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The Attitudinal and Motivational Consequences of Personality Differences in Teams

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Psychology

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Abstract

In our team-based world of work, understanding the effects of team member differences is critical. This research examined the effects of personality congruence (i.e., (dis)similarity) on individual team members' satisfaction with the team and autonomous motivation. The potential role of psychological need fulfillment as a mediator of the relation between personality congruence and these outcomes was also considered.

Multilevel polynomial regression with response surface analysis provided no evidence for a congruence pattern relating any of the HEXACO model of personality's six domains to individual satisfaction with the team, autonomous motivation, or any of the psychological needs. Supplemental analyses revealed a significant congruence pattern for the emotionality sub-trait of dependence. As individual and team levels of dependence became more discrepant, satisfaction with the team was lower.

This study contributes to the relatively limited research conducted on personality dissimilarity in teams and should provide useful direction for team composition researchers. The findings provide further evidence for the need to consider personality differences at the facet level and the potential importance of investigating moderators of personality congruence relations to explain the inconsistent findings to date. If replicated, the results could have practical implications. Individuals putting together work groups may consider the trait of dependence when affective outcomes are of concern. These implications are discussed in detail, as well as study limitations and directions for future research.

KEYWORDS: teamwork; team composition; team satisfaction; motivation;
psychological need fulfillment; personality congruence; personality dissimilarity; surface
response analysis

Summary for Lay Audience

Our world is full of team-based work. Anyone who has experienced life in a team knows that individual members can differ in countless ways. This research examined what it is like to be different than one's teammates across a wide array of personality characteristics. Specifically, it looked at how personality dissimilarity affects an individual's satisfaction with their team and autonomous work motivation. Of the personality traits examined, the only notable relation was between dependence dissimilarity and satisfaction with the team. Dependence refers to one's tendency to seek emotional support from others. When individuals are more, or less, dependent than their team, it seems that they are less satisfied with their team. When the difference is bigger, the relation is stronger.

While this finding may seem to suggest individuals composing teams should consider members' level of dependence, the present research had limitations and more research needs to be done before this can be considered an important takeaway.

Another aim of this research was to determine whether the degree to which a team fulfilled an individual's psychological needs for autonomy, competence, and relatedness helped explain why personality differences might affect satisfaction and motivation. Although these psychological needs were related to the outcomes, they did not appear to explain why dependence dissimilarity leads to lower satisfaction with the team. Nonetheless, the research supports the idea that managers should be careful to support the psychological needs of their team members to ensure viable and motivated teams.

Acknowledgments

This dissertation has not followed a traditional path if such a thing exists.

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Table of Contents

Abstract	ii
Summary for Lay Audience	iv
Acknowledgments.....	v
Table of Contents	vi
List of Tables	ix
List of Figures.....	xi
Chapter I: Introduction.....	1
Team Member Differences	2
Personality (Dis)similarity	4
Personality Dissimilarity and Satisfaction with the Team.....	6
Honesty-Humility	8
Emotionality.....	11
Extraversion	14
Agreeableness	18
Conscientiousness.....	22
Openness to Experience.....	25
Personality Dissimilarity and Autonomous Motivation	29
The Mediating Role of Psychological Need Fulfillment	32
Need Fulfillment as a Link between Personality (In)congruence and Team Member Satisfaction.....	35
Need Fulfillment as a Link between Personality (In)congruence and Autonomous Motivation.....	38
Summary.....	41
Chapter II: Method.....	41
Participants and Procedure.....	41

Missing Data	42
Careless Responding	43
Demographics	44
Measures	44
Personality	44
Psychological Need Fulfillment.....	44
Autonomous Motivation.....	45
Satisfaction with the Team	46
Analytic Strategy	46
Polynomial Regression with Response Surface Analysis.....	46
Path Analyses for Tests of Mediation.....	51
Chapter III: Results	52
Descriptive Statistics.....	52
Personality Congruence	52
Supplemental Analyses.....	60
Examination of Direct and Indirect Relations	63
Chapter IV: Discussion.....	64
Study Implications	66
Supplemental Relations Observed	68
Honesty-Humility	69
Emotionality.....	69
Extraversion	70
Conscientiousness.....	71
Limitations	72
Future Research	75

Perceived versus Actual Differences/Fit.....	75
To Whom Does Congruence Matter?	76
In Which Teams Does Congruence Matter?.....	77
Chapter V: Conclusion.....	80
References.....	81
Appendices.....	106
Appendix A: List of Measures	106
HEXACO-60	106
Psychological Need Fulfillment.....	109
Motivation.....	110
Satisfaction with the Team	111
Appendix B: Frequencies of personality scores over, under, and in-agreement with the team.....	112
Appendix C: Multilevel models for all personality-outcome relations	114
Appendix D: Ethics Approval Notices	129
Curriculum vitae	133

List of Tables

Table 1. Means, Standard Deviations, Scale Reliabilities, and Intercorrelations for Individual Variables.....	54
Table 2. Multilevel Models for Honesty-Humility and Relatedness Fulfillment	55
Table 3. Tests of Conditions for a(n) (in)Congruence Pattern on Mediators and Outcomes	57
Table 4. Multilevel Models for Dependence and Satisfaction with the Team.....	62
Table 5. Multilevel Path Analysis Results for the Trait of Dependence and Individual Satisfaction with the Team.....	64
Table 6. Multilevel Models for Honesty-Humility and Relatedness Fulfillment	114
Table 7. Multilevel Models for Honesty-Humility and Autonomy Fulfillment	114
Table 8. Multilevel Models for Honesty-Humility and Competence Fulfillment	115
Table 9. Multilevel Models for Honesty-Humility and Satisfaction with the Team	115
Table 10. Multilevel Models for Honesty-Humility and Autonomous Motivation.....	116
Table 11. Multilevel Models for Emotionality and Relatedness Fulfillment	116
Table 12. Multilevel Models for Emotionality and Autonomy Fulfillment	117
Table 13. Multilevel Models for Emotionality and Competence Fulfillment	117
Table 14. Multilevel Models for Emotionality and Satisfaction with the Team	118
Table 15. Multilevel Models for Emotionality and Autonomous Motivation.....	118
Table 16. Multilevel Models for Extraversion and Relatedness Fulfillment.....	119
Table 17. Multilevel Models for Extraversion and Autonomy Fulfillment.....	119
Table 18. Multilevel Models for Extraversion and Competence Fulfillment.....	120
Table 19. Multilevel Models for Extraversion and Satisfaction with the Team.....	120
Table 20. Multilevel Models for Extraversion and Autonomous Motivation	121
Table 21. Multilevel Models for Agreeableness and Relatedness Fulfillment.....	121
Table 22. Multilevel Models for Agreeableness and Autonomy Fulfillment.....	122

Table 23. Multilevel Models for Agreeableness and Competence Fulfillment	122
Table 24. Multilevel Models for Agreeableness and Satisfaction with the Team	123
Table 25. Multilevel Models for Agreeableness and Autonomous Motivation.....	123
Table 26. Multilevel Models for Conscientiousness and Relatedness Fulfillment.....	124
Table 27. Multilevel Models for Conscientiousness and Autonomy Fulfillment.....	124
Table 28. Multilevel Models for Conscientiousness and Competence Fulfillment.....	125
Table 29. Multilevel Models for Conscientiousness and Satisfaction with the Team.....	125
Table 30. Multilevel Models for Conscientiousness and Autonomous Motivation	126
Table 31. Multilevel Models for Openness and Relatedness Fulfillment.....	126
Table 32. Multilevel Models for Openness and Autonomy Fulfillment.....	127
Table 33. Multilevel Models for Openness and Competence Fulfillment.....	127
Table 34. Multilevel Models for Openness and Satisfaction with the Team.....	128
Table 35. Multilevel Models for Openness and Autonomous Motivation	128

List of Figures

Figure 1. A theoretical response surface demonstrating a congruence pattern.....	50
Figure 2. Response surfaces for significant multi-level models	59
Figure 3. Response surface for dependence predicting satisfaction with the team	63
Figure 4. Multiple examples of response surface analysis (RSA) surfaces.....	68

Chapter I: Introduction

The pervasive use of teams is a well-documented feature of the modern workplace. While people often think about teams as single units, anyone who has experienced life in a team knows that individual members can differ in countless ways. Over the last two decades, researchers have taken an interest in the ways that *deep-level* differences (e.g., personality traits, values, beliefs, etc.) among team members affect individual and team outcomes.

One deep-level way in which team members may differ is their personality. Personality differences have the potential to greatly influence individuals' experiences in team-based work. Given that the use of personality data to inform organizational decisions such as personnel selection (Morgeson et al., 2007) and development priorities is increasingly common, understanding how personality differences influence people's experiences in teams may help organizations compose more viable teams that also promote individual member wellbeing.

While there has been *some* research aimed at understanding the effects of team member differences in personality, the literature is sparse and results ambiguous. The present research is designed to support this literature by examining the relation between personality differences among members of project teams and two important individual outcomes – satisfaction with the team and autonomous motivation. The project advances current work by (1) examining unstudied/understudied personality traits, (2) considering the motivational consequences of personality differences, and (3) introducing psychological need fulfillment as a possible mediating mechanism. Additionally, I implement multilevel response surface analysis, a novel methodological approach that

overcomes limitations of past work that has often used difference scores to operationalize dissimilarity and neglected the nested data structure of individuals working in teams.

Multilevel response surface analysis is favoured over previously used techniques because it is less biased toward falsely supporting an effect of team member differences (Edwards & Parry, 1993; Nestler, Humberg, & Schönbrodt, 2019).

Team Member Differences

There are two primary research streams that consider team member differences. While the literature in these two streams is loosely connected, it is surprisingly siloed, with different origins, separate groups of researchers, and distinct methodologies. The first way to consider team member differences is through the lens of team diversity research. Most early research on team diversity emphasized demographic characteristics (e.g., ethnicity, sex, age, etc.) in response to an increasingly global workplace and a rising concern with social justice issues. Subsequently, scholars advocated for a shift from these “surface-level” variables to “deep-level” characteristics such as values and personality (Harrison, Price, Gavin & Florey, 2002; Van Knippenberg & Schippers, 2007). While most research on team diversity has emphasized team-level properties and outcomes, researchers have increasingly been interested in the experiences of individual members within teams (David, Avery, Witt, & McKay, 2015; Gevers & Peeters, 2009).

When diversity research is aimed at the experiences of *individuals* and how they relate to their team members, *dissimilarity* is the term most used to describe differences between members. Several theories have been used to explain how the experience of dissimilarity may negatively affect individual team members (e.g., social identity theory; Tajfel & Turner, 1986; self-categorization theory; Tsui, Egan, & O’Reilly, 1992; and

social anxiety theory; Stephan & Stephan, 1985). Most of these frameworks, however, can trace their roots back to the similarity-attraction paradigm outlined by Byrne (1971). This theory states that individuals are initially attracted to those who are similar to themselves. This attraction stems from a supposed trust that similar others will uphold one's own values and beliefs (Gevers & Peeters, 2009). By surrounding oneself with similar others, people are able to receive mutual validation of their personal characteristics (e.g., values, opinions, beliefs, etc.).

From this perspective, dissimilarity among team members is thought to lead to negative outcomes because of an incompatibility in members' values that inhibits social integration – leading to process difficulties and the frustration of individual goals. While some theorizing in the team composition literature (i.e., the information-processing/decision-making approach) has suggested potential benefits of diversity within teams, due to the unique perspectives and skills offered by members (van Knippenberg, De Dreu, & Homan, 2004), the preponderance of evidence to date seems to indicate that team member differences in work settings, whether at the individual or team level, are more likely to lead to negative outcomes or have no effect at all (Jackson, Joshi, & Erhardt, 2003; Riordan, 2000; Williams & O'Reilly, 1998).

The second theoretical lens that has been used to consider individuals embedded within teams is person-environment fit. With its origins in person-environment interaction theory (Ekehammer, 1974; Lewin, 1936), the fundamental assumption of fit research is that congruence between the characteristics of individuals and their environments typically yields positive outcomes for the individual (Edwards, 1991; Kristof, 1996). In team contexts, an individual's personal characteristics may interact

with those of his or her teammates to affect attitudes and behaviour (Kristof-Brown, Barrick, & Kay Stevens, 2005a; Neuman, Wagner, & Christiansen, 1999; Tett & Burnett, 2003). When the match between an individual and his or her proximal co-workers is of specific interest, researchers usually refer to *person-group fit*. Person-group fit has been shown to increase important individual outcomes such as commitment, satisfaction, and performance (Kristof-Brown, Zimmerman, & Johnson, 2005b).

Like the information-processing/decision-making approach to diversity, the fit literature also considers potential benefits of differences. Fit may be conceptualized as supplementary (i.e., when characteristics of the individual are similar to those of the social environment) or as complementary (i.e., when an individual completes the environment by filling some void, such as when an individual possesses valuable skills needed by a group; Muchinsky & Monahan, 1987).

Personality (Dis)similarity

When an individual possesses a personality trait to a different degree than his or her team members, he or she may find social interactions more challenging (David et al., 2019). People with different levels of a trait may find themselves on a team with fundamentally different values, producing competing goals, expectations, and behaviour regarding things like effort, scheduling, and communication. Individuals who are dissimilar may struggle to integrate into the team and cooperate with other members because of a lack of shared understanding. Similarity on personality traits, however, has been proposed to provide a common way of perceiving, interpreting, and acting on social information (Kalliath, Bluedorn, & Strube, 1999; Schaubroeck & Lam, 2002). Guillaume, Brodbeck, and Riketta (2012), for example, noted that “people feel more attracted to

others who have similar psychological characteristics, because similarity in personality, attitudes, and values eases interpersonal interactions, facilitates communication and friendship, and leads to verification and reinforcement of people's own attitudes, beliefs and personality" (p. 85). David et al. (2019) suggested that "working with others who differ in personality can be stressful for three reasons: (a) preemptively worrying about upcoming interactions with dissimilar others, (b) the stress of the ineffective interactions themselves, and (c) the lack of social support afforded them" (p. 505).

There exists some empirical support for the idea that personality similarity in teams can be preferable to members. For example, Jansen and Kristof-Brown (2005) found that pacing congruence, or fit with the hurriedness of the workgroup, tends to be associated with higher levels of satisfaction and helping behaviour. Experimental work has shown that both Type-A and Type-B individuals are more satisfied when teamed up with others of the same type (Keinan & Koren, 2002). Schaubroeck and Lam (2002) found that peer personality similarity and supervisor-subordinate personality similarity both influence promotion decisions. Outside the work domain, even similarity on seemingly less desirable traits, such as disinhibition, has been associated with greater marital satisfaction, the assumption being that similarity leads to greater feelings of being understood – similar partners are more able to interpret thoughts and behaviour accurately and respond to their partner accordingly (Derrick et al., 2016).

While the majority of studies support the proposition that dissimilarity on personality traits will produce negative outcomes, empirical evidence supports a complementarity effect of differences in some cases. This research has usually emphasized skills and abilities (Kristof, 1996), rather than personality, but there are

exceptions. For instance, in a study of supervisor-subordinate dyads, Glomb and Welsh (2005) found that dissimilarity in the personality dimension of control was associated with a subordinate's satisfaction with his/her supervisor. Subordinates were generally more satisfied when the controlling behaviour of their supervisor was matched with their own submissive tendencies.

Taken as a whole, the research on personality dissimilarity in teams has not yielded very conclusive findings. The same is true of research on personality dissimilarity in other interpersonal relationships (for a review of romantic relationships, see Weidmann, Ledermann, & Grob, 2017a). Not surprisingly, virtually all published work in this sphere has advocated for more research on personality dissimilarity to be done, expanding the traits and outcomes considered and improving the examination of previously investigated relations by using updated methodologies.

Personality Dissimilarity and Satisfaction with the Team

Some scholars have argued that researchers studying team member differences have overly emphasized team-level performance, neglecting individual-affective outcomes such as team member satisfaction (Gevers & Peeters, 2009; Peeters, Rutte, van Tuijl, & Reymen, 2006). Given that working in teams is increasingly the norm, an individual's satisfaction with the team is an important consideration for researchers and practitioners. Team member satisfaction is related to other work-related attitudes and behaviours such as commitment, turnover, and contextual performance (Gevers & Peeters, 2009), and dissatisfied team members may restrict their effort, withdraw from the team, or become a source of disruption for other members (de la Torre-Ruiz, Ferron-Vilchez, & Ortiz-de-Manojdana, 2014). Team member satisfaction can also be

considered an important outcome in its own right and a potential contributor to overall job satisfaction and wellbeing.

The idea that fit is important for satisfaction has been expressed for decades. French and Kahn (1962) suggested that if fit is not experienced, “a lack of satisfaction, a persisting experience of frustration and deprivation, and an inability to achieve valued goals in a specific set of environmental conditions” will begin to exist (p. 45).

Incongruence, particularly value incongruence, has been linked to negative organizational attitudes such as lowered affective organizational commitment and job satisfaction (Edwards & Cable, 2009; Kristof, 1996; Kristof-Brown et al., 2005b; Verquer, Beehr, & Wagner, 2003). While this evidence does not relate directly to personality incongruence at the team level, it seems reasonable to expect a similar pattern of relations, given the robust associations between personality and work values (Furnham, Petrides, Tsaosis, Pappas, & Garrod, 2005). Team members with good personality fit should be more able to anticipate the thoughts and behaviours of coworkers and arrive at consensus about which behaviours are appropriate and valued. This improved cohesion should lead to a more satisfying group experience.

David et al. (2019) argued that future research should examine the effects of dissimilarity on personality traits that have not received much attention – specifically mentioning openness to experience. Another well-established personality trait that has not been examined in dissimilarity/congruence research is honesty-humility. Both openness and honesty-humility are captured in the HEXACO model of personality which is widely accepted in academic research due to its considerable psychometric support (Ashton & Lee, 2007, 2008, 2009; Lee & Ashton, 2004, 2006, 2018). The HEXACO

model describes people in terms of six broad factors: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. Notably, the addition of the honesty-humility factor has been shown to capture variance not accounted for by the Five-Factor Model (Lee & Ashton, 2013). In the next section, the traits encompassed by the HEXACO model are introduced and the ways in which dissimilarity may influence an individual's satisfaction with the team are discussed. For each trait, the relevant evidence that exists to date is also summarized.

Honesty-Humility

Within the HEXACO model of personality, the honesty-humility domain captures an individual's willingness to manipulate others and break rules, as well as his or her desire for elevated social status and wealth (Ashton & Lee, 2008). Honesty-humility encompasses four distinct facets for which dissimilarity may influence one's satisfaction with the team.

Sincerity. Sincerity considers the tendency for people to be authentic in their relationships. Low scorers are more willing to manipulate others for personal gain, whereas high scorers tend to be more genuine in their interactions with other people (Lee & Ashton, 2004). In a teamwork context, sincere teammates might be more honest about their ability, provide truthful feedback to other members, and keep the commitments they make. Sincerity dissimilarity within a team could potentially be a frustrating experience. A highly sincere individual, for example, might grow particularly tired of less sincere teammates making flippant commitments that they do not intend to meet or being otherwise manipulated. A less sincere team member might be taken aback by the forthrightness of sincere teammates – what they perceive to be unnecessarily open

feedback on poor performance for instance. From a complementary fit perspective, however, it could also be possible that less sincere individuals are more easily able to get what they want through taking advantage of more sincere teammates who believe others will uphold their value of truthfulness.

Fairness. Fairness is concerned with an individual's willingness to engage in behaviours like cheating and stealing. Low scorers are generally more comfortable with activities involving such activities, whereas high scorers are not willing to take advantage of others (Lee & Ashton, 2004). It seems likely that dissimilarity regarding fairness will interfere with an individual's social integration in the team. An individual who is willing to obtain things through illegitimate means may feel impeded by teammates who pressure him or her to behave by the book. An individual who is unwilling to take advantage of others would feel uneasy in a team whose members cheat or steal and who may encourage others to do the same.

