ARE WE LEAVING VALIDITY ON THE TABLE?: AN EXPLORATION INTO THE VALIDITY OF PERSONALITY INTERACTIONS FOR PREDICTING JOB PERFORMANCE

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ABSTRACT

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Research in the organizational sciences on the relationship between personality and job performance has, to a large degree, focused on main effects of personality. What is neglected with this approach is any interactive effects between variables. The goal of the present research was to conduct a thorough exploration into the utility of personality variable interactions in predicting job performance. Specifically, a large, multiorganizational dataset utilizing two different measures of personality was utilized to test multiple trait by trait interactions, an aspect by aspect interaction, possible moderating effects of job context on this interaction, and possible differences in predictive validity for more specific criteria. Overall, limited support was found for hypotheses put forward. Theoretical and practical implications of these findings are discussed.

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INTRODUCTION

Since Barrick and Mount's (1991) seminal meta-analysis on the validity of personality in the prediction of job performance, there has been a resurgence of interest in this topic. After a scathing critique of utilizing personality measures in employee selection (Guion & Gottier, 1965), the work by Barrick and Mount (1991) along with others has renewed optimism and breathed new life into this area of inquiry. However, one limitation of this blossoming area of research is its fixation on main effects. Current personality research in the area of industrial and organizational psychology, by a wide margin, focuses on the main effects of personality variables on an outcome (e.g. job performance). What is neglected due to this focus is any interactive effects between personality variables.

Imagine two call center employees, both with an equally high level of extraversion. One is relatively high on conscientiousness and one is relatively low on conscientiousness. This differing level of conscientiousness may cause the individuals' extraversion to play out in different ways in the workplace. The individual higher in conscientiousness may put his or her extraverted personality to work through interactions with customers. However, the individual lower in conscientiousness may fulfill his or her extraverted tendencies through conversation with coworkers, neglecting job duties and disrupting work flow in the process. Considering extraversion in isolation would not be enough, in this scenario, to accurately predict the performance of these individuals. The benefits (or lack of benefits) of the extraverted tendencies of these employees on job performance depends on the level of another trait, and not considering the moderating effect of this trait on extraversion could lead to inaccurate prediction of job performance. The interactive effects of extraversion and conscientiousness are necessary to consider in order to get a more accurate prediction of their performance as employees.

This example illustrates the danger in neglecting possible interactive effects among personality variables in the prediction of job performance. Although it may be convenient to think of individual personality variables as acting in a vacuum, this is not the case. An individual is a constellation of all his or her traits and the configuration of these traits may impact the manifestation of each other. "… [W]e must study people, not traits, if we are interested in how well personality predicts." (Barrick & Mount, 2005, p. 362).

Within this paper, I discuss the importance of considering personality interactions in the workplace and detail a research project pertaining to investigating personality variable interactions and their role in the prediction of job performance. Specifically, I hypothesize and test the incremental validity of personality variable interactions in the prediction of job performance above main effects, compare the validity of aspect by aspect interactions and trait interactions for predicting job performance, test for occupational moderators of the validity of interactions, and test for higher predictive validity for more specific criteria as opposed to general job performance.

In terms of the structure of this paper, I first give a brief overview of the history of personality in personnel selection research. Next, I discuss previous research in the area of personality variable interactions and performance. Then, I discuss conceptualizing personality in a narrower way and possible utility of narrow personality variable interactions in predicting performance. Next, I discuss how job characteristics and context may influence the importance of personality variable interactions. Possible relationships between more specific facets of performance and personality variable interactions are then discussed. Following this review of the literature and outlining of my hypotheses, I test these hypotheses utilizing a large, multiorganizational dataset containing personality data and performance ratings. I then close the

paper with a discussion of implications derived from the results of these analyses, while suggesting avenues for future research.

General Personality Review

Personality can be defined as, "An individual's characteristic patterns of thought, emotion, and behavior, together with the psychological mechanisms behind those patterns." (Funder, 2010, p. G-7). In considering the wide implications of such individual characteristics, it is no wonder personality research has exhibited a long history in organizational psychology (e.g. Brandenburg, 1925). However, early research into the relationship between personality and organizationally relevant outcomes, such as performance, was less than supportive (e.g. Guion & Gottier, 1965). For instance, Guion and Gottier (1965) noted that, "… it must be concluded that, taken as a whole, there is no generalizable evidence that personality measures can be recommended as good or practical tools for employee selection." (p. 159). One reason put forward for this lack of support in early research was a lack of classification systems available to "reduce the thousands of personality traits into a smaller, more manageable number." (Barrick, Mount, & Judge, 2001, p. 9).

Over time, taxonomies of personality began to emerge (e.g. 16PF, EPQ). Recently, some consensus has emerged on the Five Factor Model as a valid and dominant model of personality (see Digman, 1990 for a review) and this model has experienced considerable use since the 1990's (Barrick et al., 2001). The Five Factor Model (FFM) consists of the "Big Five" personality factors, commonly referred to as extraversion, neuroticism (reverse coded as emotional stability), agreeableness, conscientiousness, and openness to experience. Extraversion is thought to be related to traits such as sociability, assertiveness, gregariousness, and activity. Neuroticism relates to characteristics such as anxiety, anger, depression, and emotionality. An

individual characterized as agreeable may be cooperative, courteous, trusting, and tolerant. Conscientious individuals exhibit dependability, organization, responsibility, and planfulness. An individual who exhibits high openness to experience may be imaginative, curious, original, and artistically oriented (Barrick & Mount, 1991).

Since the emergence of the FFM as an organizing taxonomy of personality, solving one of the problems lamented by Barrick and colleagues (2001) as limiting the usefulness of personality, there has been renewed optimism for the use of personality in predicting organizationally relevant outcomes. For instance, meta-analyses have shown personality to be predictive of performance for a wide range of jobs (e.g. Barrick & Mount, 1991; Barrick et al., 2001). Additionally, the relationship between personality and career success variables has been shown to hold over long periods of time (Judge, Higgins, Thoresen, & Barrick, 1999), and the utilization of personality in selection can add valuable incremental validity in the prediction of performance when used in combination with other selection tools, such as cognitive ability tests (Schmidt & Hunter, 1998). Personality has also demonstrated a relationship with other organizationally relevant and valued outcomes such as job satisfaction (Judge, Heller, & Mount, 2002), organizational citizenship behaviors (Chiaburu, Oh, & Marinova, 2017), and performance motivation (Judge & Ilies, 2002). In addition to research supportive of the predictive validity of personality variables, research has shown that managers also consider personality in selection contexts (Dunn, Mount, Barrick, & Ones, 1995).

Personality Variable Interactions and Job Performance

Though the usefulness of personality main effects in the prediction of organizationally relevant criteria is difficult to dispute, the utility of personality variable interactions has not been thoroughly considered in the prediction of job performance. For instance, Barrick and colleagues

(2001) found over 200 studies to include in their meta-analysis on the relationship between personality main effects and performance, while over 15 years later the author could only locate a handful of studies exploring interactive effects on performance. This is surprising, given calls for their exploration in personnel selection research (LePine, Buckman, Crawford, & Methot, 2011; Penney, David, & Witt, 2011). Below, I summarize the limited research on personality trait interactions and performance, grouped by the respective interaction examined.

Conscientiousness X agreeableness. Arguably the most explored trait by trait interaction in the prediction of job performance is that of conscientiousness interacting with agreeableness. In a study consisting of seven samples from different organizations (overall N = 1,738), Witt and colleagues (2002) found that the interaction of agreeableness and conscientiousness was predictive of supervisor rated performance above main effects in five of seven samples. In this study, among individuals who were high in conscientiousness those with high agreeableness as well received higher performance ratings. Guay and colleagues (2013) replicated these general findings in a small sample (N = 113) of South Korean bank employees by demonstrating a significant relationship between the interaction of agreeableness and conscientiousness in predicting task performance, as well as organizational citizenship behaviors. Burke and Witt (2004) found that the interaction of conscientiousness and agreeableness approached significance ($p < .10$) in the prediction of high-maintenance employee behaviors, in a regression with other relevant variables.

However, despite these supportive findings some research has not found support for the usefulness of the interaction of conscientiousness with agreeableness in predicting job performance. In an unpublished conference submission, Foster and Macan (2006) utilized a meta-analytic approach with over 100 datasets in an attempt to replicate results from Burke and

Witt (2004) demonstrating an interactive effect of conscientiousness and agreeableness. Results cast some doubt on previous research, in that consistent interactive effects between conscientiousness and agreeableness were not found and interactive effects that were found tended to be different than those found in previous research. Other published (e.g. Judge & Erez, 2007; Warr, Bartram, & Martin, 2005) and unpublished (e.g. Taylor, 2008: Yost, 2014) research has also failed to find an interactive effect between conscientiousness and agreeableness in predicting job performance.

The support for the interaction of conscientiousness and agreeableness predicting performance at the group level has also demonstrated mixed effects. Halfhill and colleagues (2005) found the interaction of group agreeableness and conscientiousness to be predictive of group performance in a small sample of military teams (N = 47), but did not find significant results from regressions in a later study (Halfhill, Nielsen, & Sundstrom, 2008).

Conscientiousness X extraversion. Research by Witt (2002) found a significant relationship between job performance and the interaction of extraversion and conscientiousness above main effects in three independent samples utilizing different personality inventories. Another interesting result was opposite relationships between extraversion and job performance for those high and low in conscientiousness. Those employees with high conscientiousness exhibited a positive relationship between extraversion and performance, where the relationship with those low in conscientiousness was negative. Yost (2014), however, did not find interactive effects in predicting leadership effectiveness. Warr and colleagues (2005) also did not find significant interactive effects between conscientiousness and extraversion for predicting objective sales performance in three samples of salespersons. However, sample size may have been a factor (N = 119, 78, 90).

Conscientiousness X emotional stability. Teng and Liu (2014) found that the interaction of conscientiousness and emotional stability was predictive of overall customer service performance for Taiwanese nurses, and more predictive than main effects for four of five facets of customer service performance. The authors also found differing directions for the relationship of conscientiousness and customer service performance facets depending on the level of emotional stability for nurses. Dunn (2014), utilizing a student sample in an experimental study, found a significant interaction between conscientiousness and neuroticism in predicting task performance, though this effect was non-significant when a three-way interaction with the two variables and experimental condition was included. Yost (2014) failed to find a significant interaction between conscientiousness and emotional stability in the prediction of cognitively-oriented leader effectiveness. Warr et al., (2005) also failed to find interactive effects.

Conscientiousness X openness to experience. Warr and colleagues (2005) failed to find a significant interactive effect between conscientiousness and openness to experience on performance. Yost (2014) also failed to find an interactive effect.

Emotional stability X extraversion. Judge and Erez (2007) tested the utility of the interaction of emotional stability and extraversion for the prediction of performance in a small sample of health and fitness center employees (N = 122) utilizing both a direct and indirect measure of this interaction and found support for both. However, Taylor (2008) did not find support for the interaction of extraversion and neuroticism over main effects for managerial performance. Yost (2014) also failed to find an interactive effect between emotional stability and extraversion in predicting relations-oriented leader effectiveness.

Emotional stability X openness to experience. Burke and Witt (2002) found support for the utility of the interaction between openness to experience and emotional stability in predicting

performance in a small sample of individuals at an international financial services firm (N = 114).

Extraversion X openness to experience. Burke and Witt (2002) also found support for the interaction between openness to experience and extraversion in predicting performance, with the slope for openness to experience in predicting job performance being more pronounced for those higher in extraversion. However, later work by Foster and Macan (2006) did not find any interactive effects that reached statistical significance.

Extraversion X agreeableness. In a study utilizing call center employees, Grant (2013) included the interaction of agreeableness and extraversion in a regression with a large number of other variables and did not find it to be predictive of objective sales revenue. Yost (2014) also failed to find an interactive effect between extraversion and agreeableness in predicting leader effectiveness.

Openness to experience X agreeableness. Burke and Witt (2002) failed to find support for the interaction of openness to experience and agreeableness in predicting performance.

