

# Understanding Organizational Commitment: A Meta-Analytic Examination of the Roles of the Five-Factor Model of Personality and Culture

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We examined the relationships between the Five-Factor Model (FFM) of personality traits and three forms of organizational commitment (affective, normative, and continuance commitment) and their variability across individualistic and collectivistic cultures. Meta-analytic results based on 55 independent samples from 50 studies ( $N = 18,262$ ) revealed that (a) all FFM traits had positive relationships with affective commitment; (b) all FFM traits had positive relationships with normative commitment; and (c) Emotional Stability, Extraversion, and Openness to Experience had negative relationships with continuance commitment. In particular, Agreeableness was found to be the trait most strongly related to both affective and normative commitment. The results also showed that Agreeableness had stronger relationships with affective and normative commitment in collectivistic cultures than in individualistic cultures. We provide theoretical and practical implications of these findings for personality, job attitudes, and employee selection and retention.

*Keywords:* Five-Factor Model of personality, organizational commitment, national culture

For many organizations, hiring and retaining highly committed employees is a key part of their human resource management strategy (Gong, Law, Chang, & Xin, 2009; Kehoe & Wright, 2013). This is because *organizational commitment*, defined as an individual's psychological bond with an organization, has been linked to a number of outcomes of interest to researchers and practitioners alike, including job performance (Cooper-Hakim & Viswesvaran, 2005; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Riketta, 2002), organizational citizenship behavior (Meyer et al., 2002; LePine, Erez, & Johnson, 2002), and turnover (Meyer et al., 2002; Mathieu & Zajac, 1990). These findings prompted researchers to examine the factors that shape organizational commitment. Up to this point, empirical evidence has largely focused on situational and experiential antecedents of organizational commitment, such as work design (Humphrey et al., 2007), leadership (Gerstner & Day, 1997; Jackson, Meyer, & Wang, 2013; Rockstuhl, Dulebohn, Ang, & Shore, 2012), organizational justice (Colquitt, Conlon, Wesson, Porter, & Ng, 2001), trust (Dirks & Ferrin, 2002), coworker support (Chiaburu & Harrison, 2008),

perceived organizational support (POS; Rhoades & Eisenberger, 2002), psychological contract breach (Zhao, Wayne, Glibkowski, & Bravo, 2007), psychological empowerment (Seibert, Wang, & Courtright, 2011), and person-organization fit (Kristof-Brown, Zimmerman, & Johnson, 2005).

In contrast, very little research has examined the dispositional antecedents of organizational commitment. Previous meta-analyses of organizational commitment (Mathieu & Zajac, 1990; Meyer et al., 2002; Riketta, 2002) included very few dispositional variables based on a few primary studies, and their findings seem inconclusive. For example, the earliest meta-analysis by Mathieu and Zajac (1990) showed that among the 26 antecedents examined, personal belief regarding competence had the strongest relationship with organizational commitment. Later, a meta-analysis by Meyer et al. (2002) examined only one dispositional variable, locus of control, as an antecedent only for affective commitment and found that the relationship, albeit based on only four studies, was significant and generalizable but lower than those of other antecedents such as organizational justice dimensions. Thoresen, Kaplan, Barsky, Warren, and de Chermont (2003) showed that Neuroticism and Extraversion, two traits of the Five-Factor Model (FFM) of personality, were significantly related to organizational commitment, although the relationships were based on only two and three studies, respectively. However, their study did not examine the other FFM traits and, thus, failed to provide us with a complete picture of the role of the FFM as a whole. Accordingly, it is not surprising that some organizational commitment scholars have concluded that dispositional factors may not play a key role in shaping organizational commitment (Meyer et al., 2002).

However, we believe that this conclusion may be premature and that a complete understanding of the determinants of organizational commitment must include not only situational factors (see

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Meyer et al., 2002), but also individual differences, such as personality traits (Lewin, 1951). Theoretically, we suggest that it is plausible to expect significant relationships between personality and organizational commitment. Job attitudes in general have long been thought to have a dispositional basis (Hoppock, 1935; Judge & Kammeyer-Mueller, 2012). This is primarily because individuals tend to perceive the same work environments idiosyncratically because individuals favor information that reinforces their predispositions through selective exposure, selective perception, and selective retention (Scarr, 1996). As such, organizational commitment may be influenced not only by work environments but also by individual traits because perceptions of work environments are influenced by individuals' idiosyncratic traits.

To better understand the antecedents of organizational commitment, we examined the dispositional bases of organizational commitment by using the FFM traits—one of the most frequently examined trait taxonomies in previous research on dispositional antecedents of job attitudes (e.g., Judge, Heller, & Mount, 2002; Swider & Zimmerman, 2010; Zimmerman, 2008). Specifically, the first purpose of our research was to develop theoretical rationale linking the FFM traits with organizational commitment and to provide meta-analytic estimates of these relationships. Our meta-analysis contributes to theory and research on personality and organizational commitment by integrating empirical findings. It was not until the early 2000s that several meta-analyses (e.g., Judge & Ilies, 2002; Judge et al., 2002; Thoresen et al., 2003) were published in the personality and job attitude literatures. Such meta-analyses have shed light on the importance of dispositional variables in explaining job attitudes and employee motivation, thereby spawning a sizable number of primary studies that measure both personality and organizational commitment. It should be noted, however, that the theoretical rationale linking personality to job attitudes was not fully developed in many of those primary studies. Thus, it is an opportune time to take stock of and synthesize cumulative findings on the relationships between personality and organizational commitment in a more comprehensive manner.

Although we argue that personality traits play an important role in shaping organizational commitment, organizational commitment may be best conceptualized as a characteristic adaptation that is influenced by the interaction of traits and situational factors (Bergman, Benzer, & Henning, 2009). This perspective is consistent with the broader literature on person-situation interactions (Lewin, 1951), which suggests that situational factors may trigger or suppress the manifestations of personality traits (e.g., R. Meyer, Dalal, & Hermida, 2010; Tett & Guterman, 2000). In this study, we view a national culture as a general situational variable that is likely to impact the magnitude of the relationships between FFM traits and organizational commitment.<sup>1</sup> Specifically, building on trait activation theory (Tett & Guterman, 2000), we propose that certain national cultures may trigger the expression of certain FFM traits, resulting in stronger relationships of these traits with organizational commitment. In so doing, we extend the recent meta-analytic findings on cross-cultural differences in specific forms of organizational commitment (e.g., Fischer & Mansell, 2009; Meyer et al., 2012). Thus, our second purpose was to examine whether the relationships between the FFM traits and organizational commitment vary across national cultures.

Finally, in considering personality-organizational commitment relationships as well as the moderating role of national culture in

these relationships, it is important to recognize that organizational commitment may take a variety of forms. Specifically, Meyer and Allen (1991, 1997) differentiated three forms of commitment: *affective commitment* (AC; an emotional attachment to the organization), *normative commitment* (NC; a felt obligation to remain with the organization), and *continuance commitment* (CC; commitment based on the costs and benefits associated with leaving the organization). This may complicate the ways in which personality traits and national culture influence organizational commitment. In developing theoretical arguments, we considered not only the role of personality and culture in the formation of organizational commitment in general, but also the ways in which these antecedents shape different justifications for remaining committed to the organization.

## Relationships of the FFM Traits With Three Forms of Organizational Commitment

### Emotional Stability

Individuals high in Emotional Stability are calm, resilient, and secure. They are less likely to be vulnerable to emotional turmoil, to encounter and engender negative experiences in their lives (Watson & Clark, 1984), and to view their work environments through negative lenses (Maertz & Griffeth, 2004) than those low in Emotional Stability. We believe that emotionally stable individuals are likely to have higher levels of AC (i.e., emotional attachment to, identification with, and involvement in the organization; Meyer & Allen, 1991) for several reasons. First, individuals high in Emotional Stability are more likely to build positive exchange relationships with exchange partners (e.g., supervisors, coworkers) and are less likely to experience interpersonal conflicts (Spector & Jex, 1998). These positive interpersonal relationships serve to reinforce the affective bonds to the organization that provides the relationships. Further, individuals high in Emotional Stability are also more likely to receive higher performance evaluation scores, more rewards (Barrick & Mount, 1991), and to obtain social support from others (Côté, 2005). On the basis of social exchange principles, employees reciprocate this support by increasing identification with and involvement in the organization. Finally, individuals high in Emotional Stability are capable of managing their emotions in various exchange contexts. As such, they are less likely to view the organization through a negative and cynical lens and thus less likely to react negatively to organizational decisions, even when those may seem unfair (Skarlicki, Folger, & Tesluk, 1999). As a result, they are more likely to develop and maintain a positive emotional attachment to the organization. We thus expect that the pro-organizational characteristics associated with high levels of Emotional Stability help individuals to develop and maintain AC.

In contrast, we propose that Emotional Stability is negatively related to CC: commitment based on the perceived costs and

<sup>1</sup> Although occupation is another moderator that could be relevant (Barrick & Mount, 1991), the small number of available primary studies based on samples from a homogenous occupation did not allow us to examine the moderating role of occupation; most primary studies were based on samples of employees from heterogeneous occupations or did not provide sufficient information in this regard.

benefits associated with leaving the organization (Meyer & Allen, 1991). Individuals low in Emotional Stability (i.e., high in Neuroticism) tend to focus more on avoidance of loss rather than pursuit of gain (Carver & White, 1994). Similarly, regulatory focus theory (Higgins, 1997) posits that individuals low in Emotional Stability are prevention focused rather than promotion focused and thus tend to be more attuned to the losses associated with leaving the organization rather than to the potential benefits in a new organization. This tendency is consistent with the nature of CC, which is characterized by the perceptions of compulsion and avoidance of negative outcomes associated with leaving the current employer (Myer, Becker, & Vandenberghe, 2004). Further, individuals low in Emotional Stability tend to be less confident in assessing their career goals and progress and making appropriate career decisions (Hackett & Betz, 1981; Page, Bruch, & Haase, 2008). Emotionally unstable individuals are less likely to possess the high initiative and self-confidence that may be required to leave an organization (Zimmerman, Boswell, Shipp, Dunford, & Boudreau, 2012). Accordingly, they may have fewer alternative options in their career paths, overestimate costs associated with leaving the current employer, and underestimate benefits associated with joining a new employer. All of these factors may lead to higher levels of CC for individuals lower in Emotional Stability. We have no strong theoretical rationale to expect that Emotional Stability should be an antecedent of felt obligation (NC).

*Hypothesis 1:* Emotional Stability is (a) positively related to AC and (b) negatively related to CC.

## Extraversion

Extraversion is a complex trait. On the one hand, extraverts are characterized by tendencies toward sociability and positive affectivity. Given their higher levels of positive affectivity, extraverts tend to perceive their work environments more positively and are more likely to recall positive information (e.g., Watson & Clark, 1997). Accordingly, they are more likely to be satisfied with their jobs (Judge et al., 2002) and affectively attached to their organization and its members (Erdheim, Wang, & Zickar, 2006). Meta-analytic evidence (Thoresen et al., 2003) supported the positive relationship between Extraversion and AC ( $\hat{\rho} = .22$ ). Although this evidence was based on only two primary studies, we also expect to find a positive relationship between Extraversion and AC.

However, we expect that Extraversion is negatively related to CC. Extraverts are socially adroit, ambitious, and likely to take initiative. They are motivated by status striving or a desire to get ahead (Barrick, Mitchell, & Stewart, 2003), and likely attempt to do so by building and maintaining high-quality social networks (Wanberg, Kanfer, & Banas, 2000). As a result, they have more job alternatives both outside and inside the organization (e.g., Erdheim et al., 2006). These alternatives might have offsetting effects on CC, with internal alternatives increasing the benefits of staying and external alternatives increasing the benefits of leaving. However, extraverts also tend to seek materialistic and sensational, albeit risky, opportunities for gaining desired power, status, or recognition in their exchange relationships (Ashton, Lee, & Paunonen, 2002; Barrick, Stewart, & Piotrowski, 2002). Extraverts seeking to get ahead are more likely to leave the organization as good job opportunities emerge because they prefer the riskier and

more sensational external opportunities, putting greater weight on the rewards in a new organization than on the costs of leaving the current organization (Zimmerman et al., 2012). Furthermore, extraverts tend to have good social skills (Digman, 1990), and thus they can build a new social network when they move to a new organization (S. Roberts, Wilson, Fedurek, & Dunbar, 2008). This network building capability, coupled with the attractiveness of external opportunities, may strengthen extraverts' tendency to pay greater attention to expected benefits in a new organization than the costs of leaving the current organization. As such, extraverts are likely to have a lower level of CC to their organizations than introverts (Naquin & Holton, 2002). It should be noted, however, that although empirical evidence has revealed a positive relationship between Extraversion and NC (Erdheim et al., 2006; Panaccio & Vandenberghe, 2012), we do not have strong theoretical justification that extraversion should be a precursor of NC.

*Hypothesis 2:* Extraversion is (a) positively related to AC and (b) negatively related to CC.