Greed Avoidance. Greed avoidance refers to a tendency to be disinterested in possessing and displaying wealth or other signs of social status (Lee & Ashton, 2004). Similarity on this dimension could lead to superior social integration. Dissimilar team members may feel that their values are not upheld, regardless of whether they are high or low scorers. Additionally, at the domain level, low levels of honesty-humility have been associated with greater risk-taking behaviours (Weller & Thulin, 2012). This effect could potentially be explained by low scorers on greed avoidance trying to pursue the greatest benefit possible in high-risk, high-reward circumstances. Team members who are dissimilar on greed avoidance may find that their contrasting goals make it difficult to agree on task strategy in some situations. It is also possible, however, that a

complementary effect is possible for low scorers – when someone concerned with displaying wealth and social status is surrounded by like others a “keeping-up-with-the-Joneses” effect may lead to frustration rather than satisfaction. As such low scorers may prefer to be surrounded by high scorers.

Modesty. Modesty is concerned with whether an individual sees himself or herself as superior to others and entitled to special privileges (Lee & Ashton, 2004). Honesty-humility has been shown to positively predict prosocial behaviour (Hilbig, Glockner, & Zettler, 2014) and this facet may help explain that effect. Modest people are less likely to view themselves as superior or special and may be more willing to help others. While modest individuals may find it difficult to relate to the sense of entitlement displayed by low-modesty teammates, it may also be possible that they can naturally offer the special treatment to which low-scoring members feel entitled without being bothered by doing so. Low-scoring individuals may find that the modesty of high-scoring teammates detracts from the perceived worth of the team because the latter do not try and position the team as being better than others. On the other hand, low scorers may enjoy being the beneficiaries of sacrifices made by teammates who do not view themselves as worthy of special treatment.

Evidence Summary. Unlike the other personality traits considered in this research, there appears to be no research to date examining the effects of honesty-humility differences among team members or within other types of relationships. Given the complete lack of existing evidence to inform hypotheses, and the competing rationale that can be offered for either a supplementary or complementary fit perspective, the following opposing hypotheses are put forward:

Hypothesis 1a: Dissimilarity in honesty-humility is negatively related to individual satisfaction with the team.

Hypothesis 1b: Dissimilarity in honesty-humility is positively related to individual satisfaction with the team.

Emotionality

Emotionality encompasses people's fear of physical danger, how anxious they tend to be, their need for emotional support from others, and the degree to which they experience sentimental attachment to others (Lee & Ashton, 2004). Each of emotionality's four facets are discussed in turn.

Fearfulness. The fearfulness facet of emotional stability reflects one's tendency to avoid danger and physical harm (Lee & Ashton, 2004). Varying levels of fearfulness may affect the types of tasks and behaviours in which team members are willing to participate. Examples include maintaining/violating safety protocols, engaging with other people that might threaten physical harm, and confidence using equipment that involves some danger. Differences in this facet likely surface only in certain work contexts (e.g., emergency services). When members perceive danger differently than their team members, it likely produces unease.

Anxiety. High scorers on anxiety tend to become preoccupied with relatively minor problems and may find even small challenges to be stressful (Lee & Ashton, 2004). In teamwork contexts, difficulties are sure to arise and individual differences in anxiety are likely to manifest. High scorers who are quite anxious compared to their team members may find other members' lack of worry to be alienating. They may also interpret their own worry as a signal of personal incompetence or otherwise fear that

teammates will perceive them as incompetent. Emotionally stable individuals will likely experience fewer negative emotions in response to stressful events and goal frustration, possibly finding other members' stress to be unnecessary or unproductive. Alternatively, however, highly anxious members may find the confidence of their less anxious peers to be reassuring. Less anxious individuals may feel particularly competent among highly anxious teammates and find that satisfying. On the other hand, the emotional demands placed on dissimilar members who do not have the abilities to meet team members' emotional needs may lead to lowered satisfaction. Diefendorff, Greguras, and Fleenor (2016) provided evidence that emotional demands-abilities fit accounts for variance in outcomes including job satisfaction and psychological need fulfilment above that explained by other fit perceptions.

Dependence. This trait describes one's need for emotional support from others (Lee & Ashton, 2004). Low scorers are self-assured; within a team of high scorers, they may grow tired of supporting the emotional and advice-seeking needs of their peers, thinking that work could be accomplished more efficiently if people were capable of independent decision-making and action. This is likely to be especially true if independent team members feel incapable of meeting emotional demands (Diefendorff et al., 2016). High scorers surrounded by low scorers, meanwhile, may find their more self-assured teammates to be distant or unsupportive.

Sentimentality. The sentimentality facet describes a tendency to feel strong emotional bonds with other people. Within a work team context, individuals likely have the expectation that relationships with teammates are temporary. That being said, there may be different expectations surrounding how much friendship people anticipate

experiencing with their teammates. Sentimental individuals may feel that their expectations are violated if less sentimental teammates seem distant or uncaring. Less sentimental teammates may feel constrained by the expectation for close interpersonal relationships or ongoing contact when grouped with high scorers.

Evidence Summary. Taken together, previous investigations at the domain level have yielded equivocal results about the effect of emotionality dissimilarity in teams. For instance, Peeters et al. (2006) found no evidence that neuroticism dissimilarity influenced individuals' satisfaction with the team. David et al. (2019), however, found that dissimilarity in emotional stability led to higher levels of emotional exhaustion, particularly for members who were less emotionally stable than their peers. Congruence in positive affectivity (which has been linked to low levels of neuroticism; John, 1990) has been related to positive attitudes about group relations and perceptions of one's influence in the group (Barsade, Ward, Turner, & Sonnefeld, 2000). On the other hand, Sung, Choi, and Kim-Jo (2014) found that team members who were less neurotic than their teammates engaged in more organizational citizenship behaviours and had higher task performance, but only when group tenure was short. Over time, neuroticism dissimilarity led to lowered job satisfaction.

Outside of work relationships, peer victimization among adolescents appears to be more frequent when an individual is more neurotic than his/her peers (Boele, Sijtsema, Kilmstra, Denissen, & Meeus, 2017). Additionally, in one study of married couples, neuroticism dissimilarity was negatively related to marital quality (Luo & Klohnen, 2005); however, in another study only male romantic partners reported lower levels of relationship satisfaction when they and their partner had dissimilar levels of neuroticism

(Weidmann, Schönbrodt, Ledermann, & Grob, 2017). Providing a small amount of support for a complementary hypothesis, emotional stability differences were associated with higher relationship satisfaction in a large representative sample of couples in the UK (but null effects in Australia) and with life satisfaction in the UK and Australia (but null effects in Germany; Dyrenforth, Kashy, Donnellan, & Lucas, 2010).

While there is some disconfirming evidence, most theorizing and empirical results support a supplementary fit effect of emotionality dissimilarity.

Hypothesis 2: Dissimilarity in emotionality is negatively related to individual satisfaction with the team.

Extraversion

Extraversion broadly refers to an individual's confidence in social situations (Lee & Ashton, 2004). Extraverted people also tend to be more energetic and experience more positive affect (John, 1990). Extraversion's four facets and the potential influence of dissimilarity are introduced next.

Social Self-Esteem. Social self-esteem represents a tendency for individuals to have a positive view of themselves in social circumstances (Lee & Ashton, 2004). Low scorers tend to question their self-worth and view themselves as unpopular. The social comparison made possible by a team context is likely to elicit thoughts about self-worth. Individuals with a negative view of self, compared to one's teammates, may be threatened by their more socially confident peers. On the other hand, it is possible that identifying with more confident team members may lead to an improved view of self – due to perceptions that the team is highly valued. While it is conceivable that individuals with a more positive self-regard would grow tired of supporting the emotional needs of

less confident peers and perhaps be tempted to disassociate, it also seems possible that high scorers would experience ego-enhancing benefits among team members who viewed themselves as unpopular. As such, it is unclear whether dissimilarity in regard to social self-esteem would affect one's experience in the team in a predictable pattern.

Social Boldness. The social boldness facet describes one's confidence within social situations. High scorers are more likely to be comfortable speaking in public and taking on leadership roles. Low scorers are less comfortable speaking up in group settings (Lee & Ashton, 2004). In team settings, it is conceivable that social boldness dissimilarity actually facilitates satisfaction. High scorers' desire to talk and low scorers' willingness to listen allow each to act according to their preference, without feeling controlled by social obligations to behave contrary to nature. High scorers' ability to entertain and drive conversation is on display, while low scorers do not have to work to externalize their thoughts, potentially fulfilling confidence needs in both. Further, the perfectly agreeable conversational imbalance that this creates may foster a sense of harmony and relatedness. In light of this reasoning, it seems reasonable to expect positive effects of complementarity for social boldness.

Sociability. The sociability facet describes an individual's propensity to enjoy social interaction. Low scorers tend to prefer solitary activities and do not seek out conversation (Lee & Ashton, 2004). Within a team context, extraverted individuals have the opportunity to be assertive, to talk, and to socialize (Neuman et al., 1999). One might expect highly sociable team members to devote a lot of time to social interactions, while more introverted individuals might prefer to keep such interactions to a minimum. Sociable team members may prefer to set in-person meetings, whereas less sociable

counterparts might prefer electronic communication. Sociable members might prefer a more collaborative approach, whereas less sociable members may prefer a “divide and conquer” approach. Dissimilarity on this facet may also affect one’s sense of competence. Less sociable individuals may struggle to conduct focused work in a social setting, while more sociable individuals have more difficulty staying engaged when work is divided and conducted alone. Self-regulatory resources are taxed when “the self alters or preserves its inner states so as to achieve various goals and meeting certain standards” (Baumeister, 2001, p. 299). When a sociable individual is expected to work independently, or a less sociable individual is expected to work interdependently it seems most likely it will be a dissatisfying experience.

Liveliness. This trait captures typical levels of energy and enthusiasm with high scorers being more dynamic and optimistic than low scorers (Lee & Ashton, 2004). High-scoring teammates are likely to have more energy they can dedicate to the team’s task and functioning. When teammates do not possess a similar level of energy and enthusiasm, the lively individual may feel that they are dragging everyone else along. On the flipside, a less enthusiastic member may find the optimism of his or her more positive teammates to be off-putting or unreasonable, particularly in the face of challenges. Low scorers may need more frequent breaks and find it difficult to sustain output. As mentioned above, similarity regarding positive affectivity has been associated with positive outcomes (Barsade et al., 2000) and it seems possible that the same pattern will be upheld for the liveliness facet of extraversion.

Evidence Summary. Existing evidence surrounding extraversion dissimilarity’s effects is mixed. Peeters et al. (2006) found that extraversion dissimilarity was negatively

related to team member satisfaction, but only among introverts, whereas Perry, Dubin, and Witt (2010) found that high-extraversion, customer-service employees experienced greater levels of emotional exhaustion when their coworkers were lower in extraversion; introverts, however, appeared unbothered by working with more extraverted coworkers. Similarity in positive affectivity (which has been linked to extraversion; John, 1990), has also been related to positive attitudes about group relations and perceptions of one's influence in the group (Barsade, Ward, Turner, & Sonnefeld, 2000) and dyads whose members were either both introverts or both extraverts had better initial interactions than dyads who were dissimilar (Cuperman & Ickes, 2009).

Kristof-Brown et al. (2005a) provided evidence for a true complementarity effect of extraversion dissimilarity. High scorers in low-scoring teams and low scorers in high-scoring teams tended to be most attracted to their teams and were also judged to be better performers by their peers and supervisors. Sung et al. (2014) found that extraversion dissimilarity positively predicted job satisfaction, task performance, and OCB among individuals who were more extraverted than their team; this effect, though, wore off over time. Liao, Joshi, and Chuang (2004) provided evidence that dissimilarity in regard to extraversion was positively related to co-worker satisfaction but also to interpersonal deviance.

Outside of the work domain, Dyrenforth et al. (2010) found that in a large, representative sample of Australian couples, dissimilarity in extraversion was related to lower relationship and life satisfaction, but this effect was not duplicated in a sample of couples from the UK. Null effects were also reported by Luo and Klohnen (2005) in their investigation of personality similarity's effects on marital quality.

Given this mixed bag of research findings and the competing rationales that can be offered by considering extraversion's facets offers, it is difficult to predict the effects of extraversion dissimilarity. Instead, the following opposing hypotheses are offered:

Hypothesis 3a: Dissimilarity in extraversion is negatively related to individual satisfaction with the team.

Hypothesis 3b: Dissimilarity in extraversion is positively related to individual satisfaction with the team.

Agreeableness

According to the HEXACO model, agreeable people are forgiving, lenient, and slow to become angry. They tend to pursue compromise and cooperation. Low scorers are more likely to hold grudges, be critical of other people, and dig in when their point of view is questioned (Lee & Ashton, 2004). The ways that dissimilarity within agreeableness' four facets might play out is discussed next, followed by a consideration of the research done to date.

Forgivingness. Forgivingness involves a propensity to feel trust and liking toward those who have caused one harm. Low scorers tend to hold grudges against those who have offended them, whereas high scorers are usually ready to re-establish friendly relations after being badly treated (Lee & Ashton, 2004). It is easy to imagine that being in a team of forgiving individuals would be more comfortable than working with unforgiving ones. It is unclear, however, how dissimilarity may affect team members. Forgiving individuals may simply forgive the unforgivingness of dissimilar teammates. They may, on the other hand, find it difficult to relate to them and find the situation exhausting. People who are less forgiving may become frustrated by how quickly their

forgiving teammates let unmet expectations and poor performance go. Alternatively, however, they may appreciate the forgiveness extended to them and be quite satisfied.

Gentleness. The gentleness facet reflects one's tendency to be mild and lenient in dealing with other people (Lee & Ashton, 2004). It seems quite likely that high scorers on the gentleness scale will prefer to have their approach mirrored by teammates. Gentle individuals are likely to find their more severe counterparts to be intimidating and/or exhausting. It is less clear how low scorers might respond to dissimilarity. They may enjoy the leniency they themselves are afforded while working with more gentle peers, but they may find the leniency afforded to the group as a whole interferes with the group's task progress.

Flexibility. Flexibility refers to one's willingness to compromise and cooperate with others. Low scorers are more inclined to be stubborn and argue their position. High scorers tend to accommodate others and avoid arguments, even when others may be unreasonable (Lee & Ashton, 2004). Given the nature of flexibility, being a low scorer among high scorers might not be very difficult. In this instance, it is very likely that the more stubborn individual would commonly get his or her preferred way. A highly flexible individual in a more argumentative team, however, is likely to find the combative environment difficult. Not only would his or her values of cooperation not be upheld, he or she might have to choose which competing stance to support or otherwise work to bargain for a middle ground. This logic suggests that flexibility dissimilarity may have negative effects, but possibly for high scorers only.

Patience. This facet indicates a tendency to remain calm. Low scorers tend to become angry quickly; high scorers are slower to feel and express anger (Lee & Ashton,

2004). It is difficult to anticipate how dissimilarity on the patience facet may affect individuals in a team. While one might expect that being a patient team member among people who are quick to express anger would be difficult, the very nature of patience might suggest that such an individual would be slow to become frustrated with his or her dissimilar team members. While low scorers are likely to become angry at others more quickly, it seems unlikely that working with more patient team members would be particularly irksome.

Evidence Summary. A few studies have investigated the effects of agreeableness dissimilarity in work groups. Supporting a supplementary fit hypothesis, David et al. (2019) found that agreeableness dissimilarity led to lowered organizational commitment through its effects on emotional exhaustion. Emotional exhaustion was greatest when individual agreeableness was higher than workgroup agreeableness, suggesting that dissimilarity is more problematic for agreeable individuals. Controlling for individual personality levels, Liao et al. (2004) found that agreeableness dissimilarity was associated with organizational deviance and that perceived organizational support mediated the relation. Day and Bedeian (1995) found that agreeableness dissimilarity from peers was negatively associated with the individual's performance.

Other research suggests that a complementary fit approach to agreeableness dissimilarity may be more appropriate. For instance, the quality of initial interactions between two individuals was lowest when it comprised two disagreeable individuals. The presence of a single agreeable individual was enough to produce a reasonably pleasant interaction (Cuperman & Ickes, 2009). Sung et al. (2014) found that within short tenure groups, agreeableness dissimilarity had a marginally negative effect on job satisfaction,

but the effect was marginally positive among longer tenured groups. Finally, Peeters et al. (2006) did not find any effect for agreeableness dissimilarity on satisfaction with the team.

In non-work domains, the difference between an individual and partner's agreeableness scores has been negatively related to perceived marital quality (Barelds, 2005) and life satisfaction (Wu, Liu, Guo, Cai, & Zhou, 2020). Chopik and Lucas (2019) also found a negative association between agreeableness dissimilarity and both relationship and life satisfaction among romantic couples. A similar effect was shown by Luo and Klohnen (2005) for male partners when the difference between agreeableness scores was considered and for both partners when the correlation between agreeableness scores was used to operationalize similarity. In their examination of relationship and life satisfaction among romantic couples, Dyrentforth et al. (2010) found that agreeableness dissimilarity was unrelated to relationships satisfaction in both their Australia and UK samples. In terms of life satisfaction, dissimilarity showed no relation in Australia, a small positive relation in the UK, and a small negative relation in Germany.

Evaluating these studies together, the effects of agreeableness dissimilarity appear ambiguous. Both a supplementary and complementary effect have been reported in existing research and rationale can be developed in support of each. Therefore, opposing hypotheses are offered once again:

Hypothesis 4a: Dissimilarity in agreeableness is negatively related to individual satisfaction with the team.

Hypothesis 4b: Dissimilarity in agreeableness is positively related to individual satisfaction with the team.

Conscientiousness

Conscientiousness is the personality domain most directly related to how individuals engage with work (Ashton & Lee, 2007; Lee & Ashton, 2018). People who are highly conscientious tend to organize their work and physical surroundings, are disciplined and deliberate in striving toward goals, and strive for excellence in their work. Low scorers tend to avoid challenging goals, act more impulsively, and are less concerned with structure and perfection (Lee & Ashton, 2004). Given these descriptions, it is easy to imagine how a team's conscientiousness composition might create coordination and motivational problems within a team. Conscientious individuals are more likely to hold high standards of performance and to implement an organized approach to goal attainment, maintaining persistence in the face of challenges. Indeed, previous research has shown that individual conscientiousness does not predict satisfaction, but team-level conscientiousness does (Molleman, Nauta, & Jehn, 2004).

Organization. Organized individuals tend to prefer a structured approach to tasks and enjoy order. Low scorers tend to be sloppy and haphazard (Lee & Ashton, 2004). Dissimilarity in preferences for organization could easily elicit frustration in collaborative work. Low scorers are likely to feel constrained or controlled by the hypervigilant systems imposed by more organized members. They may even feel that their sense of competence is threatened. High scorers working with less structured teammates are likely to find the lack of order exhausting and a threat to task performance. Dissimilarity in organization is likely to lead to different preferences related to scheduling time and the degree of structure individuals are willing to apply to the project.

Diligence. The diligence facet involves a tendency to be self-disciplined and hardworking (Lee & Ashton, 2004). It is easy to imagine that those who hold themselves to high standards would be frustrated working in a group of people who have less lofty performance goals or ability to stick with tasks that are difficult. While individuals who are less willing to exert themselves may be frustrated by the performance expectations of their more diligent teammates, it is also conceivable that they would be happy to reap the rewards of their teammates' hard work.

Perfectionism. Perfectionism refers to an individual's propensity to be thorough and concerned with details. High scorers check their work carefully, while low scorers are more willing to tolerate mistakes and neglect details (Lee & Ashton, 2004).

Individuals who are more perfectionistic are likely to be dissatisfied with the quality of work received from low-scoring team members. Often feeling they must correct what they believe is substandard work could be quite trying. Low scorers working with perfectionistic team members may grow tired of having their work always corrected and changed. They may experience threats to their sense of competence and be unmotivated to fully engage in future work assignments. As with the other conscientiousness facets, however, it also seems possible that a low scorer may enjoy the performance benefits of being teamed with high-scoring colleagues.

Prudence. The prudence facet encompasses one's degree of carefulness and impulse control. High scorers consider decisions carefully, approach options with caution, and demonstrate self-control. Low scorers are more likely to act on impulse and not consider potential consequences of their actions (Lee & Ashton, 2004). Being dissimilar on this dimension could lead to frustration surrounding choice of task strategy

and perceived momentum toward goals. Additionally, high scorers may find the lower levels of self-regulation demonstrated by dissimilar teammates to be irresponsible, while low scorers could become fatigued by the cautious approach of more prudent counterparts and feel that their creativity is being stifled and that progress is stalled unnecessarily.