Hypotheses

Due to the comparatively limited research in the area of personality interactions predicting job performance and potential value in supportive results, as well as frequent conflicting findings, further research in this area is warranted. In the current research study, I choose to focus on testing four trait by trait interactions that are theoretically driven and, in some cases, attempt to replicate previous research in which mixed findings were found in regards to the significance of considering specific trait interactions.

Extraversion X agreeableness hypothesis. The limited past research into the interaction of agreeableness and extraversion in predicting job performance is interesting, as these FFM

traits both represent traits that are socially-oriented (McCrae & Costa, 1989). The author could only locate two studies in which this interaction was explored (Grant, 2013; Yost, 2014). Within these studies, the exploration into the utility of this interaction is limited by relatively small sample sizes and by utilizing only one sample within one specific organization consisting of one position type and one personality measure (Grant, 2013; Yost, 2014).

As these traits are both socially-oriented, it would be reasonable to put forward the idea that considering these traits in isolation may neglect the interactive effects that may take place between them. In reference to extraversion and agreeableness, McCrae and Costa (1989), suggest that, "These two appear to determine directly the amount of social simulation preferred and prevailing quality of social interaction" (p .586). If extraversion is considered a trait that determines desire for social interaction and agreeableness can be a determinate of interaction quality, considering these traits in isolation may paint an incomplete picture of an individual's predicted behavior.

Work by Barrick and colleagues (2001) suggests considerable moderators at work in the relationship between extraversion and job performance based on the range of the 90% credibility interval found (-.07 to .32) within their synthesis of eight meta-analyses on the topic. I put forward the idea that agreeableness is a substantial moderator for the relationship between extraversion and job performance, partially leading to this wide credibility interval. Due to the generally positive association between agreeableness and job performance and extraversion and job performance (though not always significant) (Barrick et al., 2001), I believe that an interaction between the traits will have a synergistic effect and will be positively related to job performance as well. Thus, I hypothesize that:

H1: Agreeableness will moderate the relationship between extraversion and job performance, in that higher levels of agreeableness will lead to a stronger positive relationship between extraversion and overall job performance.

Conscientiousness X agreeableness hypothesis. One personality trait by trait interaction that has elicited more attention in its relationship with performance is the interaction of conscientiousness and agreeableness. However, mixed results have been found. Some studies show a significant interaction between conscientiousness and agreeableness in the prediction of performance (e.g. Guay et al., 2013; Witt et al., 2002), while some research has not found a significant interaction (e.g. Burke & Witt, 2004; Judge & Erez, 2007; Warr et al., 2005; Witt et al., 2002; Yost, 2014). One limitation of the past research is its reliance on somewhat modest sample sizes. For example, in Witt et al., (2002) none of the seven samples utilized were larger than 400 individuals. The largest sample included in Warr et al., (2005) included 119 individuals. Given the generally large sample sizes required to find statistically significant interactions (Champoux & Peters, 1987), future research with adequate power is needed to clear up these mixed results.

Witt and colleagues (2002) argue that agreeableness interacts with conscientiousness to predict performance in that individuals who are highly conscientious but lack social skills, as evidenced through low agreeableness, may not experience the full benefits of being a conscientious worker. For example, "…without the tendency to be cooperative, considerate, and trusting (i.e. low in agreeableness), conscientiousness will likely add little to performance." (p. 165). I agree with this logic, in that an individual who is highly conscientiousness but disagreeable may lack the interpersonal skills necessary to be effective, despite their high

conscientiousness. Based on this rationale, and in order to clarify the past mixed results of the relationship between this interaction and performance, I hypothesis that:

H2: Agreeableness will moderate the relationship between conscientiousness and job performance, in that higher levels of agreeableness will lead to a stronger positive relationship between conscientiousness and overall job performance.

Conscientiousness X extraversion hypothesis. Another interaction that may be relevant to consider in the prediction of performance, as described in the introduction of this paper, is the interaction between conscientiousness and extraversion. Some past research has been done on this interaction and its relationship with performance, but again results have been mixed (e.g. Warr et al., 2005; Witt, 2002; Yost, 2014). Again, these past studies have been afflicted with limited sample size which may explain inconsistent results.

As previously discussed, having a high degree of extraversion with a low degree of conscientiousness may lead to an individual being disruptive to the workflow of an organization, through non-organizationally relevant social interaction with peers. However, a highly extraverted and conscientious individual may harness this extraversion in a positive way and focus this energy and social needs towards building effective customer and coworker relationships. Witt (2002) provides a similar argument, that being high in either conscientiousness or extraversion does not lead to as high of performance as one would attain if an individual was high in both. For instance, Witt (2002) argues that high conscientious, low extraversion individuals may be task focused to the neglect of the person-oriented aspect of performance, and come off as cautious, prudish, reserved, and serious. A highly extraverted, but low conscientiousness individual may be boisterous, impulse-ridden, and unruly (Witt, 2002), which would clearly have a negative impact on performance. However, an individual who is

highly conscientious and highly extraverted may thrive as a persistent, purposeful, and vigorous employee (Witt, 2002). By neglecting interactive effects between conscientiousness and extraversion, accurate prediction of employee performance may be limited since synergistic effects would be missed. Based on this rationale, and in order to clarify past mixed findings, I hypothesize that:

H3: Conscientiousness will moderate the relationship between extraversion and job performance, in that higher levels of conscientiousness will lead to a stronger positive relationship between extraversion and overall job performance.

Conscientiousness X emotional stability hypothesis. As main effects, conscientiousness and emotional stability have been found to consistently and significantly predict job performance (Barrick & Mount, 1991; Barrick et al., 2005). Some past research has also explored interactive effects between conscientiousness and emotional stability (or reverse coded as neuroticism) and job performance (Teng & Liu, 2014; Warr et al., 2005; Yost, 2014). Again, mixed results have been found with some research indicating a significant relationship (e.g. Teng & Liu, 2014) and some research indicating a non-significant relationship (e.g. Warr et al., 2005; Yost, 2014). Again, limited sample size is an issue in this past research (e.g. N = 133 :Teng & Liu, 2014).

Conscientiousness has generally shown the strongest relationship with job performance out of all the Five Factor Model variables (Barrick et al., 2005). However, utilizing an individual's level of conscientiousness to predict job performance without considering their level of emotional stability in tandem may lead to inaccurate conclusions being drawn. Conscientious individuals may be seen as thorough and planful, with has clear implications for job performance. However, a high degree of neuroticism, or in other words a low degree of

emotional stability, may hinder the positive attributes associated with high conscientiousness. A highly conscientious individual may thoroughly check his or her work, where a highly neurotic and highly conscientious individual may obsess over word choice or sentence structure to the point where performance suffers. A highly conscientious individual may plan for the future, where a highly neurotic and conscientious individual may, due to anxiety and rigidness, be unable to adapt effectively if these plans need to change. Based on this rationale, I believe that individuals with a low degree of emotional stability may see less positive performance resulting from a high level of conscientiousness as opposed to if the individual was also highly emotionally stable. Thus, I hypothesis that:

H4: Emotional stability will moderate the relationship between conscientiousness and job performance, in that higher levels of emotional stability will lead to a stronger positive relationship between conscientiousness and overall job performance.

It should be noted that, as the paper progresses, additional hypotheses have been declared for the interaction of agreeableness and extraversion in regards to lower level (i.e. facet) interactions, occupational moderators of the interaction's importance, and differential relationships with a subset of criteria. It would be beyond the scope of this paper to do so with all trait by trait interactions discussed above, as the resulting paper would become exceptionally unruly. For the sake of clarity and focus, the remaining hypotheses of this paper focus on a deep dive into the interaction on extraversion and agreeableness. This interaction was chosen, as opposed to others, due to the especially deficient prior body of research on this particular interaction and the especially strong theoretical rationale for this interaction (McCrae & Costa, 1989).

Lower Level Conceptualizations of Personality.

Higher level conceptualizations of personality, such as the factors in the FFM, have largely dominated personality research in organizational sciences. However, there have been calls to explore the validity of personality in predicting organizationally relevant outcomes utilizing a narrower conceptualization of personality (Barrick & Mount, 2005; Schneider, Hough, & Dunnette, 1996). Utilizing a finer grain of personality variables may be more useful than the use of broad factors in predicting outcomes. As noted by Barrick and Mount (2005), "Representing personality with narrow subcomponents makes the finer features of each trait more explicit and narrows the range of behaviors represented so they are more similar, which enhances the diagnostic value and offers higher fidelity (predictive accuracy) for specific sets of behaviors" (p. 367).

Indeed some research does support the utility of considering lower-level personality variables in the prediction of job performance, compared to broader Five Factor Model traits (Ashton, 1998; Dudley, Orvis, Lebiecki, & Cortina, 2006; Judge, Rodell, Klinger, Simon, & Crawford, 2013). Roberts and colleagues (2005) demonstrated the usefulness of lower-level personality variables by showing that facets of conscientiousness were more strongly related to drug use, work dedication, and preventative health behaviors than trait level conscientiousness. Roberts and colleagues (2005) conclude that, "…employers who desire better predictive validity should focus on facets." (p. 134).

One reason why narrower personality variables may be more predictive than higher order factors in some cases, as noted by Barrick and Mount (2005), is that with the use of higher order factors, components within these large factors that may not be related to an outcome or related in opposite direction as other components of the trait. If this is the case, these unrelated or

oppositely related components within the trait may mute the relationship between other related components of the trait and the outcome being explored. Tett and colleagues (2005) found this when comparing the relationship between broad personality and performance variables to the relationship between more narrow personality and performance variables. Regarding the results, Tett and colleagues (2005) note that, "…several instances of cancellation were observed, where specific measures related in opposite directions within a general measure." (p. 353). They conclude that, "Reliance on broad constructs alone thus impedes detection of meaningful and practical diagnostic information linking personality and work behavior." (p. 353) and "use of broad, complex measures, although convenient, runs the risk of masking meaningful and exploitable relations at more specific levels." (p. 354-355). The use of narrower variables allows the removal of this "noise" in a suggested relationship between personality and an outcome by only focusing on a narrower slice of personality thought to be predictive of an outcome.

Interactions Between Lower Level Personality Variables.

A similar logic can be applied to the use of narrow variable interactions in the prediction of organizational outcomes. Though trait by trait interactions may be useful in the prediction of criteria, the traits conceptualized in the Five Factor Model are quite broad and may contain aspects that would not interact meaningfully in predicting an outcome such as job performance. By removing what is essentially noise in the interaction, generated by the broadness of the FFM factors, we may be able to prevent the predictive validity of the interaction from being muted.

Indeed, some past research has demonstrated the usefulness of considering narrower personality variable interactions in the prediction of performance. Research by Robie and colleagues (2005) demonstrated the usefulness of an interaction of an extraversion facet, competitiveness, and an agreeableness facet, interdependence, in the prediction of objective sales

performance when controlling for general mental ability and gender. This interaction was significant, despite a modest sample size (N = 133) (Robie et al., 2005). Unfortunately, a comparison was not made between the interaction of these facets and the interaction of the broader traits of which they relate in regards to their validity in predicting performance. Warr and colleagues (2005) also explored the validity of facet by facet interactions in predicting objective sales performance. However, Warr and colleagues (2005) did not find support for the interaction of achievement orientation (a facet of conscientiousness) and extraversion facets (potency and affiliation) in predicting objective sales performance.

Lower level personality interaction hypotheses. If the validity of narrow personality variable interactions in the prediction of job performance is going to be explored, a taxonomy of the FFM with lower level variables must be chosen to utilize for this exploration, as many exist (HPI, OPQ, NEO PI-R, etc.). For the purposes of this study, I choose to utilize the structure put forward by DeYoung and colleagues (2007). This framework, based on factor analytic explorations of Big Five measures, consists of ten lower level variables which DeYoung et al. (2007) calls aspects, with two aspects per Big Five factor. Within this taxonomy, neuroticism consists of volatility and withdrawal, extraversion consists of enthusiasm and assertiveness, agreeableness consists of compassion and politeness, openness consists of intellect and openness, and conscientiousness consists of industriousness and orderliness. Previous meta-analytic research has demonstrated significant relationships between DeYoung and colleagues' (2007) aspects and job performance (Judge et al., 2013).