## Openness to Experience

Openness to Experience refers to a tendency to be imaginative, cultured, curious, original, broad-minded, intelligent, and artistically sensitive (Barrick & Mount, 1991). Of the three forms of organizational commitment, we predict that Openness to Experience is most likely to be negatively related to CC. Like Extraversion, Openness to Experience is associated with status striving or a motivation to get ahead (Hogan & Holland, 2003). Thus, Openness is likely associated with a tendency to pursue job alternatives both inside and outside the organization. However, individuals high in Openness to Experience are more likely to prefer external alternatives, making it more likely that they will change organizations as good job alternatives arise. This is because they like to pursue diversity and experiment with new experiences (e.g., new jobs; Erdheim et al., 2006; Maertz & Griffeth, 2004). Given higher levels of need for variety and novelty, "these individuals are attracted to novel job demands, and thus more likely to seek out a different role to play in a work activity that they have previously encountered" (Dragoni, Oh, Vankatwyk, & Tesluk, 2011, p. 836). Thus, individuals high in Openness to Experience are more likely to focus on the benefits of exploring new opportunities and downplay the costs of leaving their current positions. In addition, a recent meta-analysis by Fuller and Marler (2009) showed that Extraversion and Openness to Experience are highly related to proactive personality. Proactive individuals actively seek various and novel opportunities and more challenging and complex work experiences and therefore tend to focus on the benefits of getting a job in a new organization rather than on the costs associated with leaving their current job (Bateman & Crant, 1993; Dragoni et al., 2011). Because no strong theoretical rationale exists to support relationships of Openness to Experience with AC and NC, we only hypothesize:

*Hypothesis 3:* Openness to Experience is negatively related to CC.

## Agreeableness

Individuals high in Agreeableness tend to be courteous, cooperative, flexible, and forgiving. We propose that agreeable indi-

viduals are likely to have higher levels of AC than disagreeable individuals for several reasons. First, agreeable individuals are motivated to fulfill fundamental needs associated with affiliation (Barrick et al., 2002) by being loyal, trusting, and compliant. These needs for affiliation are likely to cause them to identify with their organization. Further, because of their propensities to be trusting and loyal, agreeable individuals have a greater tolerance of inequity or unfairness in their social exchange experiences (Skarlicki et al., 1999), making it less likely that their AC will drop in response to negative experiences. In addition, due to their motive to get along with others, agreeable employees try to establish and maintain positive and harmonious relationships with other organization members. These interpersonal bonds contribute to a pleasant work environment and reinforce emotional attachments to the organization (Ilies, Fulmer, Spitzmuller, & Johnson, 2009). Agreeable individuals are also likely to contribute to positive organizational experiences even when in doubt about the organization's commitment to them because of the belief that social exchange partners will remain indebted and thus reciprocate in the end (Alcock & Mansell, 1977), thereby leading to higher levels of AC.

Further, agreeable individuals' general tendency toward loyalty and compliance may translate into higher levels of NC, or a felt obligation to stay with the organization. Agreeable individuals tend to feel supported by the organization (Kurtessis, Ford, Stewart, & Buffardi, 2009). This, coupled with their tendency to abide by the norm of reciprocity, may cause agreeable individuals to feel that they owe the organization loyalty in return for the support they have received. Agreeableness is also associated with the motivation to get along. Because social intimacy tends to dwindle when social exchange expectations are broken (Organ & Lingl, 1995), agreeable individuals are likely to feel obligated to keep up their end of the social exchange by expressing NC. Because we have no strong theoretical rationale suggesting a relationship between Agreeableness and CC (Erdheim et al., 2006), we posit the following hypothesis.

*Hypothesis 4:* Agreeableness is positively related to (a) AC and (b) NC.

### Conscientiousness

Individuals high in Conscientiousness are dependable, careful, organized, hardworking, and achievement oriented. Conscientiousness has been described as "a generalized work involvement tendency (i.e., a liking for rule-governed behavior that probably is more characteristic of work in organizations than in other life domains)" (Organ & Lingl, 1995, p. 341). For this reason, conscientious individuals are likely to develop an affective bond with work organizations. In fact, Conscientiousness has been suggested to be a dispositional root of organizational commitment (Bergman et al., 2009; Hochwarter, Perrewé, Ferris, & Guericco, 1999). Conscientious employees are not only good performers (Barrick & Mount, 1991), but also good citizens (Chiaburu, Oh, Berry, Li, & Gardner, 2011; Organ & Ryan, 1995), and as a result, they receive more rewards from the organization. Tangible and intangible rewards are an especially pleasant experience for conscientious individuals because they serve as evidence of achievement. Thus, receipt of rewards may increase AC in conscientious individuals (Barrick & Mount, 2009).

As with Agreeableness, we also expect that individuals with higher levels of Conscientiousness will have higher levels of NC than those with lower levels of Conscientiousness. Bergman et al. (2009) reasoned that conscientious people develop NC because they feel moral imperatives to act dutifully for their employer. The conceptual overlap between Conscientiousness and NC is the value of loyalty and duty. In support of this notion, highly conscientious people are less likely to withhold their effort in order to meet their job responsibilities and duties even when they perceive little support for their development efforts (Colbert, Mount, Harter, Witt, & Barrick, 2004). In a similar vein, Orvis, Dudley, and Cortina (2008) found that highly conscientious people are likely to remain loyal to their organization even if they perceive relational psychological contract breach. For conscientious people, development and maintenance of a long-term relationship with their organization is consistent with their dispositional tendencies toward loyalty and dependability (Orvis et al., 2008), and thus NC is seen to be only naturally due (Wiener, 1982). Due to no strong theoretical rationale to expect that Conscientiousness is related to CC, we posit the following hypothesis:

*Hypothesis 5:* Conscientiousness is positively related to (a) AC and (b) NC.

Finally, studies that do not specifically assess the three forms of organizational commitment often assess overall/attitudinal commitment. Because AC and overall/attitudinal commitment are similar ( $\rho = .88$ ; Meyer et al., 2002), they likely relate similarly to the FFM traits. Thus, we do not advance any specific hypothesis for the relationships between the FFM traits and overall/attitudinal commitment. However, following Cooper-Hakim and Viswesvaran (2005), we examined AC and overall/attitudinal commitment separately in the current study "to test the extent of their actual overlap" (p. 244).

### The Moderating Role of Culture in Relationships Between the FFM Traits and Organizational Commitment

As noted earlier, Bergman et al. (2009) described commitment as a characteristic adaptation, meaning that organizational commitment is not solely influenced by individual traits or situational influences, but rather stems from the interaction of individual traits and situational influences. Thus, we note that organizational commitment is better understood by considering not only personality traits but also situational factors. Among many situational factors that may interact with individual traits in influencing organizational commitment, we consider the influence of national culture in shaping the relationship between personality and organizational commitment. We specifically focus on the cultural value of individualism–collectivism and expect that this cultural value plays a role as a trait-relevant cue that may trigger the expression of emotional stability, agreeableness, and conscientiousness (Tett & Burnett, 2003).

Individualism and collectivism represent the deep structure of cultural characteristics that differentiate Western and Eastern countries (Hofstede, 2001). The individualism and collectivism dimension has been found to be useful in understanding the influence of social context on employee attitudes and behavior (e.g.,

Earley, 1989) and regarded as “central to characterizing how work is conducted” (Chatman & Barsade, 1995, p. 424). Accordingly, this dimension is one of the most widely examined cultural characteristics in cross-cultural studies (Gelfand, Erez, & Aycan, 2007). For example, several recent meta-analytic studies that have examined the moderating role of national culture (e.g., Fischer & Mansell, 2009; Jiang, Liu, McKay, Lee, & Mitchell, 2012; Meyer et al., 2012; Rockstuhl et al., 2012) included this dimension.

In collectivistic cultures, employees tend to define themselves as interdependent with family, friends, or coworkers. They see building relationships as a critical way to fulfill their strong need for belongingness (Triandis, 1995). Accordingly, they tend to invest a greater amount of time and effort to develop and maintain harmonious relationships with significant others (Markus & Kitayama, 1991). Such emphasis on interpersonal relationships is likely to build a context where individuals are receptive to social norms and obligations (Fischer & Mansell, 2009). In contrast, people in individualistic cultures are more concerned with the achievement of personal goals. Their identities are influenced more strongly by personal accomplishments than by group membership (Hofstede, 2001).

In hypothesizing the moderating role of national culture, we applied trait activation theory, focusing on the interactions between personality traits and situational factors. Tett and colleagues (Tett & Burnett, 2003; Tett & Guterman, 2000) suggested that personality traits are best described as latent potentials that are activated in the presence of trait-relevant situational cues. They noted that trait-relevant situational cues may come from task demands, social expectations, or organizational values and norms. Extending this theory, we propose that the values associated with national culture may also serve as trait-relevant situational cues because cultural values may shape social expectations directly by indicating the types of values that are valued and rewarded in a country as well as indirectly through their effects on organizational values and norms (Oh et al., 2014). We propose that the characteristics of collectivistic cultures (interdependent self, interpersonal relationships, and normative pressures) provide trait-relevant situational cues that trigger the expression of three of the FFM traits: Emotional Stability, Agreeableness, and Conscientiousness.

We expect these three traits are more strongly related with organizational commitment in collectivistic cultures (Tett & Burnett, 2003; Tett & Guterman, 2000). Individuals who have high levels of these three traits share the tendency to get along with others (Hogan & Holland, 2003) and to behave prosocially (Saucier & Goldberg, 2003; Chiaburu et al., 2011 for meta-analytic evidence). Empirical evidence further showed that people high on these three traits are likely to conform to what is socially desirable (DeYoung, Peterson, & Higgins, 2002). In collectivistic cultures, individuals are likely to define themselves as interdependent with other significant others and put greater value on high-quality interpersonal relationships and conforming to social expectations. Thus, we believe that expression of these three traits is likely to be triggered and rewarded in collectivistic cultures as individuals are expected to be prosocial and conform to social pressures and norms.

Specifically, we proposed that Emotional Stability is related to AC because emotionally stable individuals have skills and resources, including emotion management and self-esteem, that enable them to build positive social exchange relationships, perform

well enough to be recipients of social support, and ultimately develop higher levels of AC (Barrick & Mount, 1991; Côté, 2005). However, we propose that national culture influences the goals toward which those skills and resources are likely to be directed. In collectivistic cultures, the most salient focus is on building relationships and interdependent identities. Emotionally stable individuals are therefore expected to regulate their emotions (to suppress negative emotions and to express positive emotions) in the service of building relationships (Matsumoto, Yoo, & Nakagawa, 2008). Emotionally stable individuals have more resources that allow them to do this (Le et al., 2011), and the situational cues in collectivistic cultures are more likely to trigger the use of these resources to build interpersonal relationships and bonds with groups and organizations than those in individualistic cultures where the focus is more strongly on personal accomplishment. In individualistic cultures, on the other hand, emotionally stable individuals are more likely to direct their resources toward individual goals, resulting in a weaker relationship between Emotional Stability and AC.

Further, individuals who are low in Emotional Stability (i.e., neurotic) are sensitive to the risks of leaving the organization, and as a result, may have higher levels of CC than those high in Emotional Stability. We expect this negative relationship between Emotional Stability and CC is stronger in collectivistic cultures than in individualistic cultures. Given social expectations regarding harmonious relationships and stable group memberships in collectivistic cultures, the risks associated with leaving an organization are likely to include a violation of these expectations. Further, as Oh et al. (2014) discussed, labor market institutions are more limited and frequent turnover is more stigmatized in collectivistic cultures than in individualistic cultures. As a result, the risks of leaving an organization are stronger and more salient in collectivistic cultures than in individualistic cultures. Thus, the risks that lead neurotics to experience higher levels of CC are more likely to be reinforced in collectivistic cultures, leading to a stronger negative relationship between Emotional Stability and CC.

*Hypothesis 6:* Emotional Stability is (a) more strongly and positively related to AC and (b) more strongly and negatively related to CC in collectivistic cultures than in individualistic cultures.

We also hypothesized that agreeable individuals are likely to have higher levels of AC and NC than disagreeable individuals because of their latent tendencies to be loyal, trusting, and compliant. Agreeable individuals are motivated to fulfill the need to belong and abide by the norm of reciprocity, which also strengthens their bonds with the organization (Barrick et al., 2002). However, trait activation theory suggests that the relationship between Agreeableness and organizational commitment is stronger when the situational cues trigger and reward the expression of these latent tendencies (Tett & Burnett, 2003). A collectivistic culture provides such trait-relevant situational cues. The importance of the need to belong is more salient and reinforced in a collectivistic culture than in an individualistic culture. Agreeable individuals who act upon their natural tendencies to form interpersonal relationships and affective bonds with organizations are more likely to be rewarded with approval from the culture, and thus Agreeableness is more likely to manifest in higher levels of AC in a collectivistic culture.

Further, the loyalty and trust expressed by agreeable individuals are more likely to be reciprocated in collectivistic cultures than in individualistic cultures. Abiding by the norm of reciprocity is important to agreeable individuals, and thus they are likely to feel an obligation to the organization when they believe that their loyalty and trust will be reciprocated. A collectivistic culture is more likely than an individualistic culture to reinforce developing positive interpersonal relationships and fulfilling the need to belong and less likely to reward the achievement of personal goals. Thus, agreeable individuals may be more likely to feel the obligation to the organization that leads to higher levels of NC in collectivistic cultures.

*Hypothesis 7:* Agreeableness is more strongly and positively related to (a) AC and (b) NC in collectivistic cultures than in individualistic cultures.

We also expect that individualism and collectivism will influence the strength of the relationships of Conscientiousness with AC and NC. Conscientious individuals are dependable and achievement-oriented, and these motivational resources enable them to perform well and be good organizational citizens, leading to higher levels of AC (Barrick & Mount, 2009). Their tendencies to be dependable and hardworking are critical for building trust and reputation in interpersonal relationships and groups (Mayer, Davis, & Schoorman, 1995) and thus are more likely to be used in the service of building relationships and bonds in collectivistic cultures, where such goals are valued. Like Agreeableness, conscientious individuals also have the latent tendencies to be loyal and dutiful, which lead to higher levels of NC (Bergman et al., 2009). In collectivistic cultures, such tendencies are more likely to be reinforced by cultural values and group norms, making it more likely that conscientious individuals will display their loyalty through increased NC. Therefore, we expect that Conscientiousness is more strongly related to AC and NC in collectivistic cultures than in individualistic cultures.

