accomplishment striving

1. The team frequently thinks about getting work done.
2. The team focuses attention on completing work assignments.
3. The team sets goals to get a lot of work accomplished.
4. The team spends a lot of time thinking about finishing work tasks.
5. The team often considers how it can get more work done.
6. The team tries hard to get things done in the job.
7. The team puts a lot of effort into completing work tasks.
8. The team never gives up trying to finish the work.
9. The team spends a lot of effort completing work assignments.
10. Team members feel enthused when thinking about finishing work tasks.
11. It is very important to the team that it completes a lot of work.

Team cohesion

1. There is a friendly atmosphere among people.
2. People in my work group trust each other.
3. People are warm and friendly.
4. People treat each other with respect.
5. People work well together as a team.
6. People cooperate with each other.
7. People are willing to share resources.

8. People almost always speak well of it.
9. People are proud to belong to the group.

Task interdependence

1. The team works best when we coordinate our work closely.
2. Team members have to work together to get group tasks done.
3. The way individual members perform their jobs has a significant impact on others in the team.
4. My work cannot be done unless other people do their work.
5. Most of my work activities are affected by the activities of other people on the team.
6. Team members frequently have to coordinate their efforts with each other.
7. We cannot complete a project unless everyone contributes.

T3

Team task performance

1. Quantity of work output
2. Quality of work output
3. Accuracy of work
4. Customer service provided (internal and external)

Team role performance

1. Working as part of a team or work group
2. Seeking information from others in his/her work group
3. Making sure his/her work group succeeds
4. Responding to the needs of others in his/her work group

Team viability

1. Team members adjust to the changes that happen in their work environment.
2. When a problem occurs, the members of this team manage to solve it.
3. The new members are easily integrated into this team.
4. The members of this team could work a long time together.

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DISSERTATION

- **Title:** Heterogeneity VS Homogeneity: Which Is Compatible with Team Agency VS Communion?
- **Committee:** Donald Kluemper (Chair), Robert Liden, Sandy Wayne, Murray Barrick (Texas A&M University), and John Lynch
- **Abstract:** In the extant literature, researchers diverge on whether a homogeneous or heterogenous configuration is favorable for team personality. I adopt an agency/communion typology to divide personality traits and propose that a homogeneous configuration is compatible with communal traits while a heterogeneous configuration is compatible with agentic traits. In conceptualizing these homogeneous/heterogeneous configurations, I incorporate the magnitude (the degree) and the configurational (shared, minority, bimodal, fragmented configuration) approaches. Thereby, the dissertation attempts to explore the nuances of the configurations of team agentic and communal traits and to identify, as well as the underlying task- and relationship-related processes.

RESEARCH INTERESTS

- Major Team personality, leadership, temporal theory
- Minor Leader-member exchange, proactive behavior, stress coping

Major JOURNAL PUBLICATIONS

Google Scholar (820+ citations):

