

# Trait Configurations in Self-Managed Teams: A Conceptual Examination of the Use of Seeding for Maximizing and Minimizing Trait Variance in Teams

Stephen E. Humphrey  
Florida State University

John R. Hollenbeck  
Michigan State University

Christopher J. Meyer  
Baylor University

Daniel R. Ilgen  
Michigan State University

In this article, the authors argue that there is no one best way to make placement decisions on self-managed teams. Drawing from theories of supplementary and complementary fit, they develop a conceptual model that suggests that (a) maximization principles should be applied to extroversion variance (i.e., complementary fit), (b) minimization principles should be applied to conscientiousness variance (i.e., supplementary fit), and (c) extroversion variance and conscientiousness variance interact to influence team performance. They also argue that previous research has underestimated the effect of extroversion and conscientiousness variance on performance because of suboptimal design. The authors, therefore, present an alternative method for making team placement decisions (i.e., seeding) that can be used to maximize or minimize variance in teams.

*Keywords:* teams, configuration, composition, personality, seeding

Over the past several decades, organizations have increasingly moved from hierarchical organizational configurations to flatter structures, increasing the decision-making latitude of lower level employees. *Self-managed teams* (SMTs; i.e., leaderless groups with a lot of autonomy on how work is completed; Manz & Sims, 1987) have captured the attention of organizations as a possible method of capitalizing on the benefits of teamwork without suffering from the high process loss in traditional teams (Manz, 1992). The growth in the use of SMTs (Devine, Clayton, Philips, Dunford, & Melner, 1999) has led to questions of how to best compose teams, particularly in light of the varying tasks performed, the context in which teams function, and the team roles being filled.

Although individual differences are often used when creating teams (Moynihan & Peterson, 2001), it is not always clear how to conceptualize traits at the team level. Most researchers have taken an isomorphic approach (Kozlowski & Klein, 2000) by simply using the mean level of team members' traits. Although the research on traits at the individual level may inform how team members perform taskwork (i.e., the technical components of work; McIntyre & Salas, 1995), this research may be inappropriate

for examining how team members engage in teamwork (i.e., the interactive behaviors within the team; McIntyre & Salas, 1995).

Even if isomorphism is valid, and an organization practices top-down selection, it is critical to consider placement decisions when composing teams. Given a population of employees, how are members allocated to teams? Consider an organization that selected the top 100 job candidates on emotional stability. To compose 20 teams from these individuals, the organization can (a) place the 5 highest scorers on emotional stability in 1 team; place the next 5 in the 2nd team, and so on (creating team homogeneity; Klein, Dansereau, & Hall, 1994), or (b) place the top 20 scorers in 20 different teams, followed in the opposite order by the next 20 seeded backwards in the teams, and so on (creating team heterogeneity). In the first case, team emotional stability variance would be minimized, but there would be a great deal of variability in the mean across teams. In the second case, there would be no variance in the mean level of emotional stability across teams, but there would be wide variability in the variance in emotional stability within teams. If these various personality configurations differentially affect team performance, placement decisions become critically important for future team performance.

In this article, we develop a conceptual model that suggests that there is no one best way for making placement decisions, but rather that placement decisions depend on the nature of the trait. We draw from the literature on complementary and supplementary fit (Kristof, 1996) to suggest that different types of fit will be promoted via specific individual difference configurations. Although there are thousands of individual differences that could be examined for person–team (P-T) fit, we examine two personality traits (extroversion and conscientiousness) that have been suggested as being relevant to team performance (e.g., Antonioni & Park, 2001;

---

Stephen E. Humphrey, Department of Management, Florida State University; John R. Hollenbeck, Eli Broad Graduate School of Management, Michigan State University; Christopher J. Meyer, Department of Management and Entrepreneurship, Baylor University; Daniel R. Ilgen, Department of Psychology, Michigan State University.

Correspondence concerning this article should be addressed to Stephen E. Humphrey, Department of Management, College of Business, Florida State University, Tallahassee, FL 32306-1110. E-mail: stephen.humphrey@fsu.edu

Kristof-Brown, Barrick, & Stevens, 2005) in an effort to highlight how supplementary and complementary fit perspectives may be applied to SMTs.

Our goals in this article are threefold. First, we attempt to clarify how specific trait configurations can be used to increase fit within teams. Second, we take a holistic view of P-T fit by suggesting that the interaction between complementary and supplementary fit may produce unique processes and outcomes beyond main effects predictions. Finally, we argue that optimal placement decisions using the fit perspectives require one to use the seeding process described herein to produce maximal or minimal levels of variance on traits.

### Theories of Supplementary and Complementary Fit

There is a long history of studying fit within organizations (Kristof, 1996). The fit between organizational members and their environment, their organization, their vocation, and their job has been shown to affect the attitudes and behaviors of individuals. In addition, the literature on the fit between individuals and the team (P-T fit) recently has started to develop (Hollenbeck et al., 2002; Kristof, 1996), as organizational scholars have begun focusing not just on the team as a whole but also on individuals within teams.

