

THE INHIBITORY EFFECT OF GENERAL MENTAL ABILITY ON THE LINK BETWEEN  
PERSONALITY AND COUNTERPRODUCTIVE WORK BEHAVIOR

by

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(Under the Direction of Nathan T. Carter)

ABSTRACT

Counterproductive work behavior (CWB) is related to critical personal and organizational consequences and, further, is an important component of overall job performance. Thus, both researchers and practitioners are interested in better understanding antecedents of CWB. Despite popular theoretical support for general mental ability (GMA) as an antecedent of CWB, empirical evidence does not generally support a GMA-CWB relationship. In this study, I propose that one reason the GMA-CWB relationship has not seen strong empirical support is that the commonly proposed *inhibitory effect* of GMA on CWB is more appropriately interpreted as an *interaction* between GMA and other critical antecedents. Three personality traits have been consistently shown to predict CWB: conscientiousness, agreeableness, and emotional stability. Thus, I propose that the meta-trait that subsumes these three traits—stability—is one such critical antecedent of CWB. I hypothesize that GMA moderates the stability-CWB relationship such that the relationship is strongest at low levels of GMA. Results support the hypothesis across two studies. Implications for theory and practice are discussed.

INDEX WORDS: General mental ability, personality, stability, counterproductive work behavior, interaction

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## Chapter 1

### INTRODUCTION

During the last two decades, one major shift in research on selection systems has been an expansion of the criterion domain to include contextual performance in addition to more traditionally emphasized task performance (Sackett & Lievens, 2008). Whereas the term *task performance* generally concerns the core technical requirements of a job, *contextual performance* concerns other contributions to performance. Borman and Motowidlo (1993) decomposed overall job performance into task performance and prosocial behavior, the latter of which is typically referred to as organizational citizenship behavior (OCB) today. More recently, researchers have also distinguished between different dimensions of contextual performance. In addition to OCBs, researchers have argued for the importance of counterproductive workplace behavior (CWB) in overall judgments of performance. Whereas OCB is voluntary behavior that contributes positively to the psychological and social environment of organizations, CWB is voluntary behavior that harms an organization or the individuals within the organization.

Rotundo and Sackett (2002) demonstrated that all three types of performance contribute to judgements of general performance, although task performance and CWB accounted for a much larger percentage of variance in supervisors' overall judgements of performance than did OCB. CWB is of particular interest to many organizations because it is inherently harmful to the organizations' interests. For example, theft—one type of CWB—is a large financial risk for organizations (Shephard & Duston, 1987 cf Camara & Schneider, 1994). Moreover, CWB can reduce the performance of entire business units, not just the individuals committing CWBs (Dunlop & Lee, 2004), and research suggests that CWBs can lead to increased experiences of

interpersonal incivility and organizational constraints such that CWB leads to more CWB (Meier & Spector, 2013). Thus, preventing and reducing CWB is of great interest to organizations.

The growing interest in CWBs as criteria for selection systems has invigorated research on their antecedents more broadly. Traditionally, studies regarding antecedents of CWB have focused on attitudinal and personality variables (Spector & Fox, 2002), perhaps stemming from the assertion by Borman and Motowidlo (1993) that personality or “will-do” characteristics should predict contextual performance more so than ability or “can-do” characteristics. However, researchers have increasingly questioned these assumptions by exploring the relationship between intelligence and contextual performance. In their meta-analysis, Gonzalez-Mulé, Mount, and Oh (2014) found that general mental ability (GMA) and personality are approximately equal in importance for predicting OCB, but that personality shows much stronger predictive validity for CWB compared to GMA. Intriguingly, these findings seem to conflict with researchers’ general agreement that GMA *should* meaningfully predict CWB (Dilchert, Ones, Davis, & Rostow, 2007; Ones, Dilchert, & Viswesvaran, 2012).

A variety of explanations have been proposed for why the GMA-CWB relationship may be obscured (e.g., Marcus et al., 2009; Ones et al., 2012), but evidence has yet to clearly support any of them. In the current study, I offer an alternative explanation that focuses on redefining the popularly theorized *inhibitory effect* of GMA (Dilchert et al., 2007) as an *interactive* rather than a main effect. I assert that investigating an inhibitory influence of GMA requires investigating how it moderates the role of other important antecedents on CWB. I draw on a robust body of literature supporting a relationship between stability-related personality traits (i.e., conscientiousness, extraversion, and emotional stability) and CWB (Berry, Ones, & Sackett, 2007; DeYoung, Peterson, Séguin, & Tremblay, 2008) to suggest that intelligence inhibits

dispositional tendencies to engage in CWB by helping individuals anticipate its consequences. Moreover, I explore the possibility that GMA predicts different *types* of CWB (i.e., interpersonally- versus organizationally-targeted CWBs) such that personality-GMA interactions may differ by the type of CWB.

## Chapter 2

### THE CASE FOR A GMA-CWB RELATIONSHIP

#### **Extending the GMA-Deviance Relationship**

Much of the theoretical rationale for a relationship between GMA and CWB draws on the criminology literature. Researchers have argued that because CWBs reflect rule-breaking and norm-violations, they are similar to deviant behavior studied in criminology (Dilchert et al., 2007; Ones et al., 2012). Thus, to understand why we might expect a GMA-CWB relationship, it is helpful to first briefly review research regarding a more general GMA-deviance relationship.

A negative relationship between GMA and delinquency is fairly well established to-date (M. R. Gottfredson & Hirschi, 1990; Herrnstein & Murray, 1994) and persists even after controlling for other contextual factors such as socioeconomic status (Lynam, Moffitt, & Stouthamer-Loeber, 1993). There are two popular theoretical rationales for a GMA-deviance relationship that researchers have extended to postulate a GMA-CWB relationship: (a) *moral reasoning*; and (b) an *inhibitory effect* (Dilchert et al., 2007; Gonzalez-Mulé et al., 2014; Ones et al., 2012). The moral reasoning justification for a GMA-deviance link suggests that GMA indirectly affects deviance through individuals' increased capacity to evaluate the "rightness" or "wrongness" of their actions. According to Dilchert et al. (2007), this explanation suggests that moral reasoning should mediate the relationship between GMA and deviance or CWB. However, Dilchert and colleagues assert that research findings have so far not shown strong support for such a mediation pathway. Specifically, it is not clear that moral reasoning would relate to

deviance if shared variance with verbal ability were removed (Lykken, 1991 cf Dilchert et al., 2007).

The inhibitory effect suggests that because high-GMA individuals possess greater capacity to evaluate the long-term consequences of their actions, high-GMA individuals will be more likely to recognize the negative consequences of CWBs and adjust behavior accordingly. Notably, some researchers do not distinguish between the inhibitory effect and moral reasoning. For example, Gonzalez-Mulé et al. (2014) assert that both the moral reasoning and inhibitory effect rationales draw on a common, underlying mechanism by which GMA affects CWB:

At the core of these perspective is that high-GMA individuals have a greater ability to reason, learn, and solve problems. This capacity has numerous positive benefits that result in less frequent engagement in CWB: better anticipating of the possible negative consequences of CWB, greater ability to suppress or delay gratification, superior moral reasoning, and less likelihood of falling victim of the vicious frustration-aggression cycle. (p. 1224)

Thus, the rationale that GMA should relate negatively to CWB is not contingent on the mediating role of moral reasoning in the GMA-CWB pathway. Rather, the rationale lies primarily in the definition of GMA itself: that GMA enables learning, adaptation, and selection of actions appropriate for a given context (L. S. Gottfredson, 1997; Sternberg, 1997). Given the mixed support for moral reasoning as a mediator but the theoretical overlap between the moral reasoning and inhibitory effect rationales, I refer to the inhibitory effect as the key theoretical explanation for a negative GMA-CWB relationship for the remainder of this paper.

### **Explaining (the Lack of) a GMA-CWB Relationship.**

Despite the adamant that GMA *should* predict CWB, empirical evidence has not universally supported that relationship. Drawing on three large-scale studies (Dilchert et al., 2007; McHenry, Hough, Toquam, Hanson, & Ashworth, 1990; Oppler, McCloy, Peterson, Russell, & Campbell, 2001), Ones et al. (2012) suggest that GMA and CWB may show a modest, negative relationship. However, in a more recent meta-analysis, Gonzalez-Mulé et al. (2014) found no evidence of a clear relationship between GMA and CWB. Thus, empirical findings regarding the GMA-CWB relationship seem to conflict with theoretical rationales for their interrelation. This conflict has led to some discussion about why such an effect may not be supported. Three possible explanations have been primarily emphasized to-date: (a) the phenomenon of differential detection; (b) the use of different sub-dimensions of CWB; and (c) sample heterogeneity. However, none of these explanations provide a theoretical alternative to the inhibitory effect nor have they garnered clear support.

Perhaps the most popular explanation for the inconsistency between theory and empirical findings for a GMA-CWB relationship is differential detection. The differential detection hypothesis originated in the criminology literature and suggests that there is a negative GMA-deviance correlation because higher-GMA individuals are less likely to be detected when engaging in deviant behavior relative to lower-GMA individuals, not because they are less likely to engage in deviant behavior (Moffitt & Silva, 1988). Although earlier research has not clearly supported the differential detection hypothesis for either CWB or deviance more broadly (Moffitt & Silva, 1988; Ones et al., 2012), the recent meta-analysis by Gonzalez-Mulé et al. (2014) provides some preliminary evidence of differential detection. They found that the correlation between GMA and non-self-reports of CWB (e.g., supervisor ratings, objective criteria) was

slightly negative whereas the correlation between GMA and self-reports of CWB was essentially zero. Further, Gonzalez-Mulé and colleagues suggest that the negative GMA-CWB relationship for non-self-reports is unlikely to be attributable to halo error because there was no meaningful difference in the relationship for supervisor-reports and more objective criteria. Still, confidence intervals for the correlations of GMA with both self- and other-reports of CWB included zero and should be interpreted with caution.

Notably, although typically framed as such, evidence for differential detection does not preclude the possibility that GMA also predicts actual engagement in CWB. Differential detection suggests that GMA impacts whether individual engagement in CWB is *perceived* not CWB engagement itself. However, differential perception and differential engagement are not mutually exclusive. In some ways, differential detection is more appropriately characterized as a methodological artifact than a theoretical alternative to an inhibitory effect. Consequently, evidence of differential detection is not inherently evidence against the inhibitory effect.