Based on the DeYoung et al. (2007) taxonomic structure, I argue that the assertiveness aspect of extraversion and the politeness aspect of agreeableness interact in a meaningful way in the prediction of job performance. Assertiveness is related to a tendency to take charge, an

ability to influence others, act as a leader, and be expressive of opinions. Politeness is related to a tendency to respect authority, avoid conflict, and avoid pressuring other people. It is worth noting these two aspects are negatively correlated (r = -.37) (DeYoung et al., 2007). I argue that the influence of an individual's assertiveness on job performance is dependent on the individual's level of politeness. More specifically, an individual who is both high in assertiveness and high on politeness will display higher performance than an individual who is equally high on assertiveness but low on politeness. An individual who is high on assertiveness may be more likely to be decisive, persuasive, and act as a leader. If an individual is also high on politeness, these behaviors can result in positive job performance through increased effectiveness in these assertive behaviors and interpersonal relationships. If an individual who is equally high on assertiveness is low on politeness, these behaviors could result in damaged relationships and ineffective performance as an employee due to low quality assertive behaviors.

Based on this rationale, I hypothesize that:

H5: Politeness will moderate the relationship between assertiveness and overall job performance, in that the relationship between assertiveness and performance will be higher for individuals higher in politeness.

Based on the rationale that focusing on lower-level variables may remove "noise" in interactions, the validity of aspect by aspect interactions may be higher than the validity of trait by trait interactions in the prediction of job performance. Traits in the Five Factor Model represent large "buckets" of behavioral tendencies, some of which may not influence the effectiveness and expression of other behavioral tendencies. In removing these non-interactive behavioral tendencies from the interaction, the interaction of what is left may be more useful in the prediction of job performance. Unfortunately, the author could not locate any studies in

which the validity of lower-level personality variable interactions is compared to the validity of trait by trait interactions in the prediction of performance. This comparison is important, and research in this area is warranted, to determine if interactions at the lower level are worth considering over broader trait level interactions. Based on the rationale discussed, I hypothesize that:

H6: The validity of the interaction between assertiveness and politeness aspects for predicting overall job performance will be greater than the interaction between extraversion and agreeableness for predicting overall job performance.

The Effect of Context on Personality Trait Validity

Though personality has been shown to predict job performance across job types the predictive validity of personality has been shown to vary across jobs (Barrick & Mount, 1991; Barrick et al., 2001). Trait activation theory (Judge & Zapata, 2015; Tett & Burnett, 2003) has been put forward to explain this difference in relevance for personality variables across different job types based on the idea that the predictive validity of a personality trait for performance depends on the demands of the job that is being examined. In other words, trait activation theory states that, "…whether a trait predicts performance depends on the context…" (p. 1152). Judge and Zapata (2015) demonstrate meta-analytic support for this theory. The extraversion-job performance relationship was shown to be stronger in jobs that require social skills, competition, and dealing with unpleasant or angry people. The agreeableness-job performance relationship was shown to be stronger in job contexts requiring social skills and dealing with unpleasant or angry people, while weaker in job contexts where a stronger level of competition was required (Judge & Zapata, 2015).

Job context and personality variable interactions. Just as trait activation theory states that the validity for main effects of personality variables can depend on the job which is being examined, I hypothesize that the importance of interactions between personality variables can depend on the job being examined as well. The interaction between two personality traits may be more important in the prediction of job performance when examining one job type than another. Indeed, Witt and colleagues (2002) speculated that for the two samples in which they did not find a significant interaction between extraversion and conscientiousness in predicting performance, it was due to job characteristics in these samples. Agreeableness, openness to experience, and extraversion have specifically been noted as being more susceptible to the contextual effects of the job than conscientiousness and emotional stability/neuroticism (Barrick & Mount, 2005).

Personality variable interaction and job characteristics hypotheses. Utilizing trait activation theory, I hypothesize that certain job characteristics effect the validity of personality variable interactions as they would the validity of a trait for the prediction of job performance. As previous noted, Judge and Zapata (2015) found that high social skills requirements, dealing with unpleasant or angry people, and high levels of competition moderated the validity of extraversion and agreeableness in predicting job performance. I hypothesize that these moderating effects carry over to the interaction of these traits, in that:

H7: The moderating effect of agreeableness on the relationship between extraversion and overall job performance for individuals in occupations with a high social skills requirement will be greater than the moderating effect for individuals in occupations with a low social skills requirement.

H8: The moderating effect of agreeableness on the relationship between extraversion and overall job performance for individuals in occupations with a high degree of dealing with unpleasant or angry people will be greater than the moderating effect for individuals in occupations with a low degree of dealing with unpleasant or angry people.

Although Judge and Zapata (2015) found that both a high social skills requirement and a high requirement for dealing with unpleasant or angry people lead to higher validity for both agreeableness and extraversion in the prediction of job performance, level of competition exhibited differential moderating effects. Specifically, a high level of competition within an occupation led to higher predictive validity for extraversion but lower predictive validity for agreeableness in predicting job performance. Due to this, the resulting effect on the interaction of these traits for predicting job performance is ambiguous. Thus, I do not put forward a hypothesis, but instead articulate a research question:

Research Question 1: Will the moderating effect of agreeableness on the relationship between extraversion and overall job performance for individuals in occupations with a high level of competition significantly differ from the moderating effect for individuals in occupations with a low level of competition?

It should be noted that although Judge and Zapata (2015) found that attention to detail also differentially moderated the relationship between agreeableness and extraversion, with the relationship between extraversion and job performance weakened and the relationship between agreeableness strengthened, I do not put forward a hypothesis or research question for the effect of attention to detail as this relationship is less theoretically based. Agreeableness and extraversion are both interpersonally oriented traits (McCrae & Costa, 1989), and social skills, dealing with unpleasant or angry people, and level of competition are inherently interpersonally

oriented aspects of an occupation. Requirements for attention to detail are not clearly interpersonal in nature. Thus, I do not explore the effect of this contextual factor on the validity of the interaction of agreeableness and extraversion in predicting job performance.

Utilizing similar rationale as above, I hypothesize the interaction between the agreeableness aspect politeness and the extraversion aspect assertiveness will be more predictive in occupations with high social skills requirements and high requirements of dealing with unpleasant or angry people, and put forward a research question regarding the effect of level of competition on this interaction:

H9: The moderating effect of politeness on the relationship between assertiveness and overall job performance for individuals in occupations with a high social skills requirement will be greater than the moderating effect for individuals in occupations with a low social skills requirement.

H10: The moderating effect of politeness on the relationship between assertiveness and overall job performance for individuals in occupations with a high degree of dealing with unpleasant or angry people will be greater than the moderating effect for individuals in occupations with a low degree of dealing with unpleasant or angry people.

Research Question 2: Will the moderating effect of politeness on the relationship between assertiveness and overall job performance for individuals in occupations with a high level of competition significantly differ from the moderating effect for individuals in occupations with a low level of competition?

Job Performance Criteria Level of Specificity

Though general or overall job performance is often the criterion used in studying personality in the workplace, job performance can be considered multidimensional (see

Campbell & Wiernik, 2015 for a review). In reference to overall job performance, "…the bandwidth of this criterion may be too broad to be used efficiently with most personality measures." (Hogan & Roberts, 1996, p. 631). Evidence suggests that moving from general job performance to more specific and theory-driven criterion-trait pairing can lead to higher predictive validity for personality (Hogan & Holland, 2003). Results presented by Tett and colleagues (2003) support this idea as well, with some facets of performance better predicted by personality than overall performance.

Personality variable interactions and criteria specificity hypotheses. I put forward the idea that matching trait interactions to more specific and theory-driven criteria can lead to higher predictive validity than for general job performance, in a similar vein as matching main effects to more specific job performance facets. Previous research has shown trait interactions to be predictive of more specific job performance criteria other than general job performance, such as organizational citizenship behaviors (e.g. Guay et al., 2013; King, George, & Hebl, 2005) and counterproductive work behaviors (e.g. Jensen & Patel, 2011).

Extraversion and agreeableness can be considered interpersonally-oriented traits in the Five Factor Model framework (McCrae & Costa, 1989). Previously, I theorized that the interaction between these two interpersonal traits can influence overall job performance. However, due to the interpersonal nature of the variables, I hypothesize that the interaction will be more predictive of specific interpersonally-oriented aspects of job performance than for general job performance. Thus:

H11: The relationship between extraversion and interpersonally-oriented job performance will be moderated by agreeableness, in that higher levels of agreeableness will lead to a stronger positive relationship between extraversion and interpersonally-oriented job performance.

H12: The interaction of extraversion and agreeableness will be more predictive of interpersonally-oriented job performance than overall job performance.

Matching more specific criteria to more specific, narrower conceptualizations of personality than FFM traits may enhance predictive validity. Tett and colleagues (2005) also provide support for this, demonstrating that more narrow conceptualizations of personality can be more predictive of narrow criteria than broader conceptualizations. Thus:

H13: The relationship between assertiveness and interpersonally-oriented job performance will be moderated by politeness, in that higher levels of politeness will lead to a stronger positive relationship between assertiveness and interpersonally-oriented job performance.

H14: The interaction of assertiveness and politeness will be more predictive of interpersonally-oriented job performance than the interaction of extraversion and agreeableness.

Summary

There has been some research on the utility of personality variable interactions in predicting performance but a detailed exploration of their utility is missing and deeply needed. The present study provides this, by utilizing a rich sample of data and integrating recent developments in personality psychology to determine if there is utility in considering interactions in predicting performance. By considering trait by trait interactions based in theory and/or displaying mixed support in previous studies, an aspect by aspect interaction, comparing the validity of these interactions in predicting performance, exploring the effects of job context on this relationship, and exploring the predictive validity for a more specific facet of job performance, the present study seeks to illuminate this potentially fruitful area of research.

METHOD

Sample

For this study, secondary data was provided by two organizations that administer personality assessments to external clients. Seven samples representing twenty-two organizations were combined for analyses to test hypotheses and research questions put forward

Sample 1. Sample one consisted of managers from a global food and beverage retailer (N = 1258). These individuals were administered the ADEPT-15 personality assessment and supervisory performance ratings were collected for these individuals. These individuals were primarily female (59%), white (64.3%), and between the ages of 30 to 39 (35.5%).

Sample 2. Sample two consisted of non-managerial staff from the same global food and beverage retailer as Sample 1 (N = 693). These individuals were administered the ADEPT-15 personality assessment and supervisory performance ratings were collected for these individuals. These individuals were primarily female (66.1%) and white (49.9%). Age information was not available for this sample.

Sample 3. Sample three consisted of front-line, customer service, warehouse, and managerial employees from a US-based merchandise retailer (N = 1993). These individuals were administered the ADEPT-15 personality assessment and supervisory performance ratings were collected for these individuals. These individuals were primarily female (48.9%) and white (49.1%), with an average age of 41.32 years (SD = 15.97).

Sample 4. Sample four consisted of front-line sales, customer service, warehouse, and managerial employees from a US and Canada-based merchandise retailer (N = 4299). However, only a subset of these individuals were administered a personality assessment, so only 2,818 individuals were usable for the purposes of this study. Individuals were administered the

ADEPT-15 personality assessment and supervisory performance ratings were collected for these individuals. These remaining individuals were primarily female (57.9%) and white (60.1%), with an average age of 39.36 years (SD = 13.24).

Sample 5. Sample five consisted of individuals in sales, production, and support services positions in a global technology consulting and sales organization (N = 1458). Individuals were administered the ADEPT-15 personality assessment and supervisory performance ratings were collected for these individuals. These individuals were primarily from Brazil (18.3%), Mexico (16.9%), and the Philippines (15.0%) and male (54.4%). The average age for individuals in this sample with age data was 31.78 years (SD = 7.41). Race/ethnicity information was not available for this sample.

Sample 6. Sample six consisted of individuals in call center customer service roles at a global insurance organization (N = 463). Individuals were administered the ADEPT-15 personality assessment and supervisory performance ratings were collected for these individuals. Though a considerable number of individuals had missing race/ethnicity information (30.5%), individuals were primarily white (30.2%) or Black/African American (27.2%) and primarily female (72.1%). The average age of individuals in this sample was 40.23 years (SD = 12.11).