Theories of fit are based on one of two approaches: supplementary or complementary fit. *Supplementary fit* suggests that people are more comfortable and productive when they are similar to others (Muchinsky & Monahan, 1987). Higher levels of supplementary fit suggest that team members will be more attracted to each other. This approach is based on the premise of value congruence, such that people prefer being around others who share their goals and values (Cable & Edwards, 2004). Similarity can increase attraction and trust in other team members (Tsui & O'Reilly, 1989). Attraction and trust are important aspects of a team (Ilgen, Hollenbeck, Johnson, & Jundt, 2005), as performance is inextricably linked to how attracted team members are to each other (Beal, Cohen, Burke, & McLendon, 2003). Moreover, team members sharing the same goals and values experience lower levels of task and relationship conflict along with higher levels of performance (De Dreu & Weingart, 2003). Thus, supplementary fit promotes both positive attitudes (Cable & Edwards, 2004) and positive performance.

*Complementary fit*, on the other hand, suggests that people fit when they fill an unmet need (Cable & Edwards, 2004; Muchinsky & Monahan, 1987). That is, the person "fits" the team not because he or she is the same as everyone else but, rather, because he or she brings something unique to the collective that "makes it whole" (Muchinsky & Monahan, 1987, p. 271). Because team performance is a function of the effective execution of a set of interdependent roles (Belbin, 1993), a team that lacks an individual with specific skills or traits necessary to perform a team role has an unmet need (Biddle, 1979). By adding a person who "fits" this role (i.e., increasing complementary fit), the team should become more effective (Muchinsky & Monahan, 1987). Thus, higher levels of complementary fit should translate into higher levels of performance.

Although there have been several studies examining P-T fit directly or indirectly through the homogeneity and heterogeneity of team members (e.g., Beersma et al., 2003; Hill, 1975; Hollenbeck et al., 2002; Mohammed & Angell, 2003), there has been

only a limited attempt to apply complementary or supplementary fit theories to this domain (Kristof, 1996). Moreover, to our knowledge, no research has simultaneously examined complementary and supplementary P-T fit. In fact, other than Cable and Edwards's (2004) study of person-environment fit, there have not been any empirical tests of the integration of these two theories. Yet, there is reason to suspect that not only are both types of fit simultaneously relevant for a team (Kristof, 1996) but also that their interaction may produce unique outcomes. In the following section, we examine the role of complementary and supplementary fit in regard to specific traits on team performance.

### Personality Traits in SMTs

#### *Extroversion: The Case for Complementary Fit*

SMTs are teams without formal leaders (Manz & Sims, 1987) that, because they lack a formal role structure, must enter into potentially contentious role negotiations early after the formation of the team (Ilgen et al., 2005). Managing this process is vital for the success of the team. The configuration of extroversion (McCrae & Costa, 1997; Wiggins, 1979) within SMTs may be particularly important for team performance because of the interpersonal nature of this trait.

Individuals who are extroverted tend to be sociable, assertive, and dominant (Costa & McCrae, 1992; John & Srivastava, 1999). Although this is clearly a trait that is likely to have important implications for group performance, the question becomes whether one should strive to create supplementary or complementary fit with this characteristic (Kristof-Brown et al., 2005). Because personality is fundamentally an individual disposition, it is best thought of as a separation type of diversity (Harrison & Klein, in press), which means that diversity on this characteristic is best conceptualized as the variance on the trait across team members. Thus, although one can consider either the within-team variance on a trait or the team's overall mean level on the trait (Neuman, Wagner, & Christiansen, 1999), the fit approach to placing members within teams focuses explicitly on variance while ignoring the mean.

A complementary approach to fit that creates high levels of extroversion variance is expected to positively affect group dynamics through role differentiation. Extroversion variance promotes role differentiation two ways. First, as SMTs have no preexisting leadership structure (Manz & Sims, 1987), a successful SMT requires emergent leadership. Extroversion is well suited for promoting leadership emergence. Individuals who are extroverted are often identified as exemplifying strong leadership (Taggar, Hackett, & Saha, 1999) and being effective in the leadership role (Hogan, Curphy, & Hogan, 1994). They are both dominant (Costa & McCrae, 1992) and sociable (Hough, 1992), which are core components of leadership (Judge, Bono, Ilies, & Gerhardt, 2002). Thus, individuals who are high in extroversion are likely to fill the leadership roles within the team. In addition, for leadership to be successful, leaders need followers (Meindl, 1993). Team members who are less extroverted fill this role, as they are more passive (Costa & McCrae, 1992). Thus, having high extroversion variance should promote complementary fit within the team, as an SMT will be "made whole" through the inclusion of both leaders and followers.