Evidence Summary. Most of the research examining conscientiousness dissimilarity supports a supplementary fit perspective. Peeters et al. (2006) found that being either more conscientious or less conscientious than one's teammates led to lowered satisfaction with the team. Building on these findings, Gevers and Peeters (2009) conducted a study examining conscientiousness dissimilarity in 43 student project teams. They replicated the finding that conscientiousness dissimilarity was negatively related to satisfaction with the team, but it was not related to satisfaction with the team's performance. Liao et al. (2004) found that conscientiousness dissimilarity was positively related to interpersonal deviance. At the organizational level, Day and Bedeian (1995) found that conscientiousness dissimilarity predicted turnover in a sample of African-American nurses.

Contrary to their expectations, David et al. (2019) provided evidence more in line with a complementarity hypothesis. Dissimilarity in conscientiousness had a positive indirect effect on organizational commitment through emotional exhaustion in their study of work groups in the U.S. Armed Services.

In marital relationships, most studies have found a null relation between conscientiousness dissimilarity and outcomes; however, conscientiousness dissimilarity has been shown to relate negatively to self-reported marital quality, but only among

husbands (Luo & Klohnen, 2005). Recently, Chopik and Lucas (2019) found a small negative association between conscientiousness and seven of nine studied wellbeing outcomes, including relationship satisfaction. In contrast, however, Dyrenforth (2010) found that conscientiousness dissimilarity was positively related to life, but not relationship, satisfaction in their study of personality dissimilarity among romantic couples in Australia.

Once again, given the competing rationale and evidence in support of both a supplementary and complementary fit perspective for conscientiousness dissimilarity, the following hypotheses are put forward:

Hypothesis 5a: Dissimilarity in conscientiousness is negatively related to individual satisfaction with the team.

Hypothesis 5b: Dissimilarity in conscientiousness is positively related to individual satisfaction with the team.

Openness to Experience

Within the HEXACO model of personality, openness to experience describes an appreciation for novelty and beauty. High scorers are intellectually curious across an array of content areas, use their imagination often, and are happily engaged by unusual ideas and people (Ashton & Lee, 2007). Dissimilarity in openness may lead to problematic outcomes for teams. As an example, team members who are more open, may experience satisfaction and motivation during the more creative ideation phases of design (Peeters et al., 2006). They may then lose interest and withdraw effort when it comes to implementation, failing to meet the effort expectations of teammates.

Aesthetic Appreciation. Aesthetic appreciation is the openness facet concerned with one's enjoyment of beauty. High scorers tend to appreciate beauty more than low scorers (Lee & Ashton, 2004). In many project teams, aesthetic appreciation likely has few opportunities to manifest itself. That being said, it is easy to imagine how differences in this trait could lead to different priorities when producing physical work such as presentations, reports, or product prototypes. Those high in aesthetic appreciation might spend more time and energy ensuring the product is one that will be admired for its physical properties; low scorers might find this unnecessary and even a poor investment of team resources.

Inquisitiveness. The inquisitiveness facet describes a tendency for someone to seek out new information and experiences. High scorers tend to be curious about their environment and the people around them; they tend to be interested in activities such as reading and travel. Low scorers are less likely to be curious and interested in discovering things about the world around them (Lee & Ashton, 2004). There is the potential for conflicting priorities where inquisitiveness dissimilarity is considered. An inquisitive individual, working with low scorers might feel that his or her curiosity is stifled and that his or her learning and mastery potential is thwarted. A low-scoring team member may quickly find his or her curiosity saturated; if working with team members who are pursuing mastery of a topic, they may feel that the project keeps expanding unnecessarily or may feel that decisions are too often delayed while the team collects information. This occurrence could lead them to feel frustrated by lack of momentum on the team's project and desiring to just get it done. The literature on team goal-orientation could inform hypotheses about inquisitiveness dissimilarity. There is some evidence that people prefer

to work with others who have a similar preference for developing ability vs. demonstrating ability (Cameron, 2014; Dierdorff & Ellington, 2012).

Creativity. In the HEXACO model, creativity describes one's preference for innovation and experimentation. High scorers actively seek new solutions to problems and like to express themselves in art and related activities, while low scorers are content to not pursue original thought (Lee & Ashton, 2004). In collaborative work, dissimilarity on creativity may radically influence preferred task strategies. Creative minorities might feel that their need for autonomy is thwarted in teams whose members largely prefer standard processes and proven ways of doing things. They may grow frustrated in a team that values imitation over innovation. Low-scoring minority members may also experience frustration, preferring to demonstrate their existing knowledge rather than face the unknown that is encouraged by the experimentation of more creative members. They may also find that their creative teammates get caught up in generating ideas rather than executing them.

Unconventionality. Unconventionality refers to a person's willingness to accept what is unusual. Low scorers are more conforming and avoid eccentricity while high scorers are more receptive to strange and radical ideas (Lee & Ashton, 2004). Individuals who are unconventional are more likely to value self-direction and may feel controlled by team norms characterized by tradition and conformity (Anglim, Knowles, Dunlop, & Marty, 2017). Low scorers and high scorers may differ in their preferred task strategy, for instance taking on new challenges vs. preserving what works, leading to thwarted needs for minority members. Additionally, the individualistic tendencies of unconventional members may result in them not being considered 'team players'. There is some evidence

that unconventionality is related to counter-productive behaviours (c.f., Anglim, Lievens, Everton, Grant, & Marty, 2018). It seems possible that someone who values conformity would be particularly frustrated in a team of high scorers on unconventionality. High-scoring minority members, however, may find their teammates to be judgmental.

Evidence Summary. As noted by David et al. (2019) there has been very little research examining the effects of openness dissimilarity in the workplace. There is some evidence that suggests challenges are associated with group member differences in openness to experience. Liao et al. (2004) reported that openness dissimilarity was negatively related to coworker satisfaction, coworker support, perceived organizational support, organizational commitment, and organizational deviance. Peeters et al. (2006), on the other hand, found no significant relation between openness dissimilarity and satisfaction with the team.

Outside of work groups, being dissimilar from one's peers in terms of openness has also been associated with greater self-reported peer victimization in an adolescent population for individuals who are both higher and lower than the group norm (Boele et al., 2017). In studies of romantic relationships, openness dissimilarity has been linked to lowered marital quality for both men and women (Luo & Klohnen, 2005; Wu et al., 2020). Chopik and Lucas (2019) found that openness dissimilarity within couples was negatively associated with four of nine wellbeing measures, including relationship satisfaction. Dyrenforth et al. (2010) found that openness to experience dissimilarity was negatively related to relationship satisfaction in an Australian sample of romantic couples, but not in a sample from the UK. Finally, congruence in openness has been

related to the longevity of romantic relationships (Rammstedt, Spinath, Richter, & Schupp, 2013).

While the research is rather limited, that which does exist tends to support a negative or null relation between openness dissimilarity and attitudinal outcomes. As such, the following hypothesis is offered:

Hypothesis 6: Dissimilarity in openness to experience is negatively related to individual satisfaction with the team.

Personality Dissimilarity and Autonomous Motivation

The negative effects of person-environment incongruence are usually explained using an attitudinal account based on the similarity-attraction framework (Schneider, 1987), and the link between fit and attitudes like satisfaction has been supported empirically (Arthur, Bell, Villado, & Doverspike, 2006; Greguras & Diefendorff, 2009). Viewing incongruence *exclusively* through an attitudinal lens, however, may provide a limited picture of its adverse effects, and researchers have begun to consider the broader context of fit including individuals' self-regulatory processes. Some research suggests that person-environment misfit influences more than just employee attitudes, and that it induces environmental demands that require effortful self-regulation to meet organizational goals (Deng et al., 2015). Given that personality differences among team members could represent one salient environmental constraint, it is important to consider how they might influence individuals' level of motivation to meet collective goals.

The idea that team member differences can influence work motivation has been expressed previously. Ellemers, De Gilder, and Haslam (2004) argued that while most motivational theories consider the actor in isolation, work motivation could also be

explained by self-categorization and social identity processes. They suggested that these processes influence a person's emotional involvement with a group, and this emotional involvement can explain effort aimed at advancing collective interests. Other scholars have suggested that when workers are encouraged to do work their own way (i.e., workers are provided autonomy), they are more likely to take ownership of work goals and responsibility for their performance, thus increasing autonomous motivation for work (Assor, Roth, & Deci, 2004; Deci & Ryan, 2000; Reeve, 2006). Hackman and Oldham (1976) argued that having personal control over how to approach one's work is one of the key motivating features of job design. In sum, it seems that the interpersonal processes involved in teamwork may threaten motivation, especially in its more autonomous forms, when personality differences elicit work behaviours and expectations that affect one's relationships and sense of control.

Meta-analytic evidence shows that person-organization fit is strongly related to job satisfaction, moderately related to intent to quit, and weakly correlated with actual turnover (Kristof-Brown et al., 2005b). While most research has focused on poor job attitudes and turnover as typical responses to person-environment misfit, other responses exist. In their qualitative study, Follmer, Talbot, Kristof-Brown, Astrove, and Billsberry (2018), unveiled common responses to misfit. While leaving strategies (e.g., quitting) were usually the first considered, they comprised just two of the nine response patterns identified. Related to employee motivation, Follmer and colleagues also found that employees used distancing to resolve feelings of misfit, separating themselves mentally from work and their work identity and, essentially, giving up. One participant stated, "I stopped making as many comments to offer ways to make it better. So, I disengaged" (p.

446). Another participant reported, “A little bit of me has become disenfranchised, so I just want to keep my distance now” (p. 455). Generally, participants described a process of putting less and less effort into their work, professional development, and workplace relationships. When personality differences produce incompatible, superordinate goals within a team, goal attainment may seem impossible and lead to the restriction of effort.

Another piece of evidence suggesting that personality dissimilarity may be related to motivation comes from work done on value congruence. Deng et al. (2015) suggested that in addition to incongruence producing negative work behaviour through its effect on attitudes, the effects of incongruence could also be explained using a resource-based account. Specifically, they argued that value incongruence consumes an individual’s regulatory resources and leads to lower performance. Indeed, these researchers found that value incongruence was more ego-depleting and led to inferior work performance. Presumably, when individuals have their cognitive resources drained by resolving personality differences, they are less able to exercise the control required to complete work. Other research has found that value congruence among teachers’ is negatively related to controlled motivation and positively related to autonomous motivation (Li, Wang, You, & Gao, 2015). Gammoh, Mallin, and Pullins (2014) broadly examined how personality congruence between salespeople and the brands they represent is related to extrinsic and intrinsic motivation. They used a single measure of personality that reflected five dimensions (sincere, exciting, competent, sophisticated and rugged). Using absolute difference scores, they found that personality congruence was related to brand identification which was positively related to both forms of motivation.

Others have noted that employees are highly motivated to attain a sufficient level of fit and will regulate their cognition and behavior in order to do so (Latham & Pinder, 2005; Yu, 2009, 2013). When individuals are forced to work with dissimilar others, they may find the self-regulatory demands of the situation to be challenging. They must expend effort aligning their preferences and goals with those of the collective, suppressing their own preferences and engaging in activities that are discordant with their personal values (Deng et al., 2015). While individuals may engage in extra self-regulation activities to restore affective consistency (Deng et al., 2015), another way of addressing this ego depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998) may be to disassociate from the team's goal and withdraw effort and time. When the consequences of not performing one's work are considered to be low, goal dissociation and effort reduction may be more likely. Indeed, ego depletion has been linked to lower social cooperation and task effort in studies of undergraduate students (Gissubel, Beiramar, & Freire, 2018). The potential self-regulatory demands and ego depletion created by personality misfit could inhibit motivation.

Though there has been a reasonable amount of speculation surrounding the effects of fit on motivation, there is essentially no relevant empirical findings related to personality fit in teams. As such, an exploratory approach was taken to investigate the following research question:

Research Question #1: For which personality variables, if any, does dissimilarity influence a team member's autonomous motivation?

The Mediating Role of Psychological Need Fulfillment

A number of scholars have proposed that research on team member differences can be advanced by investigating the mechanisms that underlie the effects of those differences (e.g., Lawrence, 1997; Milliken & Martins, 1996; Van Knippenberg et al., 2004). Similarly, researchers considering person-environment fit have noted that there has been little investigation of the mechanisms through which fit relates to commonly studied outcomes (Greguras & Diefendorff, 2009). Though dissimilarity is typically considered to operate through principles of similarity-attraction, self-determination theory (SDT) may provide a more sophisticated understanding of why personality incongruence could lead to dissatisfaction and loss of autonomous motivation.

The concept of self-determination has received considerable attention over the past few decades, and organizational researchers have begun to establish its importance for optimal employee functioning and wellbeing at work (Gagné & Deci, 2005; Graves & Luciano, 2013; Van den Broeck et al., 2008a). Self-determined individuals experience their actions as volitional, intentional, and self-initiated (Graves & Luciano, 2013). SDT outlines the conditions that facilitate self-determined behaviour with recent work emphasizing the importance of psychological need fulfillment.¹ According to SDT, three basic needs are considered to be universal, innate, and essential for optimal human functioning (Deci & Ryan, 2000). These needs are competence, autonomy, and relatedness. The *need for competence* describes a need to evaluate oneself as effective and capable, having the ability to influence one's environment and experiencing a sense of accomplishment and mastery (Deci, 1975; Deci & Ryan, 2000). The *need for*

¹ Within SDT literature the terms psychological need satisfaction and psychological need fulfillment are both used. To avoid confusion with the satisfaction outcome variable, psychological need fulfillment is used.

autonomy involves evaluating one's actions as self-initiated or self-endorsed. A defining feature of this need is that one can freely endorse actions initiated or assigned by other people, provided they are consistent with one's own goals and values (Baard et al., 2004; Van den Broeck, 2008b). The *need for relatedness* describes the desire for close interpersonal connections with other people and is satisfied by secure and satisfying affiliations with others.

SDT suggests that need fulfillment, motivation, and wellbeing are all influenced by the social context in which one operates (Deci & Ryan, 2000; Gagné & Deci, 2005; Graves & Luciano, 2013; Vallerand & Ratelle, 2002). Contexts that validate the individual's true self (e.g., beliefs, values, interests) are likely to facilitate need fulfillment, while those that contradict the individual's true self are not (Deci & Ryan, 2000; Graves & Luciano, 2013; Sheldon & Elliot, 1999; Van den Broeck et al., 2008a). Deci and Ryan (2000) described psychological need fulfillment "...as the basis for linking the social contextual and individual difference antecedents to the growth, integrity, and wellbeing outcomes" (p. 233). Wellbeing and motivation depend on the extent that environmental structures, including membership in groups, support psychological need fulfillment (Kelly, Zuroff, Leybman, Martin, & Koestner, 2008). When an individual's environment does not support need fulfillment, individuals can experience a range of negative outcomes (e.g., Olafsen, Niemiec, Halvari, Deci, & Williams, 2017).

Greguras and Diefendorff (2009) highlighted that much of the theoretical rationale underpinning fit research suggests that person-environment fit elicits outcomes through the fulfillment of needs. These researchers found that the fulfillment of the three

basic needs partially mediated the relation between perceived person-environment fit and both affective commitment and job performance. Albeit with a different set of needs than specified in SDT, need fulfillment has also been supported as a mediator of the link between value congruence and outcomes including job satisfaction, turnover intentions, and organizational identification (Cable & Edwards, 2004; Edwards & Cable, 2009).

In light of this existing theory and related evidence, it seems reasonable to suggest that the fulfillment of basic needs acts as a mediator in the relation between person-group personality fit and outcomes such as satisfaction with the team and autonomous motivation. When personality differences lead team members to differ in their approach to work, there is presumably implicit and explicit negotiation surrounding how the team's task will be approached, particularly when the team's task involves a high degree of interdependence. Under such conditions, it seems unlikely that all team members will have their basic needs for autonomy, competence, and relatedness perfectly fulfilled. Social constraints surrounding how work will be approached thwarts the freedom to choose, threatening autonomy; negotiation 'losers' must work in a manner in which they are less comfortable, threatening competence; and divisions may be created, inhibiting relatedness.

Need Fulfillment as a Link between Personality (In)congruence and Team Member Satisfaction

The link between psychological need fulfillment and satisfaction (often discussed under the umbrella of hedonic wellbeing) has been thoroughly discussed in the SDT literature. Notably, Gagné and Deci (2005) proposed that the fulfillment of the needs for autonomy, relatedness, and competence relates positively to favourable job attitudes. This

intuitive relation has been alluded to across many theoretical domains. For example, in their work on goal setting Latham and Brown (2006) linked the need for competence with satisfaction, writing, “When one perceives one's actions as effective (i.e., goal attainment), one experiences satisfaction. Conversely, if the action is viewed as ineffective (i.e., one's goals are not attained), one experiences dissatisfaction” (p. 608).

Numerous scientific studies have supported a link between employees’ psychological need fulfillment and job attitudes/wellbeing (e.g., Baard, Deci, & Ryan, 2004; Deci et al., 2001; Gregarus & Diefendorff, 2009; Sheldon, Elliot, Kim, & Kasser, 2001; Sheldon, Ryan, & Reis, 1996; Vansteenkiste et al., 2007). Furthermore, the fulfillment of psychological needs has been explicitly related to various forms of satisfaction including work satisfaction (Gillet, Fouquereau, Forest, Brunault, & Colombat, 2012; Ilardi, Leone, Kasser, & Ryan, 1993) and job satisfaction (Deci, Connell, & Ryan, 1989; Spector et al., 2002; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). Therefore, it seems reasonable to expect that psychological need fulfillment in a group context may play an important role in predicting an individual’s satisfaction with the team.

The inclusion of person-environment fit in this causal chain has also been discussed in other scholarly work. Arthur et al. (2006) proposed that “theoretically, the relation between fit and attitudes is predicated on the reasoning that when there is fit, the environment affords individuals the opportunity to fulfill their needs...Need fulfillment results in favorable attitudes, such as job satisfaction and organizational commitment” (p. 787). In their review of the fit literature, Cable and Edwards (2004) stated that theories of

psychological need fulfillment suggest that people become dissatisfied when the supplies of their environment fall short of their desires.

Scholars have described an autonomy-supportive interpersonal context (e.g., Gillet et al., 2012). Somewhat confusingly, however, the SDT literature often uses the phrase *autonomy-supportive* to generically describe support for all three needs, not just the need for autonomy. Conducting work in a team has the potential to be need-supportive – providing members with the opportunity to endorse the team’s goals and volitionally direct effort toward them, to put their skills to use and be effective, and to develop meaningful connections with team members. Compatibility among team members is generally thought to enhance workplace interactions and communication (Adkins, Ravlin, & Meglino, 1996) and team members who share similar values are thought to hold stronger bonds with one another (Jackson et al., 1991). Incongruence, on the other hand, is thought to give rise to negative feelings such as alienation and uncertainty (Kristof-Brown & Guay, 2011) which may thwart psychological need fulfillment.

Personality incompatibilities may lead to conflict regarding collective goals and priorities, difficulty understanding and acknowledging one another’s feelings, and confusion regarding the rationale for decisions and behaviours. Incongruence on certain personality dimensions may lead to uncertainty about team members’ expectations, or an inability to meet those expectations, that threatens one’s sense of competence. Further, differences in work-related expectations due to personality incongruence imposes the risk of perceived external control as the team negotiates how and when work gets done and the standards to which members will be held.

Given that psychological need fulfillment is determined, in part, by an individual's social context and that need fulfillment has been linked to hedonic wellbeing and various forms of satisfaction, the following hypothesis is offered:

Hypothesis #7: Psychological need fulfillment mediates any relations between person-group personality fit and individual satisfaction with the team.

Need Fulfillment as a Link between Personality (In)congruence and Autonomous Motivation

Motivation – specifically *autonomous* motivation – is a key element of SDT. “Autonomous motivation is a form of motivation or self-regulation in which individuals act from their deep values, goals and interests. Autonomously motivated individuals pursue actions that are concordant or consistent with the underlying self; their behaviours are experienced as self-determined” (Graves & Luciano, 2013, p. 519). Autonomous motivation encompasses both intrinsic motivation (i.e., motivation founded on an innate personal interest and enjoyment in an activity) and identified motivation (i.e., pursuing an activity because it is consistent with one's identity, goals, or values; Gagné & Deci, 2005). Under both these conditions, individuals freely endorse their actions and can be considered authors of their own behaviour.