Sample 7. Sample seven consisted of individuals from seventeen organizations, though a large number came from a large healthcare system (~70%). Information on the organizations beyond this is unavailable. Individuals were administered the WorkKeys Talent Assessment and supervisory performance ratings for these individuals were collected via a standardized form across organizations and occupations. Though for a number of individuals gender (23.8%) or race/ethnicity (23.8%) was unavailable, the sample was primarily female (63.5%) and white (57.5%). Age information was not available for this sample.

Summary. These datasets were combined (see below for details) and the resulting sample consisted of 10,428 individuals representing 210 O*NET occupations and twenty-two organizations. See Table 1 for N per O*NET occupation (details on categorizing below) and Table 2 displays N per company. N per occupation ranged from 1 to 768, and N per organization ranged from 1 to 2,818. 8,683 individuals (83.3%) were administered the ADEPT-15 personality inventory and 1,745 (16.7%) were administered the WorkKeys Talent Assessment personality inventory.

Measures

Personality scales. Two personality inventories were utilized in the current study, the ADEPT-15 personality assessment and the WorkKeys Talent Assessment.

ADEPT-15. The ADEPT-15, or Adaptive Employee Personality Test, is a computer adaptive personality test that utilizes an ideal-point model. The assessment also utilizes a forced-choice based multi-unidimensional pairwise preference model (MUPP) in which individuals taking the assessment are presented with a choice to endorse two statements and must choose one. This assessment consists of fifteen personality dimensions: conceptual, flexibility, mastery, structure, drive, assertiveness, liveliness, sensitivity, cooperation, humility, composure, positivity, awareness, ambition, and power. See Table 3 for more information on the ADEPT-15 dimensions (Boyce, Conway, & Caputo, 2015).

WorkKeys Talent Assessment. The WorkKeys Talent assessment is a 165 item internet administered personality assessment based on the Five Factor Model of personality and emotional intelligence literature. Items are presented on a six-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree" (ACT, 2016). The assessment consists of twelve dimensions: carefulness, discipline, order, stability, optimism, cooperation, goodwill, sociability,

influence, striving, creativity, and savvy. The assessment also consists of four compound scales, consisting of elements from different constructs. These are teamwork, work discipline, managerial potential, and customer service orientation (ACT, 2016). See Table 4 for more information on the WorkKeys Talent dimensions.

Utilization of personality assessment data. The ADEPT-15 and WorkKeys Talent assessments are both aspect-based personality assessment, and neither assessment measures personality at the FFM level. However, scales from both assessments map onto the FFM variables (see Tables 5 for relationships between ADEPT-15 and WorkKeys Talent variables and FFM variables). Based on information from each assessment's respective technical manual, proxies for each FFM variables were created by combining aspects that map onto their respective traits, as outlined in Table 5.

Information from each assessment's technical manual was utilized in order to determine which aspects best represent DeYoung and colleagues' (2007) aspects of assertiveness and politeness. Research presented in the ADEPT-15 technical manual (Boyce et al., 2015) indicates that the dimension of assertiveness is related to the DeYoung and colleagues (2007) conceptualization of assertiveness and the cooperativeness dimension is related to DeYoung and colleagues' (2007) aspect of politeness. Thus, these measures from the ADEPT-15 were used in analyses pertaining to politeness and assertiveness aspects for individuals who took the ADEPT-15 personality assessment. For the WorkKeys Talent assessment, cooperation, defined as "the tendency to be likeable and cordial in interpersonal situations" and influence, defined as "the tendency to impact and dominate social situations by speaking without hesitation and often becoming a group leader" (ACT, 2016, p. 5) closely relate to DeYoung and colleagues' (2007) conceptualizations of politeness and assertiveness. Thus, cooperation and influence were used in

analyses pertaining to politeness and assertiveness aspects for individuals who took the WorkKeys Talent assessment.

Job Characteristics. Within this study, jobs were categorized according to the O*NET classification system. Individuals from Sample 1-6 reported job titles (or general job category in the case of Sample 5), and this information was categorized into O*NET job codes by two organizational psychology graduate students independently. Initial agreement regarding categorization at the job level was relatively low at 36.8% agreement. However, agreement at the job family level (e.g. 17 – Architecture and Engineering, 23 – Legal, etc.) was higher at 56.1%. The two raters met and were able to resolve all differences in coding after discussion. The coders additionally chose to revise some of their previous coding after further consideration and discussion, feeling other codes may be more accurate representations of job titles. For Sample 7, individuals were asked to self-identify their O*NET occupation. See Table 1 for N per O*NET occupational code.

Based on this O*NET categorization, job analytic information from O*NET was utilized to determine social skills requirements, requirements for dealing with unpleasant or angry people, and level for competition for each occupation in our sample. O*NET ratings of contact with others[1], dealing with unpleasant or angry people, and level of competition were used to quantify social skills requirement, requirements for dealing with unpleasant or angry people, and level of competition, respectively. Note that this approach of utilizing O*NET job analytic information was utilized by Judge and Zapata (2015). These scales range from 0 to 100, with higher scores indicating higher degrees of that characteristic (e.g. higher levels of competition).

[1] Note that Judge & Zapata (2015) used a different operationalization of the social skills job characteristic based on O*NET information

Job Performance. Supervisory job performance ratings were utilized as the criteria for the present analyses. Datasets 1 – 6 had job performance ratings unique to the organization. Overall job performance ratings were computed by combining individual job rating items into a unit-weighted composite. Objective job performance information, questions directly assessing objective performance criteria (e.g. Is this individual meeting their sales quota?), likelihood of rehire ratings, ratings of advancement potential, items specifically tapping counterproductive work behaviors (e.g. stealing, breaking rules, etc.), relative performance ratings (e.g. ratings compared to others), and items explicitly targeting overall performance were not included in this performance composite. These items were not included because they were not present in all datasets and/or targeted a specific facet of performance that seemed distinct from aspects of performance targeted by other items. In the cases where including a specific item that only a subset of individuals were asked in the composite would substantially reduce the N within a dataset with the composite rating (due to listwise deletion in analyses), this item was excluded from the composite.

Sample 7 utilized standardized performance rating scales across companies and occupations tapping core, compliance, adaptive, and interpersonal performance. Ratings on each subscale were combined to create an overall performance composite. One subscale was not included in either the overall or interpersonally oriented performance composite, as recommended by the organization providing the data.

Alphas for the overall performance composites were calculated within datasets prior to aggregation and ranged from .94 to .96.

Interpersonal Performance. For all samples, an interpersonal performance composite was created by forming a unit-weighted composite from a subset of performance ratings from the

overall performance composite that were judged by two graduate organizational psychology raters as being interpersonal in nature. The definition for interpersonal performance was based on an interpersonal performance measure utilized in Barrick, Parks, and Mount (2005). Barrick et al., (2005) describe the four items utilized in the measure as follows, "'interpersonal skills: builds and maintains rapport and productive relationships, demonstrates strong interpersonal skills when interacting with others'; 'cooperation: assists and helps others, works cooperatively with other coworkers to achieve group/team goals, maintains focus on group/team goals, facilitates workgroup interactions'; 'communication: communicates skillfully both in written and oral communications, tailors communication to the audience to facilitate understanding, actively listens and responds appropriately in discussions, presents one's self effectively (e.g., nonverbal behaviors, making presentations to others)'; 'customer service orientation: attends to customer needs and requests, listens to customers in order to understand needs and determine how they can be met, works to fill customer needs.'" (p. 754). Both graduate student raters used this characterization of interpersonal performance as a guideline, and independently coded all dependent variables in each dataset as interpersonal or not interpersonal. Agreement between raters was 83.8%, with all discrepancies resolved following discussion. Note that much of disagreement resulted from differing views as to how much a criterion must include interpersonal aspects to be distinguished as interpersonal in nature. One rater coded criteria as interpersonal if it had any interpersonal aspect described above, while the other coded a criterion as interpersonal if it was a substantial component of the performance rating. The coders decided, after discussion, that to be coded as an interpersonal performance rating the rating must at least be moderately interpersonal in nature but may contain some aspects of other performance as

well. Alphas for the interpersonal performance composites were calculated within datasets prior to aggregation and ranged from .76 to .94.

Dataset Preparation

In order for all seven datasets to be combined, substantial preparation was required. First, all datasets utilizing the ADEPT-15 inventory were prepped and combined. Within each dataset, ADEPT-15 aspects were aggregated to create FFM proxies and performance ratings were aggregated to create an overall and interpersonal performance composite. These performance composites were then standardized within datasets. The ADEPT-15 datasets were then combined and the FFM proxies and ADEPT-15 aspects representing assertiveness and politeness were standardized within this larger dataset. Within the WorkKeys Talent dataset (Sample 7), FFM proxies were created by aggregating WorkKeys Talent aspects, overall and interpersonal performance composites were created, personality variables (FFM proxies and WorkKeys Talent measures representing assertiveness and politeness), and criteria measures were standardized within this dataset. The aggregated ADEPT-15 and WorkKeys Talent datasets were then combined. Since these data were standardized prior to combination, the variables should be on the same scale and thus comparable. To further ensure no differences existed in focal variables across measures, t-tests were conducted on the personality and performance variables utilized in later analyses. No significant mean differences were found across measures for standardized focal variables ($p < .10$).Variables indicating which measure was utilized for an individual, job titles from the ADEPT-15 datasets, O*NET self-ratings from the WorkKeys Talent dataset, numeric variables representing original dataset, and a variable indicating which company an individual belongs to were retained in addition to personality and performance rating variables. To get O*NET codes for the ADEPT-15 data, a dataset representing the final categorization of

job titles into O*NET codes from graduate student raters was merged onto the job title variable, and these resulting O*NET codes for the ADEPT-15 cases were combined into a column with the self-rated WorkKeys Talent individuals' categorization. Job analytic information from O*NET regarding degree of contact with others, degree of dealing with unpleasant or angry people, and level of competition for each occupation was then merged onto the combined dataset.

RESULTS

Intercorrelations for variables at the individual level are available in Table 6 and means, standard deviations, and intercorrelations for occupational level variables (i.e. O*NET information) are available in Table 7. Since individuals in the dataset are nested within occupations and companies, ICCs were calculated to determine if multilevel analyses would be necessary to account for this nesting. See Table 8 for a summary of ICC1 and ICC2 values for individual level variables within this study. ICC values were generally low, with all ICC1 values falling below .05. Thus, when examining only individual level variables multilevel analyses were not necessary. Note that since predictors at the individual level were standardized, these variables were not centered prior to analyses. Occupational level variables were grand mean centered, utilizing the mean of these values when aggregated to the job level, prior to analyses. Individual level analyses were conducted utilizing SPSS Version 24, while multilevel analyses were conducted utilizing R Version 3.3.3 and the Multilevel R package (see Bliese, 2016).

Individual Level Analyses

Hypotheses 1 through 5 were tested utilizing moderated linear regression, with the main effects entered in step 1 and the interaction of these variables entered in step 2. See Table 9 for the results of these analyses. Hypothesis 1 suggested agreeableness moderated the relationship between extraversion and overall job performance. Agreeableness did not significantly moderate the relationship between extraversion and overall job performance (β = .01, t(9239) = .686, p > .10), thus Hypothesis 1 was not supported. Hypothesis 2 suggested agreeableness moderated the relationship between conscientiousness and overall job performance. Agreeableness did not significantly moderate the relationship between conscientiousness and job performance (β = -.01, t(9239) = -.814, p > .10), thus Hypothesis 2 was not supported. Hypothesis 3 suggested

conscientiousness moderating the relationship between extraversion and job performance. Conscientiousness did not significantly moderate the relationship between extraversion and job performance (β = -.02, t(9239) = -1.67, p > .05), thus Hypothesis 3 was not supported. Hypothesis 4 suggested emotional stability moderated the relationship between conscientiousness and job performance. Emotional stability significantly moderated the relationship between conscientiousness and job performance (β = -.03, t(9239) = -2.48, p < .05). See Figure 1 for this interaction plotted. However, it should be noted that this interaction is in the opposite direction than predicted, so Hypothesis 4 was not supported. More specifically, I hypothesized a steeper slope for conscientiousness for those high in emotional stability, but found a steeper slope for conscientiousness for those low in emotional stability.