Second, some studies have considered whether the GMA-CWB relationship may vary depending on the sub-dimension of CWB. Although a wide variety of CWB dimensions have been considered (Cullen & Sackett, 2003; Spector et al., 2006), a two-dimensional structure that differentiates between *interpersonally* and *organizationally* targeted CWBs (CWB-I and CWB-O, respectively) is generally most popular (Berry et al., 2007; Sackett, Berry, Wiemann, & Laczó, 2006). However, the explanations for how these relationships have at times proposed different effects. For example, Gonzalez-Mulé et al. (2014) point out that we might expect to see a stronger relationship between GMA and CWB-O because CWB-O is more strongly related to task performance than CWB-I, or we might expect to see a stronger relationship between GMA and CWB-I because CWB-I is more easily detected and more likely to be curbed by GMA.

Although results of their meta-analysis suggested a stronger relationship between GMA and CWB-O than CWB-I, there were not enough studies to evaluate whether the difference in magnitude was significant. Regardless, neither a stronger relationship with CWB-O or a stronger relationship with CWB-I preclude an inhibitory effect of GMA. A stronger CWB-O relationship may suggest that high-GMA individuals have an easier time anticipating the long-term consequences of these types of behavior or a stronger CWB-I relationship may suggest that high-GMA individuals recognize that these behaviors are more easily observable and therefore problematic. In either case, GMA acts to inhibit CWB.

Third, some researchers have proposed that the relationship between intelligence and CWB can be obscured by sample heterogeneity (Dilchert et al., 2007; Marcus, Wagner, Poole, Powell, & Carswell, 2009). That is, some researchers have argued that intelligence and CWB are related but only in certain occupational groups, and samples that combine occupational groups are likely to obscure this relationship at the population level. So far, research does not clearly support the sample heterogeneity explanation. In their investigation of the issue, Marcus et al. (2009) find that sample heterogeneity does not account for the inconsistent findings regarding the intelligence-CWB relationship. On the other hand, Gonzalez-Mulé et al. (2014) found some evidence that the GMA-CWB relationship was conditioned on sample. In military samples the relationship was null, but in non-military samples the relationship was slightly negative. In police samples, there was a significant, albeit small, negative GMA-CWB relationship while in non-police samples the relationship was null. Because much of the research on CWB has been conducted in military and police samples, these results suggest that the GMA-CWB may be obfuscated when samples are combined or treated as interchangeable. Still, Gonzalez-Mulé and colleagues emphasize that results are far from conclusive and should be interpreted with caution.

In fact, they note that their findings are complicated by the inability to control for other methodological factors when analyzing occupational context. For example, all police samples used objective records as measures of CWB. Thus, findings for police samples may be confounded with the differential detection hypothesis discussed above.

Like differential detection and CWB target, evidence of sample heterogeneity is not evidence against an inhibitory effect of GMA on CWB. The sample heterogeneity explanation merely suggests that the relationship might be weaker in some occupational contexts. Thus, these three explanations for the lack of empirical support for a negative GMA-CWB relationship are not wholly satisfactory. Evidence for all three explanations is tentative at best, and all three leave the question of whether and when there is an inhibitory effect of GMA on CWB unanswered.

## Chapter 3

### AN INHIBITORY EFFECT: THE CASE FOR AN INTERACTION

Clearly, there are several factors that can affect the identification of an empirical relationship between GMA and CWB. However, I argue that a thorough test of the theoretical relationship between GMA and CWB must incorporate an inhibitory, *moderating* effect of GMA. Among research that has drawn on the inhibitory effect as an explanation for a GMA-CWB link, GMA is typically thought to have a *direct* effect on CWB. However, several researchers have also suggested that the inhibitory effect may be most pronounced in the context of other deviance risk factors. Dilchert et al. (2007) suggest:

. . . the investigation of potential interaction effects could further contribute to researchers' understanding of the observed relationships. For example, it seems conceivable that the negative cognitive ability-CWB association would be even stronger among individuals who lack other personal characteristics that act as preventative factors. (p. 624)

Similarly, White et al. (1989) propose interactive effects on deviance generally. Gonzalez-Mulé and colleagues (2014) also allude to an interaction between GMA and other risk factors, suggesting high-GMA individuals have “. . . less likelihood of falling victim” to “the vicious frustration-aggression cycle” (p. 1224). The “frustration-aggression” cycle refers to evidence that other, non-GMA antecedents affect CWB, and that GMA may weaken those relationships. Thus, rather than interpreting inhibition as a simple direct effect, inhibition can be interpreted as restricting an impulse. That is, GMA may act on or *inhibit* some other inclination to engage in

CWB. Individuals who possess no other risk factors for CWB would therefore be unlikely to engage in CWB regardless of GMA.

Interpreting the inhibitory effect as interactive requires considering what other variables are critical risk factors for CWB. Although literature on the relationship between GMA and CWB is somewhat limited, there is a robust body of literature on the importance of personality in predicting CWB. Next, I propose that the meta-trait stability (i.e., conscientiousness, agreeableness, and emotional stability) is one likely target for the inhibitory influence of GMA.

### **Personality Antecedents of CWB**

Spector (2011) notes that often early work on the personality-CWB relationship was less concerned with explicating the mechanisms for the relationship than it was simply establishing that relationship. One reason for the limited tests of the theoretical relationship between GMA and CWB may be the variety of mechanisms which personality has been posited to affect CWB. Cullen and Sackett (2003) propose five mechanisms, including direct effects, indirect effects through work attitudes, and moderation of organizational events and work perceptions. Similarly, Spector (2011) describes a model in which personality influences CWB through four different pathways, including appraisal of events that may trigger CWB (e.g., work stressors), emotional reactivity, perceived control over events, and effortful control. Although a comprehensive test of all possible pathways would be extraordinarily difficult, research has begun to emerge in support of many of these individual pathways. For example, Mount, Ilies, and Johnson (2006) have shown that job satisfaction mediates the relationship between personality and CWB. Bowling and Eschleman (2010) have shown that personality can moderate the effect of work stressors on CWB.

Perhaps the strongest evidence for a direct path between personality and CWB so far has focused on personality as it relates to control (Spector, 2011). Marcus and Schuler (2004) extend the popular theory that self-control is the most important predictor of deviance generally (M. R. Gottfredson & Hirschi, 1990; Pratt & Cullen, 2000; Vazsonyi, Pickering, Junger, & Helsing, 2001) to CWB and show that, more so than several other individual differences, self-control accounts for CWB. They also note that self-control is a broad term that encompasses a variety of more specific personality traits. Prior research has shown that measures of self-control are strongly related to three of the Big Five: conscientiousness, agreeableness, and emotional stability (De Vries & Van Gelder, 2013; Marcus, 2003; O'Gorman & Baxter, 2002).

Empirical research on the relationship between personality and CWB also supports the importance of these three traits for CWB. Researchers have clearly established a link between CWB and integrity, which is a composite of conscientiousness, agreeableness, and emotional stability (Ones et al., 1993; Berry et al., 2007). Moreover, these three traits show indirect relationships between personality and CWB (Bowling & Eschleman, 2010; Mount et al., 2006). Thus, even if the precise pathway by which personality affects CWB is not entirely resolved, *which* personality traits matter seems mostly clear.

### **The Meta-Trait of Stability**

Given the importance of self-control in predicting both general deviance and CWB, the relationship between CWB and conscientiousness, agreeableness, and emotional stability may be better understood by comparing their common function to the definition of self-control. In their landmark work *A General Theory of Crime*, M. R. Gottfredson and Hirschi (1990) define self-control as “the tendency to avoid acts whose long-term costs exceed momentary advantages” (Hirschi & Gottfredson, 1994, p. 4 cf Marcus & Schuler, 2004). DeYoung (2015)’s Cybernetic

Big Five Theory asserts that personality traits categorize different strategies for goal pursuit and need fulfillment. Regarding these strategies, *conscientiousness* concerns the protection and prioritization of long-term goals (e.g., self-discipline, cautiousness), *agreeableness* relates to cooperation and altruism such that one will coordinate their individual goals with others, and *neuroticism* or its reverse *emotional stability* reflects sensitivity to a mismatch between goals and the actual state (e.g., defensiveness, withdrawal).

Taken together, the shared variance between these three traits comprises the meta-trait *stability* which promotes the “protection of goals, interpretations, and strategies, from disruption by impulses” (DeYoung, 2015, p. 10). In contrast, the meta-trait *plasticity* encompasses openness and extraversion and concerns the creation and exploration of new goals. Arguments for investigating personality as higher-order meta-traits are rooted in evidence of consistent correlations between the Big Five traits and corresponding variation in the serotonergic and dopaminergic systems (DeYoung, 2006; DeYoung, Peterson, & Higgins, 2002; Digman, 1990). Whereas conscientiousness, agreeableness, and emotional stability (*stability*) are all related to impulse control, presumably controlled by the serotonergic system, openness and extraversion (*plasticity*) are related to stimulus-seeking governed by the dopaminergic system (DeYoung et al., 2010). Meta-traits are not only helpful frameworks for conceptualizing covariance among the Big Five, they also show meaningful relationships with broad criteria. For example, *stability* has been shown to be related to conformity with social norms (DeYoung et al., 2002) and externalizing behavior more broadly (DeYoung et al., 2008).

Clearly, the key function of the meta-trait of *stability* relates to Gottfredson and Hirschi’s (1990) concept of self-control. Both concern impulse control and the prioritization of long-term versus short-term consequences. Thus, the importance of conscientiousness, agreeableness, and

emotional stability may be conceptualized in terms of this higher-order meta-trait such that all three impact one's ability to control impulses and prioritize long-term goals.

### **Hypotheses and Research Question**

To the extent that GMA is an inhibitory influence on other risk factors for CWB, an interaction between GMA and the meta-trait stability seems likely. Low stability reflects an individual's general tendency toward impulsive behavior and immediate gratification. High-GMA may help an individual to better understand the consequences of such behavior and curb impulses accordingly. However, high-GMA is not as likely to benefit high-stability individuals who are not prone to engage in CWB.

**Hypothesis 1:** GMA interacts with the meta-trait stability such that high-GMA shows a negative relationship with CWB among only low-stability individuals.

Additionally, I aim to directly test the proposed mechanism by which stability and GMA interact to affect CWB. Specifically, I propose that stability influences impulsivity, impulsivity predicts CWB, and that GMA inhibits those impulsive tendencies. Consistent with H1, I expect GMA to show a negative relationship with CWB among those with high impulsivity or, alternatively, that there will be a weakened impulsivity-CWB relationship among high-GMA relative to low-GMA individuals. Thus, I propose a moderated mediation model (see Figure 3.1) in which there is a conditional indirect effect of stability on CWB via impulsivity, and GMA moderates the second stage of mediation.