Second, high extroversion variance generally promotes role differentiation by reducing conflict that may come about during the role negotiation process. The role negotiation process is an important step in the formation stage of the team (Ilgen et al., 2005); however, it can cause conflict within the team, as individuals may fight for more prestigious (or, alternatively, easier) roles. One way to avoid conflict in this process is through the hierarchical assignment of roles. Murnighan and Conlon (1991) noted that SMTs benefit from hierarchical decision making, as it retards the escalation of conflict and speeds up decision making. Because high extroversion variance tends to promote the filling of the leadership role with a dominant individual, these teams are likely to have a dominant individual who unilaterally makes decisions, as well as more submissive individuals who are willing to do what they are told. This process can expedite role clarification, as the leader who is assigning the roles can explicitly communicate what team members should be doing, reducing the ambiguity among team members on role expectations (Graen, 1976). Thus, high extroversion variance is expected to promote complementary fit through role differentiation that can lead to the more efficient use of knowledge (Hyatt & Ruddy, 1997), greater adaptability (Moon et al., 2004), and ultimately superior performance (Druskat & Kayes, 2000).

In contrast, the supplementary approach to fit minimizes variance within the team on this dimension, and this would seem inappropriate for extroversion because of the impact this would have on group dynamics. Regardless of the mean level of extroversion within the team, having low extroversion variance will result in lower role differentiation. This will limit leadership emergence, as no one member will be appreciably more dominant than another. The lack of role differentiation similarly will limit the ability of the team to resolve role negotiation, as the team will lack a dominant leader who can make autocratic decisions (Murnighan & Conlon, 1991). Lacking an autocratic leader can promote conflict (Murnighan & Conlon, 1991), the outcome of which is generally lower performance (De Dreu & Weingart, 2003).

*Proposition 1:* Maximizing extroversion variance will result in positive team performance.

*Proposition 2:* The relationship between extroversion variance and team performance will be mediated by role differentiation, such that high extroversion variance will promote increased role differentiation in SMTs, which will in turn increase team performance.

### *Conscientiousness: The Case for Supplementary Fit*

Conscientiousness should also be important to SMT behavior. Individuals who are conscientious are purposeful, achievement-oriented, competent, organized, and self-disciplined (Costa & McCrae, 1992). At the individual level, meta-analyses have consistently demonstrated that conscientiousness has the strongest relationship with performance of all of the personality constructs (Barrick & Mount, 1991; Hertz & Donovan, 2000).

Because of the positive relationship between conscientiousness and performance at the individual level, it is logical to try to increase the mean level of conscientiousness in the team. This proposition has been supported in past research (Barrick, Stewart, Neubert, & Mount, 1998) and should be heeded when creating

teams. However, as noted earlier, even if one takes a top-down isomorphic approach to selection decisions, one still needs to address individual placement decisions. That is, when there is a given set of people within an organization that can be used to staff a team, the organization will have to determine how to best compose the team.

We argue that it is most appropriate to use the supplementary fit perspective with conscientiousness. Minimizing conscientiousness variance promotes supplementary fit through its effects on goal congruence. That is, a team with minimized conscientiousness variance will be composed of team members with the same perspectives on how hard to work and how much they want to accomplish. Team conflict will be minimized, as group norms in regards to effort should be clearly defined within the team. Indeed, research has suggested that conscientiousness similarity in dyadic pairs relates to helping behavior, and Antonioni and Park (2001) have argued directly that personality similarity on the dimension of conscientiousness "could actually lead to better interpersonal relationships and higher job performance" (p. 334) because of the similarities in purposeful, achievement-oriented, competent, organized, and self-disciplined behavior.

In contrast, a team with high conscientiousness variance is composed of high- and low-conscientiousness team members who have different aspiration levels (i.e., different goals for performance). High-conscientiousness team members desire to put in a large amount of effort, as they are, by definition, purposeful and achievement-oriented, whereas low-conscientiousness team members will desire to put in less effort. Goal differences cause the high-conscientiousness team members to resent the low-conscientiousness team members because they expend less effort on the task, which in turn forces the high-conscientiousness team members to put forth even greater efforts to accomplish the team's goals. That is, the highly conscientious team members may react negatively or will try to offset the perceived lower effort of the low-conscientiousness team members who may *free ride* (i.e., exerting less effort when working with a team than a person would exert when working alone; Williams & Karau, 1991). There is a tendency to free ride in these situations, as the expectation that other team members are going to perform at a moderate or higher level leads people to reduce their own effort (Karau & Williams, 1993).

If a team member perceives that other team members are putting in less effort, this person is likely to reduce personal effort expenditure to avoid being the "sucker" in the team (Jackson & Harkins, 1985; Kerr, 1983). This effect is predicated on the team member perceiving that the low effort is a function of low conscientiousness (LePine, Hollenbeck, Ilgen, & Hedlund, 1997). The reduction of effort by the more conscientious team members will then force a downward spiral, wherein the high-conscientiousness team members reduce their performance expectations and put in less effort. The other team members, in turn, will reduce their effort even further, team cohesion will drop, and overall team performance will plummet (Mulvey & Klein, 1998). Thus, high conscientiousness variance will likely inhibit supplementary fit, which will impede goal congruence and prevent team members from being attracted to each other (Tsui & O'Reilly, 1989) and, therefore, will ultimately result in low performance (Beal et al., 2003).