*Hypothesis 8:* Conscientiousness is more strongly and positively related to (a) AC and (b) NC in collectivistic cultures than in individualistic cultures.

## Method

### Identification of Primary Studies

Electronic databases in applied psychology (e.g., PsycINFO, EBSCOhost, Google Scholar, Web of Science) were searched with a combination of keywords representing personality (e.g., *Big Five*, *Five-Factor Model*, *Emotional Stability*, *Neuroticism*, *Extraversion*, *Extroversion*, *Introversion*, *Openness*, *Intellect*, *Agreeableness*, *Conscientiousness*) and commitment (e.g., *organizational commitment*, *affective commitment*, *continuance commitment*, *calculative commitment*, *normative commitment*). To identify unpublished studies, ProQuest Dissertations and Theses databases, Dissertation Abstracts International, the Society for Industrial and Organizational Psychology conference programs (1995–2014), and Academy of Management conference programs (1994–2013) were also searched using the same keywords. In addition, we examined the reference sections of relevant meta-analytic studies (e.g., Cooper-Hakim & Viswesvaran, 2005; Harrison, Newman, & Roth, 2006; Mathieu & Zajac, 1990; Meyer et al., 2002) and review papers (e.g., Bergman et al., 2009). Finally, we searched for possible unpublished/working and in-

press (yet unavailable online) studies by sending email requests to all major list-serves.

### Inclusion Criteria

Primary studies had to meet the following criteria to be included in the current meta-analysis. First, we only included primary studies based on employee samples from work organizations to generalize our findings to the population of employees.

Second, primary studies were included only if they measured one of the FFM traits using measures *explicitly developed* to measure the FFM traits (e.g., the NEO-PI-R, the NEO-FFI, the IPIP, the BFI, Saucier's [1994] Minimarkers). For example, Goodman (1995) and Smith (2003) were excluded because they measured FFM traits using measures *not explicitly developed* to measure the FFM traits (e.g., the OPQ and the CPI, respectively). Some studies (e.g., Aubé, Rousseau, & Morin, 2007; Richardsen, Burke, & Martinussen, 2006; Schyns & von Collani, 2002) were excluded because they only examined locus of control, self-efficacy, or Type A personality. Locus of control and generalized self-efficacy might be classified into Emotional Stability "in light of research suggesting that these traits correlate strongly with Neuroticism and, in fact, appear to represent the same factor" (Judge & Ilies, 2002, p. 797), but primary studies measuring them were excluded to ensure that all FFM traits included in the current meta-analysis are comparable in terms of measurement/construct breadth. For the same reason, primary studies measuring positive affectivity (PA) and negative affectivity (NA) that might be classified respectively into Extraversion and Neuroticism (Thoresen et al., 2003) were also excluded. This decision is consistent with the procedure used by Judge et al. (2002, see Footnote 2 on p. 532) who meta-analyzed the FFM—job satisfaction relationship while excluding PA and NA. Relatedly, Thoresen et al. (2003) conducted a meta-analysis on the relationships of PA ( $k = 15$ ) and NA ( $k = 27$ ) with organizational commitment (combining overall/attitudinal and AC) and, thus, we believe the FFM traits alone warrant separate consideration as a holistic, overarching taxonomy of personality.

Third, we included primary studies assessing at least one of the three forms of organizational commitment (Meyer & Allen, 1991): AC, NC, and CC. We did not include calculative commitment (Hrebiniak & Alutto, 1972) because the construct validity of its measure has been questioned (Meyer & Allen, 1984) and no primary studies measuring any of the FFM traits and calculative commitment were identified. Although we did not advance any specific hypothesis, we also included primary studies that measured *overall/attitudinal commitment* using the Organizational Commitment Questionnaire [OCQ; Mowday, Steers, & Porter, 1979] or O'Reilly and Chatman's (1986) measure.<sup>2</sup>

Fourth, we included only primary studies that reported enough information to calculate the correlations between FFM traits and organizational commitment. For primary studies that did not report enough information to compute a correlation, we contacted the authors of the studies to obtain the necessary information (e.g., Erdheim et al., 2006). As a result, 50 studies (55 independent samples) containing 355 correlation coefficients were included in our meta-analysis.

<sup>2</sup> In our database, except for Westerman and Simmons (2007), overall/attitudinal commitment was measured using the OCQ measure.

Finally, the minimum number of primary studies to be included in our meta-analysis was three given that good empirical evidence exists when an important relationship is found in at least *three* different studies from at least *two* different researchers (Chambless & Hollon, 1998).

### Coding Procedure and Accuracy

Two authors independently coded all the relevant articles. To verify coding accuracy, the effect sizes, sample sizes, reliability estimates, FFM measures, forms of organizational commitment, and publication status were compared. The interrater agreement rate was high at 98.9% (3160 cells/3195 cells). We resolved all of the remaining discrepancies (mostly typographical errors, failing to reverse the sign of a correlation coefficient between Neuroticism and commitment, choice of sample size when only the range of sample size is given) by thoroughly double-checking the primary studies in question. The main codes and input values for the primary studies included the meta-analysis are provided in the Appendix A.

### Meta-Analytic Procedures and Publication Bias Check

We used Hunter and Schmidt's (2004) psychometric meta-analysis method while maintaining statistical independence by retaining only one data point (correlation) per sample for a given relationship. For example, Panaccio and Vandenberghe (2012) measured the relationship between each FFM trait and CC across two time points on the same sample. In addition, S. Lee et al. (2004) measured two facets of Extraversion and AC. In these cases, we computed composite correlations instead of including two separate correlations. This is consistent with procedures used in prior meta-analyses (e.g., Chiaburu et al., 2011). In addition, correlation coefficients were corrected for unreliability in both independent and dependent variables using local reliability estimates reported (in all cases, coefficients alpha). In a few cases in which a primary study did not report reliability estimates (e.g., Brennan, 1999; Kirkwood, 2006; Naquin & Holton, 2002; Westerman & Simmons, 2007), the mean of the reliability estimates from the other primary studies for the variable were used to correct for unreliability. In several studies where only the range of sample sizes was given, we used the lower limit to be conservative (e.g., Panaccio & Vandenberghe, 2012; Radwinsky, 1999; Tsai, Chen, & Chen, 2012).

We also examined the variability of the corrected correlations across studies by calculating 80% credibility intervals (CIs). If the credibility interval around a positive average correlation excludes zero, this suggests that at least 90% of the individual correlations included in the meta-analysis are positive and thus the relationship is generalizable in most cases. We also reported the percentage of the variability in correlations across studies accounted for by statistical artifacts. A lower percentage indicates that the proportion of true between-studies variance relative to observed variance is large, which suggests the existence of moderator(s). Finally, we reported the 95% confidence intervals (CIs); if these intervals include zero, this suggests that the mean true-score correlation does not differ from zero.

To test the moderating role of culture, we conducted the independent sample *z* test with mean true-score correlations using

appropriate standard error estimates while also visually checking the degree of overlap for the confidence intervals between collectivistic and individualistic countries whenever possible (see Oh et al., 2014 for a similar method). Specifically, we computed appropriate standard error estimates for mean true-score correlations and conducted the *z* test using Equation (2) for standard error and Equation (3) for *z* test as provided in Chiaburu, Lorinkova, and Van Dyne (2013, p. 306; see also Hunter & Schmidt, 2004). We classified each sample into either individualistic (individualism scores  $\geq 51$ ) or collectivistic cultures (individualism scores  $< 51$ ) by using Hofstede & Hofstede's (2005) individualism scores (higher scores represent higher levels of individualism vs. collectivism) and their recommended cutoff score (see Rockstuhl et al., 2012). In our meta-analytic database, individualistic countries are the US (91), Canada (80), and Austria (55), whereas collectivistic countries are Pakistan (14), Taiwan (17), South Korea (18), China (20), Egypt (25), Portugal (27), and Sri Lanka (35). Consistent with Shao, Rupp, Skarlicki, and Jones (2013), we also conducted weighted least square (WLS) regression analyses where the true-score correlations between the FFM trait and each form of organizational commitment were regressed on the samples' national individualism scores presented above using the SPSS macro and syntax (random-effect model) developed by Lipsey and Wilson (2001).

To examine relative importance of the FFM traits in predicting organizational commitment, relative weight analysis (Johnson, 2000) was used. Relative weight analysis computes the proportionate contribution each predictor makes to the total variance accounted for, taking both direct and indirect effects into account. The relative weight analysis in percent form (%RW) is useful particularly because the relative magnitudes of regression coefficients are difficult to interpret due to multicollinearity among the FFM predictors. As input to each relative weight analysis, we used the true-score correlations between the FFM traits and each form of organizational commitment estimated from this study and true-score correlations among the FFM traits from Mount, Barrick, Scullen, and Round (2005; see Table 2, p. 462) and Oh (2009; Table 9, p. 196) for individualistic and collectivistic cultures, respectively.

Although we did our best to include all available studies, potential publication bias was further assessed by means of trim and fill methods (Duval & Tweedie, 2000) using Comprehensive Meta-Analysis software, Version 2 (Borenstein, Hedges, Higgins, & Rothstein, 2005; Kepes, Banks, McDaniel, & Whetzel, 2012; Kepes, Banks, & Oh, 2014). Random-effect trim-and-fill methods did not detect publication bias for any of the relationships reported in this study. In addition, subgroup analyses by publication bias (published vs. unpublished) was conducted and the results did not show any noticeable publication bias except for five relationships whose 95% CIs did not overlap and *z* values were found to be significant. Interestingly, in four of the five cases, unpublished studies reported stronger effect sizes than did published studies; publication bias is believed to exist when there is the systematic suppression (in terms of publication) of primary studies with low effect sizes and/or nonsignificant results (Kepes et al., 2014). Given this, we do not believe that publication or availability bias had any serious impact on any conclusion drawn from this study.

## Results

Across the primary studies used in the current meta-analysis, the mean reliability estimates of the FFM traits ranged from .75 to .81 and those of forms of organizational commitment ranged from .73 to .87.<sup>3</sup> The results are similar to those reported in previous meta-analyses (see Chiaburu et al., 2011 for FFM factors; Meyer et al., 2002 for commitment forms).

### Testing Hypothesized Relationships Between Personality and Organizational Commitment

The results for testing Hypotheses 1a–5b are presented in Table 1. Hypotheses 1a and 1b predicted that Emotional Stability is (a) positively related to AC and (b) negatively related to CC. The true-score correlations of Emotional Stability with AC ( $\hat{\rho} = .24$ ; 95% CI: .18, .31) and CC ( $\hat{\rho} = -.12$ ; 95% CI:  $-.19, -.06$ ) were in the hypothesized direction and significantly differed from zero. Thus, Hypotheses 1a and 1b were both supported. It should be noted, however, that the 80% CV for the relationship between Emotional Stability and CC included zero ( $-.28, .03$ ), indicating that more than 10% of the individual correlation coefficients in this meta-analysis were positive.

Hypotheses 2a and 2b predicted that Extraversion is (a) positively related to AC and (b) negatively related to CC. Both the true-score correlations of Extraversion with AC ( $\hat{\rho} = .28$ ; 95% CI: .25, .32) and CC ( $\hat{\rho} = -.08$ ; 95% CI:  $-.16, -.01$ ) were significantly different from zero. Thus, Hypotheses 2a and 2b were also supported. It is important to note that the Extraversion–CC relationship is weak and its 80% CV included zero ( $-.25, .08$ ), indicating that the negative relationship is not always generalizable; more than 10% of the individual correlation coefficients in this meta-analysis were positive.

Hypothesis 3 proposed that Openness is negatively related to CC. The true-score correlation between Openness and CC ( $\hat{\rho} = -.10$ ; 95% CI:  $-.17, -.03$ ) was small but significantly differed from zero. Thus, Hypothesis 3 was supported. However, its 80% CV ( $-.25, .06$ ) included zero, indicating that more than 10% of the correlation coefficients in this meta-analysis were positive.

Hypotheses 4a and 4b predicted that Agreeableness is positively related to (a) AC and (b) NC. The true-score correlations of Agreeableness with AC ( $\hat{\rho} = .31$ ; 95% CI: .25, .36) and NC ( $\hat{\rho} = .26$ ; 95% CI: .21, .31) were in the hypothesized direction and significantly differed from zero. Thus, Hypotheses 4a and 4b were both supported.

Hypotheses 5a and 5b suggested that Conscientiousness is positively related to (a) AC and (b) NC. The true-score correlations of Conscientiousness with AC ( $\hat{\rho} = .24$ ; 95% CI: .19, .30) and NC ( $\hat{\rho} = .18$ ; 95% CI: .13, .24) were in the hypothesized direction and nonzero. Hence, Hypotheses 5a and 5b were both supported.

For informational purposes, we also reported the true-score correlations of the FFM traits with overall/attitudinal commitment in Table 1. All of the FFM traits were positively correlated with overall/attitudinal commitment and significantly differed from zero;  $\hat{\rho}$  ranged from .18 (Openness) to .29 (Conscientiousness).