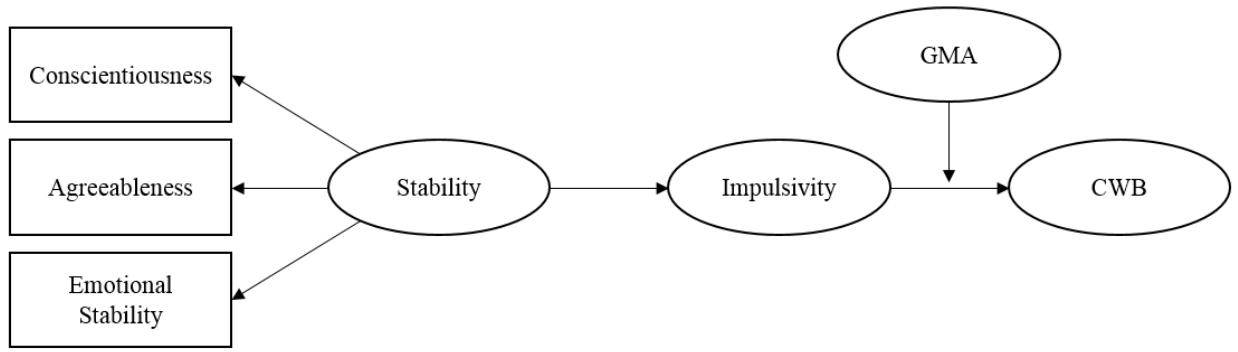
**Hypothesis 2a:** Impulsivity mediates the relationship between the meta-trait stability and CWB.

**Hypothesis 2b:** The relationship between impulsivity and CWB is moderated by GMA such that there is a weaker, positive relationship between impulsivity and CWB among high-GMA than low-GMA individuals.

Some limited research has already tested this type of stability-GMA interaction with mixed support. Postlethwaite, Robbins, Rickerson, and McKinniss (2009) found that GMA showed the strongest relationship with safety behavior among low-conscientiousness individuals. On the other hand, Ayduk, Rodriguez, Mischel, Shoda, and Wright (2007) found that verbal intelligence showed a stronger relationship with aggression among boys with high self-regulation strategies. Although these studies are not directly comparable because they employ dramatically different samples and measures, they do re-emphasize the possibility that GMA may show differential relationships with CWB depending on the target. For example, aggression is more similar to CWB-I than CWB-O, whereas safety behavior is similar to CWB-O than CWB-I. As noted above, research to date is not clear on the theoretical rationale for whether GMA should show a stronger relationship with CWB-I or CWB-O, and there is also weak empirical evidence for one over the other. Thus, in addition to considering an interaction between GMA and stability in CWB broadly, I also consider such an interaction for CWB-I and CWB-O separately.

**Research Question:** Does GMA interact with the meta-trait stability differently in CWB-I and CWB-O?

Additionally, because there is some evidence that lower-order stability components (conscientiousness, agreeableness, and emotional stability) may show slightly different relationships with CWB (Berry et al., 2007), I will conduct analyses at both the meta-trait and trait level. Conducting analyses at the trait level will help to determine whether specific traits are primarily responsible for a stability-GMA interaction.



**Figure 3.1**

*Expected relationship between the meta-trait stability—comprised of conscientiousness, agreeableness, and emotional stability—impulsivity, and CWB moderated by GMA*

## Chapter 4

### THE CURRENT STUDIES

In two proposed studies, I investigate the possible inhibitory interactive effect of stability and GMA on CWB. Both Study 1 and Study 2 utilize self-report data from large samples of full-time employees in a variety of occupational contexts. Use of self-report CWB limits the potential confounds of differential detection. That is, using only self-reports affords a more direct test of whether high-GMA individuals *engage* in less CWB than do other-reports, which test for differences in detection. Moreover, Berry, Carpenter, and Barratt (2012) find that self-reports are not inferior to other-reports of CWB. In fact, self-reported CWB tends to be slightly higher than other-reported CWB.

In Study 1, I investigate the interactive influence of stability and GMA on CWB, including both CWB-I and CWB-O as mentioned above, and consider possible differential interactions at the trait-level. Study 2 builds upon Study 1 by replicating the analyses conducted in a new sample and by directly testing the proposed mechanism by which GMA and stability interact. Specifically, Study 2 includes a measure of impulsivity and tests a moderated mediation model such that impulsivity mediates the stability-CWB relationship, and GMA moderates the second stage of mediation. Additionally, whereas Study 1 includes only a spatial measure of GMA, Study 2 incorporates both a spatial and verbal measure of GMA to account for possible differences by GMA type.

## Chapter 5

### STUDY 1

#### **Method**

##### *Sample*

Participants ( $N = 1,412$ ;  $M_{\text{age}} = 34.2$ , 66.1% female, 82.0% white) were recruited through Amazon Mechanical Turk (MTurk). To qualify, participants were required to be working full-time, living in the United States, at least 18 years old, and able to read English. Qualifications were determined based on self-report. Total amount of time to take the survey was approximately one hour, and participants were compensated \$0.75 for completing the survey.

##### *Measures*

**General Mental Ability.** Cognitive ability was assessed with a subset of the Sandia Matrices items (Matzen et al., 2010), which are free nonverbal matrix-type problems designed similarly to the proprietary Raven's Progressive Matrices (Raven, 2000; Raven & court, 1993). Respondents are asked to select an image that completes a presented pattern. Participants completed a subset of items selected to reflect a range of difficulty levels and item-types (Matzen et al., 2010). In their norming study, Matzen et al. (2010) identified a reliability coefficient a reliability coefficient that exceeded that of the Standard Progressive Matrices on which the Sandia Matrices were based (Sandia Matrices,  $\alpha = .76$ ; Standard Progressive Matrices = .73).

Answers were coded dichotomously as either correct or incorrect and scored with the two-parameter logistic (2PL) IRT model, which is appropriate for such dichotomously scored items (Embretson & Reise, 2000). After removing items that demonstrated inappropriate fit or

item parameters, a final set of 17 items was used to estimate GMA scores. Absolute and relative fit indicates suggested excellent model-data fit (RMSEA = .025, TLI = .98, CFI = .98) for the final set of Sandia Matrices items scored with the 2PL. Table 5.1 displays model-data fit statistics for all IRT-scored variables in Study 1.

**Personality.** Conscientiousness, agreeableness, and emotional stability were measured using 10-item scales from the International Personality Item Pool (IPIP; Goldberg, 1999) designed to reflect those in the NEO-PI-R (Costa & McCrae, 1992). Respondents indicate the extent to which they agree that an item describes them accurately on a scale of 1 = strongly disagree to 6 = strongly agree. Consistent with prior research that suggests ideal point IRT models more accurately represent responses to Likert-type personality measures (e.g., LaPalme, Tay, & Wang, 2017), the generalized graded unfolding model was used score all personality scales (GGUM; Roberts, Donoghue, & Lauglin, 2000). Notably, due to low degrees of freedom  $C_2$  fit statistics were calculated (Cai & Monroe, 2015). Although absolute fit indices were high for all measures (RMSEA > .08; Hu & Bentler, 1999), relative fit indices suggest good model-data fit for all three personality measures (TLI & CFI > .90, Hu & Bentler, 1999). Absolute fit indices may be inappropriate due to low degrees of freedom in the current models and the use of the  $C_2$  statistic. Moreover, marginal reliability was adequate for all three measures. Item-level RMSEA indicated adequate fit for agreeableness and emotional stability but poor fit for the conscientiousness measure (Lee & Luna-Bazaldua, 2019). Consequently, after reviewing item properties one item with extreme item parameters (“I do just enough to get by”) was removed. After removing this item, item-level RMSEA also suggested adequate fit of the conscientiousness measure. Thus, I proceeded with a 9- rather than 10-item measure of conscientiousness. An overall stability composite was created by standardizing and then

averaging the three IRT-estimated scores for conscientiousness, agreeableness, and emotional stability.

**Counterproductive Work Behavior.** CWB was measured using the popular Workplace Deviance Measure (Bennett & Robinson, 2000), which subdivides CWB into CWB-I and CWB-O. The Workplace Deviance Measure asks respondents to indicate the frequency with which they engage in a variety of behaviors on a scale of 1 = “never” to 7 = “daily.” Because the Workplace Deviance Measures is a behavior frequency measure, it was scored using the graded response model (GRM; Samejima, 1997). Absolute fit indicated good model-data fit for CWB (RMSEA = .054, TLI = .94, CFI = .96).

**Demographics and Job Characteristics.** Participants completed a basic demographics questionnaire including information such as age, gender, and occupational information.

### *Data Analysis*

Moderated multiple regression models were estimated for each of the criterion variables (overall CWB, CWB-O, and CWB-I) using the lavaan package in R (Rosseel, 2012). The lavaan package allows regression models to be estimated using maximum likelihood with robust standard errors (MLR). MLR estimation was used to account for non-normal distribution of CWB (see Figure 5.1). First, models including an interaction between stability and GMA were estimated. Then, models were constructed for interactions between the lower-order personality terms (conscientiousness, agreeableness, and emotional stability) and GMA. Quadratic terms for each variable in the interaction were included to account for possible collinearity (Cortina, 1993). All variables were standardized before creating interaction terms.

## Results

Descriptive statistics and correlations for all predictor and criteria variables in Study 1 are shown in Tables 5.2 and 5.3 respectively. Table 5.4 shows the results of moderated multiple regression models for CWB, CWB-I, and CWB-O predicted from stability and GMA. Results show evidence of a significant interactive effect of stability and GMA on overall CWB ( $b = .06$ ,  $p = .010$ ), as well as CWB-I ( $b = .05$ ,  $p = .020$ ) and CWB-O ( $b = .06$ ,  $p = .006$ ). As illustrated in Figure 5.2, the form of the stability-GMA interaction for all criteria was such that there is a negative GMA-CWB relationship among low-stability individuals but not high-stability individuals. Thus, Study 1 results support H1 for CWB and both subdimensions.

Moderated multiple regression analyses were also conducted for CWB and its subdimensions for each of the traits comprising the meta-trait stability to evaluate whether there were potential differences at the trait-level that might affect the overall interaction. Table 5.5, 5.6, and 5.7 show results of these moderated multiple regression models for the criteria predicted from GMA and conscientiousness, agreeableness, and emotional stability respectively. There was a significant interactive influence of GMA and conscientiousness as well as emotional stability on overall CWB (conscientiousness:  $b = .07$ ,  $p = .018$ ; emotional stability:  $b = .06$ ,  $p = .017$ ). Agreeableness and GMA showed a marginally significant interactive effect on CWB (agreeableness:  $b = .05$ ,  $p = .064$ ). Further, there was a significant interactive influence of conscientiousness and GMA on CWB-I (conscientiousness:  $b = .07$ ,  $p = .014$ ) but *not* CWB-O ( $b = .04$ ,  $p = .052$ ). In contrast, there was a significant interactive influence of agreeableness and GMA, as well as emotional stability and GMA, on CWB-O (agreeableness:  $b = .07$ ,  $p = .010$ ; emotional stability:  $b = .07$ ,  $p = .007$ ) but *not* CWB-I (agreeableness:  $b = .02$ ,  $p = .332$ ; emotional stability:  $b = .05$ ,  $p = .058$ ).