*Proposition 3:* Minimizing conscientiousness variance will result in positive team performance.

*Proposition 4:* The relationship between conscientiousness variance and team performance will be mediated by goal congruence, such that low conscientiousness variance will promote increased goal congruence in SMTs, which will in turn increase team performance.

### Interactive Effects of Complementary and Supplementary Fit

Thus far, we have focused on the independent effects of extroversion variance and conscientiousness variance. However, we have not examined how these two dimensions are intertwined at the team level. According to both Kristof (1996) and Cable and Edwards (2004), both complementary and supplementary fit can work simultaneously to determine overall fit.

In this context, the interaction of these two aspects of team staffing can best be conceived in terms of how the effect of role differentiation (achieved with high extroversion variance) on performance is contingent on goal congruence (achieved with minimal conscientiousness variance). Role differentiation is considered a positive aspect of team structure, as it promotes efficiency and task specialization. However, a limitation of highly differentiated role structures is that it makes individual accountability more difficult because the unique contribution of individual team members to the greater whole is harder to detect and quantify (Hollenbeck et al., 2002). That is, within highly differentiated teams, it is difficult to decompose performance into individual-level contributions to determine who is contributing the most and least.

When high levels of role differentiation are combined with high levels of goal congruence, this accountability problem is greatly reduced because of the common commitment to the mission shared by team members. That is, when all members share the same goal, there is less fear of free riding and less need to clearly quantify each person's contributions. Thus, the combined conditions of high supplementary fit on conscientiousness and high complementary fit on extroversion may have synergistic effects beyond their main effects.

On the other hand, when high levels of role differentiation are combined with low levels of goal congruence, the increased specialization of the team members makes free riding more difficult to detect. Under conditions of low goal congruence, it might be preferable for a team to experience low degrees of role differentiation because of the effects this will have on those who are low in conscientiousness (i.e., those most likely to free ride). Indeed, there is direct evidence that supports the notion that isolating and recognizing individual-level contributions can cure free riding (Miles & Greenberg, 1993). Thus, just as there may be synergistic effects that make the high-high fit conditions superior to what may be expected solely on the basis of their main effects, there also may be synergistic effects associated with the low-low fit combination that make this much less worse than might be expected solely on the basis of main effects.<sup>1</sup>

*Proposition 5:* Extroversion variance and conscientiousness variance will interact, such that the positive impact of higher levels of extroversion variance on performance will be stronger in teams with lower levels of conscientiousness variance.

### Seeding

A central tenet of our article is that for extroversion or conscientiousness variance to promote P-T fit and consequently affect performance in the ways proposed, the within-team variance on these traits must be either maximized or minimized. That is, we argue that extremely high or low levels of variance are needed to produce the necessary processes. However, the prior empirical literature on personality variance has not followed the principles of variance maximization and minimization. All of the prior studies on personality variance have examined naturally occurring variance in teams. In all of these studies, team placement decisions were made either through random assignment or based on factors other than personality.

The placement decision process used in past research is problematic. As noted by McClelland (1997), if a population is normally distributed on a variable, and a researcher expects a linear relationship between the variable and an outcome, randomly selecting a sample from the population will underestimate effect sizes. That is, because random sampling results in few subjects being at the high or low ends of the scale, the researcher is testing relationships with a sample that has a restriction in range. McClelland further documented the mathematical basis for this argument, showing precisely how suboptimal designs that fail to maximize variability on a variable underestimate the effects that would result from more optimal designs.

For example, consider a population of 150 people who are normally distributed on an extroversion scale ranging from 1 to 5. In a normally distributed population, only 10 people would be expected to have scores of 1, and 10 people would be expected to have scores of 5. Given this distribution, the likelihood that 2 individuals with scores of 1 and 2 individuals with scores of 5 would be randomly assigned to the same 4-person team (and thus maximizing variance) is roughly .0002. It is highly unlikely that a researcher passively observing teams would survey this specific team configuration in the field. Moreover, this is only one specific configuration from that population. The probability that variance was maximized across the entire set of individuals on this single trait is essentially zero.

*Seeding* teams presents one solution to this problem. The seeding process entails systematically placing people on teams. It is a holistic approach to making placement decisions in teams, as it considers both the current members of all teams and the remaining population from which selections can be made. By considering the population when making placement decisions, one can minimize variance within all teams or maximize variance across all teams.