<https://scholar.google.com/citations?user=wPw0SKgAAAAJ&hl=en&oi=sra>

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- Tu, Y., **Lu, X.**, Wang, S., & Liu, Y. (2020). When and why conscientious employees are proactive: A three-wave investigation on employees' conscientiousness and organizational proactive behavior. *Personality and Individual Differences*, 159, <https://doi.org/10.1016/j.paid.2020.109865> **(Corresponding author)**
- Lu, X.**, Zhou, H., & Chen, S. (2019). Facilitate knowledge sharing by leading ethically: The role of organizational concern and impression management climate. *Journal of Business and Psychology*, 34, 539-553. **(Corresponding author)**
- Tu, Y., **Lu, X.**, Choi, J. N., & Guo, W. (2019). Ethical leadership and team-level creativity: Mediation of psychological safety climate and moderation of supervisor support for creativity. *Journal of Business Ethics*, 159(2), 551-565.
- Tu, Y., Zhang, Y., **Lu, X.**, & Wang, S. (2019). Differentiating two facets of trust in colleagues. *Leadership & Organization Development Journal*, 41(1), 88-100.
- Lu, X.**, Xie, B., & Guo, Y. (2018). The trickle-down of work engagement from leader to follower: The roles of optimism and self-efficacy. *Journal of Business Research*, 84, 186-195.
- Lu, X.**, & Sun, J. J. (2017). Multiple pathways linking leader-member exchange to work effort. *Journal of Managerial Psychology*, 32, 270-283.
- Tu, Y., & **Lu, X.** (2016). Do ethical leaders give followers the confidence to go the extra mile? The moderating role of intrinsic motivation. *Journal of Business Ethics*, 135(1), 129-144. **(Corresponding author)**
- Tu, Y., **Lu, X.**, & Yu, Y. (2017). Supervisors' ethical leadership and employee job satisfaction: A social cognitive perspective. *Journal of Happiness Studies*, 18(1), 229-245. **(Corresponding author)**
- Lu, X.**, Tu, Y., Li, Y., & Ho, C. C. (2016). Affective and normative forces between HCHRM and turnover intention in China. *Employee Relations*, 38(5), 741-754.
- Tu, Y., & **Lu, X.** (2016). Work-to-life spillover effect of leader-member exchange in groups: The moderating role of group power distance and employee political skill. *Journal of Happiness Studies*, 17(5), 1873-1889. **(Corresponding author)**
- Xie, B., **Lu, X.**, & Zhou, W. (2015). Does double plateau always lead to turnover intention? Evidence from China with indigenous career plateau scale. *Journal of Career Development*, 42(6), 540-553. **(Corresponding author)**
- Li, Y., Xu, J., Tu, Y., & **Lu, X.** (2014). Ethical leadership and subordinates' occupational well-being: A multi-level examination in China. *Social Indicators Research*, 116(3), 823-842.
- Tu, Y., & **Lu, X.** (2013). How ethical leadership influence employees' innovative work behavior: A perspective of intrinsic motivation. *Journal of Business Ethics*, 116(2), 441-455. **(Corresponding author)**
- Xie, B., **Lu, X.**, Zhou, W., & Xin, X. (2014). The effect of career plateau on Chinese employees' affective commitment: An indigenous career plateau scale and two-mediator

model. *Frontiers of Business Research in China*, 8(3), 346-366.

PAPERS UNDER REVISION AND REVIEW

- Sun, U. Y., Xu, H., Kluemper, D.H., **Lu, X.**, & Yun, S. (Under review). How and when does abusive supervision discourage employees' taking charge? A moderated serial mediation model. *Journal of Management*.
- Lu, X.**, Tu, Y., & Zhou, H. (Under review). How and when organizational tenure diversity benefits or harms team knowledge sharing? The role of reciprocal relationship, team concern dispersion, and age diversity. *Human Resource Management*.
- Tu, Y., **Lu, X.**, & Choi, J. (Under review) Ethical but differentiating? Combined effects of the level and differentiation of ethical leadership on information sharing and innovation in work teams. *Group & Organization Management*. **(Corresponding author)**
- Lu, X.**, Kluemper, D. H., & Tu, Y. (Under review). How challenge and hindrance appraisal jointly affect employee performance. Submitted to the 2021 annual *Academy of Management (AOM)* Conference.
- Lu, X.**, & Mitra, A. (Under review). Motivational primacy of proactive employees under different configurations of proactive personality. Submitted to the 2021 annual *Academy of Management (AOM)* Conference.

WORKING PAPERS

- Lu, X.**, & Kluemper, D. H. Dual emotional pathways linking time pressure to employee work effort: A latent growth modeling perspective. (Finalizing for submission at *Journal of Management*).
- Lu, X.**, & Kluemper, D. H. Be proactive out of different motives when team distribution of proactive personality differs. (To submit at *Journal of Management*).
- Lu, X.**, Kluemper, D. H., & Chen, L. How a mixture stressor involving both challenge and hindrance works: It depends on goal orientation. (To submit at *Journal of Organizational Behavior*).
- Lu, X.**, Kluemper, D. H., & Malter, A. J. How team personality presentation predicts team performance trajectory: A socio-analytic perspective. (Working paper, to submit at *Journal of Applied Psychology*).
- Lu, X.**, Kluemper, D. H., & Malter, A. J. Team configuration of narcissism, leadership emergence, and team effectiveness: A temporal perspective. (Data analysis)
- Chen, L., & **Lu, X.** Work stressors and innovation: The role of empowerment and controllability attributional style. (Data analysis).