Figures 5.3, 5.4, and 5.4 illustrate all significant interactive effects of GMA and conscientiousness, agreeableness, and emotional stability respectively. In all cases, the GMA-CWB relationship was negative for individuals with low levels of conscientiousness, agreeableness, or emotional stability but not for individuals with high levels of these traits. Thus, although results varied somewhat between lower-level stability traits for the two CWB subdimensions, results were generally consistent with the hypothesis for overall CWB for all three traits.

## **Discussion**

Study 1 results support the hypothesis that GMA shows a negative relationship with CWB among those with low but not high stability. Further, in answer to the research question regarding the potential differential interactive influence of stability and GMA on CWB-I and CWB-O, there was little to no evidence of differences by CWB subdimensions.

Additionally, the present study explored the potential for differential interactions between GMA and the lower-order trait levels (i.e., conscientiousness, agreeableness, and emotional stability). Although results at the lower-trait level varied slightly by CWB subdimensions, results were generally consistent with the results of a stability-GMA interaction in overall CWB. In all cases of a significant interaction between lower-order personality traits and CWB, the interaction was consistent with the form of the stability-GMA interaction specified in H1 such that GMA exhibited a negative relationship with CWB among those with low but not high levels of the personality trait.

One limitation of Study 1 is the use of a spatial but no verbal measure of GMA. Because spatial reasoning is more often associated with fluid intelligence whereas verbal reasoning is typically associated with crystallized intelligence (Beauducel, Brocke, & Liepmann et al., 2001),

it is possible that the present results may be in part dependent on the use of fluid intelligence. Fluid intelligence is most commonly associated with logic whereas crystallized intelligence is most commonly associated with knowledge and experience. Differential interactions by intelligence types might suggest that either innate reasoning ability (i.e., fluid intelligence) or experience (i.e., crystallized intelligence) has a stronger inhibitive effect on CWB.

Study 2 includes both spatial and verbal measures of intelligence to explore the potential influence of crystallized versus fluid intelligence. Moreover, Study 2 includes a measure of impulsivity to test H2 and directly assess the mechanism by which GMA interacts with stability to affect CWB.

**Table 5.1***Model-data Fit Statistics for All IRT-scored Variables in Study 1*

Variable	Model	M <sub>2</sub>	df	RMSEA	RMSEA 95% CI		SRMSR	TLI	CFI	r <sub>xx</sub>	% Items
					Low	High					RMSEA > .05
Conscientiousness (10 items)*	GGUM	851.44	25	.153	.144	.162	.249	.930	.951	.92	70%
Conscientiousness (9 items)*	GGUM	365.34	18	.117	.107	.128	.101	.963	.976	.89	0%
Agreeableness*	GGUM	1066.58	25	.172	.163	.181	.218	.898	.927	.84	10%
Emotional Stability*	GGUM	610.85	25	.129	.120	.138	.112	.930	.950	.94	0%
GMA	2PL	225.62	119	.025	.010	.030	.044	.981	.983	.71	0%
CWB	GRM	293.16	57	.054	.048	.060	.076	.941	.956	.87	0%
CWB-I*	GRM	64.53	14	.051	.038	.063	.034	.991	.994	.77	0%
CWB-O*	GRM	583.23	54	.083	.078	.090	.067	.946	.956	.83	0%

r<sub>xx</sub> = IRT-based marginal reliability. <sup>a</sup>C<sub>2</sub> statistics used due to low degrees of freedom.

**Table 5.2***Descriptive Statistics for Variables in Study 1*

Variable	Scoring	<i>M</i>	<i>SD</i>	Min.	Max.
GMA	2PL	0.00	0.85	-2.81	1.94
	sum	0.61	0.17	0.00	1.00
Conscientiousness	GGUM	0.00	0.95	-2.98	2.11
	sum	3.74	0.75	1.22	5.00
Agreeableness	GGUM	0.00	0.92	-2.92	2.25
	sum	3.71	0.64	1.60	5.00
Emotional Stability	GGUM	0.00	0.94	-3.62	3.47
	sum	2.59	0.92	1.00	5.00
Stability	composite	0.00	0.75	-2.56	2.45
	composite	1.62	0.58	-0.35	3.00
CWB	GRM	0.00	0.94	-1.74	3.43
	sum	2.01	0.89	1.00	6.00
CWB-I	GRM	0.00	0.89	-1.03	3.58
	sum	2.11	0.92	1.00	6.00
CWB-O	GRM	0.00	0.91	-1.60	2.87
	sum	1.85	1.08	1.00	7.00

2PL = two-parameter logistic model. GGUM = generalized graded unfolding model. GRM = graded response model. sum = traditional sum-scoring approach (average).

**Table 5.3***Correlations for Variables in Study 1*

Variable	1.	2.	3.	4.	5.	6.	7.
1. GMA							
2. Conscientiousness	-.04						
3. Agreeableness	.10***	.37***					
4. Emotional Stability	.00	.38***	.26***				
5. Stability	.03	.78***	.73***	.73***			
6. CWB	-.03	-.34***	-.35***	-.22***	-.41***		
7. CWB-I	-.07**	-.22***	-.36***	-.15***	-.33***	.88	
8. CWB-O	-.02	-.39***	-.29***	-.23***	-.41***	.90***	.62***

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

**Table 5.4***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Stability and GMA in Study 1*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )
Step 1												
GMA	-.02	.03	.559	.165 (.165***)	-.06*	.03	.023	.011 (.011***)	-.01	.03	.870	.166 (.166***)
Stab.	-.41***	.03	<.001		-.33***	.03	<.001		-.41***	.03	<.001	
Step 2												
GMA	.00	.03	.915	.166 (.001)	-.04	.03	.122	.113 (.002)	.01	.03	.680	.168 (.002)
Stab.	-.40***	.03	<.001		-.32***	.03	<.001		-.41***	.03	<.001	
GMA <sup>2</sup>	.03	.02	.262		.03	.02	.135		.02	.02	.278	
Stab. <sup>2</sup>	-.01	.02	.701		.01	.02	.576		.01	.02	.726	
Step 3												
GMA	.00	.03	.934	.170 (.004**)	-.04	.03	.158	.116 (.003*)	.02	.03	.537	.172 (.004**)
Stab.	-.40***	.03	<.001		-.32***	.03	<.001		-.40***	.03	<.001	
GMA <sup>2</sup>	.02	.02	.434		.02	.02	.239		.02	.02	.470	
Stab. <sup>2</sup>	.00	.02	.873		.01	.02	.455		.01	.02	.563	
Stab. x GMA	.06*	.02	.010		.05*	.02	.020		.06**	.02	.006	

*Note.* Stab. = stability. *N* = 1,412\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 5.5***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Conscientiousness and GMA in Study 1*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )
Step 1												
GMA	-.04	.03	.185	.116 (.116***)	-.08**	.03	.006	.053 (.053***)	-.03	.03	.307	.156 (.156***)
Consc.	-.34***	.03	<.001		-.22***	.03	<.001		-.40***	.03	<.001	
Step 2												
GMA	-.02	.03	.397	.118 (.002)	-.06	.03	.051	.057 (.004)	-.02	.03	.569	.159 (.003)
Consc.	-.34***	.03	<.001		-.22***	.03	<.001		-.40***	.03	<.001	
GMA <sup>2</sup>	.03	.02	.212		.04	.02	.074		.02	.02	.282	
Consc. <sup>2</sup>	.01	.02	.533		.01	.02	.532		.03	.02	.123	
Step 3												
GMA	-.02	.03	.510	.123 (.005**)	-.05	.03	.077	.061 (.004**)	-.01	.03	.676	.162 (.003*)
Consc.	-.34***	.03	<.001		-.22***	.03	<.001		-.41***	.03	<.001	
GMA <sup>2</sup>	.02	.02	.285		.03	.02	.108		.02	.02	.353	
Consc. <sup>2</sup>	.02	.02	.232		.02	.02	.227		.04	.02	.051	
Consc. x GMA	.07*	.03	.018		.07*	.03	.014		.05	.03	.052	

*Note.* Consc. = conscientiousness. *N* = 1,412\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 5.6***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Agreeableness and GMA in Study 1*

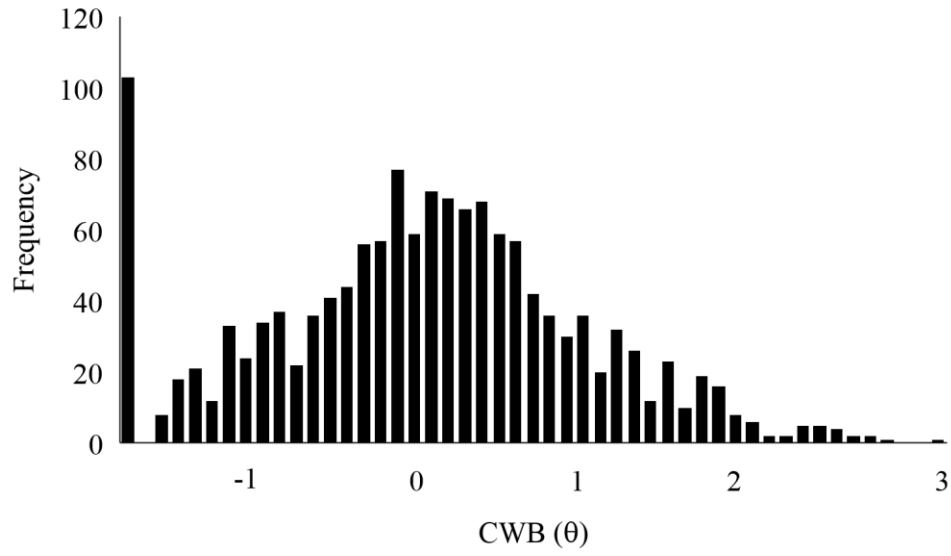
	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )
Step 1												
GMA	.01	.03	.835	.125 (.125***)	-.04	.03	.185	.132 (.132***)	.01	.03	.682	.085 (.085***)
Agr.	-.35***	.03	<.001		-.36***	.03	<.001		-.29***	.03	<.001	
Step 2												
GMA	.03	.03	.349	.128 (.003)	-.01	.03	.603	.135 (.003)	.03	.03	.243	.089 (.004*)
Agr.	-.34***	.03	<.001		-.36***	.03	<.001		-.28***	.03	<.001	
GMA <sup>2</sup>	.04	.02	.120		.03	.02	.093		.04	.02	.088	
Agr. <sup>2</sup>	-.02	.02	.368		.01	.02	.504		-.03	.02	.227	
Step 3												
GMA	.03	.03	.300	.130 (.002*)	-.01	.03	.629	.136 (.001)	.04	.03	.188	.094 (.005**)
Agr.	-.34***	.03	<.001		-.36***	.03	<.001		-.27***	.03	<.001	
GMA <sup>2</sup>	.03	.02	.211		.03	.02	.140		.03	.02	.203	
Agr. <sup>2</sup>	-.02	.02	.284		.01	.02	.569		-.03	.02	.150	
Agr. x GMA	.05	.03	.064		.02	.02	.332		.07**	.03	.010	