### Differential Relationships Between FFM Traits and Commitment Across Cultures

The results for testing Hypotheses 6a–8b are presented in Table 2. Hypotheses 6a and 6b proposed that Emotional Stability is (a) more strongly and positively related to AC and (b) more strongly and negatively related to CC in collectivistic cultures than in individualistic cultures. Emotional Stability was slightly more strongly and positively related to AC in collectivistic cultures ( $\hat{\rho} = .27$ ) than in individualistic cultures ( $\hat{\rho} = .23$ ) as hypothesized but they are not significantly different ( $z = .48$ ). Similarly, the relationship between Emotional Stability and CC was slightly stronger in collectivistic ( $\hat{\rho} = -.13$ ) than in individualistic cultures ( $\hat{\rho} = -.12$ ), but again the difference was not significant ( $z = .13$ ). Thus, we did not find support for Hypotheses 6a and 6b.

Hypotheses 7a and 7b predicted that Agreeableness is more strongly and positively related to (a) AC and (b) NC in collectivistic cultures than in individualistic cultures. As hypothesized, Agreeableness was more strongly and positively related to AC in collectivistic cultures ( $\hat{\rho} = .44$ ) than in individualistic cultures ( $\hat{\rho} = .24$ ):  $z = 3.38, p < .05$ . Similarly, the relationship between Agreeableness and NC was stronger in collectivistic ( $\hat{\rho} = .35$ ) than in individualistic cultures ( $\hat{\rho} = .23$ ):  $z = 3.31, P < .05$ . Thus, we found support for both Hypotheses 7a and 7b.

Hypotheses 8a and 8b proposed that Conscientiousness is more strongly and positively related to (a) AC and (b) NC in collectivistic cultures than in individualistic cultures. The results showed that although Conscientiousness was slightly more strongly and positively related to AC and NC in collectivistic cultures ( $\hat{\rho}s = .30$  and  $.22$ , respectively) than in individualistic cultures ( $\hat{\rho}s = .21$  and  $.17$ , respectively), the differences are not statistically significant:  $z = 1.45$  (for AC) and  $z = .98$  (for NC). Thus, Hypotheses 8a and 8b were not supported.

Again, for informational purpose, we reported the true-score correlations of the FFM traits with overall/attitudinal commitment across the two cultures in Table 2. The results showed that the relationship of Emotional Stability with overall/attitudinal commitment was significantly stronger in collectivistic cultures than in individualistic cultures;  $\hat{\rho}s$  in collectivistic and individualistic cultures are .34 versus .18 ( $z = 3.83$ ).

The WLS regression analysis results are generally consistent with the  $z$  tests results reported above. However, it is also noted that sample size ( $k$  in this case) was too small for some of these analyses to reach statistical significance, but the signs of the WLS beta weights were always found to be consistent with those of our hypotheses. Detailed WLS results are available from the first author upon request.

<sup>3</sup> The means, standard deviations, and number of samples ( $k$ ) of reliability estimates of the FFM traits are as follows: Emotional Stability ( $M = .81, SD = .09, k = 41$ ), Extraversion ( $M = .78, SD = .08, k = 35$ ), Openness/Intellect ( $M = .75, SD = .10, k = 31$ ), Agreeableness ( $M = .76, SD = .08, k = 38$ ), and Conscientiousness ( $M = .78, SD = .08, k = 47$ ). The mean ( $M$ ), standard deviation ( $SD$ ), number of samples ( $k$ ) of reliability estimates of the forms of organizational commitment are as follows: affective commitment ( $M = .84, SD = .06, k = 39$ ), normative commitment ( $M = .78, SD = .11, k = 19$ ), continuance commitment ( $M = .73, SD = .09, k = 20$ ), and overall/attitudinal commitment ( $M = .87, SD = .06, k = 14$ ).



Table 1  
*Meta-Analytic Results for the Relationships Between the FFM Personality Traits and Organizational Commitment*

Variable	<i>k</i>	<i>N</i>	$\bar{r}$	$SD_r$	$\hat{\rho}$	$SD_\rho$	80% CV	95% CI	Var %
<b>Emotional Stability</b>									
Affective commitment	32	10,138	.20	.16	.24	.18	[.02, .47]	[.18, .31]	12%
Normative commitment	15	4,744	.12	.12	.15	.14	[-.04, .33]	[.07, .22]	20%
Continuance commitment	16	4,912	-.09	.11	-.12	.12	[-.28, .03]	[-.19, -.06]	26%
Overall/attitudinal commitment	12	5,521	.16	.10	.19	.11	[.06, .33]	[.13, .26]	20%
<b>Extraversion</b>									
Affective commitment	26	7,996	.23	.08	.28	.07	[.19, .37]	[.25, .32]	48%
Normative commitment	15	3,515	.16	.08	.21	.09	[.10, .32]	[.16, .26]	50%
Continuance commitment	15	3,564	-.06	.12	-.08	.13	[-.25, .08]	[-.16, -.01]	32%
Overall/attitudinal commitment	11	4,835	.23	.10	.28	.12	[.13, .43]	[.21, .36]	18%
<b>Openness</b>									
Affective commitment	25	7,797	.07	.15	.09	.18	[-.13, .32]	[.02, .17]	14%
Normative commitment	15	3,513	.08	.10	.11	.10	[-.03, .24]	[.05, .17]	42%
Continuance commitment	15	3,562	-.06	.11	-.10	.12	[-.25, .06]	[-.17, -.03]	35%
Overall/attitudinal commitment	8	1,425	.15	.08	.18	.08	[.07, .29]	[.10, .26]	53%
<b>Agreeableness</b>									
Affective commitment	29	9,283	.24	.13	.31	.14	[.13, .48]	[.25, .36]	19%
Normative commitment	13	4,147	.20	.07	.26	.07	[.17, .35]	[.21, .31]	53%
Continuance commitment	14	4,315	.05	.12	.06	.14	[-.12, .24]	[-.02, .14]	23%
Overall/attitudinal commitment	10	2,007	.20	.07	.24	.08	[.14, .34]	[.18, .30]	54%
<b>Conscientiousness</b>									
Affective commitment	38	11,041	.20	.15	.24	.17	[.03, .46]	[.19, .30]	14%
Normative commitment	16	5,117	.14	.09	.18	.10	[.06, .31]	[.13, .24]	36%
Continuance commitment	18	5,407	.02	.10	.03	.11	[-.11, .18]	[-.02, .09]	32%
Overall/attitudinal commitment	12	2,782	.24	.14	.29	.17	[.07, .51]	[.19, .39]	16%

*Note.* *k* = number of correlation coefficients; *N* = total sample size;  $\bar{r}$  = sample-weighted mean observed correlation;  $SD_r$  = standard deviation of the observed correlation;  $\hat{\rho}$  = estimated mean true-score correlation;  $SD_\rho$  = estimated standard deviation of the true correlation; CV = credibility interval for mean true-score correlation; CI = confidence interval for mean true-score correlation; Var % = percentage of observed variance accounted for by statistical artifacts.

### The Relative Importance of the FFM Personality Traits in Predicting Organizational Commitment Across Cultures

We further performed analyses with relative weights (RWs; Johnson, 2000) to examine the relative importance of each of the FFM traits in predicting each of the three forms of organizational commitment across cultures. The results are shown in Table 3. It is noted that because there are five personality traits and the sum of %RWs is 100%, we think that the %RW of 20% or greater represents a meaningful contribution to the prediction of organizational commitment. RWs in  $R^2$  form can be computed as follows:  $(\%RW \times \text{total } R^2)/100$ . The sum of RWs is equal to total  $R^2$ . In determining AC, Agreeableness (53.1%) was the single most dominant FFM trait in collectivistic cultures, whereas Extraversion (40.8%) was the most dominant FFM trait in individualistic cultures. In determining NC, Agreeableness and Extraversion had the strongest RWs in both collectivistic (57.1% and 23.4%, respectively) and individualistic cultures (45.3% and 22.4%, respectively). For CC, the RWs of the converse of Emotional Stability (42.8%) and Agreeableness (33.3%) were dominant in collectivistic cultures, whereas those of the converse of Extraversion (34.2%), the converse of Openness (27.2%), and the converse of Emotional Stability (22.6%) were dominant in individualistic cultures. For overall/attitudinal commitment, Conscientiousness (31.1%), Emotional Stability (30.4%), and Agreeableness (20.6%) were dominant traits in collectivistic cultures, whereas Extraversion (48.5%) was the single most dominant trait in individualistic

cultures. Interestingly, the FFM traits explained more variance in AC and NC in collectivistic cultures than in individualistic cultures. That is, the FFM traits were found to be more useful in determining or predicting organizational commitment in collectivistic cultures than in individualistic cultures.

### Testing Incremental Validities of the FFM Traits Over Affectivity

Although our findings supported that the FFM traits are significantly related to organizational commitment, there may be alternative explanations for these relationships. One possible explanation is that the personality-organizational commitment relationship is confounded with affectivity given its association with both FFM traits (especially self-reported personality) and organizational commitment (Thoresen et al., 2003). Hence, we conducted supplementary analyses to examine the incremental validities of the FFM traits above and beyond PA and NA. We first obtained the raw data used in Thoresen et al. (2003) and conducted meta-analyses for the relationships of PA and NA with three forms of organizational commitment (see Appendix B). Specifically, we regressed the three forms of commitment on the FFM traits, PA, and NA. Our findings can be summarized as follows: (a) incremental validities of the FFM traits over PA and NA were all significant; (b) incremental validities of Agreeableness and Conscientiousness over the other FFM traits, PA, and NA were all significant; (c) incremental validities of the four affectivity-laden traits (PA, NA, Emotional Stability, and Extraversion) over the

Table 2. *Meta-Analytic Results of Moderator Analysis of National Culture and Publication Status on the Relationships Between the FFM Personality Traits and Organizational Commitment*

Variable	Affective commitment				Normative commitment				Continuance commitment				Overall/attitudinal commitment								
	k	N	$\bar{r}$	$\hat{\rho}$	z	k	N	$\bar{r}$	$\hat{\rho}$	z	k	N	$\bar{r}$	$\hat{\rho}$	z	k	N	$\bar{r}$	$\hat{\rho}$	z	
<b>Emotional Stability</b>																					
Published	19	5,813	.17	.20	1.60	6	1,475	-.02	-.02 <sup>L</sup>	5.22*	7	1,643	-.15	-.19	1.53	10	5,118	.15	.18 <sup>L</sup>	3.24*	
Unpublished	13	4,325	.24	.31	.48	9	3,269	.18	.23 <sup>H</sup>		9	3,269	-.07	-.08		2	403	.32	.37 <sup>H</sup>		
Collectivistic	12	3,262	.22	.27 <sup>a</sup>		4	1,025	.06	.08 <sup>b</sup>	1.12	4	954	-.10	-.13 <sup>a</sup>	.13	3	542	.29	.34 <sup>bH</sup>	3.83*	
Individualistic	20	6,876	.19	.23 <sup>a</sup>		11	3,719	.13	.16 <sup>b</sup>		12	3,958	-.09	-.12 <sup>a</sup>		9	4,979	.15	.18 <sup>bL</sup>		
<b>Extraversion</b>																					
Published	17	5,866	.23	.29	.48	8	2,182	.14	.19	.72	8	2,231	-.04	-.07	.32	9	4,432	.25	.30 <sup>H</sup>	2.12*	
Unpublished	9	2,130	.22	.27	1.45	7	1,333	.19	.23		7	1,333	-.08	-.10		2	403	.10	.12 <sup>L</sup>		
Collectivistic	14	4,159	.25	.31 <sup>b</sup>		7	2,041	.18	.26 <sup>b</sup>	1.90	6	1,851	.01	.01 <sup>bL</sup>	3.55*	4	743	.20	.23 <sup>b</sup>	.81	
Individualistic	12	3,837	.21	.26 <sup>b</sup>		8	1,474	.14	.16 <sup>b</sup>		9	1,713	-.13	-.18 <sup>bH</sup>		7	4,092	.24	.29 <sup>b</sup>		
<b>Openness</b>																					
Published	15	5,385	.04	.06	1.86	7	1,898	.09	.12	.55	7	1,947	-.04	-.07	.62	6	1,022	.12	.14	1.47	
Unpublished	10	2,412	.14	.18	3.07*	8	1,615	.07	.09		8	1,615	-.09	-.13		2	403	.22	.25		
Collectivistic	13	3,962	.15	.18 <sup>bH</sup>		7	2,041	.12	.17 <sup>bH</sup>	2.24*	6	1,851	-.01	-.02 <sup>b</sup>	1.74	3	542	.20	.24 <sup>b</sup>	1.52	
Individualistic	12	3,835	.00	.00 <sup>bL</sup>		8	1,472	.04	.04 <sup>bL</sup>		9	1,711	-.12	-.17 <sup>b</sup>		5	883	.11	.14 <sup>b</sup>		
<b>Agreeableness</b>																					
Published	16	5,110	.24	.31	.03	5	1,166	.17	.22	.94	6	1,334	.06	.08	.27	8	1,604	.17	.21 <sup>L</sup>	2.22*	
Unpublished	13	4,173	.23	.31	3.38*	8	2,981	.21	.28		8	2,981	.04	.06		2	403	.29	.34 <sup>H</sup>		
Collectivistic	10	2,946	.35	.44 <sup>aH</sup>		4	1,025	.26	.35 <sup>aH</sup>	3.31*	4	954	.11	.14 <sup>b</sup>	.92	3	542	.26	.30 <sup>b</sup>	1.61	
Individualistic	19	6,337	.19	.24 <sup>aL</sup>		9	3,122	.18	.23 <sup>aL</sup>		10	3,361	.03	.04 <sup>b</sup>		7	1,465	.18	.22 <sup>b</sup>		
<b>Conscientiousness</b>																					
Published	22	6,371	.17	.20	1.78	7	1,854	.09	.12	1.86	8	2,022	.01	.02	.31	10	2,379	.20	.24 <sup>L</sup>	3.23*	
Unpublished	16	4,670	.24	.31	1.45	9	3,263	.17	.22		10	3,385	.03	.04		2	403	.51	.60 <sup>H</sup>		
Collectivistic	14	3,950	.24	.30 <sup>a</sup>		6	1,713	.16	.22 <sup>a</sup>	.98	6	1,642	.07	.09 <sup>b</sup>	1.15	5	1,317	.31	.37 <sup>b</sup>	1.68	
Individualistic	24	7,091	.18	.21 <sup>a</sup>		10	3,404	.13	.17 <sup>a</sup>		12	3,765	.00	.01 <sup>b</sup>		7	1,465	.18	.21 <sup>b</sup>		

Note. k = number of correlation coefficients; N = total sample size;  $\bar{r}$  = sample-weighted mean observed correlation;  $\hat{\rho}$  = estimated mean true-score correlation; The independent z test was conducted using Equation (2) for standard error provided in Chiaburu et al. (2013, p. 306); see also Hunter & Schmidt, 2004; H = significantly higher than its counterpart mean true-score correlation and L = significantly lower than its counterpart mean true-score correlation based on z-testis; p-values are also reported (z  $\geq$  1.96, p < .05 two tailed).