Hypothesis 5 suggested that politeness will moderate the relationship between assertiveness and overall job performance. Politeness did not significantly moderate the relationship between assertiveness and overall job performance (β = .00, t(9239) = .381, p > .10), thus Hypothesis 5 was not supported.

Hypothesis 6 suggested that the validity of the interaction of assertiveness and politeness for predicting overall job performance will be greater than the interaction between extraversion and agreeableness for predicting overall job performance. Since neither of these relationships were significant, and thus can be interpreted as null relationships, Hypothesis 6 was not supported.

Hypothesis 11 and Hypothesis 13 were tested utilizing moderated linear regression, with the main effects entered in step 1 and the interaction of these variables entered in step 2. See Table 10 for the results of these analyses. Hypothesis 11 suggested that agreeableness will moderate the relationship between extraversion and interpersonal job performance.

Agreeableness did not significantly moderate the relationship between extraversion and interpersonal job performance (β = .00, t(9870) = .455, p > .10), thus Hypothesis 11 was not supported. Hypothesis 13 suggested that politeness will moderate the relationship between assertiveness and interpersonal job performance. Politeness did not significantly moderate the relationship between assertiveness and interpersonal job performance (β = .00, t(9871) = .489, p > .10), thus Hypothesis 13 was not supported.

Hypothesis 12 suggested that the interaction of extraversion and agreeableness will be more predictive of interpersonal performance than overall job performance. Since neither of these interactions were significant, and thus can be interpreted as null relationships, this Hypothesis was not supported.

Hypothesis 14 suggested that the interaction of assertiveness and politeness will be more predictive of interpersonal performance than the interaction between extraversion and agreeableness. Since neither of these interactions were significant, and thus can be interpreted as null relationships, Hypothesis 14 was not supported.

Multilevel Analyses

Hypotheses 7 through 10, along with Research Questions 1 and 2, were tested utilizing moderated multilevel regression with cross-level moderation and random intercepts by O*NET occupation code. Within these models, three-way interactions were included with two-way interactions among variables and main effects. See Table 11 for the results of these analyses.

Hypothesis 7 suggested a three-way interaction between agreeableness, extraversion, and social skill requirements for an occupation. There was no significant three-way interaction among these variables (b = .00, t(8516) = .159, p > .10), thus Hypothesis 7 was not supported. Hypothesis 8 suggested a three-way interaction between agreeableness, extraversion, and dealing

with unpleasant or angry people for an occupation. There was no significant three-way interaction among these variables (b = .00, t(8516) = -.114, p > .10), thus Hypothesis 8 was not supported. Research Question 1 put forward the question of a three-way interaction between agreeableness, extraversion, and level of competition in an occupation. There was a significant three-way interaction among these variables (b = .00, t(8516) = 2.198, p < .05). See Figure 2 for this interaction plotted. The relationship between agreeableness and performance is positive for individuals high in extraversion and negative for individuals who are low in extraversion, with these relationships being stronger in occupations with a high level of competition.

Hypothesis 9 suggested a three-way interaction between assertiveness, politeness, and social skills requirement for an occupation. There was no significant three-way interaction among these variables (b = .00, t(8516) = -.859, p > .10), thus Hypothesis 9 was not supported. Hypothesis 10 suggested a three-way interaction between assertiveness, politeness, and level of dealing with unpleasant or angry people for an occupation. There was no significant three-way interaction among these variables (b = .00, t(8516) = -.447, p > .10), thus Hypothesis 10 was not supported. Research Question 2 put forward the question of a three-way interaction between assertiveness, politeness, and level of competition in an occupation. There was a significant three-way interaction among these variables (b = .00, t(8516) = 2.062, p < .05). See Figure 3 for this interaction plotted. For individuals high in politeness, there was a positive relationship between assertiveness and performance. However, for individuals low in politeness there was essentially no relationship. The moderating effects of politeness on the relationship between assertiveness and overall job performance seems to be stronger in occupations with a high level of competition as compared to occupations with a lower level of competition. See Table 12 for an overall summary of hypotheses and results from this study.

DISCUSSION

The purpose of the present study was to explore the potential utility of personality variable interactions in the prediction of performance. To this end, a large rich dataset of employees across a number of organizations and occupations was utilized to test a number of hypotheses regarding trait by trait interactions, testing an aspect by aspect interaction, comparing the validity of these interactions in predicting performance, exploring how job characteristics may amplify or mute the interaction, and exploring the predictive validity for a more specific facet of job performance. However, I failed to find support for all hypotheses put forward to this end.

Hypothesis 1 through 5 posited interactive effects of personality variables in the prediction of overall job performance. The current study failed to find significant interactive effects in the prediction of overall performance between agreeableness and extraversion (H1), agreeableness and conscientiousness (H2), extraversion and conscientiousness (H3), and politeness and assertiveness (H5). A significant moderating effect was found for emotional stability on the relationship between conscientiousness and overall job performance (H4). However, this effect was in the opposite direction than predicted. Overall, limited support was found for utilizing personality variable interactions in the prediction of overall job performance. Furthermore, support was not found for differences in predictive validity for trait by trait and aspect by aspect interactions (H6/H14).

Hypotheses 8 through 11 and Research Question 1 and 2 posited a moderating effect of job characteristics on the interaction of personality variables in the prediction of overall job performance. In other words, a three-way interaction was tested between personality variables and theoretically determined job characteristics in the prediction of overall job performance. The

current study failed to find support for the hypothesized three-way interactions. However, in exploring Research Question 1 and 2 significant three-way interactions were found between agreeableness, extraversion, and level of competition within an occupation and politeness, assertiveness, and level of competition within an occupation. In both cases, the interactions between the personality variables in the prediction of overall job performance were more pronounced in occupations with a high level of competition.

Hypotheses 11 and 13 posited interactive effects between personality variables in the predictive of interpersonal job performance, but no support was found for these hypotheses. Specifically, the current study failed to find significant interactive effects between extraversion and agreeableness (H11) and assertiveness and politeness (H13) in the prediction of interpersonally-oriented job performance. Significant differences were not found in the predictive validity of these interactions for interpersonally-oriented performance as compared to overall performance (H12).

Taken as a whole, the results of this study find limited support for the conclusion that personality variable interactions can add incrementally above main effects in the prediction of job performance. Though there were some exceptions, these results generally support previous research that found little support for the use of personality variable interactions in predicting performance (e.g. Warr et al., 2005), as opposed to research more supportive of their use (Witt, 2002; Witt et al., 2002). These general conclusions drawn from this study do not seem to change regardless of level of personality variable interaction (i.e. trait vs aspect), job characteristics of the job in question, and measure of performance utilized.

Implications

A number of implications can be derived from the results of the present study, in both theoretical and practical terms.

Theoretical implications. There are a number of theoretical implications from the results of the present study. In terms of trait activation theory (Tett & Burnett, 2003), the present study found limited support for extending this theory to interactions. In other words, the importance of interactions in the prediction of job performance did not generally depend on trait activation theory derived job characteristics. However, level of competition within an occupation seemed to be an exception to this within these data in that the level of competition significantly moderated the interaction between personality variables supporting the generalization of trait activation to personality variable interactions. It may be the case that level of competition is an especially potent job characteristic in regards to trait activation theory. However, without *a priori*, theoretically driven hypotheses these results for level of competition should be interpreted with caution. Regardless, these mixed findings for extending trait activation theory suggest future research may be needed to clarify these results.

A number of researchers have put forward the idea that moving from general job performance to more specific theoretically-driven criterion-variable pairings can result in higher predictive validity for personality variables (Hogan & Holland, 2003; Hogan & Roberts, 1996). Within the present study, I did not find a significant difference in the relationships, failing to find support for the benefits of increasing criteria specificity for personality variable interactions. These findings cast some doubt on increasing predictive validity by moving to more specific, theoretically driven variable-criterion pairings. However, implications that can be drawn from these results are severely limited by the lack of distinctness for overall and interpersonal job

performance in these data (i.e. r = .94). Different results may be found if these hypotheses were tested utilizing data with more differentiated performance measures.

In addition to more granularity in criteria, researchers have also argued in favor of more granularity in personality variables for prediction purposes (Barrick & Mount, 2005; Schneider et al.,1996). Within this study, I sought to extend this argument to interactions of personality variables. However, I did not find support for interactions at the aspect level having higher validity than at the trait level. The implication from these findings is that interactions between lower level personality variables may have limited usefulness for the prediction of performance beyond trait by trait interactions. Additionally, these results do not support the calls to move from FFM traits to lower level conceptualizations of personality to increase prediction.

Practical implications. In regards to the interaction of conscientiousness and emotional stability, conscientiousness was more strongly related to overall job performance for those low in emotional stability than those high in emotional stability. Though contrary to my initial hypothesis, these results are interesting. A post-hoc explanation based on these results may be that for individuals who are low in emotional stability, high conscientiousness may be a compensatory mechanism. In other words, the planful and organized nature of highly conscientious individual may help to dampen some of the negative effects of low emotional stability from anxiety, emotionality, etc. Thus, conscientiousness may be more important for low emotional stability individuals in terms of job performance than for other employees. One implication of this possible compensatory functioning of high conscientiousness for those low in emotional stability is that, instead of screening out all individuals low in emotional stability, high conscientiousness could prevent individuals from being screened out of the hiring process due to this low emotional stability.

In terms of practical implications, the main takeaway from the present study is that interactions between personality variables may have limited utility in terms of predicting job performance based on results presented. Within the study, only one interaction significantly predicted job performance. However, even this interaction was in the opposite direction than predicted based on theory. Based on the present results, personality variable interactions seem to display a null or inconsistent relationship with performance. Thus, utilizing personality variable interactions in applied contexts, such as for personnel selection purposes, would generally be inadvisable at the present time absent evidence to the contrary.

Limitations

As with any research, the current study has limitations that may warrant caution in the generalization and interpretation of results.

Within this study, data from two proprietary personality inventories were utilized to test hypotheses put forward. In order to do so, scales from these personality inventories were combined to create proxies for FFM variables based on information within their respective technical manuals (ACT, 2016; Boyce et al., 2015). Scales from these inventories were also used as representations for DeYoung et al., (2007)'s aspects of assertiveness and politeness. However, it may be the case that these proxies or scales themselves did not accurately represent the constructs they were assigned to represent. For instance, combining the ADEPT-15 aspects of Structure and Drive to form a proxy for conscientiousness may have failed to capture all the components of conscientiousness. Alternatively, this proxy may have contained aspects of personality unrelated to conscientiousness in the form of construct contamination. The measures utilized as DeYoung et al., (2007)'s aspects may also be deficient or contaminated with

irrelevant components. For example, the ADEPT-15 measure cooperativeness displays only a small correlation with a measure of DeYoung et al., (2007)'s aspect politeness (r = .17).

Another limitation of the present study is in regards to the high correlation between overall job performance and interpersonally-oriented job performance. In the present study, I sought to test if the interactions of agreeableness and extraversion and politeness and assertiveness exhibited a stronger relationship with interpersonally-oriented job performance as compared to overall job performance. However, the correlation between these measures was extremely high. This lack of dimensionality in job performance rating is not unique to this study and data, and has been found in prior research (Viswesvaran, Schmidt, & Ones, 2005). However, this indicates very little differentiation between these measures, limiting the likelihood of finding differential relationships between them and the interactions tested.

A further limitation of the present study is its reliance on O*NET job characteristic data. As discussed in previous work (Bradburn, Ryan, McKinniss, & Way, 2018), the O*NET ratings of job characteristics may be less precise than gathering targeted job information from incumbents themselves. The ratings provided by O*NET may fail to capture idiosyncrasies present within specific organizations or variations in job characteristics among jobs with similar titles. Utilizing these distal ratings may thus limit detection of any actual moderating effects of context.

Future Research

Given the limited amount of previous research on interactions of personality variables and their relationship with job performance, there are a number of potentially fruitful areas available for future research.