*Note.* Agr. = agreeableness. *N* = 1,412\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 5.7***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Emotional Stability and GMA in Study 1*

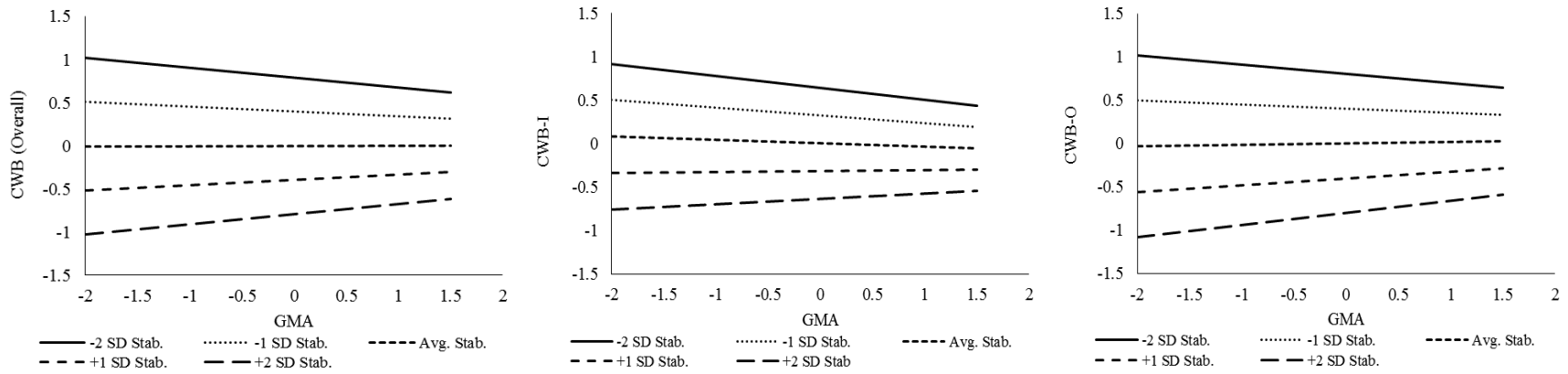
	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )
Step 1												
GMA	-.03	.03	.371	.049 (.049***)	-.07*	.03	.015	.029 (.029***)	-.02	.03	.610	.053 (.053***)
ES	-.22***	.03	<.001		-.16***	.03	<.001		-.23**	.03	.001	
Step 2												
GMA	-.01	.03	.793	.057 (.008**)	-.05	.03	.108	.036 (.007**)	.01	.03	.841	.061 (.008**)
ES	-.20***	.03	<.001		-.14***	.03	<.001		-.22***	.03	<.001	
GMA <sup>2</sup>	.04	.02	.058		.05*	.02	.026		.04	.02	.056	
ES <sup>2</sup>	-.04*	.02	.026		-.02	.02	.132		-.04*	.02	.041	
Step 3												
GMA	-.01	.03	.849	.062 (.005**)	-.05	.03	.118	.038 (.002)	.01	.03	.781	.066 (.005**)
ES	-.19***	.03	<.001		-.14***	.03	<.001		-.20***	.03	<.001	
GMA <sup>2</sup>	.04	.02	.078		.04*	.02	.034		.04	.02	.078	
ES <sup>2</sup>	-.04*	.02	.020		-.03	.02	.114		-.04*	.02	.030	
ES x GMA	.06*	.03	.017		.05	.03	.058		.07**	.03	.007	

*Note.* ES = emotional stability. *N* = 1,412\**p* < .05. \*\**p* < .01. \*\*\**p* < .001



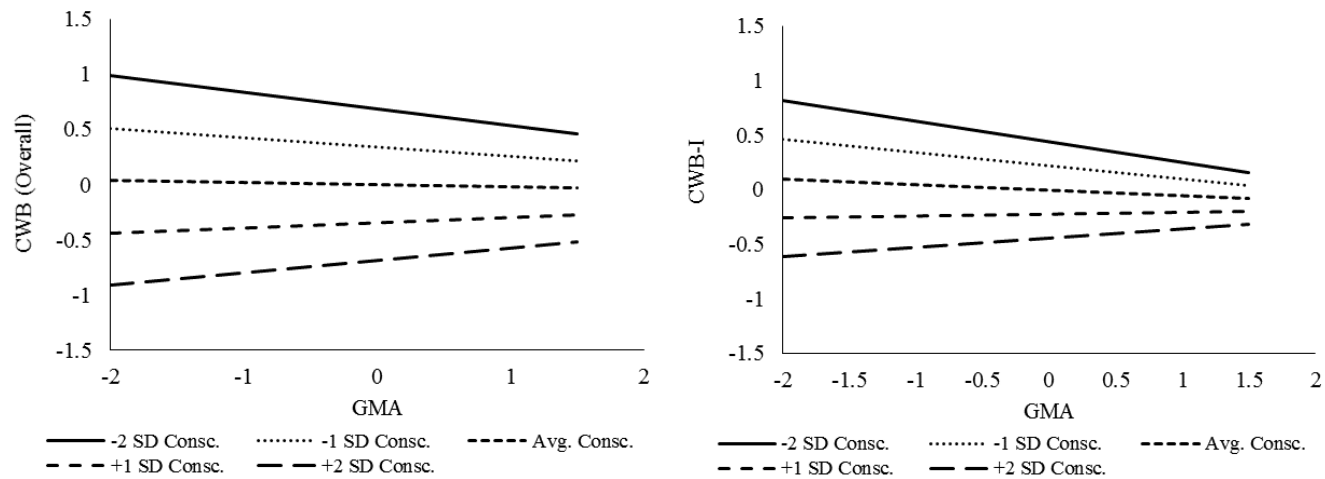
**Figure 5.1**

*Histogram of CWB Distribution in Study 1*



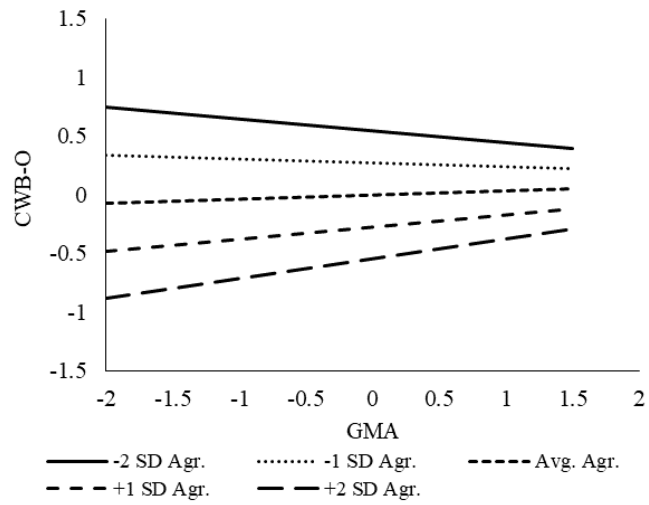
**Figure 5.2**

*Graphs of the interactive effect of stability and GMA on CWB (left), CWB-I (middle), and CWB-O (right) in Study 1*



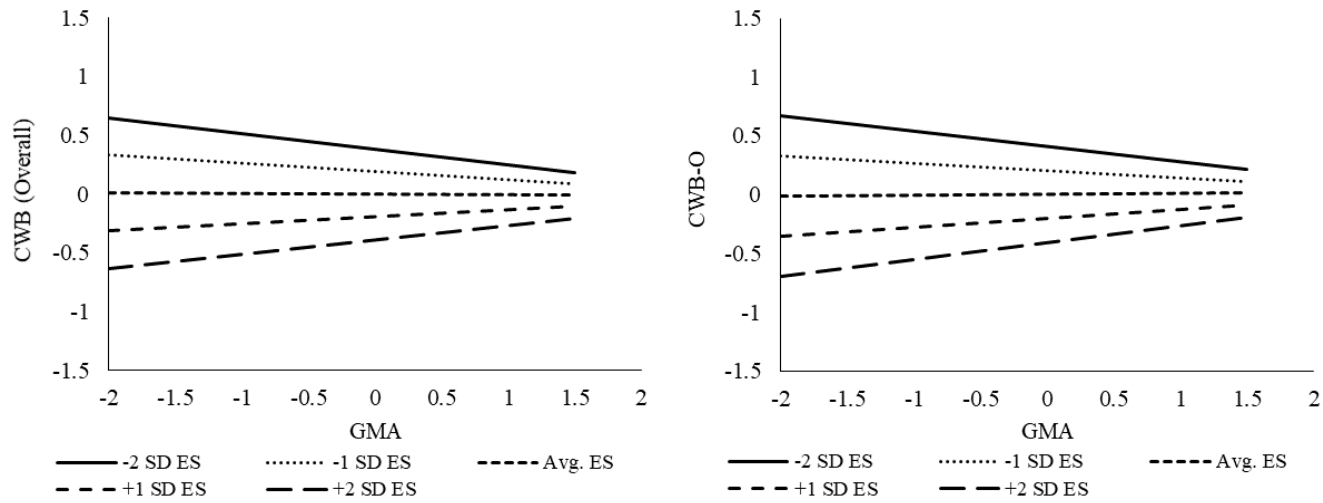
**Figure 5.3**

*Graphs of the interactive effect of conscientiousness and GMA on CWB (left) and CWB-I (right) in Study 1*



**Figure 5.4**

*Graph of the interactive effect of agreeableness and GMA on CWB-O in Study 1*



**Figure 5.5**

*Graphs of the interactive effect of emotional stability and GMA on CWB (left) and CWB-O (right) in Study 1*

## Chapter 6

### STUDY 2

Study 2 aims to build on Study 1 by exploring the mechanism by which stability and GMA interact to affect CWB. I hypothesize that there is a conditional indirect effect of stability on CWB such that (a) impulsivity mediates the relationship between stability and CWB, and (b) GMA moderates the impulsivity-CWB relationship. Specifically, I expect that GMA will inhibit impulsivity such that the positive impulsivity-CWB relationship is weaker among low- relative to high-GMA individuals. In addition to testing H2, Study 2 replicates Study 1 by testing H1 such that there is an interactive effect of stability and GMA on CWB. Like Study 1, Study 2 also considers CWB-I and CWB-O to evaluate whether this interactive influence varies by CWB subdimension and considers interactions at the trait-level. Finally, Study 2 also includes both a spatial and verbal measure of intelligence to investigate the possibility that GMA type may influence the interactive influence of GMA and stability on CWB.