According to SDT, conditions that satisfy the three basic psychological needs foster more autonomous forms of motivation, while those that impede need fulfillment thwart motivation and growth (Greguras & Diefendorff, 2009; Kelly et al., 2008). Competence and autonomy are consistently discussed as critical for motivation, while relatedness is suggested to provide “distal support” (Ryan & Deci, 2000, p. 235). Despite the presumed importance of need fulfillment for autonomous motivation, however,

scholars have pointed out that surprisingly few studies have actually assessed the relation between the two constructs and have argued that more research supporting the link should be conducted (e.g., Graves & Luciano, 2013).

Despite the arguments that more research is necessary, there *are* several empirical studies that have addressed the proposed relation between need fulfillment and intrinsic motivation. Sheldon and Bettencourt (2002), for example, found that individuals who had their needs for relatedness and competence satisfied in a group showed greater commitment, more positive affect, and greater intrinsic motivation (see for other exceptions: Lynch, Plant, & Ryan, 2005; Richer, Blanchard, & Vallerand., 2002; Van den Broeck et al., 2010). Research has also linked psychological need fulfillment to motivation-related constructs such as vitality (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000) and work engagement (Deci et al., 2001).

The social context in which one works likely influences autonomous motivation through psychological need fulfilment. For example, Graves and Luciano (2013) found that leader-member exchange quality was related to the fulfilment of psychological needs; in turn, the satisfaction of competence and autonomy needs was associated with higher levels of autonomous motivation (intrinsic and identified). These researchers suggested their findings might be applied to other exchange relationships, including those between team members.

When individuals have low-quality exchanges with their team members due to personality incongruence, they are unlikely to have their basic psychological needs met and demotivation is a probable outcome. Team members are unlikely to be autonomously motivated, for instance, if they do not feel they can be personally effective within the

social context and that their own personal attributes will allow them to meet the behavioural expectations of their teammates. Indeed, Greguras and Diefendorff (2009) found that demands-abilities fit was related to competence need fulfillment. If team members experience a persistent inability to achieve valued goals as a result of personality dissimilarity, it is likely that their sense of competence and autonomous motivation will be compromised.

Personality differences may also cause dissimilar members to feel that their behaviour is controlled by traits represented by the majority. For instance, an individual with a more haphazard approach to work may feel controlled by the deadlines and accountability enforced by more organized teammates. A less sociable member may feel controlled by the frequent in-person meetings proposed by more sociable teammates. When individuals feel that their approach to work is controlled and not consistent with their natural inclinations, they are unlikely to feel that their behaviour is endorsed and autonomous. Engaging in self-consistent activities at work should enhance enthusiasm and interest, producing motivation.

Finally, team members may be less likely to participate enthusiastically when their interpersonal needs are not met. When relationships within a team are more transactional and less characterized by mutual liking, people's sense of belonging and relatedness may be threatened, leading them to aim less effort and attention at collective interests. When personality dissimilarity leads individuals to feel a lack of attachment or identification with their team members, they will be less likely to feel that their effort leads to desirable outcome.

Hypothesis #8: Psychological need fulfillment mediates any relations between person-group personality fit and autonomous motivation?

Summary

Based on the results of the literature reviewed in this section, it appears that not including psychological need fulfillment would lead to a mis-specified explanatory model of the relation between person-group fit and the outcomes of satisfaction with the team and autonomous motivation. Accordingly, the inclusion of psychological need fulfillment in this model, and the assessment of the role that it plays, is a key theoretical contribution of this study.

Chapter II: Method

Participants and Procedure

The sample for this study consisted of undergraduate engineering students enrolled in a two-semester engineering design course. Students participated on project teams of three to five members to complete three design projects during the academic year. The first project lasted six weeks and involved designing or modifying an object, system, or process to maximize its environmental friendliness. The second project was also six weeks in duration and involved designing and building an apparatus that could launch a projectile to hit a target at varied distances 2-10 metres away. The final project was spanned 11 weeks. Students were tasked with engineering a solution to a challenge that would improve the quality of life for a disadvantaged nation, community, or people. This project culminated in a showcase attended by the university community and judged by a panel of experts. Participation in the study was optional and involved completion of in-class, computer-based surveys at three time points. Personality traits were assessed at

Time 1, prior to group interaction. Psychological need fulfillment was assessed at Time 2, following the teams' first design project. Autonomous motivation and satisfaction with the team were assessed at Time 3, at the end of the year. While a large number of students ($n = 1143$) participated in at least one survey, the final sample size -- after addressing missing data and careless responding -- was 437 students working in 135 teams.

Missing Data

Only teams with complete personality data were included in the primary analyses. The reason for this decision stems from simulation studies aimed at understanding the impact of missing data on dissimilarity research. Allen, Stanley, Williams, and Ross (2007) examined six types of non-response, comparing how the absence of individual data alone (while maintaining the true dissimilarity index) and distortion in the true degree of dissimilarity (caused by calculating a dissimilarity index that did not include the missing group members) influenced observed vs. true correlations.

For four of the six non-response conditions, a distortion in the true degree of dissimilarity biased the observed correlation more severely than the absence of individual data (with the true dissimilarity score maintained). Specifically, bias in the correlation was more severe for dissimilarity distortion under conditions of random non-response, one-tailed non-response (high- or low-scoring group members missing), median non-response, or when individuals with low dissimilarity scores were removed. The absence of individual data, while maintaining the true dissimilarity score, was worse when non-response was systematic and two-tailed, with either both high and low scorers removed, or when individuals with high dissimilarity scores were removed from the group.

In the present case, missing personality data was virtually always a result of not attending the first class of the semester. Meta-analytic research linking class attendance to personality has demonstrated negative correlations between both conscientiousness and agreeableness and absenteeism, and a positive correlation between extraversion and absenteeism (Cuadrado, Salgado, & Moscoso, 2021). This would suggest that one-tailed non-response is most likely for these factors. The meta-analytic correlation for emotional stability and openness to experience was non-significant. While this could suggest multiple types of non-response pattern, it is difficult to form a reasonable rationale that would suggest that both high and low scorers on these domains would be less likely to attend class. Though there appears to be no published research directly addressing the relation between honesty-humility and class attendance, one paper has addressed the relation between honesty-humility and counterproductive academic behaviours (of which absenteeism is one) and found a strong negative correlation comparable in magnitude to that of conscientiousness (De Vries, de Vries, & Born, 2011). This seems to provide reasonable grounds to speculate that a one-tailed non-response pattern was most likely.

Taken together, this reasoning suggests that either a random, median, or one-tailed non-response pattern is most likely and maintaining the integrity of the true degree of dissimilarity was favoured over maintaining the entire sample. At this stage there was a usable sample of 712 participants working in 177 teams.

Careless Responding

As a means of detecting careless responding that could negatively influence the quality of the data, each survey included one or two attention check items, depending on the length of the survey. Participants were instructed to select specific response options to

ensure they were reading carefully (e.g., “To ensure quality data, please select “Strongly Disagree”). Individuals who responded incorrectly to one or both of these attention-check items had their data removed for the given survey; teams who had a member carelessly respond to personality items were also removed due to the importance of having accurate representations of the true degree of dissimilarity within each team. The final usable sample sizes ranged from 423-437 for tests of incongruence.

Demographics

The final sample was primarily male (79.4%) and had a median age of 18 years. The most represented ethnic groups were: White/Caucasian (51.4%), Chinese (11.2%), and Arab/West Asian (11%). The majority of participants spoke English as a first language (75%) with Chinese (8.6%), Arabic (3.8%), and Urdu (1.8%) being the other most represented languages. Participants reported a median of 12 months of work experience.

Measures

Personality

The 60-item HEXACO Personality Inventory-Revised (HEXACO-60; Ashton & Lee, 2009) was selected to measure the six personality factors. This instrument has shown good psychometric properties and has been used extensively in published academic work. Participants rated their agreement to statements about themselves on a 5-point, Likert-type scale (1 = Strongly Disagree, 5 = Strongly Agree). All scale reliabilities are listed in the diagonal of Table 1. A complete list of survey items can be found in Appendix A.

Psychological Need Fulfillment

Psychological need fulfillment was measured using an adapted form of the Basic Psychological Needs Scale (Gagné, 2003; Ilardi, Leone, Kasser, & Ryan, 1993).

Participants were asked to think about how each item related to their experience on their team and indicated their responses on a 7-point, Likert-type scale (1 = Not at All True, 4 = Somewhat True, 7 = Very True). The Basic Psychological Needs Scale is comprised of 21 items, seven measuring each need – autonomy, competence, and relatedness.

Autonomous Motivation

Autonomous motivation was assessed using the Multidimensional Work Motivation Scale (Gagné et al., 2015). The scale was adapted slightly to fit the context of student project teams. A 7-point, Likert-type scale (1 = Strongly Disagree, 7 = Strongly Agree) was used. As with other work in the SDT literature, the various subscales were combined to form a relative autonomy index (cf. Ryan & Connell, 1989; Vallerand, 1997; Vallerand, Pelletier, & Koestner, 2008). Intrinsic motivation, the highest form of self-determined motivation was given a weight of +2, identified regulation +1, introjected regulation -1, and external regulation -2.

It is important to note that there continues to be debate in the SDT literature about the appropriate way to treat the various forms of motivation along the underlying autonomy continuum. Some researchers (e.g., Chemolli & Gagné, 2014) argue against the use of a relative autonomy index, suggesting that individuals may simultaneously exhibit varying degrees of each distinct kind of motivation, in essence sitting at multiple locations across the continuum. Following this logic, alternatives such as using each subscale separately or using person-centered approaches such as latent profile analysis have been proposed (e.g., Chemolli & Gagné, 2014; Howard, Gagné, Morin, & Van den

Broeck, 2016). Other researchers, however, have disagreed with the criticisms leveled at the relative autonomy index and have found that it demonstrates better convergent validity with theoretically related variables such as well-being and trait autonomy (Sheldon, Osin, Gordeeva, Suchkov, & Sychev, 2017). Recently, evidence has shown that motivation profiles tend to differ primarily due to the global level of self-determined motivation, which is closely approximated by the relative autonomy index, though person-centred profiles can reveal unique differences in the specific quality of motivation by considering each form (Howard, Morin, and Gagné, 2021).

Given the ongoing debate and methodological constraints imposed by the use of polynomial regression analysis with response surface modeling (i.e., that profiles could not be integrated into the analyses), the decision was made to use the relative autonomy index.

Satisfaction with the Team

Satisfaction with the team was measured using a 9-item scale developed in previous work (Cameron & Allen, 2016, 2017). A 7-point, Likert-type scale was used (-3 = Very dissatisfied, 3 = Very satisfied). Items included content related to satisfaction with the team's performance, satisfaction with team members, and satisfaction with the benefits of being a member of the team.

Analytic Strategy

Polynomial Regression with Response Surface Analysis

To address the set of hypotheses relating personality dissimilarity to satisfaction with the team, and to see if a personality congruence pattern was significantly related to psychological need fulfillment or autonomous motivation, polynomial regression with

response surface analysis (RSA) was employed. This procedure allows researchers to examine the extent to which combinations of two predictor variables relate to an outcome (Edwards, 2002; Shanock, Baran, Gentry, Pattison, & Heggstad, 2010) – in this case an individual’s score on the focal personality trait and the average score of his/her team members (excluding the focal individual).²

RSA is especially useful when the discrepancy (difference) between the two predictors is of interest, as is the case in this research. To date, most of the research conducted on team member dissimilarity has used difference scores to operationalize incongruence (e.g., Barsade et al., 2000; Gevers & Peters, 2009; Peeters et al., 2006; Schaubroeck & Lam, 2002; Liao et al., 2004, 2008), with these scores being correlated with the focal outcome. This approach has been criticized, however, because it is biased toward falsely claiming support for (in)congruence hypotheses (Edwards & Parry, 1993). RSA has been promoted as a more conservative and flexible approach as it also allows researchers to examine different ways the two predictors might influence the outcome. For a step-by-step guide and useful clarifications on the appropriate application, interested readers should consult the excellent work of Humberg, Nestler, and Back (2019) and Nestler et al. (2019).

² The average score of one’s team members on a focal personality trait can be considered a *configural property* of the team to which one belongs (Klein & Kozlowski, 2000). Following the approach of other person-group fit/dissimilarity research, an additive composition model (Chan, 1998) was employed to operationalize team levels of the focal personality trait by calculating a summary index based on the mean of the lower-level trait (Briker, Walter, & Cole, 2020). Team composition researchers sometimes take an interest in other team properties such as the dispersion of an individual-level trait (e.g., the variance in extraversion across the team), the highest/lowest score (e.g., the most/least conscientious individual; Klein & Kozlowski, 2000). Within this research, however, the focus was on the experience of dissimilar members, so the greatest degree of dissimilarity would occur in teams where an individual scored very high/low on the focal trait and their team members primarily scored high/low in the opposite direction.

In order to justify the use of RSA, a reasonable proportion of individuals must be considered dissimilar from their teammates on the variable of interest. To investigate the percentage of individuals that might qualify as being dissimilar, the procedures outlined by Fleenor, McCauley, and Brutus (1996) were followed. This procedure involves standardizing both individual and team scores to eliminate asymmetrical effects that unequal variances may have on agreement categorization (Edwards, 1994). Any respondent that is a half standard deviation above or below the team score is considered sufficiently discrepant. In the present sample, there was good representation across categories (i.e., below the team, above the team, and in agreement; see Appendix B) and proceeding with RSA was justifiable. To reduce multicollinearity and help with the interpretation of surface models, all predictors (i.e., individual and team personality scores) were scale-centered by subtracting the midpoint of the scale (cf. Atwater, Ostroff, Yammarino, & Fleenor, 1998; Edwards, 1994). Multicollinearity between the predictors was checked by ensuring the variance inflation factor (VIF) was smaller than 5 for each predictor set (Fox, 2016; Humberg et al., 2019). For no set of predictors did the VIF exceed this threshold.

To account for the multi-level nature of the data (i.e., individuals nested within teams), the procedures for multi-level response surface analysis (MRSA) detailed by Nestler et al. (2019) were used to see whether a congruence pattern for any personality trait was related to any of the mediators or outcome variables. Broadly, this involves estimating a regression equation where the two predictor variables, their squared terms, and their interaction term are used to predict the outcome variable (Nestler et al., 2019). For an individual i in the Level-2 unit t , the MRSA model for Level 1 is:

$$z_{it} = b_{0t} + b_{1t}x_{it} + b_{2t}y_{it} + b_{3t}x_{it}^2 + b_{4t}x_{it}y_{it} + b_{5t}y_{it}^2 + e_{it} \quad (1)$$

The resulting coefficients of the multilevel regression are then used to evaluate features of the estimated response surface. In MRSA, the average response surface across Level 2 units is examined, and it is possible to examine whether the response surfaces vary across the Level 2 units if the multi-level model suggests that to be the case.

To understand how the nested nature of the data influenced the possible congruence relations, a stepwise analysis of (a) a null model, (b) a random-intercept and fixed slope model, and (c) a model in which the intercept and slope for the first two quadratic terms were random³ was conducted and model improvement (LaHuis & Ferguson, 2009) was assessed to settle on the appropriate model for plotting the average surface. Multilevel models were conducted using the lme4 package for R (Bates, Maechler, Bolker, & Walker, 2019).

If a model that adds the set of quadratic personality terms is a significant improvement over the null model, it suggests that some relation between an individual's level of the focal trait and the average level of the remaining team members exists with the dependent variable of interest. Interpreting the precise nature of the relationship, however, is made easier by analyzing the three-dimensional surfaces generated by the unstandardized regression coefficients (Humberg et al., 2019; Kristof-Brown et al., 2005).

Figure 1 shows a sample response surface signifying a congruence (i.e., dissimilarity) pattern. The slope of the line of perfect agreement (where $X = Y$) is given by the expression $a_1 = (b_1 + b_2)$. This line reflects how agreement between an individual's

³ This is a method of solving model convergence issues that arise when the slopes of all five quadratic terms are allowed to vary (Nestler et al., 2019).

score on the focal personality trait and the average score of his or her team members relates to the plotted outcome. It shows the various levels of the outcome for people whose levels of the two predictors are very similar across the spectrum of low to high scores. Curvature along the line of perfect agreement is calculated by the equation $a_2 = (b_3 + b_4 + b_5)$. If the test of this value is significant it indicates that the relation between personality scores that are in agreement, and the outcome, is nonlinear.

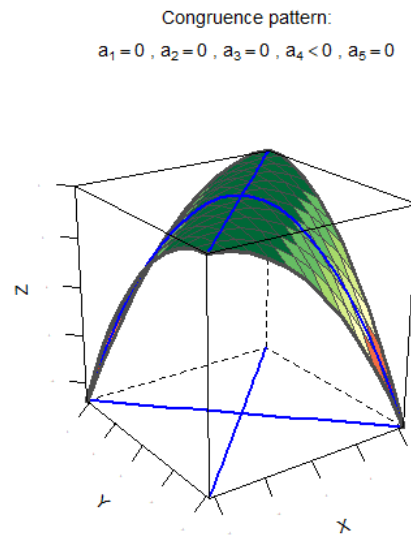


Figure 1. A theoretical response surface demonstrating a congruence pattern such that the outcome (z) is lowest when values of x and y become more discrepant.

The line that runs perpendicular to the line of perfect agreement is most often referred to as the line of incongruence (where $X = -Y$). Significant curvature along this line (in relation to the level of the outcome variable) is indicated by the expression $a_4 = (b_3 - b_4 + b_5)$, which captures how the degree of discrepancy between the two predictor variables influences the plotted outcome. For example, significant negative curvature (as indicated in Figure 1) would mean that the outcome variable is thwarted more as the levels of the two predictor variables become more disparate. The slope of the line of

incongruence is indicated by the expression $a_3 = (b_1 - b_2)$. It provides an indication about whether the direction of discrepancy matters.

At least three conditions must be satisfied for a congruence pattern to be supported (Humberg et al., 2019, Nestler et al., 2019). First, there must be negative curvature along the line of incongruence, indicating that as predictor values become more discrepant, the outcome is lower. This is indicated by a significant, negative value for a_4 (Condition 1). Second, the inverted U-shaped parabola must be maximized at congruent levels of the predictor which is indicated by a non-significant a_3 value (Condition 2). Third, the first principal axis (or ridge of the surface), where values of the predictors lead to the highest outcomes, must not differ significantly from the line of congruence. This means that the intercept of the first principal axis (p_{10}) must be approximately 0 and the confidence interval for its slope (p_{11}) must include 1 (Condition 3). When Conditions 1 and 2 are satisfied, this can be simplified to the condition a_5 , where $a_5 = b_3 - b_5$ (Nestler et al., 2019). For positive values of a_4 , indicating that discrepant predictor values lead to *higher* levels of the outcome, the second principal axis is of interest and three conditions must be replaced by (1) $a_4 > 0$, (2) $a_3 \approx 0$, and (3) $p_{20} \approx 0$ and $p_{21} \approx 1$.

Path Analyses for Tests of Mediation

The lavaan package (Rosseel, 2012) for structural equation modeling in R was used to investigate the hypothesis that personality congruence might operate through psychological need fulfillment to influence satisfaction with the team and autonomous motivation. Multilevel path models (1-1-1) were constructed because the data were hierarchically organized. For the individual (I) and team personality (T) variables, the five polynomial terms used to investigate potential congruence patterns were combined to

create a block variable, following the guidance of Cable and Edwards (2004) and Edwards and Cable (2009). Using this procedure to calculate the path coefficients allowed the direct, indirect, and total effects associated with the model to be assessed to determine the extent to which psychological need fulfillment explained any of the relations between personality congruence and either satisfaction with the team or autonomous motivation.

Chapter III: Results

Descriptive Statistics

Table 1 contains means, standard deviations, correlations, and reliability estimates for the measures used in the study. The means and standard deviations indicated good dispersion and little range restriction for the personality variables. The distribution of motivation and satisfaction scores suggested the presence of a slight ceiling effect. Of note, the fulfillment of each of the three psychological needs was positively related to both outcome variables.

Personality Congruence

The first step to investigate Hypotheses 1-6 and Research Question 1 was to evaluate whether the set of five quadratic terms for individual and team personality for any given trait (i.e., the individual score, the average team score less the focal individual, their squared terms, and their product) was significantly related to the mediators or outcomes. Nested multilevel models were compared to see which of the three tested models (null, random intercepts, and random intercepts and slopes) provided the best fit to the data. The intra-class correlations (ICCs) for mediators and outcomes ranged from (0.00 for autonomous motivation to 0.31 for satisfaction with the team). For only

satisfaction with the team did there appear to be substantial variance attributable to specific group membership. For all other variables the ICC was less than .07.