<sup>a</sup> Hypothesized moderators. <sup>b</sup> Nonhypothesized moderators.

\* p < .05.

Table 3

*Relative Importance of the FFM Personality Traits in Determining Organizational Commitment Between Collectivistic and Individualistic Cultures*

Variable	Affective commitment		Normative commitment		Continuance commitment		Overall/attitudinal commitment	
	Col	Ind	Col	Ind	Col	Ind	Col	Ind
	%RW	%RW	%RW	%RW	%RW	%RW	%RW	%RW
Emotional stability	12.4	17.4	1.6	12.8	<b>42.8<sup>a</sup></b>	<b>22.6<sup>a</sup></b>	<b>30.4</b>	8.2
Extraversion	18.3	<b>40.8</b>	<b>23.4</b>	<b>22.4</b>	1.7	<b>34.2<sup>a</sup></b>	6.8	<b>48.5</b>
Openness/Intellect	3.3	7.2	5.7	1.6	3.8 <sup>a</sup>	<b>27.2<sup>a</sup></b>	11.1	6.1
Agreeableness	<b>53.1</b>	<b>21.2</b>	<b>57.1</b>	<b>45.3</b>	<b>33.3</b>	11.6	<b>20.6</b>	18.8
Conscientiousness	12.9	13.5	12.3	17.8	18.4	4.4	<b>31.1</b>	18.4
$R^2$	.25	.14	.16	.07	.07	.07	.21	.12
$R$	.50	.37	.40	.27	.26	.26	.46	.35

*Note.* %RW = relative weights in percentage form (calculated by dividing individual relative weights by their sum [total  $R^2$ ] and multiplying by 100), which add up to 100% (Johnson, 2000).  $R^2$  = squared multiple correlation computed using the true-score correlations among the FFM traits reported in Mount et al. (2005 Table 2, p. 462) and Oh (2009; Table 9, p. 196) for individualistic and collectivistic cultures, respectively; %RW equal to or greater than 20% are in boldface; Col = Collectivistic, Ind = Individualistic.

<sup>a</sup>The sign of the corresponding true-score correlation is negative; that is, the %RW is for the converse of the FFM trait.

other three FFM traits were all significant; and (4) Agreeableness was the strongest predictor of both AC and NC among the seven dispositional predictors (see Table 4).

### Discussion

In his book chapter, Meyer (2009) noted that “employees, as human beings, have a natural inclination to make commitments to and expect commitments from others” (pp. 54–55) and emphasized the criticality of organizational commitment even in a changing world of work. Despite its importance, the antecedents of organizational commitment have not been fully examined (Bergman et al., 2009; Johnson & Hezlett, 2008). To supplement past research that has focused heavily on situational antecedents of organizational commitment, we developed and tested distinct theoretical justifications regarding the relationships of the FFM traits with three forms of organizational commitment and the moderating role of national culture in the personality-organizational commitment relationships. Our meta-analytic results showed that the FFM traits were significantly related to the three forms of organizational commitment and that some relationships were stronger in collectivistic cultures than in individualistic cultures.

### Theoretical Implications

Our results have several implications for the personality and commitment literatures. First, we provided a theoretical rationale and meta-analytic evidence regarding the dispositional basis of organizational commitment. Notably, we found that the FFM traits as a whole are significantly associated with three forms of organizational commitment and more strongly in collectivistic cultures than individualistic cultures; multiple  $R$ s were .37 (individualistic) and .50 (collectivistic) for AC, .27 (individualistic) and .40 (collectivistic) for NC, and .26 (both individualistic and collectivistic cultures) for CC. This is as strong as the multivariate relationship between the FFM traits and job satisfaction ( $R = .41$ ; Judge et al., 2002). In particular, all of the FFM traits are significantly and positively related to both AC and NC. We also provided initial

theoretical rationale for these relationships and suggest ways that this theoretical rationale may be extended later in the discussion section. This theoretical contribution is important because although the FFM traits have been examined as important antecedents of various attitudinal and behavioral work outcomes (Barrick & Mount, 2009), their influence on organizational commitment has been rarely examined in the personality and organizational commitment literatures.

Second, the current findings underscore the role of Agreeableness in shaping organizational commitment. Agreeableness was the strongest predictor of both AC and NC. The importance of Agreeableness in explaining organizational commitment is consistent with recent meta-analyses showing that Agreeableness plays a critical role in understanding organizational citizenship behaviors (Chiaburu et al., 2011; Ilies et al., 2009), turnover (Zimmerman, 2008), and counterproductive workplace behavior (Berry, Ones, & Sackett, 2007). Given its tendency toward trust and loyalty (i.e., to get along), Agreeableness may be especially relevant for predicting employee outcomes that are reliant on strong interpersonal or social exchange relationships. As such outcomes are becoming more and more critical in employee, group, and organizational effectiveness (e.g., Allen & Rush, 1998; Ilies et al., 2009; Podsakoff, Whiting, Podsakoff, & Blume, 2009), our results also highlight the criticality of Agreeableness in predicting and explaining employee outcomes in contemporary workplaces.

Third, our findings also emphasize the potential for extending our knowledge regarding the nomological network between personality and job attitudes. Thus far, the relationship between personality and job attitudes has often been understood to be due to their common, affective basis (via positive and negative affectivity; Judge et al., 2002; Panaccio & Vandenberghe, 2012; Thoresen et al., 2003). Our findings showed, however, that the pattern of relationships of the FFM traits with organizational commitment is different from their relationships with job satisfaction, thereby indicating that the relationships between personality and job attitudes are more complex than we previously thought. In particular, we note that the relationships of Agreeableness with AC and

Table 4  
*Predicting Three Forms of Organizational Commitment Using the FFM Personality Traits and Affectivity*

Variable	Affective commitment					Normative commitment					Continuance commitment				
	R	R <sup>2</sup>	ΔR	ΔR <sup>2</sup>	β	R	R <sup>2</sup>	ΔR	ΔR <sup>2</sup>	β	R	R <sup>2</sup>	ΔR	ΔR <sup>2</sup>	β
<b>Model</b>															
FFM only (1)	.40	.16				.31	.10				.21	.05			
PA and NA only (2)	.36	.13				.25	.06				.20	.04			
PA, NA, EMS, EXT, OPE (3)	.38	.14				.27	.07				.22	.05			
AGR, CON, OPE (4)	.34	.11				.28	.08				.13	.02			
FFM + PA and NA (5)	.44	.19				.34	.12				.27	.08			
<b>Incremental validities</b>															
FFM over PA and NA (5)–(2)			.08	.06				.09	.06				.07	.04	
PA NA over FFM (5)–(1)			.04	.03				.03	.02				.06	.03	
Increments by AGR CON (5)–(3)			.06	.05				.07	.05				.05	.03	
Increments by PA NA EMS EXT (5)–(4)			.10	.08				.06	.04				.14	.06	
<b>Regression on all variables</b>															
Positive affectivity					.19					.16					–.22
Negative affectivity					–.10					–.10					–.02
Emotional stability					–.04					–.11					–.17
Extraversion					.09					.05					.05
Openness					–.05					.02					–.07
Agreeableness					.21					.21					.10
Conscientiousness					.07					.07					.14

*Note.* All values are significant at  $p < .01$  level; PA = positive affectivity; NA = negative affectivity; EMS = Emotional Stability; EXT = Extraversion; OPE = Openness to Experience; AGR = Agreeableness; CON = Conscientiousness; FFM = Five-Factor Model of personality. For these analyses, we first obtained raw data used in Thoresen et al. (2003) and conducted meta-analyses for the relationships of PA and NA with three forms of organizational commitment (see Appendix B). The true-score correlations of PA and NA with the FFM traits from Steel et al. (2008, Table 2); intercorrelations among the FFM traits (Mount et al., 2005, Table 2); and the correlation between PA and NA from Watson et al. (1999, Table 4) were used as input to the regression analysis results.

overall/attitudinal commitment ( $\hat{\rho}$ s = .31 and .24, respectively) were stronger than the relationship of Agreeableness with job satisfaction ( $\hat{\rho}$  = .17; Judge et al., 2002). In addition, Openness was found to have significant relationships with all forms of organizational commitment whereas it was not significantly related to job satisfaction (Judge et al., 2002). These differences are noteworthy because job satisfaction and AC have been suggested to share affective underpinnings (Thoresen et al., 2003) and are sometimes suggested to capture almost the same latent construct (Harrison et al., 2006; Le, Schmidt, Harter, & Lauver, 2010). However, FFM traits appear to have different relationships with these two work attitudes.

Fourth, with regard to the distinctiveness of the three forms of organizational commitment, our results suggest that AC and NC have a similar pattern of relationships with the FFM traits; they have the strongest relationship with Agreeableness and positive relationships with Emotional Stability, Extraversion, Openness, and Conscientiousness. This overlap is consistent with Meyer et al.'s (2002) suggestion that positive work experiences from emotional attachment to an organization (AC) may cause employees to feel more obligated to reciprocate (NC). For CC, we found that Emotional Stability, Extraversion, and Openness negatively and significantly correlate with CC as hypothesized, thereby supporting prior research evidence regarding the distinctiveness of CC compared with AC and NC (Meyer et al., 2002).

Fifth, our meta-analysis extends current knowledge about the relationships among personality, culture, and organizational commitment. We used trait activation theory to develop our hypotheses regarding the moderating role of national cultures and found that

Agreeableness tended to have stronger positive relationships with AC and NC in collectivistic cultures. That is, Agreeableness, a loyalty-related trait, is likely to play a more critical role in predicting AC and NC in collectivistic cultures. Furthermore, although we did not hypothesize a priori, we found that Emotional Stability is more strongly related to overall/attitudinal organizational commitment in collectivistic cultures. Our finding not only emphasizes that personality and culture have a joint influence on forming organizational commitment but also supports the utility of trait activation theory (Tett & Burnett, 2003; Tett & Guterman, 2000) in explaining this suggested person by culture interaction. Specifically, cultures can be regarded as providing situational cues that reward and reinforce the expression of certain personality traits (e.g., Agreeableness).

It should be noted, however, that although we hypothesized that collectivistic cultures would also activate the expression of Emotional Stability and Conscientiousness such that their relationships with organizational commitment would be stronger in collectivistic cultures, we did not find support for these hypotheses. We propose two possible explanations for this. First, Agreeableness, with its focus on affiliation and cooperation, may be more likely to be triggered in a collectivistic culture with its norms and rewards for affiliation and cooperation than Emotional Stability or Conscientiousness are. Although we expected that Emotional Stability and Conscientiousness would have stronger relationships with organizational commitment in collectivistic cultures, arguing that the personal resources possessed by these individuals would be more likely to be directed toward the goals of relationship building in a collectivistic culture, our findings showed that these traits are

also triggered in individualistic cultures. In individualistic cultures, personal resources of emotionally stable and conscientious individuals may be more likely to be directed toward individual goals, resulting in rewards that are then reciprocated through organizational commitment. This logic would suggest that Emotional Stability and Conscientiousness are likely to impact organizational commitment in both collectivistic and individualistic cultures, which is consistent with our findings that culture does not moderate these relationships. Second, it is also possible that our data were not precise or large enough to detect the moderating role of culture with respect to Emotional Stability and Conscientiousness.

### Practical Implications

In general, our findings show that FFM traits play an important role in understanding employee commitment to the organization. Consistent with previous studies on personality traits in the workplace, practitioners will benefit from considering all of the FFM traits in their selection systems. In this study, we found that the FFM traits are moderately related to organizational commitment, meaning that some people are likely to be predisposed to have positive attitudes toward their organizations. Particularly, we note that two affect-oriented FFM traits (Emotional Stability and Extraversion) and two loyalty-oriented FFM traits (Agreeableness and Conscientiousness) have impressive associations with AC and NC. With prior evidence on the importance of selecting on the FFM traits for higher performance, we suggest that selection on all FFM traits can be important for obtaining and retaining committed employees in conjunction with employee support programs.

Furthermore, the importance of selecting on the FFM traits seems to be more pronounced for organizations in collectivistic cultures. This cross-cultural difference may have practical implications for multinational corporations (MNCs). Personality-based selection is anticipated to particularly help MNCs retain committed employees through their ongoing international assignments. MNCs usually face varying types of obstacles and challenges (e.g., cultural diversity, geographic dispersion, rapid changes in the global environment) that cause great difficulty in nurturing strong commitment in employees (S. Taylor, Levy, Boyacigiller, & Beechler, 2008). Selecting employees predisposed to be committed to their organization may help minimize such impacts of turbulent social and environmental challenges on employee commitment. Our study further suggests that if MNCs operate in collectivistic countries and/or hire most employees from collectivistic countries, the potential benefit from such selection programs will be greater as the FFM traits become more strongly associated with organizational commitment in those countries.