Seeding begins by sorting the population on a specific trait (e.g., extroversion). Next, a decision is made to minimize or maximize trait variance, as this directs future action. To minimize trait variance, people are placed on teams using a top-down sorting process in which the highest scorers are placed on one team, the next highest scorers are placed on the next team, and so on. In

<sup>1</sup> Technically, a significant interaction between extroversion variance and conscientiousness variance will constrain the interpretation of any main effects between either extroversion variance or conscientiousness variance and team performance. Thus, if Proposition 5 is supported, one must reconsider the interpretation of support for Proposition 1 and Proposition 3.

contrast, to maximize variance, the highest scorers are placed on separate teams. Next, the lowest scorers are placed in reverse order on those teams, such that the lowest scorer would be paired with the highest scorer, continuing until all of the teams are filled.

### Discussion

Several researchers have examined the main effects of personality on individual performance (Barrick, Mount, & Judge, 2001). However, the literature examining personality configuration at the team level has developed more slowly. Researchers have not adequately studied the interaction between team members who possess varying levels of personality traits. Moreover, researchers have not examined how these configurations interact at the team level. Using the theories of complementary and supplementary fit, we addressed this weakness in the literature on team composition through the examination of two specific personality traits.

#### *Contributions: Conceptual, Methodological, and Practical*

In this article, we have made conceptual, methodological, and practical contributions to the literature on personality configurations in teams. Conceptually, we have provided the first theoretical model of the interaction between complementary and supplementary fit in teams. Several scholars have noted the importance of simultaneously examining both types of fit (Cable & Edwards, 2004; Kristof, 1996); however, research has neglected to examine how these types of fit interplay at the team level. In examining complementary and supplementary fit, we have identified two specific processes (i.e., role differentiation and goal congruence) that we suggest would act as the mediating mechanisms through which extroversion variance and conscientiousness variance affect team performance.

We have presented a methodological process for addressing a weakness in the literature on trait variance in teams. That is, although several researchers have examined variance (e.g., Barrick et al., 1998; Barry & Stewart, 1997; Kichuk & Wiesner, 1997; Kristof-Brown et al., 2005; Neuman et al., 1999), none has explicitly maximized variance. Instead, these researchers have used arbitrary, post hoc percentage cutoffs (Barry & Stewart, 1997), confounded variance with mean (Kichuk & Wiesner, 1997), or suffered from a restriction in range on variance by relying on naturally occurring variance (Barrick et al., 1998). Thus, these investigators have essentially created moderate levels of diversity (Harrison & Klein, in press), resulting in suboptimal tests of the relationship between variance and performance (McClelland, 1997). The seeding process presented herein, however, provides a way for scholars and practitioners alike to create high-variance (or low-variance) teams. By seeding, one creates a threefold increase on the variance across teams.<sup>2</sup> This is expected to result in more powerful and more accurate tests of the relationships between trait variance and performance.

We feel that this is an important step; however, in regards to studying more complex configurations of traits at the team level, this article only scratches the surface of the myriad issues associated with human resource placement. For example, we went from the first moment of the distribution (the mean) to the second (the variance); however, the third and fourth moments (e.g., skew or kurtosis) of the distribution might be better for some other char-

acteristics. For example, the skew captures the concept of “critical mass” (the majority of members lean in one direction), and the kurtosis captures the degree to which there may be extreme outliers in a group. Work still needs to be done matching traits to potential distributions.

In our opinion, the field is coming close to have taken the examination of main effects of individual differences on performance at the individual level as far as it can go, in the sense that we now see meta-analyses of past meta-analyses (e.g., see the second-order meta-analysis of individual-level personality by Barrick et al., 2001). Although it is critical to effectively summarize the past, this focus on the past needs to be complemented by forward-focused research agenda, and the paucity of literature on configuration effects is one direction that may prove important for both theory and practice.

Third, in terms of practical significance, our article points directly to a simple and straightforward applied intervention (seeding) that can be used to promote both complementary and supplementary fit. This process has obvious practical implications in terms of making placement decisions with teams and distributing variability traits through teams. As virtually all approaches to personnel selection are job-based and proceed in a vertically top-down fashion, the seeding approach, which is team-based and proceeds horizontally across units, is unique relative to what one would see in any standard human resources textbook regarding selection and placement.

It is rather obvious to state that organizations need to base staffing decisions at the individual level on empirically established valid predictors of performance, and applied psychologists have focused extensively on this goal in the past 50 years. As a result of those efforts, we have a long list of meta-analyzed characteristics from which to choose when making individual selection or rejection decisions. However, we suggest in contexts where people work together, selecting the best people into the organization is just the first step in a critical two-step process that also needs to consider placement and composition issues.

There has been far less research on optimization processes for composing teams with different individuals. Our model suggests that these kinds of placement decisions may have a large impact on the functioning of the team. We suggest that no one simple rule (variance maximization or minimization) should be applied to all traits. Beyond individual-level selection decisions, organizations also need to make placement decisions. We have provided guidance on how to place people into teams on the basis of extroversion and conscientiousness scores.