Nonetheless, contemporary recommendations suggest that multilevel analysis is still most appropriate for minimizing Type I errors in situations that involve nested data (Huang, 2018).

For honesty-humility, the nested multilevel models showed that including the set of quadratic terms as random intercepts improved model fit beyond the null model for relatedness fulfillment ($\Delta deviance = -11.50, df = 5, p < .05$) and autonomous motivation ($\Delta deviance = -25.40, df = 5, p < .001$). This suggests some form of relation existed across groups. Allowing the slopes to vary for the quadratic terms did not provide any model improvement for relatedness fulfillment and the random-intercepts, random-slopes model for autonomous motivation failed to converge. To help with readability, the results for the multilevel models for honesty-humility and relatedness fulfillment are presented in Table 2, but the remaining nested model comparisons are included in Appendix D.

Table 1. Means, Standard Deviations, Scale Reliabilities, and Intercorrelations for Individual Variables

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Honesty-Humility	3.29	0.66	(.77)													
2. Emotionality	3.00	0.66	.06	(.77)												
3. Extraversion	3.42	0.64	.00	-.20**	(.82)											
4. Agreeableness	3.29	0.60	.37**	-.18**	.07	(.76)										
5. Conscientiousness	3.69	0.52	.26**	.03	.20**	.11**	(.74)									
6. Openness	3.24	0.61	.10**	-.06	.03	.03	.06	(.73)								
7. Autonomy Support	4.78	0.84	.05	-.20**	.46**	.06	.17**	.07	(.63)							
8. Relatedness Support	5.20	0.94	.13**	-.04	.48**	.14**	.24**	-.01	.66**	(.80)						
9. Competence Support	4.83	0.93	.08	-.13**	.45**	.04	.26**	.03	.66**	.63**	(.69)					
10. Extrinsic Regulation	5.35	0.91	-.15**	.16**	.00	-.06	.11**	-.05	-.07	.07	-.02	(.74)				
11. Introjected Regulation	5.43	1.08	.04	.28**	.01	.00	.17**	-.01	-.05	.11*	-.02	.04	(.74)			
12. Identified Regulation	5.64	1.13	.17**	.16**	.13**	.14**	.33**	.00	.14**	.23**	.16**	.15**	.40**	(.87)		
13. Intrinsic Motivation	5.03	1.33	.15**	-.01	.18**	.15**	.18**	.10*	.23**	.26**	.26**	.19**	.20**	.38**	(.92)	
14. Satisfaction with the Team	5.23	1.32	.10*	-.01	.11**	.20**	-.04	-.02	.15**	.24**	.17**	.19**	.07	.04	.15**	(.96)

Note. n ranged from 567-712 as the calculation of bivariate correlations did not have the same missing data restrictions as the main analyses; Coefficient alphas are in parenthesis along the diagonal.

* $p < .05$ (two-tailed); ** $p < .01$ (two-tailed)

Table 2. Multilevel Models for Honesty-Humility and Relatedness Fulfillment

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
	Intercept	5.19***	0.05	5.10***	0.07	5.10***	0.07
	Individual Honesty-Humility (x)			0.16	0.09	0.13	0.10
	Team Honesty-Humility (y)			-0.04	0.18	-0.08	0.20
	x ²			-0.07	0.08	-0.05	0.08
	xy			0.11	0.18	0.18	0.19
	y ²			0.35	0.20	0.39*	0.20
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1192.8		1181.30		1177.90	
	Δ Deviance			-11.50*		-3.40	

Note. $N = 437$ individuals in 135 teams. *** $p < .001$ ** $p < .01$ * $p < .05$

For emotionality, the nested multilevel models showed that the random intercept model for autonomy fulfillment was a significant improvement beyond the null model ($\Delta deviance = -18.70$, $df = 5$, $p < .01$), as was that for autonomous motivation ($\Delta deviance = -20.00$, $df = 5$, $p < .01$). Adding the random slopes did not improve these models.

For extraversion, the random-intercept models offered significant improvement over the null model for relatedness fulfillment ($\Delta deviance = -124.60$, $df = 5$, $p < .001$), autonomy fulfillment ($\Delta deviance = -113.38$, $df = 5$, $p < .001$), competence fulfillment ($\Delta deviance = -111.50$, $df = 5$, $p < .001$), and autonomous motivation ($\Delta deviance = -17.90$, $df = 5$, $p < .01$). Once again, adding the random slopes did not improve these models or led to convergence failure.

For agreeableness, the random-intercept models offered significant improvement over the null model for relatedness fulfillment ($\Delta deviance = -14.30$, $df = 5$, $p < .05$),

satisfaction with the team ($\Delta deviance = -15.90, df = 5, p < .01$), and autonomous motivation ($\Delta deviance = -15.00, df = 5, p < .05$). For satisfaction with the team, the random-intercept, random-slope model provided significant improvement over the random-intercept model ($\Delta deviance = -11.60, df = 5, p < .05$), indicating that the relation between the quadratic terms and satisfaction with the team varied across groups.

For conscientiousness, the random intercept model resulted in improved model fit over the null model for relatedness fulfillment ($\Delta deviance = -32.70, df = 5, p < .001$), autonomy fulfillment ($\Delta deviance = -20.00, df = 5, p < .01$), competence fulfillment ($\Delta deviance = -39.50, df = 5, p < .001$), and autonomous motivation ($\Delta deviance = -22.60, df = 5, p < .001$). Adding random slopes did not improve model fit.

For openness, the random-intercept model was an improvement over the null model only for autonomous motivation ($\Delta deviance = -12.40, df = 5, p < .05$). Once, again adding random slopes did not improve model fit.

Next, the tests of the three conditions required for a congruence pattern were conducted for any multilevel model that indicated a relation between the five quadratic terms and the dependent variable. The parameters for tests of these features are presented in Table 3. As can be seen, Condition 1, that there is curvature along the line of incongruence, was not supported for any of the models. This indicates that congruence between individual and team personality was not related to any of the proposed mediators or outcomes. Thus, Hypotheses 1-6 and 7-8 were not supported and there was no evidence of the relations examined as part of Research Question 1.

Table 3. Tests of Conditions for a(n) (in)Congruence Pattern on Mediators and Outcomes

	Honesty-Humility					Emotionality				
	a1	a2	a3	a4	a5	a1	a2	a3	a4	a5
Personality → Relatedness	0.12	0.40	0.20	0.17	-0.42*	-	-	-	-	-
Personality → Autonomy	-	-	-	-	-	-0.22	0.25	-0.26*	-0.16	0.13
Personality → Competence	-	-	-	-	-	-	-	-	-	-
Personality → Satisfaction	-	-	-	-	-	-	-	-	-	-
Personality → Motivation	0.26	0.28	2.10**	-0.74	-0.21	-1.12	3.41**	-0.76	1.19	-1.49

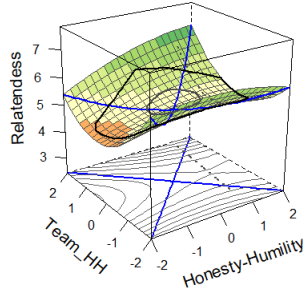
	Extraversion					Agreeableness				
	a1	a2	a3	a4	a5	a1	a2	a3	a4	a5
Personality → Relatedness	0.75***	0.01	0.71***	0.18	0.01	0.21	0.29	0.15	-0.19	0.01
Personality → Autonomy	0.58**	0.06	0.74***	0.32	-0.15	-	-	-	-	-
Personality → Competence	0.72***	0.11	0.57**	0.24	0.05	-	-	-	-	-
Personality → Satisfaction	-	-	-	-	-	0.30	0.67	0.48	0.58	-0.60
Personality → Motivation	0.36	0.59	1.83*	1.09	-0.32	0.42	1.32	1.43	-0.33	-0.48

	Conscientiousness					Openness				
	a1	a2	a3	a4	a5	a1	a2	a3	a4	a5
Personality → Relatedness	0.49	-0.01	0.56	-0.25	-0.09	-	-	-	-	-
Personality → Autonomy	0.88	-0.38	0.28	-0.14	-0.01	-	-	-	-	-
Personality → Competence	0.97	-0.26	0.75*	0.13	-0.26	-	-	-	-	-
Personality → Satisfaction	-	-	-	-	-	-	-	-	-	-
Personality → Motivation	2.73	-1.47	5.26**	2.53	-2.47*	1.23	-2.09	1.46	1.20	-0.20

Note. N = 423-437. *** $p < .001$ ** $p < .01$ * $p < .05$. Only parameters for significant multilevel models are shown.

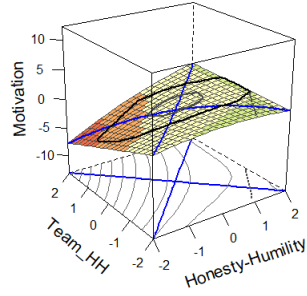
a)

a1: 0.12 a2: 0.40 a3: 0.20 a4: 0.17 a5: -0.42



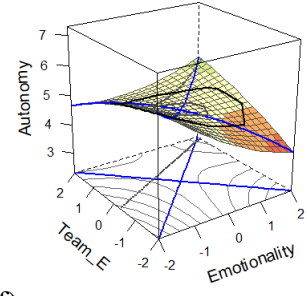
b)

a1: 0.26 a2: 0.28 a3: 2.10 a4: -0.74 a5: -0.21



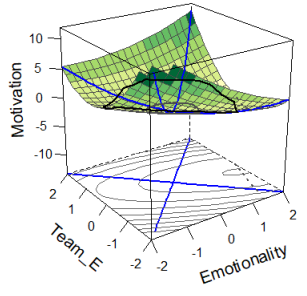
c)

a1: -0.22 a2: 0.25 a3: -0.26 a4: -0.16 a5: 0.13



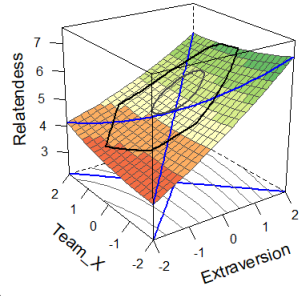
d)

a1: -1.12 a2: 3.41 a3: -0.76 a4: 1.19 a5: -1.49



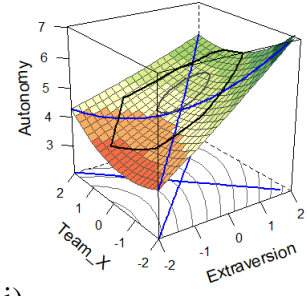
e)

a1: 0.75 a2: 0.01 a3: 0.71 a4: 0.18 a5: 0.01



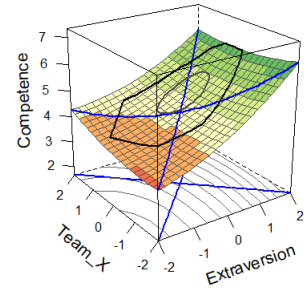
f)

a1: 0.58 a2: 0.06 a3: 0.74 a4: 0.32 a5: -0.15



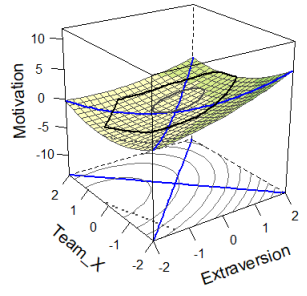
g)

a1: 0.72 a2: 0.11 a3: 0.57 a4: 0.24 a5: 0.05



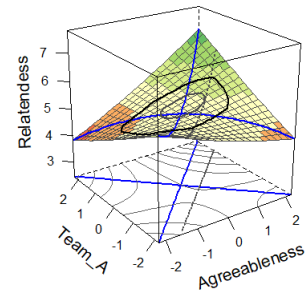
h)

a1: 0.36 a2: 0.59 a3: 1.83 a4: 1.09 a5: -0.32



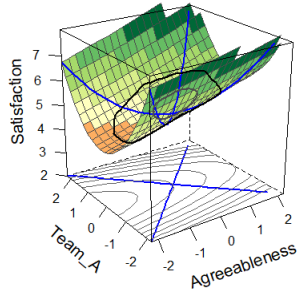
i)

a1: 0.21 a2: 0.29 a3: 0.15 a4: -0.19 a5: 0.01



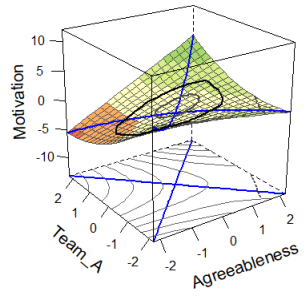
j)

a1: 0.30 a2: 0.67 a3: 0.48 a4: 0.58 a5: -0.60



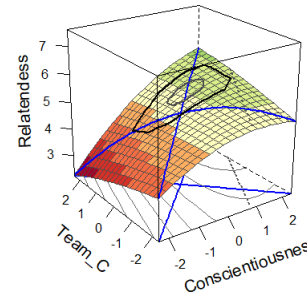
k)

a1: 0.42 a2: 1.32 a3: 1.43 a4: -0.33 a5: -0.48



l)

a1: 0.49 a2: -0.01 a3: 0.56 a4: -0.25 a5: -0.09



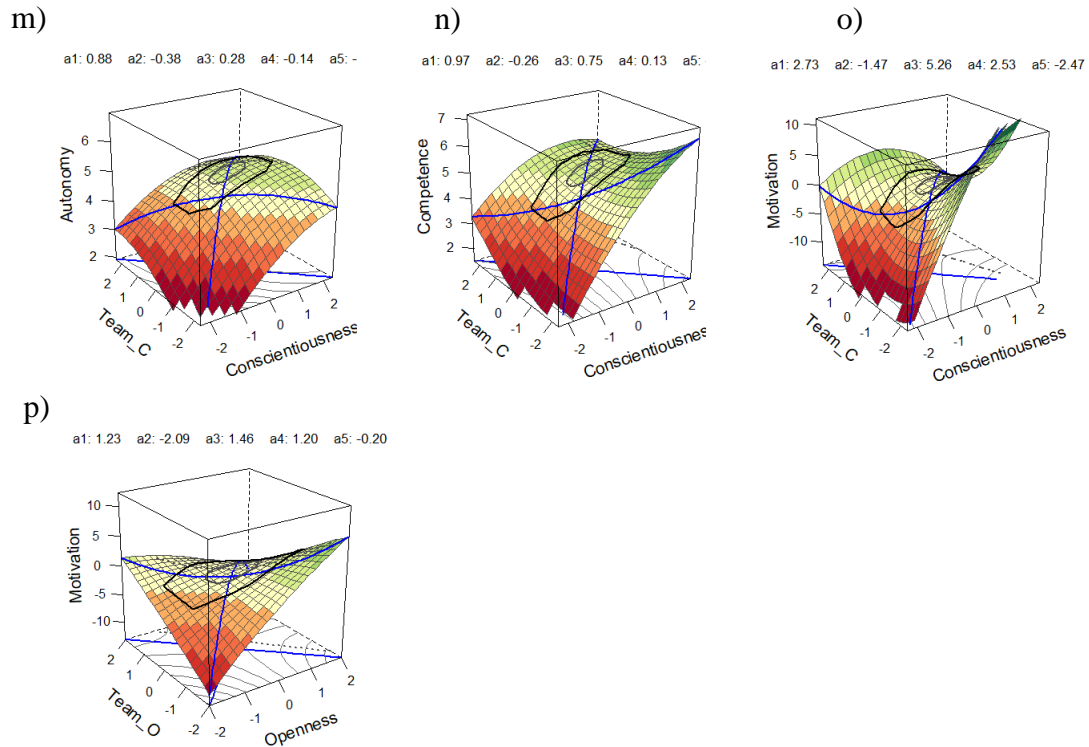


Figure 2. Response surfaces for significant multi-level models. Along the x-axis is the individual's score on the focal personality trait. Along the y-axis is the average score of the remaining team members on the focal personality trait. The mediator or outcome is located along the z-axis.

While none of the response surfaces indicate a strict congruence pattern, there are a few patterns worth attention for future discussion. The response surface linking individual and team honesty-humility to autonomous motivation had a positive slope of the line of incongruence, showing that autonomous motivation is at its lowest when individual honesty-humility is low and team honesty-humility is high. A negative slope of the line of incongruence was observed for emotionality and autonomy fulfillment such that autonomy fulfillment was lowest at high individual levels of emotionality and low team levels. For extraversion, the surfaces show that the fulfillment of all three psychological needs increases as both individual and team levels of extraversion go up, and at low levels of extraversion need fulfillment is greater in the presence of extraverted team members. Finally, the surface relating individual and team conscientiousness to

competence fulfillment had a positive slope of the line of incongruence. Additionally, there is a visual complementarity pattern at high and low levels such that high scorers feel more competent and motivated in low-scoring teams, whereas low scorers feel more competent and motivated in high-scoring teams. It is important to note, however, that these relations were not and could not be tested in the present study (cf. Humberg et al., 2019).

Supplemental Analyses.

Team composition researchers have called for others to investigate the effects of personality differences within teams at the facet-level (e.g., David et al., 2019). This call is sensible given that narrow traits are rarely examined and have proven to be better predictors than broad traits of an assortment of outcomes such as academic success and counterproductive behaviour (de Vries, de Vries, & Born, 2011), problematic smart phone use (Horwood & Anglim, 2018), and proactivity (de Vries, Wawoe, & Holtrop, 2016) to name a few.

Each of the HEXACO's broad factors is comprised of four sub-traits that may uniquely influence motivations, values, and predict behaviour in social situations (Cuperman & Ickes, 2009). This idea was expressed in the introductory rationale in which I considered how dissimilarity in the HEXACO model may influence team member experiences. For instance, conscientiousness encompasses both organization and diligence – sub-traits that could conceivably lead to very different work behaviours that would affect team experiences.

The research context for this study made it impossible to administer a longer version of the HEXACO inventory that would allow for reliable measurement of each

sub-facet. In the 60-item version of the inventory, sub-facets are represented by just two or three items. In the present administration this yielded facet-level reliabilities ranging from .30 to .75.⁴ Given the low reliabilities and the already large number of tests administered, it was decided it was not appropriate to present findings for personality facets in the main analyses.

In supplemental analyses, however, one subtrait did demonstrate a congruence relation – the dependence facet of emotionality on satisfaction with the team. Dependence had a reliability rating of .53 and is discussed as a supplemental finding that may be of interest. Reliability trade-offs are often made to maintain validity of very short scales for use in applied contexts (e.g., Credé, Harm, Niehorster, & Gaye-Valentine, 2012; Gosling, Renfrow, and Swann, 2003).

As can be seen in Table 4, the random intercept model provided better fit to the data than the null model ($\Delta deviance = -15.60$, $df = 5$, $p < .01$), indicating that the five quadratic terms for dependence were related to satisfaction with the team across groups. In this instance, adding random slopes caused convergence failure.

⁴ For personality facets measured with just two items, the Spearman-Brown correlation was used to compute reliability rather than Cronbach's alpha (cf. Eisinga, Te Grotenhuis, & Pelzer, 2013).