#### **Method**

##### *Sample*

As in Study 1, participants ( $N = 1,241$ ;  $M_{age} = 34.2$ , 45.5% female, 80.0% white) were recruited through Amazon Mechanical Turk (MTurk) using the same qualifications. Participants again completed all measures in the form of an online questionnaire. Total amount of time to take the survey was approximately 40 minutes, and participants were compensated \$3.00 for completing the survey.

## *Measures*

**General Mental Ability.** Two measures of GMA were administered in Study 2. As in Study 1, a subset of Sandia Matrices items was administered (Matzen et al., 2010). Participants completed a 10-item measure designed to represent items with a range of difficulties and appropriate item parameters (Harris et al., under review). Because the Sandia Matrices are matrix-completion problems and may therefore primarily reflect spatial reasoning, participants also completed a 9-item<sup>1</sup> verbal GMA measure comprised of verbal reasoning as well as letter and number series (i.e., choosing the next letter or number to complete a sequence) item types from the International Cognitive Ability Resource (ICAR, 2014). Answers to both the Sandia Matrices and ICAR items were coded dichotomously as either correct or incorrect and scored with the 2PL IRT model. The verbal measure was scored using a 2-factor model in which verbal reasoning and series items comprised separate factors that were allowed to covary. Both absolute and relative fit statistics indicated excellent model-data fit for the Sandia Matrices measure (RMSEA = .043, TLI = .96, CFI = .97) and the final set of ICAR items (RMSEA = .032, TLI = .97, CFI = .98). Model-data fit statistics for all IRT-scored variables in Study 2 are shown in Table 6.1.

**Personality.** Conscientiousness, agreeableness, and emotional stability were measured using the IPIP-120 (Maples, Guan, Carter, & Miller, 2014), a free measure of the FFM. The IPIP-120 is a 120-item self-report measure similar to the NEO PI-R (Costa & McCrae, 1992) with 24 items per trait. Respondents indicated the extent to which they agree that an item describes them accurately on a scale of 1 = strongly disagree to 5 = strongly agree. As in Study 1, traits were scored using the GGUM and an overall stability composite will be created by

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<sup>1</sup> A 10-item measure was administered. However, due to an error in administration for one of the items, only 9-items were used to score GMA.

averaging the three scores. As in Study 1, absolute fit indices were somewhat high, likely due to low degrees of freedom. However, all other fit indices suggested good model-data fit for all three personality measures.

**Counterproductive Work Behavior.** As in Study 1, CWB was measured using the popular Workplace Deviance Measure (Bennett & Robinson, 2000) and scored using the GRM. Both absolute and relative fit indices indicated excellent model-data fit (RMSEA = .049, TLI = .96, CFI = .97).

**Impulsivity.** Participants completed a shortened 20-item measure of the UPPS-P Impulsive Behavior Scale (Cyders, Littlefield, Coffey, & Karyadi, 2014; Lynam, 2013). Consistent with the use of the GGUM for other traits in the current studies, impulsivity was scored using the GGUM. Absolute fit statistics indicated adequate model-data fit (RMSEA = .08), and relative fit statistics suggested good model-data fit (TLI = .97, CFI = .97). Additionally, item-level RMSEAs and marginal reliability suggested good model-data fit.

**Demographics and Job Characteristics.** Participants completed a basic demographics questionnaire including information such as age, gender, and occupational information.

### ***Data Analysis***

Moderated multiple regression models were estimated as described in Study 1. Additionally, consistent with Study 1, MLR estimation was used to account for the non-normal distribution of CWB (see Figure 6.1) but only for CWB and CWB-O. Test statistics indicated that MLR estimation was not needed for CWB-I in Study 2. Additionally, H2 was tested using the PROCESS macro in SPSS for regression-based path analysis (Hayes, 2013). Indirect effects were tested using bias-corrected bootstrapping with 10,000 samples (Preacher, Rucker, & Hayes, 2007).

## Results

Descriptive statistics and correlations for all predictor and criteria variables in Study 2 are shown in Tables 6.2 and 6.3 respectively. Table 6.4 shows the results of moderated multiple regression models for CWB, CWB-I, and CWB-O predicted from stability and GMA. Results showed evidence of a significant interactive effect of stability and GMA on overall CWB ( $b = .13, p = < .001$ ), as well as CWB-I ( $b = .14, p = < .001$ ) and CWB-O ( $b = .11, p = < .001$ ). As illustrated in Figure 6.2, the form of all three interactions was such that there is a negative GMA-CWB relationship among low-stability individuals but not high-stability individuals. Thus, Study 2 results support H1 for CWB and both subdimensions.

In Study 2, two measures of GMA (spatial vs. verbal) were administered in order to evaluate for possible differential interactive effects dependent on GMA type. Table 6.5 shows the results of moderated multiple regression analyses for the interactive effect of stability and the spatial GMA measure only whereas Table 6.6 shows the results for the interactive effect of stability and the verbal GMA measure only. Although the spatial measure showed a slightly stronger main effect on CWB, both measures showed significant interactions with GMA for CWB and its subdimensions. Figures 6.3 and 6.4 illustrate these interactions. Interactions were relatively similar between the two measure types, suggesting that the interactive effect of stability and GMA on CWB does not vary by GMA type.

As in Study 1, moderated multiple regression analyses were also conducted for CWB and its subdimensions for each of the traits comprising the meta-trait stability to evaluate for potential differences at the trait-level. Table 6.7, 6.8, and 6.9 show results of these moderated multiple regression models for the criteria predicted from GMA and conscientiousness, agreeableness, and emotional stability respectively. All three traits showed a significant

interactive effect with GMA on CWB and both its subdimensions. Conscientiousness and GMA showed a significant interactive effect on CWB ( $b = .12, p < .001$ ), CWB-I ( $b = .13, p < .001$ ), and CWB-O ( $b = .08, p = .002$ ). Agreeableness and GMA showed a significant interactive effect on CWB ( $b = .11, p < .001$ ), CWB-I ( $b = .10, p < .001$ ), and CWB-O ( $b = .11, p < .001$ ). Finally, emotional stability and GMA also showed a significant interactive effect on CWB ( $b = .13, p < .001$ ), CWB-I ( $b = .13, p < .001$ ), and CWB-O ( $b = .10, p < .001$ ).

Figures 6.5, 6.6, and 6.7 illustrate the significant interactive effects for conscientiousness, agreeableness, and emotional stability respectively. In all cases, the GMA-CWB relationship was negative for individuals with low levels of conscientiousness, agreeableness, or emotional stability but not for individuals with high levels of these traits. Thus, interactive effects of GMA and the lower-level traits comprising stability appear to minimally vary by trait level or CWB type and were generally consistent with H1.

H2 proposed that there would be a conditional indirect effect of stability on CWB through impulsivity such that GMA moderated stage 2 of the mediation. Table 6.10 shows the results of moderated mediation analyses. GMA moderated the path between impulsivity and CWB ( $b = .07, p = .007$ ), as well as CWB-I ( $b = .08, p = .002$ ) and CWB-O ( $b = .05, p = .038$ ). Further, the index of moderated mediation was significant for CWB and CWB-I when GMA acted on the second stage of mediation (CWB:  $b = .04, 95\% \text{ CI} = [.01, .07]$ ; CWB-I:  $b = .05, 95\% \text{ CI} = [.02, .08]$ ), although the confidence interval for the index of moderated mediation in CWB-O included zero (CWB-O:  $b = .03, 95\% \text{ CI} = [.00, .07]$ ). In contrast, GMA did not moderate the path between stability and impulsivity ( $b = .01, p = .805$ ). Thus, results support H2 such that GMA moderates the path between impulsivity and CWB. Figure 6.8 illustrates the path estimates for the conditional indirect effect of stability on CWB, as well as the conditional

indirect effect at one standard deviation below and above mean GMA as well as at mean GMA. Conditional indirect effects were further consistent with H2 such that the effect weakened at high relative to low GMA.

## **Discussion**

Study 2 results support the hypothesis that GMA shows a negative relationship with CWB among individuals with low but not high in stability. Further, in answer to the research question regarding the potential differential influence of GMA on CWB-I and CWB-O, there was little to no evidence of differential interactive effects of stability and GMA on the two CWB subdimensions. Moreover, there was a significant interactive effect of all lower-level stability traits (conscientiousness, agreeableness, and emotional stability) and GMA on CWB and both subdimensions consistent with the form specified in H1. Thus, results overall were consistent with H1.

Study 2 also explored the possibility that the interactive effect of stability and GMA on CWB might vary by GMA type. Both spatial and verbal measures of GMA were administered (reflecting fluid and crystallized intelligence respectively), and multiple regressions analyses were conducted for GMA scored from each measure separately. Results did not appear to vary by GMA measure type, suggesting that the interactive effect does not appear to vary by GMA type.

Finally, Study 2 included a measure of impulsivity in order to directly test the mechanism by which GMA inhibits CWB. Results of a moderated mediation analyses in which impulsivity mediated the path between stability and CWB suggested that GMA moderated the second but not first stage of mediation, consistent with H2. Thus, results suggest that GMA inhibits individuals

with the dispositional impulsivity from engaging in CWB. That is, GMA inhibits *behavior* but does not reduce dispositional tendencies toward impulsivity.

Overall, results of Study 2 support H1 and H2. Moreover, in answer to the research question and investigations into possible differential effects at the lower-trait level and by GMA subtype, results suggest that findings are relatively robust. Findings did not appear to vary meaningfully as a consequence of CWB subdimensions, lower-level trait, or GMA measure type.