Finally, we recognize it is challenging to apply the seeding process in applied contexts, as organizations often staff teams with those people available (or using other criteria). Nevertheless, this work suggests that, beyond matching individuals to jobs, organi-

<sup>2</sup> This increase is based on the results of a simple simulation of placement decisions run by the authors. Results of 100 random assignments from a population of 100 people, with a mean of 4 and an *SD* of 1, produced an *SD* of .32 across the teams on the mean level of the trait and an *SD* of .29 across the teams on the *SD* of the trait. In contrast, maximizing variance for the same population via seeding produced an *SD* of .00 across the teams on the mean level of the trait and an *SD* of .83 across the teams on the *SD* of the trait.

zations must take care to match individuals to teams given that the needs for one team might differ from the needs of another. Any attempt to maximize (or minimize) the variance on specific traits using the seeding process, even if only a subset of the organization is used as the base population, will allow organizations to better reap the benefits of P-T fit.

### *Directions for Future Research*

Although we have narrowly focused on only two individual differences in this article, there is reason to suspect that the theories of complementary and supplementary fit may be appropriate for examining P-T fit with other individual difference characteristics. First, it may be particularly appropriate to use the complementary fit perspective with openness to experience. People high on openness to experience tend to be more creative (King, Walker, & Broyles, 1996; McCrae, 1987), which may help a team pursue an exploration agenda (March, 1991). However, if a team is composed only of members with high openness to experience, short-term performance may suffer as the team pursues only new and unique directions. Instead, coupling high-openness team members with low-openness team members can allow a team to simultaneously pursue exploration and exploitation behaviors (March, 1991), leading to higher overall performance.

Second, a team with high agreeableness variance may have high levels of performance. A team composed of members with uniformly high levels of agreeableness will be cohesive and cooperative, but it is likely to suffer from the debilitating effects of groupthink (Esser, 1998). A team with uniformly low levels of agreeableness is unlikely to reach consensus, preventing the team from accomplishing interdependent pursuits. Instead, applying complementary fit to agreeableness may lead teams to develop cohesion and encourage different perspectives.

Third, the complementary fit perspective may be most appropriate for both numerical and analytic ability. As noted by Laughlin and Adamopoulos (1980), decision making and problem solving in teams is essentially the combination of various perspectives. For some team tasks, team members are extremely capable of recognizing and implementing the correct solution (Laughlin & Futoran, 1985). In particular, intellectual tasks (e.g., tasks involving mathematical or analytical processing) are highly demonstrable (Laughlin & Adamopoulos, 1980) and, thus, are likely to encourage the acceptance of the "correct" solution by team members. All that is necessary for the team to perform well on these types of tasks is that one team member is able to reach the correct solution (Steiner, 1972). Therefore, it is less important that a team is composed of individuals uniformly high (or even similar in levels) on either numerical or analytic ability. Instead, it is most appropriate to ensure that at least one team member is high on numerical (or analytic) ability and then turn to filling complementary needs.

Fourth, a team can benefit from applying complementary fit to experience. Recent research has highlighted that people with different levels of experience approach problem solving and creativity differently (Galenson & Weinberg, 2001). It would be beneficial, therefore, for a team to include people both high and low on experience to encourage team innovation.

There are several individual differences for which the supplementary fit perspective is most appropriate. For example, recent

research has suggested that teams perform better when team members share similar cultural values (Kirkman & Shapiro, 2005). Team members with different cultural values have different expectations on what appropriate team behavior is, which leads to ineffective team processes and low team performance (Thomas, 1999). Thus, the supplementary fit perspective is best when building a team using cultural values.

The supplementary fit perspective is best when staffing a team using physical ability. Physical tasks tend to be conjunctive (i.e., team performance is a function of the worst member; Steiner, 1972). Therefore, it is most beneficial for the team members to have similar levels of physical ability, as team members with high levels of physical ability are wasted on teams with low-ability members, as these low-ability members drive the ultimate performance of the team.

Taken together, this preliminary examination of the P-T fit domain suggests that there are numerous individual differences that can be used to develop fit within teams. Although we specified the full theoretical model for only two such individual differences, there appear to be numerous opportunities for researchers and practitioners alike to develop individual difference models of P-T fit. We would encourage researchers to examine both the main effects of the individual differences discussed herein and also the interactive effects between these types of fit.

We implore researchers to examine P-T fit with populations for which variance on traits is either maximized or minimized. Doing so increases the ability to optimally test theoretical models (McClelland, 1997). The seeding process provides one method to overcome problems with suboptimal data sets, as it provides a practical and straightforward method for maximizing and minimizing variance on traits within teams.