Table 4. *Multilevel Models for Dependence and Satisfaction with the Team*

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>						
Intercept	5.21***	0.09	5.47***	0.12		
Individual Honesty-Humility (x)			0.20*	0.08		
Team Honesty-Humility (y)			0.20	0.18		
x ²			-0.09	0.06		
xy			0.32**	0.12		
y ²			-0.10	0.16		
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1426.8		1411.20			
Δ Deviance			-15.60**			

Note. *N* = 425 individuals in 134 teams. ****p* < .001 ***p* < .01 * *p* < .05. The random-intercept and random-slope model failed to converge.

a1: 0.40 a2: 0.13 a3: 0.00 a4: -0.51 a5: 0.01

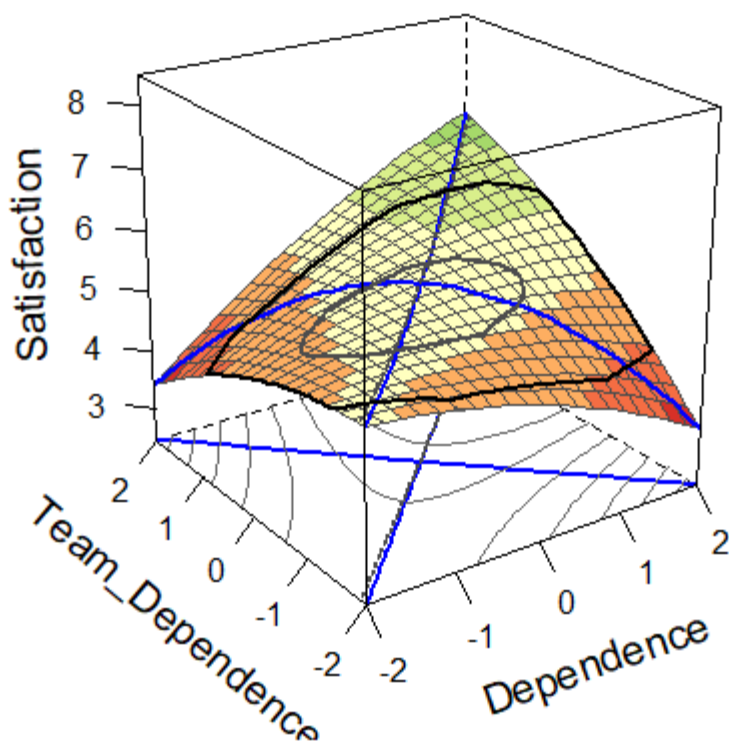


Figure 3. Response surface for dependence predicting satisfaction with the team. Along the x-axis is the individual's dependence score. Along the y-axis is the average dependence score of the remaining team members. Satisfaction with the team is located along the z-axis. Along the Line of Incongruence ($X = -Y$), satisfaction decreases as individual and team dependence levels become more discrepant.

The dependence-satisfaction surface satisfied the three conditions for a congruence pattern. There was negative curvature along the line of incongruence ($a_4 = -.51, p < .01$). The inverted, u-shaped parabola was maximized at congruent levels of dependence ($a_3 = .00, p = ns$). Finally, the first principal axis where values of satisfaction are maximized did not differ significantly from the line of congruence ($a_5 = .01, p = ns$).

Examination of Direct and Indirect Relations

Given the surprising lack of support for any congruence relations in examining the first two research questions, the path models at the domain level are not presented in

investigation of Hypothesis 7 and 8.⁵ The path analysis relating dependence congruence to satisfaction with the team is presented below. As can be seen in Table 5, there was a significant direct and total relation between the dependence block variable and satisfaction with the team. The indirect relations through fulfillment of the psychological needs, however, were not significant.

Table 5. *Multilevel Path Analysis Results for the Trait of Dependence and Individual Satisfaction with the Team*

Path Type	Estimate	Std. Error
Individual-level		
(a) Dependence → Relatedness	0.00	0.11
(b) Dependence → Autonomy	-0.06	0.10
(c) Dependence → Competence	-0.18	0.11
(d) Relatedness → Satisfaction	0.07	0.11
(e) Autonomy → Satisfaction	-0.12	0.12
(f) Competence → Satisfaction	0.06	0.10
(g) Dependence → Satisfaction	0.30*	0.14
Indirect effects		
(ad)	-0.01	0.02
(be)	0.01	0.01
(cf)	0.00	0.01
Total effects		
Dependence → Satisfaction	0.29*	0.14

Note. $n = 358$. The label “Dependence” refers to the block variable computed from the five quadratic terms involving the individual and team scores, their squares, and their product. The reported path coefficients were computed using the lavaan package for R.

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

Chapter IV: Discussion

This project was designed to contribute to the sparse research on personality congruence in teams. Notably, it adopted a more conservative and flexible analytical approach that has been recommended over those traditionally used in personality

⁵ For readers interested in how the set of quadratic terms, irrespective of a congruence pattern, played out in these path models, results are available from the author.

dissimilarity research. To my knowledge, this is the first study in a teamwork context to employ the multilevel response surface analysis procedures outlined by Nestler et al. (2019) to account for the non-independence of the data.

Hypotheses 1-6 were concerned with whether an individual's satisfaction with his or her team was related to person-group fit with respect to any of the study's personality variables. While past research has found support for a personality congruence effect, such a pattern was not observed for any of the HEXACO's primary factors in the present study. The conservative nature of MRSA may explain the null findings as dissimilarity effects have been historically small under less conservative methodologies (e.g., difference scores, correlated actor/partner scores, etc.). Supplemental analyses revealed that the relation between individual and team dependence, however, did satisfy the criteria to indicate the presence of a congruence relation. These results suggest a supplementary fit perspective explains the relation best. Individuals seem to prefer working with others who possess a similar level of dependence.

In addition to providing more empirical data regarding the relation between personality differences and satisfaction, the work also applied a motivational lens that has often been considered theoretically important in the fit literature but never tested as it relates to personality differences in teams. Research Question 1 was concerned with whether an individual's level of autonomous motivation was related to person-group fit for any of the study's personality variables. The results suggested that the joint relation of individual and team personality and autonomous motivation did not represent a congruence pattern.

Finally, the research sought to go beyond the similarity-attraction paradigm as an explanatory mechanism for dissimilarity effects by introducing psychological need fulfillment as a potential mediator. Hypotheses 7-8 considered whether psychological need fulfillment mediated the relation between individual and team personality and the outcomes. The results indicated that a congruence pattern explained none of the relations between individual and team personality and any of the three psychological needs, providing no support for either hypothesis. While the results did not support the importance of need fulfillment, the research addressed a call for team composition researchers to consider more theoretically robust explanations for dissimilarity/diversity effects.

Study Implications

The primary purpose of this research was to help inform project team composition by identifying personality traits for which dissimilarity/person-group fit might influence team member attitudes (i.e., satisfaction with the team) and autonomous motivation. The results provided very little support for the notion that simply being dissimilar from one's teammates on a particular trait is a driving force of these outcomes. In fact, for only the trait of dependence did a congruence pattern emerge with discrepant individual and team levels being related to lower levels of satisfaction with the team.

This particular pattern is understandable in a project team context. Dependent members who prefer to receive emotional assurance from other people may feel isolated and unsupported in a group of independent individuals who are more self-assured and may not understand or appreciate these emotional needs. Independent individuals who do not have the same need for emotional support may feel that associated activities interfere

with goal pursuit for instance. To call this an important managerial implication at this juncture, however, would be premature and additional research to replicate this finding is clearly needed.

Generally, however, the finding that dependence congruence was significantly related to satisfaction does suggest that not all personality facets of a broad trait relate to affective outcomes in exactly the same way. While dependence dissimilarity was related to lower levels of satisfaction with the team, emotionality's other subtraits – fearfulness, anxiety, and sentimentality – were not. This provides some evidence that calls for thoughtful research at the trait level (e.g., David et al., 2019) are indeed warranted.

One of the intended theoretical outcomes of this research was an enhanced understanding of the mechanisms by which personality differences among team members might lead to dissatisfaction and demotivation. The dissimilarity literature usually pits information-processing theory against the similarity-attraction paradigm (and its variants) when it comes to understanding the mechanisms underlying dissimilarity effects. This is usually the endpoint for theorizing about relations between team member differences and outcomes. Team composition researchers have yet to invest significant attention to understanding more specific mechanisms. The present research was aimed at extending our understanding by introducing psychological need fulfillment as a theoretical mediating mechanism. While the nested multilevel models did indicate that the combination of individual and team scores was related to psychological need fulfillment in many instances, the relations were not explained by a congruence pattern. Composing teams to optimize the level of congruence on the personality traits of prospective members appears not to be a critical managerial decision. All things considered, this

preliminary work fails to support SDT as a robust framework for understanding personality congruence effects in teams.

Supplemental Relations Observed

While the focused investigation of a personality congruence pattern yielded only one significant result, a number of supplemental patterns were observed that are discussed below. With statistical developments related to congruence research (c.f., Humberg et al., 2019, Humberg, Schönbrodt, Back, & Nestler, 2020) these observations may help guide future research.

One of the most cited advantages of using RSA is that it can help identify how combinations of predictors influence an outcome. While a congruence pattern like that tested in this research is one way that two predictors may relate to an outcome, there are others, as indicated in Figure 4 (e.g., Nestler et al., 2019). For example, a response

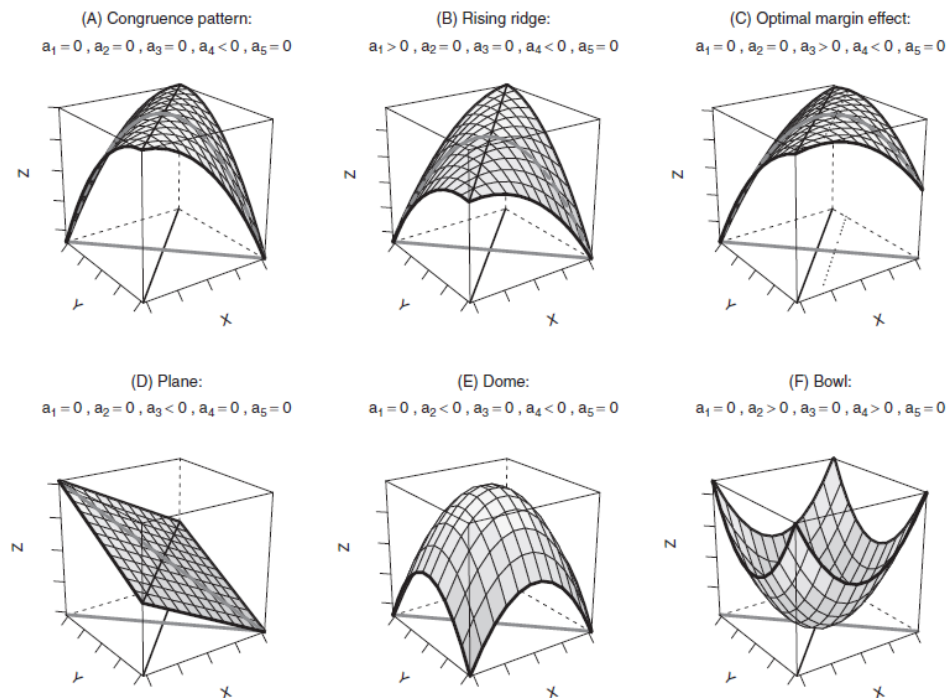


Figure 4. Multiple examples of response surface analysis (RSA) surfaces. Taken from Nestler, Humberg, and Schönbrodt (2019).

surface may indicate a linear additive effect such that levels of the outcome increase as both x and y increase together. An optimal margin effect (see Figure 4c) describes a surface that indicates values of the outcome are maximized when x or y exceeds the other by a certain amount. The results of this study indicated a number of planar patterns (Figure 4d), with a significant slope of the line of incongruence and the absence of any other significant parameters.

Honesty-Humility

The response surface relating individual and team honesty-humility to autonomous motivation showed that autonomous motivation is at its lowest when individual honesty-humility is low and team honesty-humility is high (Figure 2b). It appears that being low on honesty-humility in a team that scores highly may be a demotivating experience. One possible explanation of this pattern is that team members who are low on the facets of sincerity and greed-avoidance are particularly likely to participate in practices that high scorers would deem unethical. Perceiving that the moral grounds of their team members interfere with goal pursuit, low scorers may lose their sense of being autonomously motivated. Future research should examine if this pattern is observed in other data sets and populations.

Emotionality

The response surface relating individual and team emotionality to autonomy fulfillment showed that autonomy fulfillment was at its lowest when individual levels of emotionality were high and team levels were low (Figure 2c). This could suggest that individuals who have higher emotional needs feel that their behaviour is constrained within teams whose members are dissimilar. For instance, an individual who routinely

feels anxious and perhaps prefers to seek emotional support from others may feel like it is more difficult to pursue that support among others without the same need. The lack of anxiety and emotional support seeking from others could signal that the behaviour is undesired or unvalued within the group and not to be pursued, thwarting the fulfillment of autonomy among high scorers on emotionality. Again, this line of reasoning would need to be pursued further.

Extraversion

For extraversion, the response surfaces relating individual and team levels to the three psychological needs indicated a linear additive effect (i.e., fulfillment of the three needs increased as levels of both individual and team extraversion increased; Figures 2e-g). Additionally, at low levels of extraversion, need fulfillment was maximized within highly extraverted teams. It is possible that for low scorers on extraversion there is a complementarity pattern of personality differences that is not realized for high scorers. In this case low scorers on extraversion may find it significantly easier to have their relationship needs fulfilled when other team members are more sociable and bold. Low scorers, who may have lower levels of positive self regard, could have competence beliefs enhanced due to being surrounded by the positive evaluations of more extraverted teammates both generally and about the team. Finally, low scorers are more likely able to behave autonomously in teams with highly extraverted members. There is more opportunity to listen rather than speak and take direction from others when surrounded by more dominant team members. This would be an interesting effect to test a priori.

Conscientiousness

The response surfaces relating individual and team conscientiousness to both competence fulfillment and autonomous motivation hinted at a level-dependent pattern (Figure 2n-o). At low levels of individual conscientiousness, competence fulfillment and autonomous motivation were maximized when the team was highly conscientious. At high levels of individual conscientiousness, however, competence fulfillment and autonomous motivation were maximized at low team levels.

Within the literature, the flexibility of RSA has often been overextended. Recent work, however, has highlighted that the mathematical properties of traditional RSA do not truly allow for conclusions about asymmetric and level-dependent effects (cf. Humberg et al., 2019) and more complex models incorporating cubic terms are required to test such patterns. While proposed methods have been recently published (Humberg et al., 2020), the authors are clear that they are most appropriately used in a priori tests and they also require larger sample sizes than traditional RSA to be effective.

Hypotheses surrounding this pattern could be tested in future studies using the procedures outlined by Humberg et al. (2020). It is possible that low-conscientiousness individuals are more likely to experience goal attainment within a team of conscientious individuals, producing a sense of accomplishment and motivation. This could be the result of the team providing the structure necessary for the individual to experience personal effectiveness or could be a vicarious experience due to the goal pursuit and success of more conscientious team members. For high-conscientiousness individuals in low-conscientiousness teams, it is possible that the need for behaviours associated with conscientiousness (e.g., organization, goal pursuit, etc.) creates a sense of competence

and autonomous motivation – either because the individual is critical for the success of the team or because social comparison produces a sense of capability. Regardless, this might represent a fruitful direction for future investigation.

Limitations

While the study had a number of strengths, there are evident limitations to the approach used in this research. One of the initially designed intentions of this research was to examine the possibility of asymmetric effects of personality congruence (i.e., whether scoring higher or lower than one's team member influenced the outcome). At the time this research was commenced, two prominent guides on the use of RSA suggested that the analytic technique was appropriate for drawing conclusions about such effects (Barranti, Carlson, & Côté; Shanock et al., 2010). Subsequent methodological work, however, has indicated that though the technique may provide hints about asymmetry, it cannot be used to test the statistical significance of such relations (Humberg et al., 2019). While methods to rectify this concern are now being published (Humberg et al., 2020), they could not be employed post hoc because of research design considerations such as sample size. Researchers might be able to use the results of this research to inform more targeted investigations about potential asymmetric effects.

It would also be valuable to assess how personality fit affects team members' attitudes and motivation over time. While the variables in this research were measured over a period of time, the analytic approach was not truly longitudinal. The problem is that polynomial regression with response surface modelling has not yet been applied to longitudinal analyses. While one could use difference scores to operationalize personality dissimilarity and use those scores as a predictor in a longitudinal model (e.g., a multi-

level, growth-curve) the benefits of response surface modelling in this preliminary research seemed to outweigh the limitations of neglecting time at this juncture. That being said, some research, using difference scores, has supported a moderating effect of group tenure on personality dissimilarity-outcome relations (Sung et al., 2014). Also related to the role of time, it is possible that individuals are able to adapt to incongruence over time to mitigate potential negative effects. Mark Twain (1898) wrote, “A round man cannot be expected to fit in a square hole right away. He must have time to modify his shape.” The theory of work adjustment suggests that individuals can adapt their work preferences to contextual constraints in order to satisfy their needs (Dawis & Lofquist, 1984). Indeed, in their qualitative study of responses to misfit at work Follmer et al. (2018) found that changing the self, either fundamentally or one’s surface-level behaviour, was a common response to incongruence. While personality is thought to be relatively enduring, it is possible that team members regulate their individual behaviour in such a way that buffers the impact of personality dissimilarity. Misfit has been viewed as partially malleable by other researchers (Shipp & Jansen, 2011; Yu, 2013) and some research has even shown that employees’ general beliefs and values can even converge with their coworkers over time (Kohn & Schooler, 1982). It makes sense then to aim at including the role of time as RSA methodology continues to advance.

Another serious limitation relates to the supplementary analyses presented and the measurement of personality facets. Given that the survey length was constrained by the research context, it was impossible to administer the 200-item version of the HEXACO personality inventory. The 60-item version that was used assesses many facets with as few as two items, and scale reliability was low. Again, this research was exploratory, and

future research would do well to replicate the finding relating dependence congruence to satisfaction with the team. It would also be advantageous to answer the call for more research at the facet level by providing a more focused test of facets that might be particularly likely to influence team experiences.

Related to study design, the recommended sample size for polynomial regression is 2 to 3 times what would be needed to detect linear main effects (Aiken & West, 1991; Humberg et al., 2019). While the sample size was designed to be more than sufficient, the pervasiveness of careless responding, and the conservative manner in which it was treated, did lead to a useable sample that was much closer to the necessary threshold than had been hoped and I may have been unable to detect small effects with desired levels of power. That being said, even after taking into account missing data and careless responding, the sample size for this project was greater than the majority of similar work.

The many tests of significance involved in this study is another caution when interpreting the results because of the inflated risk of Type I error. While some researchers advocate for adjusting p-values using a method such as the Bonferroni correction, this approach has been criticized as overly conservative and may lead to increases in Type II error (Streiner & Norman, 2011). Some argue that in the beginning stages of a research program the risks of Type II error are greater because it can indicate that an area of research is not worth pursuing (Rothman, 1990). Regardless, the null hypothesis was not rejected in any of the main analyses, so this does not appear to be a substantial limitation.

Future Research

In addition to research designed to rectify this study's limitations and investigate the supplemental patterns already discussed, there are a number of theoretical considerations that may provide a useful path forward.

Perceived versus Actual Differences/Fit

Both the diversity and person-environment fit literatures have distinguished between differences that are noticed and those that are not. In fit scholarship, researchers refer to *perceived fit* (i.e., one's judgement of congruence between their personal and environmental characteristics) and *actual fit* (i.e., the mathematically derived comparison between person and environment variables; Jansen & Kristof-Brown, 2005; Kristof, 1996).

Many researchers have argued for the measurement of fit perceptions, suggesting that it is actually perceptions of fit (misfit) that influence employee attitudes and behaviours (Cable & DeRue, 2002). Harrison et al. (2002) suggested, for example, that "if differences are to be meaningful, they must be perceived" (p. 1032). Perceptions of fit are also thought to be more proximal and thus stronger predictors than objective measures (Cable & DeRue, 2002; Greguras & Diefendorff, 2009). Meta-analytic evidence suggests that perceptions of fit are more predictive than objective fit for nearly all outcomes (Kristof-Brown et al., 2005b) and recent research has aimed at developing more valid measures of perceived person-group fit than have previously been used (Li, Kristof-Brown, & Nielsen, 2019). Measuring perceptions directly would allow for additional (i.e., longitudinal) methods to be more easily applied because diversity/congruence perceptions are usually assessed as a single variable.

A possible reason for the rather underwhelming findings in this research is the decision to study actual fit between team members. It is possible that some of the traits examined in this research were not sufficiently salient to the students' projects for differences to be detectable or meaningful. For example, it is unlikely that teams were exposed to much physical danger that would have surfaced differences in fearfulness. Indeed, research has demonstrated that some personality traits, such as extraversion, are much more easily detectable than others (Gosling, Ko, Mannarelli, & Morris, 2002; Kenny, 1994) Nonetheless, other scholars have argued that people do not need to be able to recognize trait differences/similarities for them to have an effect (Scaubroeck & Lam, 2002) and the practical aim of this research was to uncover individual differences that organizations might use when assembling project teams – a purpose for which perceived differences have no use.

To Whom Does Congruence Matter?