CONFERENCE PRESENTATIONS

- Lu, X.**, & Kluemper, D. H. (Accepted). The role of time in time pressure: Dual pathways between time pressure and engagement. To be presented at the 2020 annual *Academy of Management (AOM)* Conference, Vancouver, BC, Canada.
- Ubaka, A., **Lu, X.**, & Gutierrez, L. (Accepted). Is white always the standard? Using replication to extend what we know About leadership prototypes. To be presented at the 2020 annual *Academy of Management (AOM) Conference*, Vancouver, BC, Canada. *Best Student Conference Paper' award in the Gender and Diversity in Organizations*

Division

- Lu, X.,** Kluemper, D. H., & Malter, A. J. (2019). How team personality presentation predicts team performance trajectory: A socio-analytic perspective". To be presented at the 2019 Meeting of the ***Southern Management Association***, Norfolk, Virginia.
- Chen, L., & **Lu, X.** (2019). Work stressors and innovation: The role of empowerment and controllability attributional style. To be presented at the 2019 annual ***Academy of Management (AOM)*** Conference, Boston, Massachusetts.
- Lu, X.,** & Zhou, H. (2018). Motivational processes linking ethical leadership to knowledge sharing. Presented at the 2018 annual ***Academy of Management (AOM)*** Conference, Illinois, Chicago.
- Sun, J. & **Lu, X.** (2017). Multiple pathways linking leader member exchange to work effort. Manuscript presented at the 2017 annual ***Academy of Management (AOM)*** Conference, Atlanta, Georgia.
- Lu, X.,** & Sun, J. J. (2016). How ethical leadership enhances knowledge sharing through generalized exchange? Manuscript presented at the 2016 annual ***Academy of Management (AOM)*** Conference, Anaheim, California.
- Lu, X.,** & Sun, J. J. (2016). Individual reciprocation embedded in LMX: A three-way interaction study. Manuscript presented at the second ***HR International Conference (HRIC) of AOM***, Sydney, Australia.
- Sun, J., & **Lu, X.** (2015). For whom LMX is positively related to burnout? Manuscript presented at the 2015 ***Society for Industrial-Organizational Psychology (SIOP)***, Philadelphia, PA.
- Xie, B., **Lu, X.,** & Zhou, W. (2014). Does double plateau always lead to turnover intention? Evidence from China. Manuscript presented at the 2014 ***Academy of Management (AOM)*** Conference, Philadelphia, PA.

AWARDS & RECOGNITIONS

- 2020: Best Student Conference Paper' award in the Gender and Diversity in Organizations Division at the 80th Academy of Management Annual Meeting.
- 2016-2020: Liautaud Doctoral Fellowship & College of Business Administration Fellowship.
- 2013: A second prize winner of the 2013 International Academy for Chinese Management Research Li Ning Dissertation Proposal Grants.

TEACHING EXPERIENCE

- Instructor, *Human Resource Management*, University of Illinois at Chicago (Fall 2017, Spring 2018, Spring 2019) Received 4.22/5.0 average rating for teaching effectiveness from student evaluations
- Instructor, *Organizational theory*, University of Illinois at Chicago (Fall 2018) Received 4.36/5.0 average rating for teaching effectiveness from student evaluations

TEACHING ASSISTANTSHIP

University of Illinois at Chicago

- MGMT 485 Corporate Sustainability Responsibility Fall, 2017

- BA 495 Business Strategy Fall, 2020
- BA 495 Business Strategy Spring, 2021
- MGMT 350 External Environment of Business 2021, Spring

PROFESSIONAL EXPERIENCE

Professional Memberships:

- Academy of Management
- International Association of Chinese Management Research
- Southern Management Association

Ad Hoc Reviewer:

- Journal of Business Ethics, 2013, 2014, 2015, 2016(2), 2017(2), 2018(2), 2019(3), 2020(3), 2021
- Journal of Business Psychology, 2014, 2017
- International Journal of Human Resource Management, 2015, 2018(2)
- Journal of Managerial Psychology, 2017, 2018
- Journal of Career Development, 2015, 2016
- Creativity Research Journal, 2017, 2018, 2019(2)