### References

- Antonioni, D., & Park, H. (2001). The effects of personality similarity on peer ratings of contextual work behaviors. *Personnel Psychology, 54*, 331-360.
- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology, 44*, 1-26.
- Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment, 9*, 9-30.
- Barrick, M. R., Stewart, G. L., Neubert, M. J., & Mount, M. K. (1998). Relating member ability and personality to work-team processes and team effectiveness. *Journal of Applied Psychology, 83*, 377-391.
- Barry, B., & Stewart, G. L. (1997). Composition, process, and performance in self-managed groups: The role of personality. *Journal of Applied Psychology, 82*, 62-78.
- Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and performance in groups: A meta-analytic clarification of construct relations. *Journal of Applied Psychology, 88*, 989-1004.
- Beersma, B., Hollenbeck, J. R., Humphrey, S. E., Moon, H., Conlon, D. E., & Ilgen, D. R. (2003). Cooperation, competition, and team performance: Toward a contingency approach. *Academy of Management Journal, 46*, 572-590.
- Belbin, R. M. (1993). *Team roles at work*. Oxford, England: Butterworth-Heinemann.
- Biddle, B. J. (1979). *Role theory: Expectations, identities, and behaviors*. New York: Academic Press.

- Cable, D. M., & Edwards, J. R. (2004). Complementary and supplementary fit: A theoretical and empirical integration. *Journal of Applied Psychology, 89*, 822–834.
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PIR): Professional manual*. Odessa, FL: Psychological Assessment Resources.
- De Dreu, C. K. W., & Weingart, L. R. (2003). Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. *Journal of Applied Psychology, 88*, 741–749.
- Devine, D. J., Clayton, L. D., Phillips, J. L., Dunford, B. B., & Melner, S. B. (1999). Teams in organizations—Prevalence, characteristics, and effectiveness. *Small Group Research, 30*, 678–711.
- Druskat, V. U., & Kayes, D. C. (2000). Learning versus performance in short-term project teams. *Small Group Research, 31*, 328–353.
- Esser, J. K. (1998). Alive and well after 25 years: A review of groupthink research. *Organizational Behavior and Human Decision Processes, 73*, 116–141.
- Galenson, D. W., & Weinberg, B. A. (2001). Creating modern art: The changing careers of painters in France from impressionism to cubism. *The American Economic Review, 91*, 1063–1071.
- Graen, G. (1976). Role-making processes within complex organizations. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1201–1245). Chicago: Rand McNally.
- Harrison, D. A., & Klein, K. J. (in press). What's the difference? Diversity constructs as separation, variety, or disparity in organizations. *Academy of Management Review*.
- Hill, R. E. (1975). Interpersonal compatibility and work group performance. *Journal of Applied Behavioral Science, 11*, 210–219.
- Hogan, R., Curphy, G. J., & Hogan, J. (1994). What we know about leadership: Effectiveness and personality. *American Psychologist, 49*, 493–504.
- Hollenbeck, J. R., Moon, H., Ellis, A. P. J., West, B. J., Ilgen, D. R., Sheppard, L., et al. (2002). Structural contingency theory and individual differences: Examination of external and internal person–team fit. *Journal of Applied Psychology, 87*, 599–606.
- Hough, L. M. (1992). The “Big Five” personality variables construct confusion: Description versus prediction. *Human Performance, 5*, 139–155.
- Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The Big Five revisited. *Journal of Applied Psychology, 85*, 869–879.
- Hyatt, D. E., & Ruddy, T. M. (1997). An examination of the relationship between work group characteristics and performance: Once more into the breach. *Personnel Psychology, 50*, 553–585.
- Ilgen, D. R., Hollenbeck, J. R., Johnson, M. D., & Jundt, D. K. (2005). Teams in organizations: From input–process–output models to IMO models. *Annual Review of Psychology, 56*, 517–543.
- Jackson, J. M., & Harkins, S. G. (1985). Equity in effort: An explanation of the social loafing effect. *Journal of Personality and Social Psychology, 49*, 1199–1206.
- John, O. P., & Srivastava, S. (1999). The Big Five Trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102–138). New York: Guilford Press.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology, 87*, 765–780.
- Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology, 65*, 681–706.
- Kerr, N. L. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology, 45*, 819–828.
- Kichuk, S. L., & Wiesner, W. H. (1997). The Big Five personality dimensions and team performance: Implications for selecting successful product design teams. *Journal of Engineering Technology Management, 14*, 195–221.
- King, L. A., Walker, L. M., & Broyles, S. J. (1996). Creativity and the five-factor model. *Journal of Research in Personality, 30*, 189–203.
- Kirkman, B. L., & Shapiro, D. L. (2005). The impact of cultural value diversity on multicultural team performance. In J. L. Chang & D. L. Shapiro (Eds.), *Advances in international management: Vol. 18. Managing multinational teams* (pp. 33–67). London: Elsevier.
- Klein, K. J., Dansereau, F., & Hall, R. J. (1994). Levels issues in theory development, data collection, and analysis. *Academy of Management Review, 19*, 195–229.
- Kozlowski, S. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 3–90). San Francisco: Jossey-Bass.
- Kristof, A. L. (1996). Person–organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology, 49*, 1–49.
- Kristof-Brown, A. L., Barrick, M. A., & Stevens, C. K. (2005). When opposites attract: A multi-sample demonstration of complementary person–team fit on extraversion. *Journal of Personality, 73*, 935–957.
- Laughlin, P. R., & Adamopoulos, J. (1980). Social combination processes and individual learning for six-person cooperative groups on an intellectual task. *Journal of Personality and Social Psychology, 38*, 941–947.
- Laughlin, P. R., & Futoran, G. C. (1985). Collective induction: Social combination and sequential transition. *Journal of Personality and Social Psychology, 48*, 608–613.
- LePine, J. A., Hollenbeck, J. R., Ilgen, D. R., & Hedlund, J. (1997). Effects of individual differences on the performance of hierarchical decision-making teams: Much more than g. *Journal of Applied Psychology, 82*, 803–811.
- Manz, C. C. (1992). Self-leading work teams: Moving beyond self-management myths. *Human Relations, 45*, 1119–1140.
- Manz, C. C., & Sims, H. P. (1987). Leading workers to lead themselves: The external leadership of self-managing work teams. *Administrative Science Quarterly, 32*, 106–129.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*, 71–87.
- McClelland, G. H. (1997). Optimal design in psychological research. *Psychological Methods, 2*, 3–19.
- McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology, 52*, 1258–1265.
- McCrae, R. R., & Costa, P. T., Jr. (1997). Personality trait structure as a human universal. *American Psychologist, 52*, 509–516.
- McIntyre, R. M., & Salas, E. (1995). Measuring and managing for team performance: Emerging principles from complex environments. In R. A. Guzzo & E. Salas (Eds.), *Team effectiveness and decision making in organizations* (pp. 9–45). San Francisco: Jossey-Bass.
- Meindl, J. (1993). Reinventing leadership: A radical, social psychological approach. In J. K. Murnighan (Ed.), *Social psychology in organizations: Advances in theory and research* (pp. 89–118). Englewood Cliffs, NJ: Prentice Hall.
- Miles, J. A., & Greenberg, J. (1993). Using punishment threats to attenuate social loafing effects among swimmers. *Organizational Behavior and Human Decision Processes, 56*, 246–265.
- Mohammed, S., & Angell, L. (2003). Personality heterogeneity in teams: Which differences make a difference for team performance? *Small Group Research, 34*, 651–677.
- Moon, H., Hollenbeck, J. R., Humphrey, S. E., Ilgen, D. R., West, B. J., Ellis, A. P. J., et al. (2004). Asymmetric adaptability: Dynamic team structures as one-way streets. *Academy of Management Journal, 47*, 681–695.