### Limitations and Directions for Future Research

The present study has limitations that suggest directions for future research. First, our meta-analytic results should be generalized with caution because some correlations were estimated based on a small number of primary studies, thereby increasing the likelihood of second-order sampling error and thus making our moderator analyses less generalizable. Thus, our findings on the personality-organizational commitment relationships across individualistic and collectivistic cultures need to be replicated in future studies. Further, the small number of primary studies limited our

ability to examine other potential situational moderators in order to better understand the circumstances under which personality traits have stronger or weaker relationships with the three forms of organizational commitment. For example, future research might explore whether the moderating effects of organizational culture are similar to the effects found for national culture. In addition, all of the primary studies were based on cross-sectional data which may be subject to bias due to common method variance (CMV). Studies using observer ratings of FFM traits will eliminate the biasing effect of CMV, and as Oh, Wang, and Mount (2011) found, observer ratings of FFM traits may be more strongly related to organizational commitment than self ratings. The cross-sectional nature of the data in almost all primary studies included in the meta-analysis also prevented the examination of more complex causal relationships in the data. For example, although we proposed that national culture is a moderator that influences the strength of the relationship between personality and organizational commitment, it is also possible that national culture may influence personality traits through its impact on neural connectivity in the brain (Kitayama & Uskul, 2011). Future research using longitudinal designs with repeated measures is needed to more fully explore these more complex relationships.

Second, our meta-analysis also focuses only on the relationship between FFM traits and organizational commitment. Future research, as more primary studies are conducted, may investigate the relationships of the FFM traits with commitment toward different targets (e.g., career commitment, work involvement, and union commitment; Cooper-Hakim & Viswesvaran, 2005). Furthermore, future research may also examine the relationships between personality traits and organizational commitment profiles (e.g., Meyer & Herscovitch, 2001; Meyer, Stanley & Parfyonova, 2012).

Third, we examined the personality-organizational commitment relationships using broad personality traits, and future research should be encouraged to examine these relationships at the narrow facet level. This is important because doing so may help build a more nuanced theory of the relationships among personality, culture, and commitment, which in turn enables us to better explain different aspects of organizational commitment (cf., Ashton, 1998; Moon, 2001; Roberts, Chernyshenko, Stark, & Goldberg, 2005). In addition, future research should examine non-FFM personality traits such as Honesty-Humility defined as “the tendency to be fair and genuine in dealing with others” (vs. the tendency to pretenacious, greedy, and sly), which might be positively related to NC, but negatively to CC (Ashton & Lee, 2007, p. 156). Furthermore, such efforts may help expand our understanding of the culture-personality interactions. In hindsight, we speculate that the facet level of personality may be more likely to be activated by cultural cues because of its homogeneity. For example, duty (one facet of Conscientiousness) is more likely than achievement striving (the other facet of Conscientiousness) to be triggered in collectivistic cultures because being dutiful may relate closely to maintaining socially harmonious relationships. Thus, future research may seek to disaggregate the facet level personality traits to develop and test more specific hypotheses.

Fourth, although we developed and tested hypotheses regarding the FFM trait-organizational commitment relationships, we found several unexpected results. For example, Openness is significantly related to all forms of organizational commitment, and the two affect-oriented traits (Emotional Stability and Extraversion) are

also positively related to NC. In regard to the moderating role of cultures, Openness is more strongly and positively related to AC and NC in collectivistic cultures. Furthermore, the relationships of Openness and Extraversion with CC were stronger in individualistic cultures. We speculate that this is because these two “getting ahead” traits are more likely to be reinforced in individualistic cultures by the emphasis on personal goal achievement rather than group membership. Due to this reinforced tendency, employees high in Extraversion and/or Openness are likely to feel lower social pressure to stay within the organization and to perceive lower costs of leaving the organization when they find personal growth opportunities outside the organization in individualistic cultures.

Despite these limitations, this study is the first to provide a comprehensive picture of the relationships between the FFM traits and the three forms of organizational commitment, suggesting a meaningful dispositional basis of organizational commitment. Future research developing a broader, overarching theoretical framework built upon our results is needed to further clarify these linkages.

### Conclusion

If we consider highly committed employees as valuable assets, then both researchers and practitioners should find ways to nurture commitment in employees. Thus, an important goal of this study was to examine the dispositional antecedents of organizational commitment. We conducted a meta-analysis of the relationships between the FFM traits and three forms of organizational commitment and examined the moderating role of national culture in the personality–organizational commitment relationships. In general, our meta-analytic results suggested that the FFM traits were significantly associated with different forms of organizational commitment and that some relationships were stronger in collectivistic cultures while other relationships were stronger in individualistic cultures. Thus, our study highlights that researchers must consider both personality and cultural contexts in predicting and explaining organizational commitment. We hope that this study will lead to more theoretical developments and systemic investigations of dispositional and situational influences on organizational commitment.

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## Appendix A

## Main Codes and Input Values For The Primary Studies Included The Meta-Analysis

Source	Pub	Culture	X	Y	N	r	r <sub>xx</sub>	r <sub>yy</sub>
Bakker et al. (2010)	P	Ind	EMS	AttC	3007	.15	.87	.84
Bakker et al. (2010)	P	Ind	EXT	AttC	3007	.28	.80	.84
Bove & Mitzifiris (2007)	P	Ind	AGR	AttC	202	.11	.71	.72
Bove & Mitzifiris (2007)	P	Ind	CON	AttC	202	.11	.61	.72
Bove & Mitzifiris (2007)	P	Ind	EXT	AttC	202	.01	.73	.72
Bove & Mitzifiris (2007)	P	Ind	EMS	AttC	202	.02	.74	.72
Brennan (1999)	U	Ind	CON	AC	93	-.09		
Brennan (1999)	U	Ind	EMS	AC	93	.23		
Chuang & Su (2005)	P	Col	AGR	AttC	139	.16	.73	.93
Chuang & Su (2005)	P	Col	CON	AttC	139	.20	.78	.93
Chuang & Su (2005)	P	Col	EXT	AttC	139	.30	.76	.93
Chuang & Su (2005)	P	Col	EMS	AttC	139	.21	.79	.93
Chuang & Su (2005)	P	Col	OPE	AttC	139	.15	.71	.93
Du & Choi (2010)	P	Col	CON	AttC	574	.20	.77	.85
Erdheim et al. (2006)	P	Ind	AGR	AC	183	.06	.88	.82
Erdheim et al. (2006)	P	Ind	CON	AC	183	.19	.86	.82
Erdheim et al. (2006)	P	Ind	EXT	AC	183	.19	.83	.82
Erdheim et al. (2006)	P	Ind	EMS	AC	183	.13	.83	.82
Erdheim et al. (2006)	P	Ind	OPE	AC	183	-.04	.90	.82
Erdheim et al. (2006)	P	Ind	AGR	CC	183	.03	.88	.88
Erdheim et al. (2006)	P	Ind	CON	CC	183	.21	.86	.88
Erdheim et al. (2006)	P	Ind	EXT	CC	183	-.22	.83	.88
Erdheim et al. (2006)	P	Ind	EMS	CC	183	-.25	.83	.88
Erdheim et al. (2006)	P	Ind	OPE	CC	183	-.22	.90	.88
Erdheim et al. (2006)	P	Ind	AGR	NC	183	.20	.88	.89
Erdheim et al. (2006)	P	Ind	CON	NC	183	.05	.86	.89
Erdheim et al. (2006)	P	Ind	EXT	NC	183	.18	.83	.89
Erdheim et al. (2006)	P	Ind	EMS	NC	183	-.01	.83	.89
Erdheim et al. (2006)	P	Ind	OPE	NC	183	.06	.90	.89
Fausz (Sample 1, 1994)	U	Ind	AGR	AC	30	-.12	.76	.83
Fausz (Sample 1, 1994)	U	Ind	CON	AC	30	-.09	.60	.83
Fausz (Sample 1, 1994)	U	Ind	AGR	AC	199	.29	.77	.81
Fausz (Sample 1, 1994)	U	Ind	CON	AC	199	.11	.87	.81
Flynn & Schaumberg (2012)	P	Ind	CON	AC	111	-.01	.66	.93
Fortunato (2004)	P	Ind	EMS	AC	309	.11	.94	.91
Fortunato (2004)	P	Ind	EMS	CC	309	-.09	.94	.75
Fortunato (2004)	P	Ind	EMS	NC	309	-.06	.94	.81
Hackney (2012)	U	Ind	CON	AC	282	.15	.83	.88
Hackney (2012)	U	Ind	CON	CC	282	.01	.83	.70
Hackney (2012)	U	Ind	CON	NC	282	.22	.83	.89
Hackney (2012)	U	Ind	OPE	AC	282	.08	.87	.88
Hackney (2012)	U	Ind	OPE	CC	282	-.06	.87	.70
Hackney (2012)	U	Ind	OPE	NC	282	.11	.87	.89
Hawass (2012)	P	Col	EMS	AC	119	-.20	.70	.86
Hawass (2012)	P	Col	CON	AC	119	.47	.71	.86
Hawass (2012)	P	Col	EMS	CC	119	.23	.70	.71
Hawass (2012)	P	Col	CON	CC	119	.04	.71	.71
Hawass (2012)	P	Col	AGR	CC	119	.05	.70	.71
Hill (2002)	U	Ind	AGR	AC	102	-.14	.69	.87
Hill (2002)	U	Ind	CON	AC	102	-.02	.76	.87
Hill (2002)	U	Ind	EXT	AC	102	.16	.71	.87
Hill (2002)	U	Ind	EMS	AC	102	.12	.82	.87
Hill (2002)	U	Ind	AGR	CC	102	.06	.69	.79
Hill (2002)	U	Ind	CON	CC	102	-.12	.76	.79
Hill (2002)	U	Ind	EXT	CC	102	-.02	.71	.79
Hill (2002)	U	Ind	EMS	CC	102	-.08	.82	.79
Hill (2002)	U	Ind	AGR	NC	102	-.01	.69	.88
Hill (2002)	U	Ind	CON	NC	102	.07	.76	.88

(Appendices continue)

## Appendix A (continued)

Source	Pub	Culture	X	Y	N	r	r <sub>xx</sub>	r <sub>yy</sub>
Hill (2002)	U	Ind	EXT	NC	102	.08	.71	.88
Hill (2002)	U	Ind	EMS	NC	102	.11	.82	.88
Hill (2002)	U	Ind	OPE	AC	102	.06	.67	.87
Hill (2002)	U	Ind	OPE	CC	102	-.05	.67	.79
Hill (2002)	U	Ind	OPE	NC	102	.09	.67	.88
Howard (2008)	U	Ind	AGR	AC	126	.15	.71	.79
Howard (2008)	U	Ind	CON	AC	126	-.03	.76	.79
Howard (2008)	U	Ind	EXT	AC	126	.10	.75	.79
Howard (2008)	U	Ind	EMS	AC	126	.08	.74	.79
Howard (2008)	U	Ind	OPE	AC	126	.02	.75	.79
Howard (2008)	U	Ind	AGR	CC	126	-.13	.71	.70
Howard (2008)	U	Ind	CON	CC	126	-.16	.76	.70
Howard (2008)	U	Ind	EXT	CC	126	-.30	.75	.70
Howard (2008)	U	Ind	EMS	CC	126	-.22	.74	.70
Howard (2008)	U	Ind	AGR	NC	126	.11	.71	.82
Howard (2008)	U	Ind	CON	NC	126	-.11	.76	.82
Howard (2008)	U	Ind	EXT	NC	126	.02	.75	.82
Howard (2008)	U	Ind	EMS	NC	126	-.01	.74	.82
Howard (2008)	U	Ind	OPE	NC	126	.09	.75	.82
Howard (2008)	U	Ind	OPE	CC	126	.01	.75	.70
F. Huang (2007)	U	Col	AGR	AC	305	.44	.78	.88
F. Huang (2007)	U	Col	CON	AC	305	.35	.77	.88
F. Huang (2007)	U	Col	EXT	AC	305	.33	.84	.88
F. Huang (2007)	U	Col	EMS	AC	305	.22	.71	.88
F. Huang (2007)	U	Col	AGR	CC	305	.07	.78	.81
F. Huang (2007)	U	Col	CON	CC	305	.11	.77	.81
F. Huang (2007)	U	Col	EXT	CC	305	.02	.84	.81
F. Huang (2007)	U	Col	EMS	CC	305	-.11	.71	.81
F. Huang (2007)	U	Col	AGR	NC	305	.24	.78	.73
F. Huang (2007)	U	Col	CON	NC	305	.22	.77	.73
F. Huang (2007)	U	Col	EXT	NC	305	.24	.84	.73
F. Huang (2007)	U	Col	EMS	NC	305	.14	.71	.73
F. Huang (2007)	U	Col	OPE	CC	305	-.05	.71	.81
F. Huang (2007)	U	Col	OPE	AC	305	.25	.71	.88
F. Huang (2007)	U	Col	OPE	NC	305	.14	.71	.73
T. Huang (2003)	U	Col	AGR	AC	226	.22	.71	.84
T. Huang (2003)	U	Col	CON	AC	226	.13	.83	.84
T. Huang (2003)	U	Col	EXT	AC	226	.12	.80	.84
T. Huang (2003)	U	Col	EMS	AC	226	.02	.70	.84
T. Huang (2003)	U	Col	OPE	AC	226	.12	.74	.84
A. Hunter (2009)	U	Ind	EMS	AC	1648	.31	.73	.85
A. Hunter (2009)	U	Ind	CON	AC	1648	.37	.72	.85
A. Hunter (2009)	U	Ind	AGR	AC	1648	.21	.65	.85
A. Hunter (2009)	U	Ind	EMS	CC	1648	.02	.73	.82
A. Hunter (2009)	U	Ind	CON	CC	1648	.09	.72	.82
A. Hunter (2009)	U	Ind	AGR	CC	1648	.06	.65	.82
A. Hunter (2009)	U	Ind	EMS	NC	1648	.26	.73	.82
A. Hunter (2009)	U	Ind	CON	NC	1648	.17	.72	.82
A. Hunter (2009)	U	Ind	AGR	NC	1648	.21	.65	.82
Kappagoda (2013)	P	Col	EMS	AC	470	.07	.90	.84
Kappagoda (2013)	P	Col	EXT	AC	470	.24	.89	.84
Kappagoda (2013)	P	Col	CON	AC	470	.11	.81	.84
Kappagoda (2013)	P	Col	AGR	AC	470	.18	.81	.84
Kappagoda (2013)	P	Col	OPE	AC	470	-.11	.89	.84
Kim et al. (2013)	P	Col	EXT	AC	262	.46	.85	.73
Kim et al. (2013)	P	Col	EMS	AC	262	.11	.90	.73
Kim et al. (2013)	P	Col	AGR	AC	262	.49	.76	.73
Kim et al. (2013)	P	Col	CON	AC	262	.61	.80	.73
Kim et al. (2013)	P	Col	OPE	AC	262	.53	.83	.73
Kirkwood (2006)	U	Ind	CON	AC	122	.14		.85
Kirkwood (2006)	U	Ind	CON	CC	122	-.15		.82