An interesting and under-researched question is whether incongruence/dissimilarity bears similar weight for all individuals. Future research could consider how individual personality may moderate simple congruence relationships. Prior research suggests that this may be a fruitful direction. For example, Liao, Chuang, and Joshi (2008) found that extraversion and agreeableness were negatively associated with perceived dissimilarity. Other research has shown that certain personality types are more susceptible to emotional exhaustion. Conscientious individuals are more likely to adapt in order to ensure goal attainment, and agreeable people strive to nurture strong interpersonal relationships that help buffer against emotional exhaustion; individuals who are low in emotional stability, on the other hand, tend to experience higher levels of

negative emotion and self-doubt which lead to exhaustion (Swider & Zimmerman, 2010). It seems possible that individuals possessing high levels of extraversion, agreeableness, and conscientiousness may be less likely to experience deleterious effects of dissimilarity. In contrast, more neurotic team members are likely to experience more negative emotions and judge things more negatively (Judge et al., 2002), which could lead to exacerbated effects.

As another consideration, Follmer et al. (2018) found that some participants framed misfit as an opportunity for growth. It is possible that people who are more open, flexible, or have a learning goal orientation are less likely to be concerned about dissimilarity or incongruence. Research on value congruence suggests that it is not necessarily the amount of discrepancy between values that matters most, but the importance of those values (Cable & Edwards, 2004). It may be the case that individuals also vary in their assessment of the importance of personality differences. The potential for individual-level moderators could be more thoughtfully incorporated into future research on personality congruence.

In Which Teams Does Congruence Matter?

Various groups of researchers have suggested that neglecting potential moderators could explain the frequent weak or null effects of person-environment fit (Kristof-Brown et al., 2005; Verquer et al., 2003). In addition to attributes of individuals, it is also possible that characteristics of the team dictate when personality dissimilarity will influence outcomes. A prime example of this is the research conducted by David et al. (2019) who found that social justice climate attenuated the relation between personality dissimilarity and emotional exhaustion. Idiosyncratic experiences of teams may allow

certain differences to manifest themselves more apparently or cause them to be more troubling. For instance, dissimilar individuals may be perfectly satisfied, provided their team is performing well.

The degree of interdependence may be an important moderator that was not studied in this research. Guillaume et al. (2012) presented meta-analytic evidence that surface-level dissimilarity had a stronger negative effect on social integration when the team's task was highly interdependent. This is important for two reasons: First, the context of the present research was student project teams in a course that made up just one seventh of the students' course load. It is entirely possible that the students' overall dependence on team members for accomplishing their individual goals was insufficient to produce monumental effects of personality incongruence. Second, future research should specifically consider team interdependence as a moderator of the congruence relations uncovered in this study. The incorporation of such Level-2 moderators into the MRSA methodology is now possible (Nestler et al., 2019).

Follmer et al. (2018) proposed that misfit perceptions can be triggered by changes in the work environment or social signals sent by others. It is possible that idiosyncratic team experiences would cause dissimilarity on certain personality dimensions to seem particularly relevant and upsetting. Certain personality traits of team members may also influence social cues of misfit. For example, a team marked by high agreeableness, one in which team members are warm, gentle, patient, and forgiving, may be less likely to make a dissimilar other feel unwelcome and unwanted. A discrepancy between objective and subjective misfit could be explained by a lack of social cues from such teams. Similarly, team members who are highly agreeable may be more responsive to different team

members and willing to adapt when dissimilar members attempt to change their environment. Follmer and colleagues identified shaping others' behaviours or expectations as a response to misfit and proposed that resolution attempts would be dependent on the malleability of the environment.

Related to the present findings, team members' self-efficacy for meeting emotional demands/level of empathy might mitigate against the damaging effects of dependence dissimilarity. In romantic partner research, perceived partner responsiveness has been associated with relationship satisfaction (Derrick et al., 2016). This also raises the question as to whether considering an individual's score against the team's mean score is the right approach to understanding individual experiences. For instance, would having one similarly dependent team member be sufficient to restrict this effect? Would having a single, highly empathic individual hedge against the negative effect? In a similar vein, often in groups with no formal leader, an informal leader emerges. It is conceivable that the personality match between a team member and this single individual is most important for need fulfillment and more distal outcomes like satisfaction and motivation. Indeed, past research has shown that leaders play a prominent role in fostering need fulfillment (e.g., Graves & Luciano, 2013; Lanaj, Johnson, & Lee, 2016; Parfyonova et al., 2019) and congruence in supervisor-subordinate relationships can influence the quality of exchanges and feelings of liking (e.g., Briker et al., 2020; Schaubroeck & Lam, 2002; Strauss, Barrick, & Connerley, 2001).

The consideration of these boundary conditions and others might help shed light on when incongruence shows a stronger relation with important work attitudes and behaviour.

Chapter V: Conclusion

Previous studies on personality similarity/congruence have largely yielded null or modest results; the present research was no different. There was little evidence that personality congruence robustly predicted satisfaction with the team or autonomous motivation. Furthermore, while the proposed mediators were related to the outcome variables, there was no support for a mediation effect of the proposed congruence relations. One possible takeaway from this research is that individuals interested in composing teams to promote positive affect should consider matching members' level of dependence, though replication of this pattern would be necessary to seriously propose that as a recommendation.

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Appendices

Appendix A: List of Measures

HEXACO-60

Instructions: Please circle the number indicating how much you agree with each statement about you.

Response Scale:

Strongly Disagree	Disagree	Neutral (neither agree nor disagree)	Agree	Strongly Agree
1	2	3	4	5

Items:

1. I would be quite bored by a visit to an art gallery.
2. I plan ahead and organize things, to avoid scrambling at the last minute.
3. I rarely hold a grudge, even against people who have badly wronged me.
4. I feel reasonably satisfied with myself overall.
5. I would feel afraid if I had to travel in bad weather conditions.
6. I wouldn't use flattery to get a raise or promotion at work, even if I thought I would succeed.
7. I'm interested in learning about the history and politics of other countries.
8. I often push myself very hard when trying to achieve a goal.
9. People sometimes tell me that I am too critical of others.
10. I rarely express my opinions in group meetings.
11. I sometimes can't help worrying about little things.
12. If I knew that I could never get caught, I would be willing to steal a million dollars.

13. I would enjoy creating a work of art, such as a novel, a song, or a painting.
14. When working on something, I don't pay much attention to small details.
15. People sometimes tell me that I'm too stubborn.
16. I prefer jobs that involve active social interaction to those that involve working alone.
17. When I suffer from a painful experience, I need someone to make me feel comfortable.
18. Having a lot of money is not especially important to me.
19. I think that paying attention to radical ideas is a waste of time.
20. I make decisions based on the feeling of the moment rather than on careful thought.
21. People think of me as someone who has a quick temper.
22. On most days, I feel cheerful and optimistic.
23. I feel like crying when I see other people crying.
24. I think that I am entitled to more respect than the average person is.
25. If I had the opportunity, I would like to attend a classical music concert.
26. When working, I sometimes have difficulties due to being disorganized.
27. My attitude toward people who have treated me badly is "forgive and forget".
28. I feel that I am an unpopular person.
29. When it comes to physical danger, I am very fearful.
30. If I want something from someone, I will laugh at that person's worst jokes.
31. I've never really enjoyed looking through an encyclopedia.
32. I do only the minimum amount of work needed to get by.

33. I tend to be lenient in judging other people.
34. In social situations, I'm usually the one who makes the first move.
35. I worry a lot less than most people do.
36. I would never accept a bribe, even if it were very large.
37. People have often told me that I have a good imagination.
38. I always try to be accurate in my opinions when people disagree with me.
39. I am usually quite flexible in my opinions when people disagree with me.
40. The first thing that I always do in a new place is to make friends.
41. I can handle difficult situations without needing emotional support from anyone else.
42. I would get a lot of pleasure from owning expensive luxury goods.
43. I like people who have unconventional views.
44. I make a lot of mistakes because I don't think before I act.
45. Most people tend to get angry more quickly than I do.
46. Most people are more upbeat and dynamic than I generally am.
47. I feel strong emotions when someone close to me is going away for a long time.
48. I want people to know that I am an important person of high status.
49. I don't think of myself as the artistic or creative type.
50. People often call me a perfectionist.
51. Even when people make a lot of mistakes, I rarely say anything negative.
52. I sometimes feel that I am a worthless person.
53. Even in an emergency I wouldn't feel like panicking.
54. I wouldn't pretend to like someone just to get that person to do favors for me.

- 55. I find it boring to discuss philosophy.
- 56. I prefer to do whatever comes to mind, rather than stick to a plan.
- 57. When people tell me that I'm wrong, my first reaction is to argue with them.
- 58. When I'm in a group of people, I'm often the one who speaks on behalf of the group.
- 59. I remain unemotional even in situations where most people get very sentimental.
- 60. I'd be tempted to use counterfeit money, if I were sure I could get away with it.

Psychological Need Fulfillment

Instructions: Please read each of the following items carefully, thinking about how it relates to **your experience on your team**, and then indicate how true it is for you.

Response Scale:

not at all true			somewhat true			very true
1	2	3	4	5	6	7

Items:

- 1. I feel like I am free to decide for myself how to live.
- 2. I really like the people I interact with.
- 3. Often, I do not feel very competent.
- 4. I feel pressured.
- 5. People I know tell me I am good at what I do.
- 6. I get along with people I come into contact with.
- 7. I pretty much keep to myself and don't have a lot of social contacts.
- 8. I generally feel free to express my ideas and opinions.
- 9. I consider the people I regularly interact with to be my friends.

10. I have been able to learn interesting new skills.
11. I frequently have to do what I am told.
12. People care about me.
13. Most days I feel a sense of accomplishment from what I do.
14. People I interact with tend to take my feelings into consideration.
15. I do not get much of a chance to show how capable I am.
16. There are not many people that I am close to.
17. I feel like I can pretty much be myself.
18. The people I interact with regularly do not seem to like me much.
19. I often do not feel very capable.
20. There is not much opportunity for me to decide for myself how to do things.
21. People are generally pretty friendly towards me.

Motivation

Instructions: Using the scale provided, select the option corresponding to your level of agreement with the answers to the following statement:

Why do you put effort into your studies in general?

Response Scale:

Strongly Disagree	Disagree	Slightly Disagree	Neither Disagree nor Agree	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

1. To get others' approval (e.g., family, friends, peers, professors...).
2. To avoid getting poor grades.

3. Because I have to prove to myself that I can succeed in my studies.
4. Because I personally consider it important to put effort into my studies.
5. Because I enjoy my studies.
6. Because others will respect me more (e.g., family, friends, peers, professors...).
7. To create good opportunities for my future.
8. Because it makes me feel proud of myself.
9. Because putting effort into my studies aligns with my personal values.
10. Because I find my studies engaging.
11. To avoid being criticized by others (e.g., family, friends, peers, professors...).
12. To do well in my courses.
13. Because otherwise I will feel ashamed of myself.
14. Because putting effort into my studies has personal significance to me.
15. Because I find my studies interesting.
16. Because otherwise I will feel guilty.

Satisfaction with the Team

Instructions: For each statement, please indicate your degree of satisfaction.

Responses Scale:

Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Satisfied	Very Satisfied
1	2	3	4	5	6	7

Items:

1. How satisfied are you with the current members of your team?
2. How satisfied are you with the benefits you receive from being a member of this team?

3. How satisfied are you with your team's performance?
4. How satisfied are you with the way you and your team members work together?
5. How satisfied are you with the quality of your team's work?
6. How satisfied are you with the relationships among members of your team?
7. How satisfied are you with the influence this team has had on your well-being?
8. How satisfied are you with your team's success, relative to other, similar teams?
9. How satisfied are you with how helpful this team is to you?

Appendix B: Frequencies of personality scores over, under, and in-agreement with the team.

Honesty-Humility	
Over	260
In Agreement	192
Under	260

Emotionality	
Over	265
In Agreement	193
Under	254

Extraversion	
Over	260
In Agreement	208
Under	244

Sincerity	
Over	257
In Agreement	191
Under	264

Fearfulness	
Over	257
In Agreement	197
Under	258

Esteem	
Over	271
In Agreement	181
Under	260

Fairness	
Over	267
In Agreement	205
Under	240

Anxiety	
Over	264
In Agreement	201
Under	242

Boldness	
Over	270
In Agreement	199
Under	243

Greed Avoidance	
Over	241
In Agreement	219
Under	247

Dependence	
Over	259
In Agreement	191
Under	257

Sociability	
Over	281
In Agreement	166
Under	260

Modesty	
Over	267
In Agreement	184
Under	261

Sentimentality	
Over	262
In Agreement	187
Under	263

Liveliness	
Over	263
In Agreement	186
Under	258

Agreeableness	
Over	248
In Agreement	227
Under	237

Conscientiousness	
Over	267
In Agreement	193
Under	252

Openness	
Over	244
In Agreement	260
Under	208

Forgiveness	
Over	254
In Agreement	200
Under	258

Organization	
Over	258
In Agreement	195
Under	259

Aesthetic Appreciation	
Over	252
In Agreement	180
Under	280

Gentleness	
Over	267
In Agreement	197
Under	248

Diligence	
Over	247
In Agreement	214
Under	246

Inquisitiveness	
Over	248
In Agreement	222
Under	241

Flexibility	
Over	261
In Agreement	195
Under	256

Perfectionism	
Over	271
In Agreement	219
Under	222

Creativity	
Over	261
In Agreement	192
Under	259

Patience	
Over	265
In Agreement	186
Under	260

Prudence	
Over	266
In Agreement	205
Under	241

Unconventionality	
Over	253
In Agreement	200
Under	259

Appendix C: Multilevel models for all personality-outcome relations

Table 6. *Multilevel Models for Honesty-Humility and Relatedness Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
	Intercept	5.19***	0.05	5.10***	0.07	5.10***	0.07
	Individual Honesty-Humility (x)			0.16	0.09	0.13	0.10
	Team Honesty-Humility (y)			-0.04	0.18	-0.08	0.20
	x ²			-0.07	0.08	-0.05	0.08
	xy			0.11	0.18	0.18	0.19
	y ²			0.35	0.20	0.39*	0.20
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1192.8		1181.30		1177.90	
	Δ Deviance			-11.50*		-3.40	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 7. *Multilevel Models for Honesty-Humility and Autonomy Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
	Intercept	4.80***	0.04	4.70***	0.06	4.70***	0.07
	Individual Honesty-Humility (x)			-0.00	0.08	-0.00	0.09
	Team Honesty-Humility (y)			0.07	0.16	0.08	0.17
	x ²			0.11	0.07	0.11	0.07
	xy			0.03	0.16	0.04	0.17
	y ²			0.09	0.17	0.08	0.18
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1081.80		1077.30		1076.70	
	Δ Deviance			-4.50		-0.60	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 8. Multilevel Models for Honesty-Humility and Competence Fulfillment

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>						
Intercept	4.85***	0.05	4.77***	0.07	4.77***	0.07
Individual Honesty-Humility (x)			-0.02	0.09	-0.02	0.09
Team Honesty-Humility (y)			-0.13	0.18	-0.12	0.18
x2			0.14	0.08	0.14	0.08
xy			0.09	0.18	0.09	0.19
y2			0.18	0.20	0.17	0.20
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1189.20		1183.90		1183.20	
Δ Deviance			-5.30		-0.70	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 9. Multilevel Models for Honesty-Humility and Satisfaction with the Team

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>						
Intercept	5.21***	0.09	5.12***	0.12	5.13***	0.12
Individual Honesty-Humility (x)			0.04	0.13	0.03	0.12
Team Honesty-Humility (y)			0.49	0.31	0.47	0.27
x2			0.03	0.09	0.02	0.09
xy			0.07	0.28	0.06	0.27
y2			-0.33	0.35	-0.33	0.34
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1426.8		1422.60		1421.00	
Δ Deviance			-4.20		-1.60	

Note. *N* = 425 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 10. *Multilevel Models for Honesty-Humility and Autonomous Motivation*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	-0.50**	0.18	-0.51	0.28		
Individual Honesty-Humility (x)			1.18***	0.34		
Team Honesty-Humility (y)			-0.92	0.69		
x ²			-0.22	0.27		
xy			0.51	0.68		
y ²			-0.01	0.82		
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	2320.60		2295.20			
Δ Deviance			-25.40***			

Note. *N* = 423 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 11. *Multilevel Models for Emotionality and Relatedness Fulfillment*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	5.19***	0.05	5.11***	0.06	5.10***	0.06
Individual Emotionality (x)			-0.01	0.07	-0.01	0.07
Team Emotionality (y)			-0.00	0.12	-0.02	0.13
x ²			0.10	0.08	0.11	0.08
xy			0.18	0.17	0.22	0.18
y ²			0.29	0.18	0.33*	0.18
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1192.80		1187.60		1183.70	
Δ Deviance			-5.20*		-3.90	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 12. *Multilevel Models for Emotionality and Autonomy Fulfillment*

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>						
Intercept	4.80***	0.04	4.77***	0.06	4.77***	0.06
Individual Emotionality (x)			-0.24	0.06	-0.23	0.06
Team Emotionality (y)			0.02	0.10	0.03	0.11
x2			0.09	0.07	0.09	0.07
xy			0.20	0.15	0.23	0.15
y2			-0.04	0.15	-0.03	0.15
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1081.80		1063.10		1059.60	
Δ Deviance			-18.70		-3.50	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 13. *Multilevel Models for Emotionality and Competence Fulfillment*

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>						
Intercept	4.85***	0.05	4.80***	0.06	4.80***	0.06
Individual Emotionality (x)			-0.18	0.07	-0.18	0.07
Team Emotionality (y)			0.03	0.12	0.04	0.12
x2			0.02	0.08	0.03	0.08
xy			0.08	0.17	0.10	0.17
y2			0.23	0.17	0.22	0.17
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1189.20		1179.70		1177.00	
Δ Deviance			-9.50		-2.70	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 144. *Multilevel Models for Emotionality and Satisfaction with the Team*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept		5.21***	0.09	5.13***	0.11	5.13***	0.11
Individual Emotionality (x)				0.06	0.10	0.04	0.11
Team Emotionality (y)				0.28	0.22	0.32	0.23
x2				0.04	0.10	0.04	0.11
xy				0.56	0.27	0.56	0.27
y2				0.54	0.37	0.54	0.40
<i>Model Comparison</i>							
Deviance (-2 log likelihood)		1426.8		1420.20		1416.50	
Δ Deviance				-6.60		-3.70	

Note. *N* = 425 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 15. *Multilevel Models for Emotionality and Autonomous Motivation*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept		-0.50**	0.18	-0.89	0.25	0.87***	0.25
Individual Emotionality (x)				-	0.94***	-0.91	0.29
Team Emotionality (y)				-0.18	0.49	-0.18	0.50
x2				0.40	0.31	0.37	0.31
xy				1.11	0.69	1.10	0.70
y2				1.90	0.94	1.92	0.97
<i>Model Comparison</i>							
Deviance (-2 log likelihood)		2320.60		2300.60		2300.10	
Δ Deviance				-20.00***		-0.50	

Note. *N* = 423 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 16. *Multilevel Models for Extraversion and Relatedness Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
	Intercept	5.19***	0.05	4.85***	0.07		
	Individual Extraversion (x)			0.73***	0.09		
	Team Extraversion (y)			0.02	0.17		
	x2			0.05	0.07		
	xy			-0.08	0.15		
	y2			0.04	0.17		
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1192.80		1068.20			
	Δ Deviance			-124.60***			

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 17. *Multilevel Models for Extraversion and Autonomy Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
	Intercept	4.80***	0.04	4.51***	0.07	4.51***	0.08
	Individual Extraversion (x)			0.66***	0.08	0.65***	0.10
	Team Extraversion (y)			-0.08	0.16	-0.10	0.20
	x2			0.02	0.06	0.03	0.06
	xy			-0.13	0.14	-0.13	0.15
	y2			0.17	0.15	0.19	0.17
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1081.76		968.38		964.03	
	Δ Deviance			-113.38***		-4.35	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 18. Multilevel Models for Extraversion and Competence Fulfillment

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	B	SE	B	SE	B	SE
<i>Fixed Effects</i>						
Intercept	4.85***	0.05	4.47***	0.07		
Individual Extraversion (x)			0.64***	0.09		
Team Extraversion (y)			0.07	0.17		
x2			0.11	0.07		
xy			-0.07	0.15		
y2			0.06	0.17		
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1189.20		1077.70			
Δ Deviance			-111.50***			