**Table 6.1***Model-data Fit Statistics for All IRT-scored Variables in Study 2*

Variable	Model	M <sub>2</sub>	df	RMSEA	RMSEA 95% CI		SRMSR	TLI	CFI	r <sub>xx</sub>	% Items
					Low	High					RMSEA > .05
Conscientiousness	GGUM	2622.07	132	.123	.119	.128	.244	.938	.947	.94	0%
Agreeableness	GGUM	767.01	132	.062	.058	.066	.129	.927	.935	.97	0%
Emotional Stability	GGUM	1137.39	132	.113	.109	.115	.088	.893	.903	.97	0%
GMA (spatial)	2PL	115.71	35	.043	.035	.051	.038	.958	.967	.71	0%
GMA (verbal)	2PL	57.95	26	.032	.021	.042	.034	.970	.978	.57/.66 <sup>b</sup>	0%
CWB	GGUM	228.13	57	.049	.043	.056	.062	.960	.970	.91	0%
CWB-I*	GRM	72.88	14	.058	.045	.072	.028	.993	.995	.80	0%
CWB-O*	GRM	771.92	54	.104	.097	.110	.066	.963	.970	.89	0%
Impulsivity	GGUM	980.43	110	.080	.075	.085	.083	.966	.972	.95	0%

r<sub>xx</sub> = IRT-based marginal reliability. <sup>a</sup>C<sub>2</sub> statistics used due to low degrees of freedom. <sup>b</sup>empirical reliability estimated separately for the two factors (i.e., verbal reasoning and letter/number sequencing).

**Table 6.2***Descriptive Statistics for Variables in Study 2*

Variable	Scoring	<i>M</i>	<i>SD</i>	Min.	Max.
GMA (spatial)	2PL	0.00	0.84	-1.98	1.65
	sum	0.51	0.22	0.00	1.00
GMA (verbal)	2PL	0.00	0.76	-1.77	1.53
	sum	0.53	0.23	0.00	1.00
GMA	2PL	0.00	0.88	-2.33	1.98
	sum	0.53	0.19	0.00	1.00
Conscientiousness	GGUM	0.00	0.95	-2.22	4.85
	sum	4.49	0.77	2.12	6.00
Agreeableness	GGUM	-0.01	0.94	-2.19	2.68
	sum	4.26	0.69	1.83	6.00
Emotional Stability	GGUM	0.00	0.96	-2.71	3.06
	Sum	2.98	0.93	1.00	5.58
Stability	composite	0.00	0.81	-2.44	2.76
	composite	1.92	0.67	-0.28	3.57
CWB	GRM	0.00	0.96	-1.72	2.42
	sum	2.30	1.29	1.00	6.47
CWB-I	GRM	0.00	0.92	-1.03	2.44
	sum	2.06	1.41	1.00	6.71
CWB-O	GRM	0.00	0.95	-1.63	2.48
	sum	2.44	1.30	1.00	6.58
Impulsivity	GGUM	0.01	0.92	-2.94	3.12
	sum	1.93	0.49	1.00	3.45

2PL = two-parameter logistic model. GGUM = generalized graded unfolding model. GRM = graded response model. sum = traditional sum-scoring approach (average).

**Table 6.3***Correlations for Variables in Study 2*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. GMA (spatial)										
2. GMA (verbal)	.54***									
3. GMA	.88***	.88***								
4. Conscientiousness	.17***	.07**	.14***							
5. Agreeableness	.08**	.03	.60***	.46***						
6. Emotional Stability	.07**	.06*	.08**	.62***	.36***					
7. Stability	.13***	.07**	.11***	.86***	.75***	.82***				
8. CWB	-.24***	-.13***	-.21***	-.53***	-.29***	-.35***	-.48***			
9. CWB-I	-.28***	-.15***	-.24***	-.45***	-.27***	-.28***	-.41***	.90***		
10. CWB-O	-.21***	-.13***	-.20***	-.53***	-.25***	-.36***	-.47***	.95***	.76***	
11. Impulsivity	-.27***	-.20***	-.27***	-.66***	-.34***	-.44***	-.59***	.44***	.40***	.42***

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

**Table 6.4***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Stability and GMA in Study 2*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )
Step 1												
GMA	-.16***	.03	<.001	.260 (.260***)	-.20***	.03	<.001	.210 (.210***)	-.14***	.03	<.001	.244 (.244***)
Stab.	-.47***	.02	<.001		-.39***	.03	<.001		-.46***	.02	<.001	
Step 2												
GMA	-.15***	.03	<.001	.276 (.016***)	-.19***	.03	<.001	.224 (.014***)	-.14***	.03	<.001	.254 (.010***)
Stab.	-.42***	.03	<.001		-.35***	.03	<.001		-.42***	.03	<.001	
GMA <sup>2</sup>	.08***	.02	<.001		.08***	.02	<.001		.07**	.02	.001	
Stab. <sup>2</sup>	-.06**	.02	.001		-.04*	.02	.021		-.04	.02	.056	
Step 3												
GMA	-.14***	.03	<.001	.290 (.014***)	-.18***	.03	<.001	.240 (.016***)	-.13***	.03	<.001	.264 (.010***)
Stab.	-.41***	.03	<.001		-.34***	.03	<.001		-.41***	.03	<.001	
GMA <sup>2</sup>	.06**	.02	.004		.06**	.02	.003		.06**	.02	.007	
Stab. <sup>2</sup>	-.07**	.02	.001		-.05**	.02	.007		-.04*	.02	.039	
Stab. x GMA	.13***	.03	<.001		.14***	.03	<.001		.11***	.03	<.001	

*Note.* Stab. = stability. *N* = 1,241\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 6.5***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Stability and Spatial GMA in Study 2*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta R^2$ )
Step 1												
GMA	-.18***	.03	<.001	.267 (.267***)	-.23***	.03	<.001	.221 (.221***)	-.15***	.03	<.001	.246 (.246***)
Stab.	-.46***	.02	<.001		-.38***	.03	<.001		-.45***	.02	<.001	
Step 2												
GMA	-.16***	.03	<.001	.283 (.016***)	-.20***	.03	<.001	.236 (.015***)	-.13***	.03	<.001	.257 (.011***)
Stab.	-.41***	.03	<.001		-.34***	.03	<.001		-.42***	.03	<.001	
GMA <sup>2</sup>	.08***	.02	<.001		.08***	.02	<.001		.07***	.02	<.001	
Stab. <sup>2</sup>	-.06*	.02	.002		-.04*	.02	.019		-.04	.02	.062	
Step 3												
GMA	-.15***	.03	<.001	.294 (.011**)	-.19***	.03	<.001	.250 (.014***)	-.12***	.03	<.001	.265 (.008***)
Stab.	-.41***	.03	<.001		-.34***	.03	<.001		-.41***	.03	<.001	
GMA <sup>2</sup>	.06**	.02	.003		.06**	.02	.001		.06**	.02	.004	
Stab. <sup>2</sup>	-.07**	.02	.001		-.05**	.02	.005		-.04*	.02	.036	
Stab. x GMA	.12***	.03	<.001		.13***	.03	<.001		.09**	.03	.002	

*Note.* Stab. = stability. GMA represented by spatial measure of GMA only. *N* = 1,241\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 6.6***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Stability and Verbal GMA in Study 2*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )
Step 1												
GMA	-.10***	.03	<.001	.245 (.245***)	-.13***	.03	<.001	.186 (.186***)	-.10***	.03	<.001	.233 (.233***)
Stab.	-.48***	.02	<.001		-.41***	.03	<.001		-.47***	.02	<.001	
Step 2												
GMA	-.11***	.03	<.001	.251 (.006***)	-.13***	.03	<.001	.190 (.004*)	-.10***	.03	<.001	.236 (.003)
Stab.	-.44***	.03	<.001		-.38***	.03	<.001		-.44***	.03	<.001	
GMA <sup>2</sup>	.03	.02	.188		.03	.02	.153		.03	.02	.213	
Stab. <sup>2</sup>	-.05**	.02	.003		-.04	.02	.066		-.03	.02	.089	
Step 3												
GMA	-.11***	.03	<.001	.264 (.013***)	-.13***	.03	<.001	.202 (.012***)	-.10***	.03	<.001	.245 (.009***)
Stab.	-.43***	.03	<.001		-.37***	.03	<.001		-.43***	.03	<.001	
GMA <sup>2</sup>	.03	.02	.284		.03	.02	.269		.02	.02	.302	
Stab. <sup>2</sup>	-.05**	.02	.002		-.04*	.02	.048		-.04	.02	.078	
Stab. x GMA	.11***	.02	<.001		.12***	.03	<.001		.10***	.02	<.001	

*Note.* Stab. = stability. GMA represented by verbal measure of GMA only. *N* = 1,241

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 6.7***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Conscientiousness and GMA in Study 2*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )
Step 1												
GMA	-.14***	.03	<.001	.303 (.303***)	-.19***	.03	<.001	.238 (.238***)	-.13***	.03	<.001	.298 (.298***)
Consc.	-.51***	.02	<.001		-.43***	.03	<.001		-.52***	.02	<.001	
Step 2												
GMA	-.12***	.03	<.001	.317 (.014***)	-.16***	.03	<.001	.254 (.016***)	-.10***	.03	<.001	.313 (.015***)
Consc.	-.55***	.03	<.001		-.47***	.03	<.001		-.56***	.03	<.001	
GMA <sup>2</sup>	.07***	.02	<.001		.08***	.02	<.001		.07**	.02	.002	
Consc. <sup>2</sup>	.05**	.02	.002		.06***	.02	<.001		.07***	.02	<.001	
Step 3												
GMA	-.11***	.02	<.001	.328 (.011***)	-.15***	.03	<.001	.269 (.015***)	-.09***	.02	<.001	.319 (.006**)
Consc.	-.54***	.03	<.001		-.46***	.03	<.001		-.56***	.03	<.001	
GMA <sup>2</sup>	.05*	.02	.014		.05*	.02	.014		.05*	.02	.017	
Consc. <sup>2</sup>	.05**	.02	.004		.06***	.02	<.001		.06***	.02	<.001	
Consc. x GMA	.12***	.03	<.001		.13***	.03	<.001		.08**	.03	.002	

*Note.* Consc. = conscientiousness. *N* = 1,241\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 6.8***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Agreeableness and GMA in Study 2*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )
Step 1												
GMA	-.20***	.03	<.001	.121 (.121***)	-.23***	.03	<.001	.124 (.124***)	-.18***	.03	<.001	.096 (.096***)
Agr.	-.28***	.03	<.001		-.25***	.03	<.001		-.24***	.03	<.001	
Step 2												
GMA	-.13***	.03	<.001	.236 (.115***)	-.17***	.03	<.001	.231 (.107***)	-.12***	.03	<.001	.189 (.093***)
Agr.	-.21***	.02	<.001		-.20***	.03	<.001		-.19***	.03	<.001	
GMA <sup>2</sup>	.09***	.02	<.001		.09***	.02	<.001		.09***	.02	<.001	
Agr. <sup>2</sup>	-.29***	.03	<.001		-.27***	.02	<.001		-.25***	.03	<.001	
Step 3												
GMA	-.13***	.03	<.001	.247 (.011***)	-.16***	.03	<.001	.240 (.009***)	-.12***	.03	<.001	.198 (.009***)
Agr.	-.23***	.03	<.001		-.21***	.03	<.001		-.21***	.03	<.001	
GMA <sup>2</sup>	.09***	.02	<.001		.09***	.02	<.001		.08***	.02	<.001	
Agr. <sup>2</sup>	-.29***	.03	<.001		-.28***	.02	<.001		-.26***	.03	<.001	
Agr. x GMA	.11***	.03	<.001		.10***	.03	<.001		.11***	.03	<.001	