One obvious area for future research would be to explore other possible two-way interactions between personality variables at the trait, aspect, or even facet level. Three-way personality variable interactions could also be explored in their relationship to performance. Additional job characteristic moderators and specific aspects of job performance could also be explored. There is a nearly infinite number of interactions, situational moderators, and criteria pairings that could be explored. However, I caution that research in this area should be based on theory to avoid false positives in terms of significance. Despite modest findings from the current study, testing other interactions or job characteristics may elicit results more supportive than those found presently. I also encourage others to replicate the analyses conducted in the present study, especially addressing limitations previously mentioned.

Another avenue for future research could be modeling interactions between personality variables using a structural equation modeling framework. Utilizing interactions between latent factors as opposed to modeling interactions with observed scores in the prediction of job performance could help to mitigate the issue commonly found with interactions of low reliability. For instance, two orthogonal variables with reliability of .7 would result in an interaction with reliability of .49 (Aguinis, Gottfredson, & Wright, 2011). With such low reliability, any relationship with performance for interactions would be attenuated. Utilizing a structural equational modeling framework with latent variables would mitigate this issue and may, potentially, lead to different results than if observed scores were used.

In addition to trait activation theory, the theory of situational strength has also gained considerable traction in the personality literature (see Meyer, Dalal, & Herminda, 2010 for a review). Generally, situational strength theories postulate that cues in the situation as to what constitutes acceptable or expected behavior or constraints on behavior moderate relationships

between personality and behaviors like job performance (Mischel, 1977; Weiss & Adler, 1984). Situations that are weaker, or have less constraints on behavior or cues, are thought to lead to higher predictive validity for personality. Within the present study, situational strength was not incorporated into models tested. Future research may explore the role of situational strength for the predictive validity of interactions. In other words, the predictive validity of personality variable interactions for job performance may be higher in contexts with low situational strength and muted in contexts with high situational strength, mirroring results found for main effects (Judge & Zapata, 2015). O*NET job characteristics could be used to represent situational strength, as done by Judge and Zapata (2015), and incorporated into three-way interactions like trait activation variables were in the present study.

Conclusion

Within the present study, I sought to explore the usefulness of personality variable interactions in the prediction of job performance. After testing a number of hypotheses and possible moderating variables, it seems as if the usefulness of personality variable interactions in predicting performance is limited. However, despite these unsupportive results I encourage future research to further pursue this area of research due to its past neglect and potential value.

APPENDIX

Table 1:
Frequencies of ONET Codes/Occupations Represented in Combined Dataset

Code	N	Occupation
43-4051.00	768	Customer Service Representatives
35-3021.00	761	Combined Food Preparation and Serving Workers, Including Fast Food
11-9051.00	717	Food Service Managers
35-1012.00	572	First-Line Supervisors of Food Preparation and Serving Workers
41-2031.00	523	Retail Salespersons
41-1011.00	460	First-Line Supervisors of Retail Sales Workers
15-1142.00	435	Network and Computer Systems Administrators
43-5081.03	417	Stock Clerks- Stockroom, Warehouse, or Storage Yard
33-9099.02	367	Retail Loss Prevention Specialists
15-1199.09	328	Information Technology Project Managers
49-9071.00	312	Maintenance and Repair Workers, General
41-2011.00	256	Cashiers
53-1021.00	249	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand
53-7062.00	231	Laborers and Freight, Stock, and Material Movers, Hand
13-1071.00	227	Human Resources Specialists
29-2052.00	208	Pharmacy Technicians
31-1014.00	205	Nursing Assistants
43-6014.00	198	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive
11-9199.07	193	Security Managers
29-1141.00	175	Registered Nurses
31-9099.00	126	Healthcare Support Workers, All Other
31-9092.00	120	Medical Assistants
43-9061.00	113	Office Clerks, General
41-4011.00	109	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
53-7064.00	100	Packers and Packagers, Hand
43-5081.01	95	Stock Clerks, Sales Floor
49-3023.00	94	Automotive Service Technicians and Mechanics
43-6011.00	87	Executive Secretaries and Executive Administrative Assistants
15-1133.00	84	Software Developers, Systems Software
11-9199.04	82	Supply Chain Managers
29-2061.00	72	Licensed Practical and Licensed Vocational Nurses
13-2051.00	61	Financial Analysts
43-1011.00	60	First-Line Supervisors of Office and Administrative Support Workers
37-2012.00	57	Maids and Housekeeping Cleaners
13-1111.00	54	Management Analysts
35-2021.00	47	Food Preparation Workers
51-9199.00	41	Production Workers, All Other
43-5081.02	37	Marking Clerks

Table 1 (cont'd):
Frequencies of ONET Codes/Occupations Represented in Combined Dataset

43-6013.00	36	Medical Secretaries
27-1026.00	36	Merchandise Displayers and Window Trimmers
13-2071.00	35	Credit Counselors
43-4171.00	35	Receptionists and Information Clerks
43-3031.00	32	Bookkeeping, Accounting, and Auditing Clerks
13-1081.02	31	Logistics Analysts
13-2041.00	30	Credit Analysts
37-2011.00	25	Janitors and Cleaners, Except Maids and Housekeeping Cleaners
15-1141.00	24	Database Administrators
43-9199.00	23	Office and Administrative Support Workers, All Other
35-3041.00	23	Food Servers, Nonrestaurant
43-3011.00	21	Bill and Account Collectors
13-1151.00	21	Training and Development Specialists
35-2012.00	20	Cooks, Institution and Cafeteria
13-1199.03	20	Customs Brokers
35-9099.00	19	Food Preparation and Serving Related Workers, All Other
49-9098.00	19	Helpers--Installation, Maintenance, and Repair Workers
31-9095.00	19	Pharmacy Aides
15-1121.00	18	Computer Systems Analysts
33-1099.00	17	First-Line Supervisors of Protective Service Workers, All Other
11-3121.00	17	Human Resources Managers
49-9043.00	17	Maintenance Workers, Machinery
43-5071.00	17	Shipping, Receiving, and Traffic Clerks
13-2099.04	12	Fraud Examiners, Investigators and Analysts
43-4141.00	12	New Accounts Clerks
29-2099.00	11	Health Technologists and Technicians, All Other
43-4199.00	10	Information and Record Clerk, All Other
13-1141.00	10	Compensation, Benefits, and Job Analysis Specialists
29-2071.00	9	Medical Records and Health Information Technicians
37-1011.00	8	First-Line Supervisors of Housekeeping and Janitorial Workers
43-3051.00	8	Payroll and Timekeeping Clerks
39-9021.00	8	Personal Care Aides
11-9151.00	8	Social and Community Service Managers
39-9099.00	7	Personal Care and Service Workers, All Other
15-1143.00	7	Computer Network Architects
27-3041.00	7	Editors
31-1011.00	7	Home Health Aides
51-6011.00	7	Laundry and Dry-Cleaning Workers
17-2199.04	7	Manufacturing Engineers
11-3061.00	7	Purchasing Managers
21-1093.00	7	Social and Human Service Assistants

Table 1 (cont'd):
Frequencies of ONET Codes/Occupations Represented in Combined Dataset

35-3031.00	7	Waiters and Waitresses
37-2019.00	6	Building Cleaning Workers, All Other
51-8099.00	6	Plant and System Operators, All Other
35-3022.00	6	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop
11-1021.00	6	General and Operations Managers
27-1024.00	6	Graphic Designers
13-1161.00	6	Market Research Analysts and Marketing Specialists
11-2021.00	6	Marketing Managers
51-5113.00	6	Print Binding and Finishing Workers
13-1199.00	5	Business Operations Specialists, All Other
29-9099.00	5	Healthcare Practitioners and Technical Workers, All Other
35-2019.00	5	Cooks, All Other
15-1111.00	5	Computer and Information Research Scientists
15-1151.00	5	Computer User Support Specialists
43-9021.00	5	Data Entry Keyers
35-9011.00	5	Dining Room and Cafeteria Attendants and Bartender Helpers
35-9021.00	5	Dishwashers
11-9111.00	5	Medical and Health Services Managers
43-5061.00	5	Production, Planning, and Expediting Clerks
13-1023.00	5	Purchasing Agents, Except Wholesale, Retail, and Farm Products
19-4099.01	5	Quality Control Analysts
13-1022.00	5	Wholesale and Retail Buyers, Except Farm Products
25-9099.00	4	Education, Training, and Library Workers, All Other
37-3019.00	4	Grounds Maintenance Workers, All Other
51-3011.00	4	Bakers
43-9011.00	4	Computer Operators
43-4041.02	4	Credit Checkers
29-2012.00	4	Medical and Clinical Laboratory Technicians
51-9111.00	4	Packaging and Filling Machine Operators and Tenders
39-9032.00	4	Recreation Workers
13-1041.07	4	Regulatory Affairs Specialists
49-2098.00	4	Security and Fire Alarm Systems Installers
43-2021.00	4	Telephone Operators
11-9199.00	3	Managers, All Other
25-3099.00	3	Teachers and Instructors, All Other
51-2099.00	3	Assemblers and Fabricators, All Other
39-9031.00	3	Fitness Trainers and Aerobics Instructors
51-9198.00	3	Helpers--Production Workers
35-9031.00	3	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop
15-1122.00	3	Information Security Analysts
37-3011.00	3	Landscaping and Groundskeeping Workers

Table 1 (cont'd):
Frequencies of ONET Codes/Occupations Represented in Combined Dataset

23-2011.00	3	Paralegals and Legal Assistants
51-9151.00	3	Photographic Process Workers and Processing Machine Operators
51-5111.00	3	Prepress Technicians and Workers
43-3061.00	3	Procurement Clerks
29-2034.00	3	Radiologic Technologists
11-2022.00	3	Sales Managers
33-9032.00	3	Security Guards
15-1132.00	3	Software Developers, Applications
15-1199.07	2	Data Warehousijng Specialists
21-1099.00	2	Community and Social Services Specialists, All Other
41-3099.00	2	Sales Representatives, Services, All Other
41-9099.00	2	Sales and Related Workers, All Other
23-1022.00	2	Arbitrators, Mediators, and Conciliators
13-2011.02	2	Auditors
39-9011.00	2	Childcare Workers
15-1131.00	2	Computer Programmers
11-9021.00	2	Construction Managers
35-2011.00	2	Cooks, Fast Food
43-5032.00	2	Dispatchers, Except Police, Fire, and Ambulance
29-2041.00	2	Emergency Medical Technicians and Paramedics
37-1012.00	2	First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers
51-1011.00	2	First-Line Supervisors of Production and Operating Workers
39-5012.00	2	Hairdressers, Hairstylists, and Cosmetologists
21-1022.00	2	Healthcare Social Workers
23-1011.00	2	Lawyers
53-3033.00	2	Light Truck or Delivery Services Drivers
17-3029.09	2	Manufacturing Production Technicians
43-4151.00	2	Order Clerks
43-4051.03	2	Patient Representatives
51-5112.00	2	Printing Press Operators
31-1013.00	2	Psychiatric Aides
29-2053.00	2	Psychiatric Technicians
41-3031.03	2	Securities and Commodities Traders
27-3042.00	2	Technical Writers
21-2099.00	1	Religious Workers, All Other
25-1199.00	1	Postsecondary Teachers, All Other
33-2011.00	1	Firefighters
33-9099.00	1	Protective Service Workers, All Other
49-9021.00	1	Heating, Air Conditioning, and Refrigeration Mechanics and Installers
13-2011.01	1	Accountants

Table 1 (cont'd):
Frequencies of ONET Codes/Occupations Represented in Combined Dataset