APPLIED EXPERIENCE

- 2020: Field Research in **Beyondwinet Information Technology Co., Ltd**
Prepared research materials and questionnaires.
Administered surveys online.
Integrated data.
Drafted feedback report.
- 2017-2019: Field Research Experience at a **Park District** with Dr. Don Kluemper.
Data collection.
Assisted with writing feedback report.
- 2016-2019: Longitudinal Field Research among **MBA students** with Dr. Don Kluemper.
Designed research studies.
Administered surveys via Qualtrics.
Integrated the data collected from over 300 MBA students from over 120 teams across 11 time points each year for 3 years.
- 2019-2020: Field Research in **Meiko Electronics Co., Ltd**
Designed research studies.
Administered surveys.
- 2019: Field Research in **Shenzhen Real-estate Co., Ltd**
Prepared research materials and questionnaires.
Administered surveys online.
Wrote and presented feedback report.
- 2018: Field Research in **China Wonderland Co., Ltd**
Prepared research materials and questionnaires.
Administered surveys on-site and online.
Wrote and presented feedback report.
- 2017: Field Research in **Guangxi Yangxiang Co., Ltd**

Designed research studies.
Administered surveys on-site and online.
Wrote and presented feedback report.

OTHER PUBLICATIONS

- Lu, X., & Tu, Y.** (2018). To share or not to share: Knowledge sharing in a social dilemma perspective. *Advances in Psychological Science*, 26(11), 2057-2067. (in Chinese, CSSCI)
- Zhou, H., **Lu, X.**, & Shi, K. (2018). When time pressure increases daily job absorption? The moderating role of job characteristics. *Nankai Management Review*, 4, 158-168. (in Chinese, CSSCI) **(Corresponding author)**
- Sun, J. J., & **Lu, X.** (2017). Ethical leadership: The conceptualization and measurement. *Advances in Psychological Science*, 22(1), 130-138. (in Chinese, CSSCI) **(Corresponding author)**
- Chen, S., Li, X. & **Lu, X.** (2016). A study on motives of voice: The moderating role of regulatory focus. *Chinese Journal of Management*, 13(4), 551-559. (in Chinese, CSSCI)
- Lu, X.**, & Sun, J. (2016). When leader-member exchange increases emotional exhaustion? The role of belief in reciprocity and power distance orientation. *Acta Psychologica Sinica*, 48(5), 566-577. (in Chinese, CSSCI). **(Corresponding author)**
- Sun, J. J., **Lu, X.**, & Sun, J. (2015). The curvilinear relationship between perceived organizational support and work engagement and its boundary conditions. *Chinese Management Science*, 28, 93-102. (in Chinese, CSSCI) **(Corresponding author)**
- Lu, X.**, & Tu, Y. (2015). The short-term fluctuation of work engagement. *Advances in Psychological Science*, 23(2), 268-279. (in Chinese, CSSCI)
- Tu, Y., **Lu, X.**, Guo, W., & Wang, Z. (2014). What benefits do ethical leaders gain? Ethical leadership, LMX mean and leaders' benefits. *Acta Psychologica Sinica*, 46(9), 1378-1391. (in Chinese, CSSCI)
- Lu, X.**, & Tu, Y. (2014). A review of organization-based self-esteem and its contextualization. *Advances in Psychological Science*, 22(1), 130-138. (in Chinese, CSSCI)

SERVICE

External:

- 2018-2020: Conference Reviewer at Academy of Management.

UIC:

- 2019-2020: Organized research incubator meetings for the PhD students at UIC.
- 2019-2020: Organized faculty-student meetings at UIC.
- 2015-2016: Assisted in the 'AACSB Re-accreditation Review'.

ADDITIONAL

Skills:

- Research methods: Proficient in Hierarchical Linear Modeling (HLM), path analysis, Multilevel Structural Equation Modeling (MSEM), polynomial regression, and Latent Growth Modeling (LGM).

- Technical Skills: Mplus 7, HLM 7, SPSS 21, SAS, MS Office.

Training:

- CARMA Quantitative Short Courses, June 2017
- Gordon Cheung Method Workshop at UIC, 2017-2019