- Moynihan, L. M., & Peterson, R. S. (2001). A contingent configuration approach to understanding the role of personality in organizational groups. In R. I. Sutton & B. M. Staw (Eds.), *Research in organizational behavior* (pp. 327–378). London: Elsevier Science.
- Muchinsky, P. M., & Monahan, C., J. (1987). What is person–environment congruence? Supplementary versus complementary fit. *Journal of Vocational Behavior*, *31*, 268–277.
- Mulvey, P. W., & Klein, H. J. (1998). The impact of perceived loafing and collective efficacy in group goal processes and group performance. *Organizational Behavior and Human Decision Processes*, *74*, 62–87.
- Murnighan, J. K., & Conlon, D. E. (1991). The dynamics of intense work groups: A study of British string quartets. *Administrative Science Quarterly*, *36*, 165–186.
- Neuman, G. A., Wagner, S. H., & Christiansen, N. D. (1999). The relationship between work-team personality composition and the job performance of teams. *Group & Organization Management*, *24*, 28–45.
- Steiner, I. D. (1972). *Group process and productivity*. New York: Academic Press.
- Taggar, S., Hackett, R., & Saha, S. (1999). Leadership emergence in autonomous work teams: Antecedents and outcomes. *Personnel Psychology*, *52*, 899–926.
- Thomas, D. C. (1999). Cultural diversity and work group effectiveness: An experimental study. *Journal of Cross-Cultural Psychology*, *30*, 242–263.
- Tsui, A. S., & O'Reilly, C. A. (1989). Beyond simple demographic effects: The importance of relational demography in superior–subordinate dyads. *Academy of Management Journal*, *32*, 402–423.
- Wiggins, J. S. (1979). A psychological taxonomy of trait-descriptive terms: The interpersonal domain. *Journal of Personality and Social Psychology*, *37*, 395–412.
- Williams, K. D., & Karau, S. J. (1991). Social loafing and social compensation: The effects of expectations of co-worker performance. *Journal of Personality and Social Psychology*, *61*, 570–581.

Received October 11, 2005

Revision received August 9, 2006

Accepted August 21, 2006 ■