25-3011.00	1	Adult Basic and Secondary Education and Literacy Teachers and Instructors
11-2011.00	1	Advertising and Promotions Managers
35-3011.00	1	Bartenders
29-2031.00	1	Cardiovascular Technologists and Technicians
35-1011.00	1	Chefs and Head Cooks
15-1152.00	1	Computer Network Support Specialists
35-2014.00	1	Cooks, Restaurant
43-4021.00	1	Correspondence Clerks
41-2021.00	1	Counter and Rental Clerks
41-9011.00	1	Demonstrators and Product Promoters
29-1021.00	1	Dentists, General
29-1031.00	1	Dietitians and Nutritionists
49-2094.00	1	Electrical and Electronics Repairers, Commercial and Industrial Equipment
25-2021.00	1	Elementary School Teachers, Except Special Education
13-1041.03	1	Equal Opportunity Representatives and Officers
43-4071.00	1	File Clerks
27-4032.00	1	Film and Video Editors
11-3031.02	1	Financial Managers, Branch or Department
47-1011.00	1	First-Line Supervisors of Construction Trades and Extraction Workers
49-1011.00	1	First-Line Supervisors of Mechanics, Installers, and Repairers
39-1021.00	1	First-Line Supervisors of Personal Service Workers
53-1031.00	1	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators
47-2042.00	1	Floor Layers, Except Carpet, Wood, and Hard Tiles
27-1023.00	1	Floral Designers
21-1091.00	1	Health Educators
47-4051.00	1	Highway Maintenance Workers
43-4161.00	1	Human Resources Assistants, Except Payroll and Timekeeping
19-3032.00	1	Industrial-Organizational Psychologists
25-9031.00	1	Instructional Coordinators
13-1075.00	1	Labor Relations Specialists
51-4041.00	1	Machinists
39-9011.01	1	Nannies
39-2021.00	1	Nonfarm Animal Caretakers
47-2141.00	1	Painters, Construction and Maintenance
51-9196.00	1	Paper Goods Machine Setters, Operators, and Tenders
13-2052.00	1	Personal Financial Advisors
19-2012.00	1	Physicists
27-2012.03	1	Program Directors

Table 1 (cont'd):
Frequencies of ONET Codes/Occupations Represented in Combined Dataset

25-1066.00	1	Psychology Teachers, Postsecondary
11-2031.00	1	Public Relations and Fundraising Managers
47-2181.00	1	Roofers
41-4012.00	1	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products
25-2031.00	1	Secondary School Teachers, Except Special and Career/Technical Education
39-5094.00	1	Skincare Specialists
15-1199.01	1	Software Quality Assurance Engineers and Testers
15-2041.00	1	Statisticians
13-2082.00	1	Tax Preparers
53-3041.00	1	Taxi Drivers and Chauffeurs
51-6064.00	1	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders
11-3031.01	1	Treasurers and Controllers

Table 2:
N per Company in Combined Dataset

Company	N	Personality Assessment Utilized
1	1951	ADEPT-15
2	1993	ADEPT-15
3	463	ADEPT-15
4	2818	ADEPT-15
5	1458	ADEPT-15
6	11	WorkKeys Talent
7	7	WorkKeys Talent
8	2	WorkKeys Talent
9	78	WorkKeys Talent
10	4	WorkKeys Talent
11	1	WorkKeys Talent
12	101	WorkKeys Talent
13	21	WorkKeys Talent
14	144	WorkKeys Talent
15	1205	WorkKeys Talent
16	1	WorkKeys Talent
17	23	WorkKeys Talent
18	2	WorkKeys Talent
19	84	WorkKeys Talent
20	55	WorkKeys Talent
21	4	WorkKeys Talent
22	2	WorkKeys Talent

Table 3:
Information on Dimensions included in the ADEPT-15 Personality Assessment

Dimension	Definition	Test-Retest Reliability
Drive	Extent to which someone is proactive and persistent	.61
Structure	Extent to which someone is planful, detail-oriented, and rule-conscious	.70
Conceptual	Extent to which someone is conceptual and intellectually curious	.71
Flexibility	Extent to which someone is flexible, adaptable, and open-minded	.68
Mastery	Extent to which someone is learning-oriented and improvement-oriented	.55
Ambition	Extent to which someone is ambitious and goal-directed	.62
Power	Extent to which someone is controlling, directive, and motivated to lead	.56
Assertiveness	Extent to which someone is assertive, directive and motivated to lead	.69
Liveliness	Extent to which someone is outgoing, energetic, and socially confident	.71
Composure	Extent to which someone is composed, calm, and relaxed	.73
Positivity	Extent to which someone is happy, optimistic, and resilient	.70
Awareness	Extent to which someone is reflective and self-aware	.44
Cooperativeness	Extent to which someone is cooperative and trusting	.66
Sensitivity	Extent to which someone is compassionate, caring, and understanding	.66
Humility	Extent to which someone is modest and genuine	.57

Adapted from Boyce et al., 2015

Table 4:
Information on Dimensions included in the WorkKeys Talent Personality Assessment

Dimension	Definition	Sample item	Reliability (Alpha)
Carefulness	Tendency to think and plan carefully	I prefer to plan ahead	.81
Discipline	Tendency to be responsible, dependable, and follow through with tasks without becoming distracted or bored	Once I start a task, I see it through to the end	.87
Order	Tendency to be neat and well-organized	My workspace is usually cluttered (reverse cluttered)	.85
Stability	Tendency to maintain composure and rationality in situations of actual or perceived stress	I get stressed easily (reserve coded)	.86
Optimism	Tendency toward having a positive outlook and confidence of actual or perceived outcomes	I tend to believe that things will work out for the best	.83
Cooperation	Tendency to be likable and cordial in interpersonal situations	I usually get along well with others	.83
Goodwill	Tendency to be forgiving and to believe others are well-intentioned	I think most of the people I deal with are selfish (reverse coded)	.82
Sociability	Tendency to enjoy being in other people's company and to work with others	I frequently attend social gatherings	.89
Influence	Tendency to impact and dominate social situations by speaking without hesitation and often becoming a group leader	I am often the leader of groups I belong to	.86
Striving	Tendency to have high aspiration levels and to work hard to achieve goals	I know what my goals are and I constantly work toward them	.86
Creativity	Tendency to be imaginative and to think "outside the box"	I enjoy finding creative solutions to problems	.85
Savvy	Tendency to read other people's motives, understand office politics, and anticipate the needs and intentions of others	It is easy for me to pick up on the politics at work	.83

ACT, 2016

Table 5:
Relationship between ADEPT-15 and WorkKeys Talent Aspects and Five Factor Model Variables

Five Factor Model Personality Variable	Personality Inventory	Aspects from Respective Inventory
Conscientiousness	ADEPT-15	Structure, Drive
	WorkKeys Talent	Carefulness, Discipline, Order
Extraversion	ADEPT-15	Assertiveness, Liveliness
	WorkKeys Talent	Sociability, Influence, Striving
Agreeableness	ADEPT-15	Sensitivity, Cooperation
	WorkKeys Talent	Cooperation, Goodwill
Emotional Stability	ADEPT-15	Composure, Positivity
	WorkKeys Talent	Stability, Optimism
Openness to Experience	ADEPT-15	Conceptual, Flexibility
	WorkKeys Talent	Creativity

Table 6:
Correlations Between Level 1 (Individual) Level Variables

Variable	N	1	2	3	4	5	6	7	8
1. Openness to Experience	10427								
2. Conscientiousness	10427	.17							
3. Extraversion	10427	.32	.20						
4. Agreeableness	10428	.22	.21	.29					
5. Emotional Stability	10428	.25	.28	.25	.35				
6. Assertiveness	10428	.28	.17	.79	.10	.13			
7. Politeness	10428	.21	.21	.24	.84	.30	.08		
8. Overall Performance	9243	.05	.08	.02	.03	.05	.04	.02	
9. Interpersonal Performance	9875	.05	.08	.03	.06	.08	.03	.05	.94

Note: Correlations ≥ .02 are significant at $p < .05$, correlations ≥ .03 were significant at $p < .01$. All individual level variables have been standardized, and thus means and standard deviations are not reported.

Table 7:
Correlations Between Level 2 (Occupation) Level Variables

Job Level Variables	M	SD	N	1	2
1. Contact with Others	87.01	9.60	182		
2. Dealing with Unpleasant or Angry People	52.87	14.52	182	.57***	
3. Level of Competition	51.83	13.41	182	.03	-.04

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

Table 8:
ICC1 and ICC2 Values for Individual Level Variables

Variable	Occupation		Company	
	ICC1	ICC2	ICC1	ICC2
Openness	0.048	0.72	0.032	0.94
Conscientiousness	0.024	0.55	0.020	0.91
Extraversion	0.021	0.52	0.014	0.87
Agreeableness	0.015	0.43	0.021	0.91
Emotional Stability	0.035	0.64	0.040	0.95
Assertiveness	0.028	0.59	0.010	0.83
Politeness	0.013	0.40	0.020	0.89
Overall Performance	0.045	0.73	0.000	-48.67
Interpersonal Performance	0.035	0.64	0.010	0.89

Table 9:
Result of Moderated Regressions (H1- H5) Predicting Overall Job Performance

		Agreeableness X Extraversion (H1)	Agreeableness X Conscientiousness (H2)	Conscientiousness X Extraversion (H3)	Emotional Stability X Conscientiousness (H4)	Politeness X Assertiveness (H5)
Step 1						
	Main Effect 1	.024*	.014	.081***	.035***	.020
	Main Effect 2	.015	.079***	.006	.073***	.041***
R2		.001	.007	.007	.008	.002
Step 2						
	Main Effect 1	.025*	.014	.080***	.033***	.020
	Main Effect 2	.015	.080***	.005	.073***	.041***
	Interaction	.007	-.008	-.017	-.026*	.004
Δ R2		.000	.000	.000	.001*	.000

Note: Main Effect 1 and 2 are the 1st and 2nd variables mentioned in the column heading, respectively. Regression weights reported are standardized beta weights. N = 9243 *$p < .05$ ***$p < .01$

Table 10:
Result of Moderated Regressions (H11 & H13) Predicting Interpersonal Job Performance

		Agreeableness X Extraversion (H11)	Politeness X Assertiveness (H13)
Step 1			
	Main Effect 1	.055***	.046***
	Main Effect 2	.014	.028***
R2		.003	.003
Step 2			
	Main Effect 1	.055***	.046***
	Main Effect 2	.015	.028***
	Interaction	.005	.005
Δ R2		.000	.000

Note: Main Effect 1 and 2 are the 1st and 2nd variables mentioned in the column heading, respectively. Regression weights reported are standardized beta weights.
N = 9874-9875 *$p < .05$ ***$p < .01$

Table 11:
Results of Moderated Multilevel Regressions (H7-H10, RQ1 &RQ2) Predicting Overall Job Performance

	Agreeableness X Extraversion X Social Skills (H7)	Agreeableness X Extraversion X Unples. or Angry People (H8)	Agreeableness X Extraversion X Competition (RQ1)	Assertiveness X Politeness X Social Skills (H9)	Assertiveness X Politeness X Unples or Angry People (H10)	Assertiveness X Politeness X Competition (RQ2)
Intercept	.044	.053	.056	.047	.058	.059
Main Effect 1	.025*	.009	.022*	.032***	.040***	.034***
Main Effect 2	.011	.017	.014	.020	.003	.015
Main Effect 3	-.001	-.003	.006*	-.001	-.003	.006*
Interaction 1 (1X2)	.007	.007	.007	.008	.008	.006
Interaction 2 (1X3)	-.001	.002	.000	.001	-.001	.000
Interaction 3 (2x3)	.002	.000	.000	-.001	.002	-.001
3-Way Interaction	.000	.000	.002*	-.001	.000	.002*

Note: Main Effect 1, 2, and 3 are the 1st, 2nd, and 3rd variables mentioned in the column heading, respectively. Regression weights reported are unstandardized regression weights. Level 1 (individual) N = 8664, Level 2 (Occupation) N = 142. *$p < .05$ *** $p < .01$

Table 12:
Summary of Hypotheses and Results

Hypothesis Number	Hypothesis	Result
H1	Agreeableness will moderate the relationship between extraversion and job performance, in that higher levels of agreeableness will lead to a stronger positive relationship between extraversion and overall job performance.	Not Supported.
H2	Agreeableness will moderate the relationship between conscientiousness and job performance, in that higher levels of agreeableness will lead to a stronger positive relationship between conscientiousness and overall job performance.	Not Supported.
H3	Conscientiousness will moderate the relationship between extraversion and job performance, in that higher levels of conscientiousness will lead to a stronger positive relationship between extraversion and overall job performance.	Not Supported.
H4	Emotional stability will moderate the relationship between conscientiousness and job performance, in that higher levels of emotional stability will lead to a stronger positive relationship between conscientiousness and overall job performance.	Significant moderation, but opposite of predicted. Not Supported.
H5	Politeness will moderate the relationship between assertiveness and overall job performance, in that the relationship between assertiveness and performance will be higher for individuals higher in politeness.	Not Supported.
H6	The validity of the interaction between assertiveness and politeness aspects for predicting overall job performance will be greater than the interaction between extraversion and agreeableness for predicting overall job performance.	Not Supported.
H7	The moderating effect of agreeableness on the relationship between extraversion and overall job performance for individuals in occupations with a high social skills requirement will be greater than the moderating effect for individuals in occupations with a low social skills requirement.	Not Supported.
H8	The moderating effect of agreeableness on the relationship between extraversion and overall job performance for individuals in occupations with a high degree of dealing with unpleasant or angry people will be greater than the moderating effect for individuals in occupations with a low degree of dealing with unpleasant or angry people.	Not Supported.