(Appendices continue)

## Appendix A (continued)

Source	Pub	Culture	X	Y	N	r	r <sub>xx</sub>	r <sub>yy</sub>
Ko & Cho (2009)	P	Col	EXT	AttC	201	.32	.81	.91
Ko & Cho (2009)	P	Col	CON	AttC	201	.30	.81	.91
C. Lee et al. (2014)	P	Col	EXT	AC	264	.25	.84	.94
C. Lee et al. (2014)	P	Col	EMS	AC	264	.82	.96	.94
C. Lee et al. (2014)	P	Col	OPE	AC	264	.05	.87	.94
C. Lee et al. (2014)	P	Col	AGR	AC	264	.65	.97	.94
C. Lee et al. (2014)	P	Col	CON	AC	264	.01	.65	.94
S. Lee et al. (2004)	P	Col	EMS	AC	328	.06		.88
S. Lee et al. (2004)	P	Col	EXT	AC	328	.35		.88
S. Lee et al. (2004)	P	Col	AGR	AC	328	.38		.88
S. Lee et al. (2004)	P	Col	OPE	AC	328	.17		.88
S. Lee et al. (2004)	P	Col	EMS	CC	328	-.16		.80
S. Lee et al. (2004)	P	Col	EXT	CC	328	.01		.80
S. Lee et al. (2004)	P	Col	AGR	CC	328	.30		.80
S. Lee et al. (2004)	P	Col	OPE	CC	328	-.08		.80
S. Lee et al. (2004)	P	Col	EMS	NC	328	-.03		.68
S. Lee et al. (2004)	P	Col	EXT	NC	328	.21		.68
S. Lee et al. (2004)	P	Col	AGR	NC	328	.26		.68
S. Lee et al. (2004)	P	Col	OPE	NC	328	.24		.68
Liao et al. (2004)	P	Ind	AGR	AttC	286	.28	.81	.93
Liao et al. (2004)	P	Ind	CON	AttC	286	.31	.79	.93
Liao et al. (2004)	P	Ind	EXT	AttC	286	.05	.85	.93
Liao et al. (2004)	P	Ind	EMS	AttC	286	.19	.83	.93
Liao et al. (2004)	P	Ind	OPE	AttC	286	.06	.77	.93
Matzler & Renzl (2007)	P	Ind	AGR	AC	199	.35	.79	.92
Matzler & Renzl (2007)	P	Ind	CON	AC	199	.26	.80	.92
Matzler & Renzl (2007)	P	Ind	EMS	AC	199	.26	.81	.92
Matzler et al. (2011)	P	Ind	AGR	AC	68	.42	.82	.92
Matzler et al. (2011)	P	Ind	CON	AC	68	.23	.82	.92
Ménard et al. (2011)	P	Ind	EMS	NC	284	.09	.80	.88
Ménard et al. (2011)	P	Ind	EXT	NC	284	.13	.61	.88
Ménard et al. (2011)	P	Ind	AGR	NC	284	.10	.55	.88
Ménard et al. (2011)	P	Ind	CON	NC	284	.14	.64	.88
Ménard et al. (2011)	P	Ind	EMS	AC	284	.10	.80	.80
Ménard et al. (2011)	P	Ind	EXT	AC	284	.25	.61	.80
Ménard et al. (2011)	P	Ind	AGR	AC	284	.19	.55	.80
Ménard et al. (2011)	P	Ind	CON	AC	284	.21	.64	.80
Ménard et al. (2011)	P	Ind	EMS	CC	284	-.23	.80	.71
Ménard et al. (2011)	P	Ind	EXT	CC	284	-.09	.61	.71
Ménard et al. (2011)	P	Ind	AGR	CC	284	.10	.55	.71
Ménard et al. (2011)	P	Ind	CON	CC	284	-.14	.64	.71
Michel & Bowling (2013)	P	Ind	AGR	AttC	380	.25	.85	.94
Michel & Bowling (2013)	P	Ind	CON	AttC	380	.11	.84	.94
Michel & Bowling (2013)	P	Ind	EMS	AttC	380	.35	.91	.94
Morrison (1997)	P	Ind	AGR	AC	1596	.15	.77	.85
Morrison (1997)	P	Ind	CON	AC	1596	.06	.82	.85
Morrison (1997)	P	Ind	EXT	AC	1596	.20	.78	.85
Morrison (1997)	P	Ind	EMS	AC	1596	.22	.84	.85
Morrison (1997)	P	Ind	OPE	AC	1596	-.10	.66	.85
Naquin & Holton (2002)	P	Ind	AGR	AC	239	.28		
Naquin & Holton (2002)	P	Ind	CON	AC	239	.43		
Naquin & Holton (2002)	P	Ind	EXT	AC	239	.26		
Naquin & Holton (2002)	P	Ind	EMS	AC	239	.25		
Naquin & Holton (2002)	P	Ind	AGR	CC	239	-.13		
Naquin & Holton (2002)	P	Ind	CON	CC	239	-.13		
Naquin & Holton (2002)	P	Ind	EXT	CC	239	-.29		
Naquin & Holton (2002)	P	Ind	EMS	CC	239	-.14		
Naquin & Holton (2002)	P	Ind	OPE	AC	239	.15		
Naquin & Holton (2002)	P	Ind	OPE	CC	239	-.29		
Oh et al. (2009)	U	Col	AGR	AttC	113	.39	.75	.82
Oh et al. (2009)	U	Col	CON	AttC	113	.29	.86	.82

(Appendices continue)

## Appendix A (continued)

Source	Pub	Culture	X	Y	N	r	r <sub>xx</sub>	r <sub>yy</sub>
Oh et al. (2009)	U	Col	EXT	AttC	113	.24	.81	.82
Oh et al. (2009)	U	Col	EMS	AttC	113	.23	.84	.82
Oh et al. (2009)	U	Col	OPE	AttC	113	.09	.79	.82
Panaccio and Vandenberghe (2012)	P	Ind	EXT	AC	181	.18	.86	.89
Panaccio and Vandenberghe (2012)	P	Ind	AGR	AC	181	.14	.67	.89
Panaccio and Vandenberghe (2012)	P	Ind	CON	AC	181	.14	.77	.89
Panaccio and Vandenberghe (2012)	P	Ind	EMS	AC	181	.01	.86	.89
Panaccio and Vandenberghe (2012)	P	Ind	OPE	AC	181	.07	.79	.89
Panaccio and Vandenberghe (2012)	P	Ind	EXT	NC	181	-.01	.86	.90
Panaccio and Vandenberghe (2012)	P	Ind	AGR	NC	181	.04	.67	.90
Panaccio and Vandenberghe (2012)	P	Ind	CON	NC	181	-.10	.77	.90
Panaccio and Vandenberghe (2012)	P	Ind	EMS	NC	181	-.05	.86	.90
Panaccio and Vandenberghe (2012)	P	Ind	OPE	NC	181	-.03	.79	.90
Panaccio and Vandenberghe (2012)	P	Ind	EXT	CC	181	-.14	.86	.77
Panaccio and Vandenberghe (2012)	P	Ind	AGR	CC	181	-.15	.67	.77
Panaccio and Vandenberghe (2012)	P	Ind	CON	CC	181	-.13	.77	.77
Panaccio and Vandenberghe (2012)	P	Ind	EMS	CC	181	-.27	.86	.77
Panaccio and Vandenberghe (2012)	P	Ind	OPE	CC	181	-.09	.79	.77
D. Park et al. (2007)	U	Col	AGR	AC	571	.36	.75	.83
D. Park et al. (2007)	U	Col	CON	AC	571	.33	.71	.83
D. Park et al. (2007)	U	Col	EXT	AC	571	.21	.82	.83
D. Park et al. (2007)	U	Col	EMS	AC	571	.35	.81	.83
D. Park et al. (2007)	U	Col	OPE	AC	571	.22	.71	.83
G. S. Park & Yoo (Sample 1, 2007)	P	Col	CON	AC	244	.11	.81	.84
G. S. Park & Yoo (Sample 1, 2007)	P	Col	EXT	AC	244	.15	.72	.84
G. S. Park & Yoo (Sample 1, 2007)	P	Col	CON	CC	244	.08	.81	.58
G. S. Park & Yoo (Sample 1, 2007)	P	Col	EXT	CC	244	.01	.72	.58
G. S. Park & Yoo (Sample 1, 2007)	P	Col	CON	NC	244	.06	.81	.62
G. S. Park & Yoo (Sample 1, 2007)	P	Col	EXT	NC	244	.13	.72	.62
G. S. Park & Yoo (Sample 1, 2007)	P	Col	OPE	AC	244	.04	.76	.84
G. S. Park & Yoo (Sample 1, 2007)	P	Col	OPE	CC	244	.02	.76	.58
G. S. Park & Yoo (Sample 1, 2007)	P	Col	OPE	NC	244	.06	.76	.62
G. S. Park & Yoo (Sample 2, 2007)	P	Col	CON	AC	618	.18	.81	.83
G. S. Park & Yoo (Sample 2, 2007)	P	Col	EXT	AC	618	.21	.72	.83
G. S. Park & Yoo (Sample 2, 2007)	P	Col	CON	CC	618	.05	.81	.62
G. S. Park & Yoo (Sample 2, 2007)	P	Col	EXT	CC	618	.07	.72	.62
G. S. Park & Yoo (Sample 2, 2007)	P	Col	CON	NC	618	.14	.81	.62
G. S. Park & Yoo (Sample 2, 2007)	P	Col	EXT	NC	618	.14	.72	.62
G. S. Park & Yoo (Sample 2, 2007)	P	Col	OPE	AC	618	.14	.76	.83
G. S. Park & Yoo (Sample 2, 2007)	P	Col	OPE	CC	618	.07	.76	.62
G. S. Park & Yoo (Sample 2, 2007)	P	Col	OPE	NC	618	.12	.76	.62
G. S. Park & Yoo (Sample 3, 2007)	P	Col	CON	AC	154	.25	.81	.83
G. S. Park & Yoo (Sample 3, 2007)	P	Col	EXT	AC	154	.09	.72	.83
G. S. Park & Yoo (Sample 3, 2007)	P	Col	CON	CC	154	.15	.81	.53
G. S. Park & Yoo (Sample 3, 2007)	P	Col	EXT	CC	154	.08	.72	.53
G. S. Park & Yoo (Sample 3, 2007)	P	Col	CON	NC	154	.10	.81	.59
G. S. Park & Yoo (Sample 3, 2007)	P	Col	EXT	NC	154	.14	.72	.59
G. S. Park & Yoo (Sample 3, 2007)	P	Col	OPE	AC	154	.19	.76	.83
G. S. Park & Yoo (Sample 3, 2007)	P	Col	OPE	CC	154	.14	.76	.53
G. S. Park & Yoo (Sample 3, 2007)	P	Col	OPE	NC	154	.05	.76	.59
Protolipac et al. (2006)	U	Ind	AGR	AC	224	.18	.61	.77
Protolipac et al. (2006)	U	Ind	CON	AC	224	.05	.73	.77
Protolipac et al. (2006)	U	Ind	EXT	AC	224	.14	.67	.77
Protolipac et al. (2006)	U	Ind	EMS	AC	224	.19	.63	.77
Protolipac et al. (2006)	U	Ind	OPE	AC	224	.06	.43	.77
Protolipac et al. (2006)	U	Ind	AGR	CC	224	.25	.61	.72
Protolipac et al. (2006)	U	Ind	CON	CC	224	.08	.73	.72
Protolipac et al. (2006)	U	Ind	EXT	CC	224	-.01	.67	.72
Protolipac et al. (2006)	U	Ind	EMS	CC	224	-.21	.63	.72
Protolipac et al. (2006)	U	Ind	AGR	NC	224	.27	.61	.67
Protolipac et al. (2006)	U	Ind	CON	NC	224	.27	.73	.67

(Appendices continue)