Note. N = 437 individuals in 135 teams. *** $p < .001$ ** $p < .01$ * $p < .05$

Table 19. Multilevel Models for Extraversion and Satisfaction with the Team

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	B	SE	B	SE	B	SE
<i>Fixed Effects</i>						
Intercept	5.21***	0.09	5.05***	0.15	4.93***	0.17
Individual Extraversion (x)			0.14	0.15	0.26	0.20
Team Extraversion (y)			0.77*	0.34	1.00*	0.43
x2			-0.04	0.11	-0.05	0.12
xy			0.14	0.26	-0.03	0.31
y2			-0.68*	0.32	-0.67	0.38
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1426.8		1416.90		1409.40	
Δ Deviance			-9.90		-7.50	

Note. N = 425 individuals in 134 teams. *** $p < .001$ ** $p < .01$ * $p < .05$

Table 20. *Multilevel Models for Extraversion and Autonomous Motivation*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	-0.50**	0.18	-0.97**	0.33		
Individual Extraversion (x)			1.09*	0.42		
Team Extraversion (y)			-0.74	0.77		
x2			0.26	0.31		
xy			-0.25	0.69		
y2			0.58	0.82		
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	2320.60		2302.70			
Δ Deviance			-17.90**			

Note. *N* = 423 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 21. *Multilevel Models for Agreeableness and Relatedness Fulfillment*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	5.19***	0.05	5.09***	0.07	5.08***	0.07
Individual Agreeableness (x)			0.18	0.10	0.22	0.11
Team Agreeableness (y)			0.03	0.16	0.07	0.18
x2			0.03	0.09	0.03	0.10
xy			0.24	0.21	0.17	0.23
y2			0.02	0.16	-0.01	0.15
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1192.8		1178.50		1172.50	
Δ Deviance			-14.30*		-6.00	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 22. *Multilevel Models for Agreeableness and Autonomy Fulfillment*

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>						
Intercept	4.80***	0.04	4.76***	0.06	4.76***	0.07
Individual Agreeableness (x)			0.10	0.09	0.11	0.09
Team Agreeableness (y)			0.25	0.14	0.27	0.15
x2			-0.11	0.08	-0.13	0.09
xy			0.14	0.18	0.12	0.19
y2			-0.12	0.14	-0.13	0.14
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1081.80		1073.20		1071.50	
Δ Deviance			-8.60		-1.70	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 23. *Multilevel Models for Agreeableness and Competence Fulfillment*

	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>						
Intercept	4.85***	0.05	4.84***	0.07	4.84***	0.07
Individual Agreeableness (x)			0.04	0.10	0.06	0.11
Team Agreeableness (y)			-0.10	0.16	-0.07	0.17
x2			-0.02	0.10	-0.03	0.10
xy			0.25	0.21	0.21	0.22
y2			0.03	0.16	0.01	0.16
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1189.20		1185.40		1183.20	
Δ Deviance			-3.80		-2.20	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 244. Multilevel Models for Agreeableness and Satisfaction with the Team

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>							
	Intercept	5.21***	0.09	5.00***	0.13	5.00***	0.13
	Individual Agreeableness (x)			0.38**	0.14	0.39*	0.18
	Team Agreeableness (y)			-0.14	0.29	-0.09	0.29
	x2			0.00	0.13	0.01	0.14
	xy			0.11	0.31	0.04	0.36
	y2			0.64	0.39	0.61	0.40
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1426.8		1410.90		1399.30	
	Δ Deviance			-15.90**		-11.60*	

Note. *N* = 425 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 255. Multilevel Models for Agreeableness and Autonomous Motivation

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Fixed Effects</i>							
	Intercept	-0.50**	0.18	-0.78**	0.28		
	Individual Agreeableness (x)			0.92*	0.34		
	Team Agreeableness (y)			-0.51	0.69		
	x2			0.00	0.27		
	xy			0.82	0.68		
	y2			0.49	0.82		
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	2320.60		2305.60			
	Δ Deviance			-15.00*			

Note. *N* = 423 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 266. *Multilevel Models for Conscientiousness and Relatedness Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
		B	SE	B	SE	B	SE
<i>Fixed Effects</i>							
	Intercept	5.19***	0.05	4.88***	0.22	4.85***	0.21
	Individual Conscientiousness (x)			0.53*	0.25	0.53*	0.25
	Team Conscientiousness (y)			-0.04	0.39	0.08	0.41
	x2			-0.11	0.12	-0.10	0.12
	xy			0.12	0.26	0.11	0.27
	y2			-0.02	0.20	-0.11	0.25
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1192.8		1160.10		1160.10	
	Δ Deviance			-32.70***		0.00	

Note. N = 437 individuals in 135 teams. *** $p < .001$ ** $p < .01$ * $p < .05$

Table 27. *Multilevel Models for Conscientiousness and Autonomy Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
		B	SE	B	SE	B	SE
<i>Fixed Effects</i>							
	Intercept	4.80***	0.04	4.41***	0.19		
	Individual Conscientiousness (x)			0.58**	0.22		
	Team Conscientiousness (y)			0.30	0.33		
	x2			-0.13	0.10		
	xy			-0.12	0.23		
	y2			-0.12	0.18		
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1081.80		1061.80			
	Δ Deviance			-20.00**			

Note. N = 437 individuals in 135 teams. *** $p < .001$ ** $p < .01$ * $p < .05$

Table 28. Multilevel Models for Conscientiousness and Competence Fulfillment

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	4.85***	0.05	4.32***	0.20		
Individual Conscientiousness (x)			0.86***	0.24		
Team Conscientiousness (y)			0.11	0.37		
x2			-0.16	0.12		
xy			-0.19	0.26		
y2			0.10	0.19		
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1189.20		1149.70			
Δ Deviance			-39.50***			

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 299. Multilevel Models for Conscientiousness and Satisfaction with the Team

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	5.21***	0.09	5.07***	0.40	5.33***	0.30
Individual Conscientiousness (x)			-0.07	0.39	-0.31	0.38
Team Conscientiousness (y)			0.43	0.84	-0.25	0.71
x2			-0.07	0.17	-0.02	0.17
xy			0.02	0.42	0.26	0.43
y2			-0.10	0.48	0.29	0.46
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1426.8		1422.20		1416.90	
Δ Deviance			-4.60		-5.30	

Note. *N* = 425 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 30. *Multilevel Models for Conscientiousness and Autonomous Motivation*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	-0.50**	0.18	-1.61	0.87	-1.61	0.87
Individual Conscientiousness (x)			4.00***	1.05	3.99***	1.07
Team Conscientiousness (y)			-1.27	1.81	-1.26	1.81
x2			-0.97	0.50	-0.97	0.50
xy			-2.00	1.10	-2.01	1.11
y2			1.50	1.15	1.52	1.17
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	2320.60		2298.00		2297.80	
Δ Deviance			-22.60***		-0.20	

Note. *N* = 423 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 31. *Multilevel Models for Openness and Relatedness Fulfillment*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	5.19***	0.05	5.11***	0.07	5.08***	0.07
Individual Openness (x)			-0.10	0.10	-0.12	0.10
Team Openness (y)			-0.09	0.18	-0.09	0.18
x2			0.18	0.10	0.20*	0.10
xy			0.19	0.19	0.26	0.21
y2			0.21	0.24	0.27	0.26
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1192.8		1187.80		1183.90	
Δ Deviance			-5.00		-3.90	

Note. *N* = 437 individuals in 135 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 32. *Multilevel Models for Openness and Autonomy Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
	Intercept	4.80***	0.04	4.74***	0.06	4.74***	0.06
	Individual Openness (x)			-0.03	0.09	-0.03	0.09
	Team Openness (y)			0.13	0.15	0.12	0.15
	x2			0.13	0.09	0.12	0.09
	xy			0.25	0.17	0.26	0.17
	y2			-0.22	0.20	-0.21	0.20
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1081.80		1073.80		1073.60	
	Δ Deviance			-8.00		-0.20	

Note. $N = 437$ individuals in 135 teams. *** $p < .001$ ** $p < .01$ * $p < .05$

Table 33. *Multilevel Models for Openness and Competence Fulfillment*

		Model					
		Null		Random Intercept		Random Intercept and Random Slope	
<i>Fixed Effects</i>		<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
	Intercept	4.85***	0.05	4.78***	0.07	4.78***	0.07
	Individual Openness (x)			-0.04	0.10	-0.04	0.10
	Team Openness (y)			0.07	0.17	0.07	0.17
	x2			0.11	0.10	0.11	0.10
	xy			0.22	0.19	0.22	0.19
	y2			-0.04	0.23	-0.04	0.23
<i>Model Comparison</i>							
	Deviance (-2 log likelihood)	1189.20		1185.50		1185.50	
	Δ Deviance			-3.70		0.00	

Note. $N = 437$ individuals in 135 teams. *** $p < .001$ ** $p < .01$ * $p < .05$

Table 34. *Multilevel Models for Openness and Satisfaction with the Team*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	5.21***	0.09	5.25***	0.12	5.23***	0.12
Individual Openness (x)			-0.03	0.15	-0.05	0.14
Team Openness (y)			-0.26	0.30	-0.30	0.27
x2			0.01	0.13	0.02	0.12
xy			-0.10	0.30	-0.04	0.30
y2			0.24	0.39	0.33	0.39
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	1426.8		1425.50		1424.10	
Δ Deviance			-1.30		-1.40	

Note. *N* = 425 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Table 35. *Multilevel Models for Openness and Autonomous Motivation*

<i>Fixed Effects</i>	Model					
	Null		Random Intercept		Random Intercept and Random Slope	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	-0.50**	0.18	-0.53	0.27		
Individual Openness (x)			1.34	0.42		
Team Openness (y)			-0.12	0.69		
x2			-0.32	0.37		
xy			-1.65	0.78		
y2			-0.12	1.01		
<i>Model Comparison</i>						
Deviance (-2 log likelihood)	2320.60		2308.20			
Δ Deviance			-12.40*			

Note. *N* = 423 individuals in 134 teams. ****p*<.001 ***p*<.01 * *p*<.05

Appendix D: Ethics Approval Notices



Research Ethics

Western University Non-Medical Research Ethics Board NMREB Delegated Initial Approval Notice

Principal Investigator: Prof. Natalie Allen
Department & Institution: Social Science\Psychology, Western University

NMREB File Number: 108317
Study Title: Understanding Engineering Project Teams (2016-2017)
Sponsor: Social Sciences and Humanities Research Council

NMREB Initial Approval Date: September 12, 2016
NMREB Expiry Date: September 12, 2017

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Western University Protocol		2016/08/28
Letter of Information & Consent		2016/08/28
Instruments	Survey 1	2016/08/28
Instruments	Survey 2	2016/08/21
Other	Alternative Assignment - Received for Information	2016/08/29

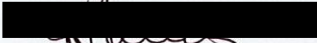
The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.


Ethics Officer, on behalf of Dr. Riley Hinson, NMREB Chair or delegated board member

Ethics Officer: Erika Basile ___ Nicole Kaniki ___ Grace Kelly ___ Katelyn Harris Vikki Tran ___ Karen Gopaul ___

Western University, Research, Support Services Bldg., Rm. 5150
London, ON, Canada N6G 1G9 t. 519.661.3036 f. 519.850.2466 www.uwo.ca/research/ethics



**Western University Non-Medical Research Ethics Board
NMREB Amendment Approval Notice**

Principal Investigator: Prof. Natalie Allen
Department & Institution: Social Science\Psychology, Western University

NMREB File Number: 108317
Study Title: Understanding Engineering Project Teams (2016-2017)
Sponsor: Social Sciences and Humanities Research Council

NMREB Revision Approval Date: October 24, 2016
NMREB Expiry Date: September 12, 2017

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Instruments	Questionnaire 3	2016/10/14
Revised Western University Protocol	Received Oct 14, 16	

The Western University Non-Medical Science Research Ethics Board (NMREB) has reviewed and approved the amendment to the above named study, as of the NMREB Amendment Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.



Ethics Officer, on behalf of Dr. Riley Hinson, NMREB Chair

Ethics Officer: Erika Basile Katelyn Harris Nicole Kaniki Grace Kelly Vikki Tran Karen Gopaul



Western University Non-Medical Research Ethics Board
NMREB Amendment Approval Notice

Principal Investigator: Prof. Natalie Allen
Department & Institution: Social Science\Psychology, Western University

NMREB File Number: 108317
Study Title: Understanding Engineering Project Teams (2016-2017)
Sponsor: Social Sciences and Humanities Research Council

NMREB Revision Approval Date: February 14, 2017
NMREB Expiry Date: September 12, 2017

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Revised Western University Protocol		2017/02/01
Instruments	Questionnaire 4	2017/02/01


The Western University Non-Medical Science Research Ethics Board (NMREB) has reviewed and approved the amendment to the above named study, as of the NMREB Amendment Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.


Ethics Officer, on behalf of Dr. Riley Hanson, NMREB Chair
EO: Erika Basile ___ Nicole Kaniki ___ Grace Kelly Katelyn Harris ___ Nicola Morphet ___ Karen Gopaul ___



Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Prof. Natalie Allen
Department & Institution: Social Science\Psychology, Western University

NMREB File Number: 109667
Study Title: Understanding Engineering Project Teams (2017-2018)

NMREB Initial Approval Date: September 08, 2017
NMREB Expiry Date: September 08, 2018

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Western University Protocol	Received September 4, 2017	
Recruitment Items	Recruitment Script	2017/09/03
Letter of Information & Consent		2017/09/03
Instruments	Questionnaire 1 - Received August 8, 2017	
Instruments	Questionnaire 2 - Received August 8, 2017	2017/08/08
Instruments	Questionnaire 3 - Received August 8, 2017	
Instruments	Questionnaire 4 - Received August 8, 2017	
Instruments	Alternative Assignment - Received August 8, 2017	

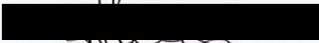
The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.



Ethics Officer, on behalf of Dr. Randal Graham, NMREB Chair or delegated board member

EO: Erika Basile ___ Grace Kelly ___ Katelyn Harris Nicola Morphet ___ Karen Gopaul ___ Patricia Sargeant ___ Kelly Patterson ___

Curriculum vitae

Kyle A. Cameron
Ph.D. Candidate: Industrial and Organizational Psychology
The University of Western Ontario

EDUCATION

- 2022 PhD, The University of Western Ontario, Department of Psychology
Supervisor: Dr. Natalie J. Allen
Thesis Title: *The attitudinal and motivational consequences of personality differences in teams*
- 2014 M.Sc., The University of Western Ontario, Department of Psychology
Supervisor: Dr. Natalie J. Allen
Thesis Title: *Goal orientation heterogeneity in teams: Investigating implications for individual satisfaction with the team and team conflict*
- 2012 B.B.A., Schulich School of Business, York University

PUBLICATIONS

- 2019 Parfynova, N. M., Meyer, J. P., Espinoza, J. A., Anderson, B. K., Cameron, K. A., Daljeet, K. N., & Vaters, C. (2019). Managerial support for employees' psychological needs: A multidimensional approach. *Canadian Journal of Behavioural Science*.

Professional Publications

- 2013 Cameron, K. A. (2013, December 15). Examining error prevention at work. *Public Sector Digest*.

TEACHING EXPERIENCE

King's University College

Professor, Department of Psychology
Course Title: Psychology at Work (Fall 2019)

The University of Western Ontario

Lecturer, Department of Management and Organization Studies
Course Title: Evidence-based Management in Human Resources (Winter 2019)

Lecturer, Department of Management and Organization Studies
Course Title: Organizational Behaviour (Fall 2016, Winter 2017)

Lecturer, Department of Psychology
Course Title: Psychology at Work (Fall 2016)

Tutorial Instructor, Department of Psychology
Course Title: Statistics for Psychology (F/W 2013-2014, F/W 2014-2015, F/W 2015-2016)

Teaching Assistant, Department of Psychology
Course Title: Introduction to Industrial and Organizational Psychology (F/W 2012-2013)

Lambton College

Associate Professor (part-time), School of Business
Course Title: Organizational Behaviour (Winter 2016)

AWARDS & DISTINCTIONS

2020 Human Resources Professionals Association, CKE2 Knowledge Exam Top Scorer
2016 Joseph-Armand Bombardier CGS Doctoral Scholarship, Social Sciences and Humanities Research Council
2014 Ontario Graduate Scholarship
2013 Joseph-Armand Bombardier CGS Master's Scholarship, Social Sciences and Humanities Research Council
2012-Present Western Graduate Research Scholarship, The University of Western Ontario
2012 Dean's Honour List, Schulich School of Business, York University
2008-2012 York University Entrance Scholarship
2008 Millennium Excellence Scholarship
2008 J. Ross Stevenson Award (for outstanding school achievement)
2008 Warren Campbell Memorial Award (for leadership, a drive for excellence, and sportsmanship)
2008 Lieutenant Governor's Community Volunteer Award

CONFERENCE ACTIVITY

2017 Cameron, K. A. & Allen, N. J. (2017, July). *Revisiting the multidimensional measurement of team member satisfaction*. Poster presented at the Interdisciplinary Network for Group Research Annual Conference, St. Louis, MO.

2017 Allen, N. J., Stanley, D. J., Cameron, K. A., McMenamin, J., Ouslis, N., Lee, H. H., Woodley, H. J. R. (2017, July). *Group performance: A 10-year bibliometric review of conceptualizations and assessment*. Paper presented at the Interdisciplinary Network for Group Research Annual Conference, St. Louis, MO.

- 2017 Cameron, K. A., Anderson, B. K., Daljeet, K. J., Espinoza, J., Vaters, C., & Meyer, J. P. (2017, June). *Need-supportive management, need satisfaction, and performance: Test of a mediation model*. Poster presented at Canadian Psychological Association Annual Convention, Toronto, ON.
- 2016 Cameron, K. A. & Allen, N. J. (2016, July). *Measuring team member satisfaction*. Poster presented at the Interdisciplinary Network for Group Research Annual Conference, Helsinki, Finland.
- 2015 Cameron, K. A. (2015, June). *Goal orientation heterogeneity in teams: Investigating implications for individual satisfaction with the team and team conflict*. Poster presented at the Canadian Psychological Association Annual Convention, Ottawa, ON.
- 2014 Cameron, K. A. & Lee, H. H. (2014, June). *Examining the relationship between goal orientation and psychological safety*. Poster presented at the Canadian Psychological Association Annual Convention, Vancouver, BC.
- 2014 Lee, H. H., Cameron, K. A., Allen, N. J. (2014, June). *Development of a trait psychological safety measure*. Poster presented at the Canadian Psychological Association Annual Convention, Vancouver, BC.
- 2013 Lee, H. H., Allen, N. J., Cameron, K. A., & Woodley, H. J. R. (2013, June). *Rethinking the measurement of team psychological safety: Referent use validity and the role of core self-evaluations*. Paper presented at the Administrative Sciences Association of Canada Annual Conference, Calgary, AB.

RESEARCH EXPERIENCE

- 2012-2020 Research Assistant, The TeamWork Lab, The University of Western Ontario
- 2015-2016 Research Assistant, Dr. Jennifer Robertson, Management and Organization Studies, The University of Western Ontario
- 2015-2016 Research Assistant, Dr. Bonnie Simpson, Management and Organization Studies, The University of Western Ontario
- 2011-2012 Research Assistant, Dr. Chris Bell, Schulich School of Business, York University

INDUSTRY EMPLOYMENT EXPERIENCE

- 2021-Present Manager, Organizational Development, London Health Sciences Centre
 2020-2021 Organizational Development Specialist, London Health Sciences Centre

2020 Quality Assurance Auditor (COVID-19 Redeployment), London Health Sciences Centre
2020 Perimeter Screening Site Lead (COVID-19 Redeployment), London Health Sciences Centre
2016-2019 Talent Management Consultant, Carswell Partners
2008-2011 Skills Program Coordinator, Fair Havens Conference Centre

PROFESSIONAL CERTIFICATIONS

LEADS Organizational Facilitator
Getting Things Done® Organizational Facilitator
Crucial Accountability® Organizational Facilitator
Certified Human Resources Leader (CHRL)

DEPARTMENTAL/UNIVERSITY SERVICE

Coordinator Mass Testing, Department of Psychology, The University of Western Ontario (2014-2016)
Treasurer Psychology Graduate Students Association, The University of Western Ontario (2013-2014)
Member Workload & Resource Planning Committee, The University of Western Ontario, Department of Psychology (2013-2014)

PROFESSIONAL & COMMUNITY SERVICE

2019-Present Chair, Leadership Council, *Safe Families, London & Middlesex*
2015-2016 Local Representative for the Canadian Society for Industrial & Organizational Psychology

PROFESSIONAL MEMBERSHIPS

Human Resources Professionals Association