Table 12 (cont'd):
Summary of Hypotheses and Results

H9	The moderating effect of politeness on the relationship between assertiveness and overall job performance for individuals in occupations with a high social skills requirement will be greater than the moderating effect for individuals in occupations with a low social skills requirement.	Not Supported.
H10	The moderating effect of politeness on the relationship between assertiveness and overall job performance for individuals in occupations with a high degree of dealing with unpleasant or angry people will be greater than the moderating effect for individuals in occupations with a low degree of dealing with unpleasant or angry people.	Not Supported.
H11	The relationship between extraversion and interpersonally-oriented job performance will be moderated by agreeableness, in that higher levels of agreeableness will lead to a stronger positive relationship between extraversion and interpersonally-oriented job performance.	Not Supported.
H12	The interaction of extraversion and agreeableness will be more predictive of interpersonally-oriented job performance than overall job performance.	Not Supported.
H13	The relationship between assertiveness and interpersonally-oriented job performance will be moderated by politeness, in that higher levels of politeness will lead to a stronger positive relationship between assertiveness and interpersonally-oriented job performance.	Not Supported.
H14	The interaction of assertiveness and politeness will be more predictive of interpersonally-oriented job performance than the interaction of extraversion and agreeableness.	Not Supported.

Figure 1:
Emotional Stability Moderating Relationship Between Conscientiousness and Overall Job Performance

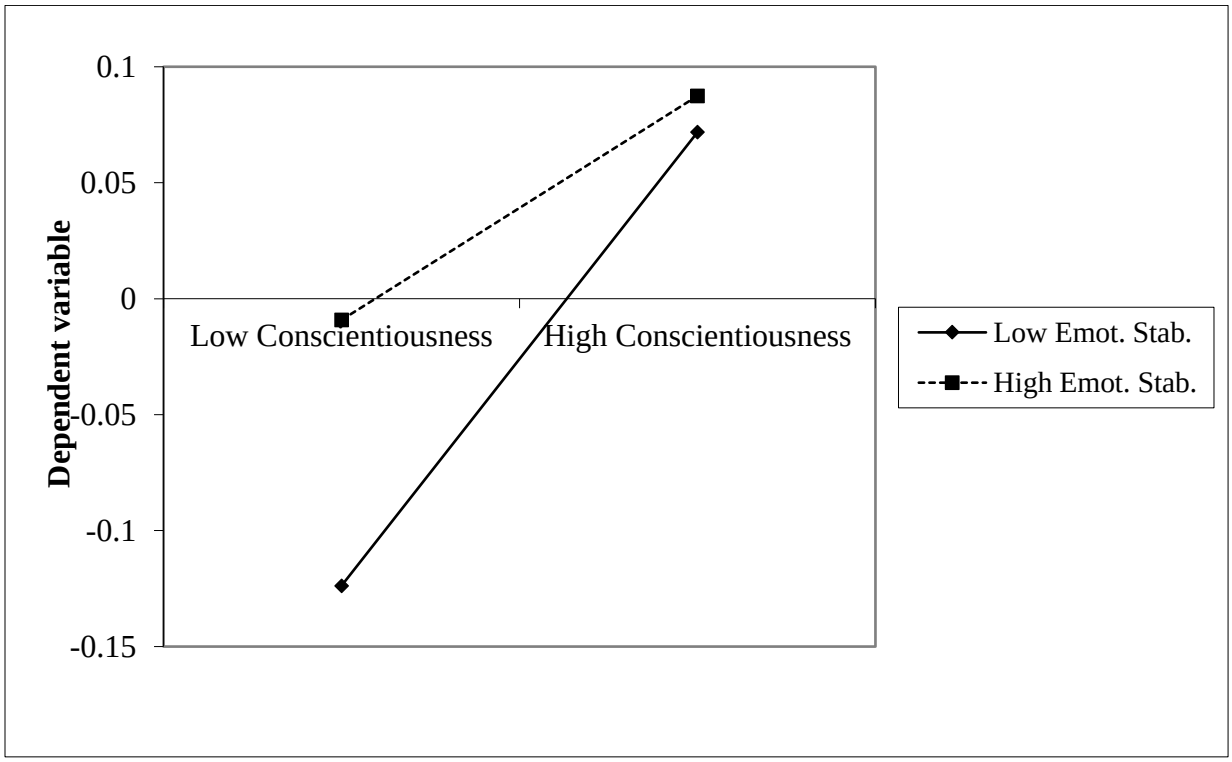


Figure 2:
Three-Way Interaction Between Agreeableness, Extraversion, and Level of Competition in the Prediction of Overall Job Performance

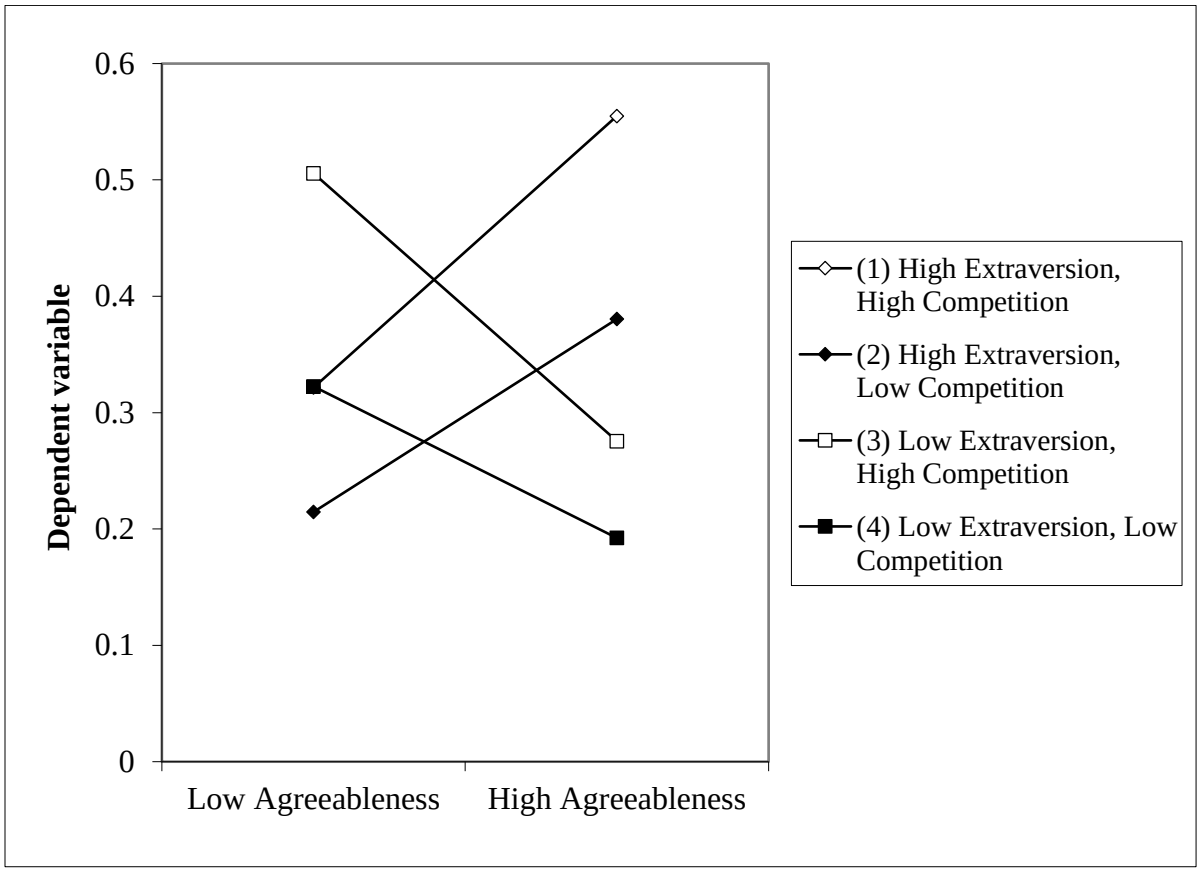
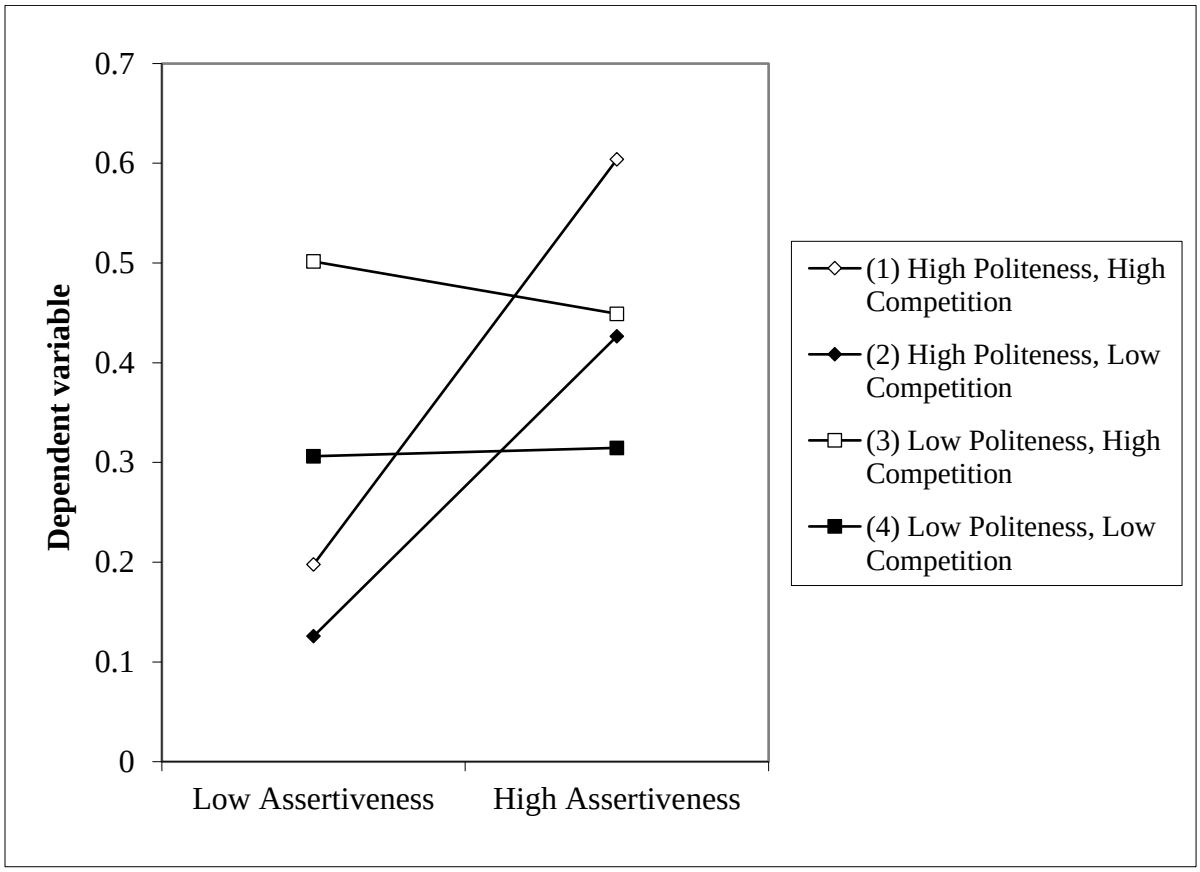


Figure 3:
Three-Way Interaction Between Assertiveness, Politeness, and Level of Competition in the Prediction of Overall Job Performance



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