## Appendix A (continued)

Source	Pub	Culture	X	Y	N	r	r <sub>xx</sub>	r <sub>yy</sub>
Protolipac et al. (2006)	U	Ind	EXT	NC	224	.35	.67	.67
Protolipac et al. (2006)	U	Ind	EMS	NC	224	.14	.63	.67
Protolipac et al. (2006)	U	Ind	OPE	NC	224	.16	.43	.67
Protolipac et al. (2006)	U	Ind	OPE	CC	224	-.04	.43	.72
Radwinsky (1999)	U	Ind	CON	AC	166	.20	.72	.65
Radwinsky (1999)	U	Ind	EMS	AC	166	.12	.86	.65
Radwinsky (1999)	U	Ind	AGR	AC	166	.13	.78	.65
Raja et al. (2004)	P	Col	CON	AC	197	.32	.77	.82
Raja et al. (2004)	P	Col	EXT	AC	197	.18	.62	.82
Raja et al. (2004)	P	Col	EMS	AC	197	.13	.72	.82
Reio (2011)	P	Ind	EMS	AttC	507	.15	.71	.89
Richards & Schat (2011)	P	Ind	EXT	AC	146	.20	.64	.87
Richards & Schat (2011)	P	Ind	EMS	AC	146	.29	.56	.87
Richards & Schat (2011)	P	Ind	OPE	AC	146	.16	.64	.87
Richards & Schat (2011)	P	Ind	AGR	AC	146	.25	.70	.87
Richards & Schat (2011)	P	Ind	CON	AC	146	.19	.69	.87
Silva (2006)	P	Ind	AGR	AttC	159	-.02	.72	.86
Silva (2006)	P	Ind	CON	AttC	159	.41	.78	.86
Silva (2006)	P	Ind	EXT	AttC	159	.42	.78	.86
Silva (2006)	P	Ind	EMS	AttC	159	.33	.87	.86
Silva (2006)	P	Ind	OPE	AttC	159	.12	.70	.86
Spagnoli & Gaetano (2012)	P	Col	EXT	AC	190	.30	.66	.67
Spagnoli & Gaetano (2012)	P	Col	AGR	AC	190	.19	.60	.67
Spagnoli & Gaetano (2012)	P	Col	CON	AC	190	.22	.74	.67
Spagnoli & Gaetano (2012)	P	Col	EMS	AC	190	.06	.76	.67
Spagnoli & Gaetano (2012)	P	Col	OPE	AC	190	-.07	.68	.67
Spagnoli & Gaetano (2012)	P	Col	EXT	NC	190	.17	.66	.77
Spagnoli & Gaetano (2012)	P	Col	AGR	NC	190	.21	.60	.77
Spagnoli & Gaetano (2012)	P	Col	CON	NC	190	.15	.74	.77
Spagnoli & Gaetano (2012)	P	Col	EMS	NC	190	-.04	.76	.77
Spagnoli & Gaetano (2012)	P	Col	OPE	NC	190	.01	.68	.77
Spector & Che (2014)	P	Ind	CON	AC	146	-.03	.86	.84
Spector & Che (2014)	P	Ind	EMS	AC	146	-.11	.88	.84
S. G. Taylor et al. (2011)	P	Ind	CON	AC	190	.09	.93	.79
S. G. Taylor et al. (2011)	P	Ind	EMS	AC	190	.07	.92	.79
S. G. Taylor et al. (2011)	P	Ind	AGR	AC	190	.07	.84	.79
Timmerman (2008)	U	Ind	EMS	AC	288	.20	.84	.87
Timmerman (2008)	U	Ind	EMS	NC	288	.07	.84	.86
Timmerman (2008)	U	Ind	EMS	CC	288	-.13	.84	.78
Tsai et al. (2012)	P	Col	CON	AC	128	.37	.92	.85
Tsai et al. (2012)	P	Col	EXT	AC	128	.16	.90	.85
Tsai et al. (2012)	P	Col	OPE	AC	128	.13	.89	.85
Tsai et al. (2012)	P	Col	EMS	AC	128	.33	.87	.85
Tsai et al. (2012)	P	Col	AGR	AC	128	.36	.82	.85
Waters, L. (mentor, 2004)	P	Ind	AGR	AttC	166	.10	.80	.87
Waters, L. (mentee, 2004)	P	Ind	CON	AttC	166	.24	.91	.84
Waters, L. (mentor, 2004)	P	Ind	EXT	AttC	166	.21	.76	.87
Waters, L. (mentee, 2004)	P	Ind	EMS	AttC	166	-.17	.89	.84
Waters, L. (mentor, 2004)	P	Ind	OPE	AttC	166	-.03	.70	.87
Waters, L. (mentee, 2004)	P	Ind	AGR	AttC	166	.21	.86	.84
Waters, L. (mentor, 2004)	P	Ind	CON	AttC	166	-.04	.87	.87
Waters, L. (mentee, 2004)	P	Ind	EXT	AttC	166	-.01	.78	.84
Waters, L. (mentor, 2004)	P	Ind	EMS	AttC	166	-.03	.86	.87
Waters, L. (mentee, 2004)	P	Ind	OPE	AttC	166	.29	.80	.84
Watrous-Rodriguez (2010, Sample 1)	U	Ind	CON	AC	133	.22	.89	.87
Watrous-Rodriguez (2010, Sample 1)	U	Ind	AGR	AC	133	.17	.91	.87
Watrous-Rodriguez (2010, Sample 1)	U	Ind	EXT	AC	133	.09	.89	.87
Watrous-Rodriguez (2010, Sample 1)	U	Ind	EMS	AC	133	.08	.78	.87
Watrous-Rodriguez (2010, Sample 1)	U	Ind	OPE	AC	133	.12	.81	.87
Watrous-Rodriguez (2010, Sample 1)	U	Ind	CON	NC	133	.20	.89	.86
Watrous-Rodriguez (2010, Sample 1)	U	Ind	AGR	NC	133	.13	.91	.86

(Appendices continue)



## Appendix A (continued)

Source	Pub	Culture	X	Y	N	r	r <sub>xx</sub>	r <sub>yy</sub>
Watrous-Rodriguez (2010, Sample 1)	U	Ind	EXT	NC	133	.02	.89	.86
Watrous-Rodriguez (2010, Sample 1)	U	Ind	EMS	NC	133	.12	.78	.86
Watrous-Rodriguez (2010, Sample 1)	U	Ind	OPE	NC	133	.06	.81	.86
Watrous-Rodriguez (2010, Sample 1)	U	Ind	CON	CC	133	-.02	.89	.56
Watrous-Rodriguez (2010, Sample 1)	U	Ind	AGR	CC	133	-.12	.91	.56
Watrous-Rodriguez (2010, Sample 1)	U	Ind	EXT	CC	133	-.03	.89	.56
Watrous-Rodriguez (2010, Sample 1)	U	Ind	EMS	CC	133	-.10	.78	.56
Watrous-Rodriguez (2010, Sample 1)	U	Ind	OPE	CC	133	-.09	.81	.56
Watrous-Rodriguez (2010, Sample 2)	U	Ind	CON	AC	241	.07	.73	.82
Watrous-Rodriguez (2010, Sample 2)	U	Ind	AGR	AC	241	.19	.75	.82
Watrous-Rodriguez (2010, Sample 2)	U	Ind	EXT	AC	241	.24	.84	.82
Watrous-Rodriguez (2010, Sample 2)	U	Ind	EMS	AC	241	.01	.72	.82
Watrous-Rodriguez (2010, Sample 2)	U	Ind	OPE	AC	241	-.07	.65	.82
Watrous-Rodriguez (2010, Sample 2)	U	Ind	CON	NC	241	.02	.73	.89
Watrous-Rodriguez (2010, Sample 2)	U	Ind	AGR	NC	241	.19	.75	.89
Watrous-Rodriguez (2010, Sample 2)	U	Ind	EXT	NC	241	.16	.84	.89
Watrous-Rodriguez (2010, Sample 2)	U	Ind	EMS	NC	241	.00	.72	.89
Watrous-Rodriguez (2010, Sample 2)	U	Ind	OPE	NC	241	-.19	.65	.89
Watrous-Rodriguez (2010, Sample 2)	U	Ind	CON	CC	241	-.17	.73	.79
Watrous-Rodriguez (2010, Sample 2)	U	Ind	AGR	CC	241	.00	.75	.79
Watrous-Rodriguez (2010, Sample 2)	U	Ind	EXT	CC	241	-.10	.84	.79
Watrous-Rodriguez (2010, Sample 2)	U	Ind	EMS	CC	241	-.20	.72	.79
Watrous-Rodriguez (2010, Sample 2)	U	Ind	OPE	CC	241	-.18	.65	.79
Wefald et al. (2011)	P	Ind	EXT	AC	382	.30	.85	.88
Wefald et al. (2011)	P	Ind	EMS	AC	382	.10	.79	.88
Wefald et al. (2011)	P	Ind	OPE	AC	382	.12	.80	.88
Wefald et al. (2011)	P	Ind	AGR	AC	382	.28	.79	.88
Wefald et al. (2011)	P	Ind	CON	AC	382	.15	.81	.88
Westerman & Simmons (2007)	P	Ind	AGR	AttC	106	.13		
Westerman & Simmons (2007)	P	Ind	CON	AttC	106	.12		
Westerman & Simmons (2007)	P	Ind	EXT	AttC	106	.23		
Westerman & Simmons (2007)	P	Ind	EMS	AttC	106	.01		
Westerman & Simmons (2007)	P	Ind	OPE	AttC	106	.18		
C. Y. Wu (2006)	U	Col	AGR	AttC	290	.25	.78	.96
C. Y. Wu (2006)	U	Col	CON	AttC	290	.59	.76	.96
C. Y. Wu (2006)	U	Col	EXT	AttC	290	.05	.80	.96
C. Y. Wu (2006)	U	Col	EMS	AttC	290	.36	.83	.96
C. Y. Wu (2006)	U	Col	OPE	AttC	290	.27	.85	.96
C. T. Wu (2007)	U	Col	AGR	AC	202	.27	.81	.84
C. T. Wu (2007)	U	Col	CON	AC	202	.22	.73	.84
C. T. Wu (2007)	U	Col	EXT	AC	202	.41	.82	.84
C. T. Wu (2007)	U	Col	EMS	AC	202	.41	.66	.84
C. T. Wu (2007)	U	Col	AGR	CC	202	-.12	.81	.77
C. T. Wu (2007)	U	Col	CON	CC	202	.00	.73	.77
C. T. Wu (2007)	U	Col	EXT	CC	202	-.20	.82	.77
C. T. Wu (2007)	U	Col	EMS	CC	202	-.16	.66	.77
C. T. Wu (2007)	U	Col	AGR	NC	202	.31	.81	.64
C. T. Wu (2007)	U	Col	CON	NC	202	.30	.73	.64
C. T. Wu (2007)	U	Col	EXT	NC	202	.26	.82	.64
C. T. Wu (2007)	U	Col	EMS	NC	202	.18	.66	.64
C. T. Wu (2007)	U	Col	OPE	CC	202	-.22	.61	.77
C. T. Wu (2007)	U	Col	OPE	AC	202	.33	.61	.84
C. T. Wu (2007)	U	Col	OPE	NC	202	.12	.61	.64

Note. Pub = publication status; P = Published; U = Unpublished; Col = collectivistic culture; Ind = individualistic culture; EMS = Emotional Stability; EXT = Extraversion; OPE = Openness/Intellect; AGR = Agreeableness; CON = Conscientiousness; AttC = overall/attitudinal commitment; AC = affective commitment; NC = normative commitment; CC = continuance commitment; N = sample size; r = observed correlation coefficient; r<sub>xx</sub> = reliability of FFM trait (coefficient alpha as reported in primary studies); r<sub>yy</sub> = reliability of organizational commitment (coefficient alpha as reported in primary studies).

(Appendices continue)

## Appendix B

## Meta-Analytic Results for the Relationships Between Affectivity and Organizational Commitment

Affectivity	Organizational commitment	<i>k</i>	<i>N</i>	$\bar{r}$	$SD_r$	$\hat{\rho}$	$SD_\rho$	80% CV	95% CI	Var %
PA	Affective	4	1,372	.26	.08	.32	.08	[.22, .42]	[.23, .41]	39%
NA	Affective	6	1,776	-.19	.05	-.23	.00	[-.23, -.23]	[-.27, -.18]	100%
PA	Normative	2	867	.17	.05	.23	.03	[.19, .27]	[.15, .31]	79%
NA	Normative	3	1,093	-.12	.11	-.15	.13	[-.31, .01]	[-.30, .00]	21%
PA	Continuance	3	1,065	-.14	.06	-.20	.06	[-.27, -.13]	[-.29, -.11]	62%
NA	Continuance	6	1,567	.05	.17	.07	.21	[-.20, .34]	[-.11, .25]	14%
PA	Overall/attitudinal	8	2,684	.33	.13	.43	.14	[.25, .60]	[.32, .53]	17%
NA	Overall/attitudinal	12	4,231	-.23	.09	-.29	.11	[-.43, -.14]	[-.35, -.22]	25%

*Note.* *k* = number of correlation coefficients; *N* = total sample size;  $\bar{r}$  = sample-weighted mean observed correlation;  $SD_r$  = standard deviation of the observed correlation;  $\hat{\rho}$  = estimated mean true-score correlation;  $SD_\rho$  = estimated standard deviation of the true correlation; CV = credibility interval for mean true-score correlation; CI = confidence interval for mean true-score correlation; Var % = percentage of observed variance accounted for by statistical artifacts. PA = positive affectivity; NA = negative affectivity.

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