*Note.* Agr. = agreeableness. *N* = 1,241\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 6.9***Results of Regression Analyses for CWB, CWB-I, and CWB-O Predicted by Emotional Stability and GMA in Study 2*

	CWB				CWB-I				CWB-O			
	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )	<i>b</i>	SE	<i>p</i>	R <sup>2</sup> ( $\Delta$ R <sup>2</sup> )
Step 1												
GMA	-.19***	.03	<.001	.161 (.161***)	-.23***	.03	<.001	.129 (.129***)	-.17***	.03	<.001	.158 (.158***)
ES.	-.34***	.03	<.001		-.26***	.03	<.001		-.35***	.03	<.001	
Step 2												
GMA	-.17***	.03	<.001	.208 (.047***)	-.21***	.03	<.001	.170 (.041***)	-.15***	.03	<.001	.195 (.037***)
ES.	-.27***	.03	<.001		-.20***	.03	<.001		-.29***	.03	<.001	
GMA <sup>2</sup>	.09***	.02	<.001		.10***	.02	<.001		.09***	.02	<.001	
ES. <sup>2</sup>	-.12***	.02	<.001		-.27***	.02	<.001		-.11***	.02	<.001	
Step 3												
GMA	-.16***	.03	<.001	.223 (.015***)	-.20***	.03	<.001	.186 (.016***)	-.15***	.03	<.001	.204 (.009***)
ES.	-.28***	.03	<.001		-.21***	.03	<.001		-.30***	.03	<.001	
GMA <sup>2</sup>	.08***	.02	<.001		.08***	.02	<.001		.07***	.02	.001	
ES. <sup>2</sup>	-.12***	.02	<.001		-.11***	.02	<.001		-.10***	.02	<.001	
ES. x GMA	.13***	.03	<.001		.13***	.03	<.001		.10***	.03	<.001	

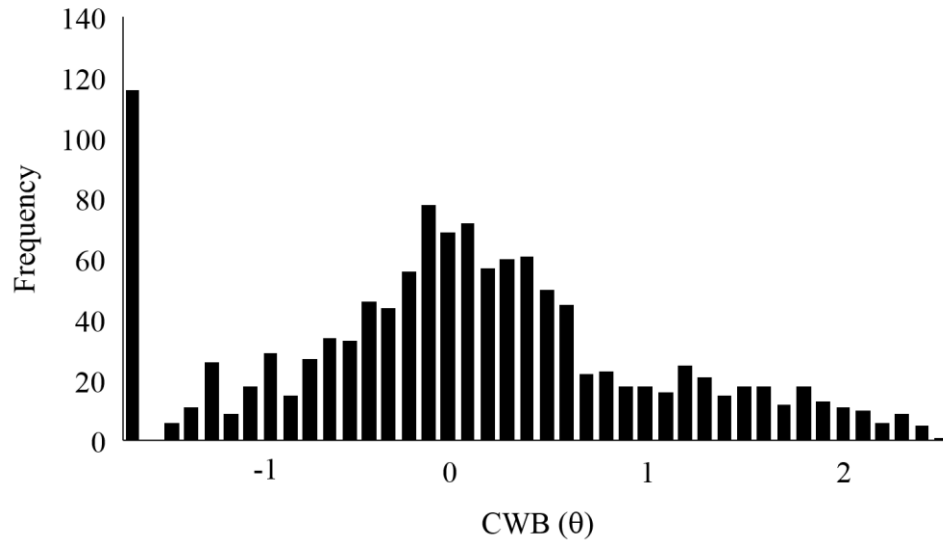
*Note.* ES = emotional stability. *N* = 1,241\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 6.10**

*Results of Moderated Mediation Model for CWB, CWB-I and CWB-O*

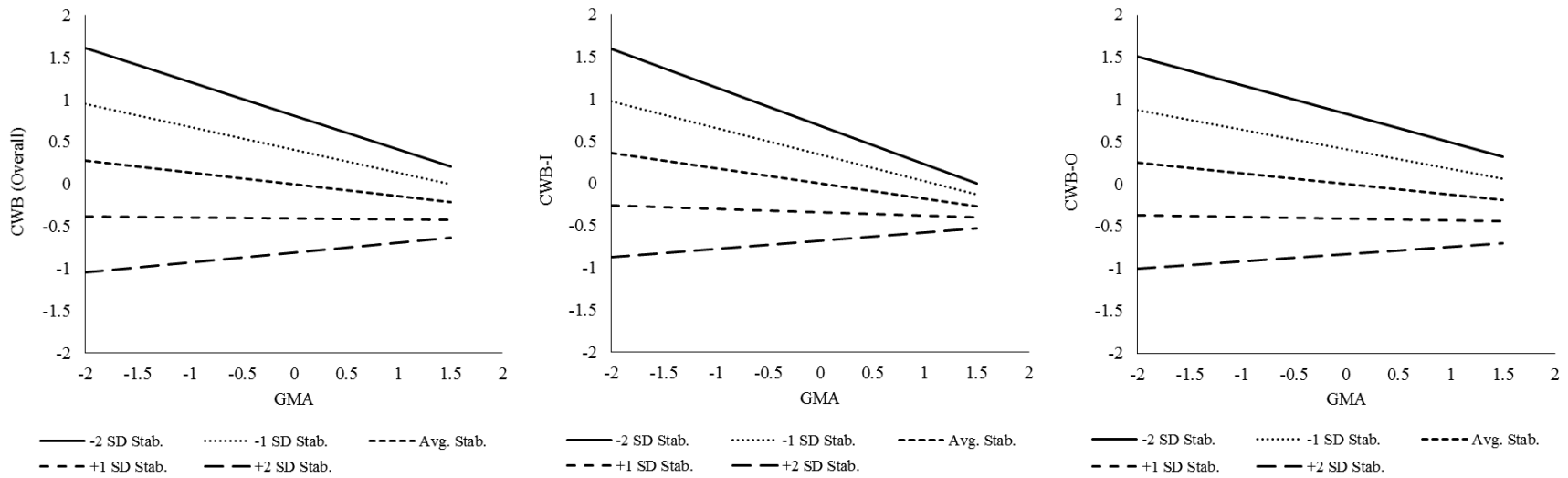
Predictor	Impulsivity			CWB			CWB-I			CWB-O		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>t</i>	<i>b</i>	SE	<i>p</i>
<b>Step 1 (Mediation)</b>												
Stability	-.59***	.02	<.001	-.35***	.03	<.001	-.27***	.03	<.001	-.34***	.03	<.001
Impulsivity				.23***	.03	<.001	.23***	.03	<.001	.22***	.03	<.001
Model F-Test				$F(2, 1238) = 229.42,$ $p < .001$			$F(2, 1238) = 160.41,$ $p < .001$			$F(2, 1238) = 212.21,$ $p < .001$		
R <sup>2</sup> ( $\Delta R^2$ )				.270 (.270***)			.206 (.206***)			.255 (.255***)		
<b>Step 2 (Moderated Mediation)</b>												
Stability	-.57***	.02	<.001	-.34***	.03	<.001	-.27***	.03	<.001	-.34***	.03	<.001
GMA	-.20***	.02	<.001	-.11***	.03	<.001	-.15***	.03	<.001	-.10***	.03	<.001
Impulsivity				.21***	.02	<.001	.20***	.03	<.001	.20***	.03	<.001
Stability x GMA (Stage 1)	-.01	.02	.805									
Impulsivity x GMA (Stage 2)				-.07**	.03	.007	-.08**	.03	.002	-.05**	.03	.038
Model F-Test				$F(4, 1236) = 125.06,$ $p < .001$			$F(4, 1236) = 95.67,$ $p < .001$			$F(4, 1236) = 113.22,$ $p < .001$		
R <sup>2</sup> ( $\Delta R^2$ )				.2888 (.018***)			.236 (.031***)			.268 (.013***)		

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



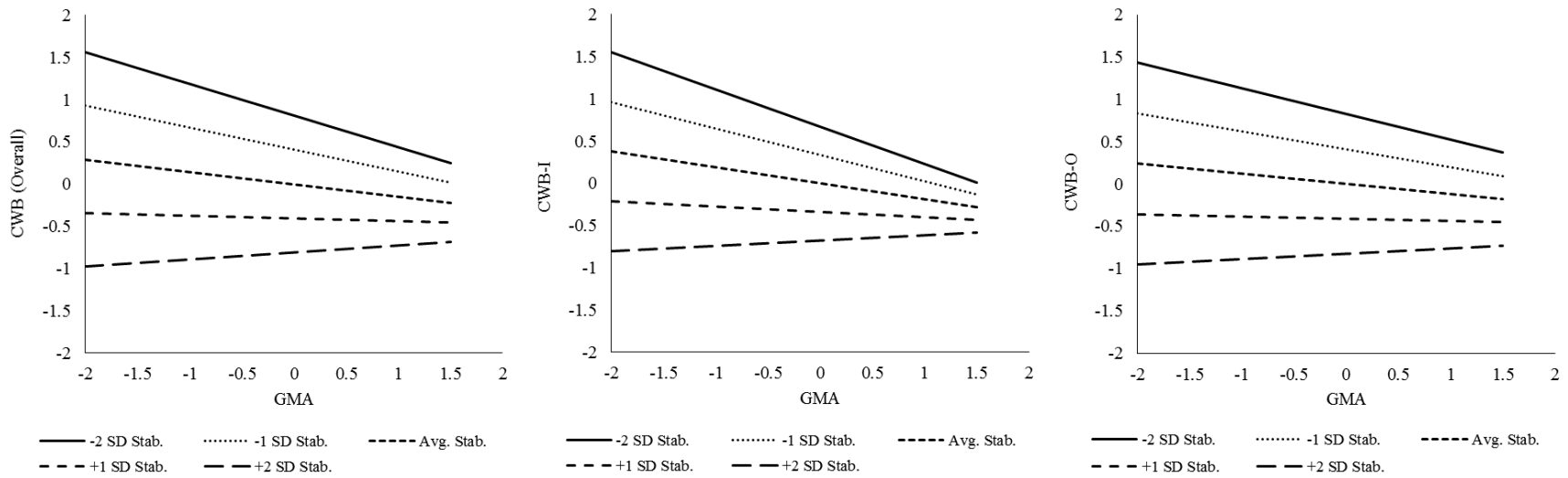
**Figure 6.1**

*Histogram of CWB Distribution in Study 2*



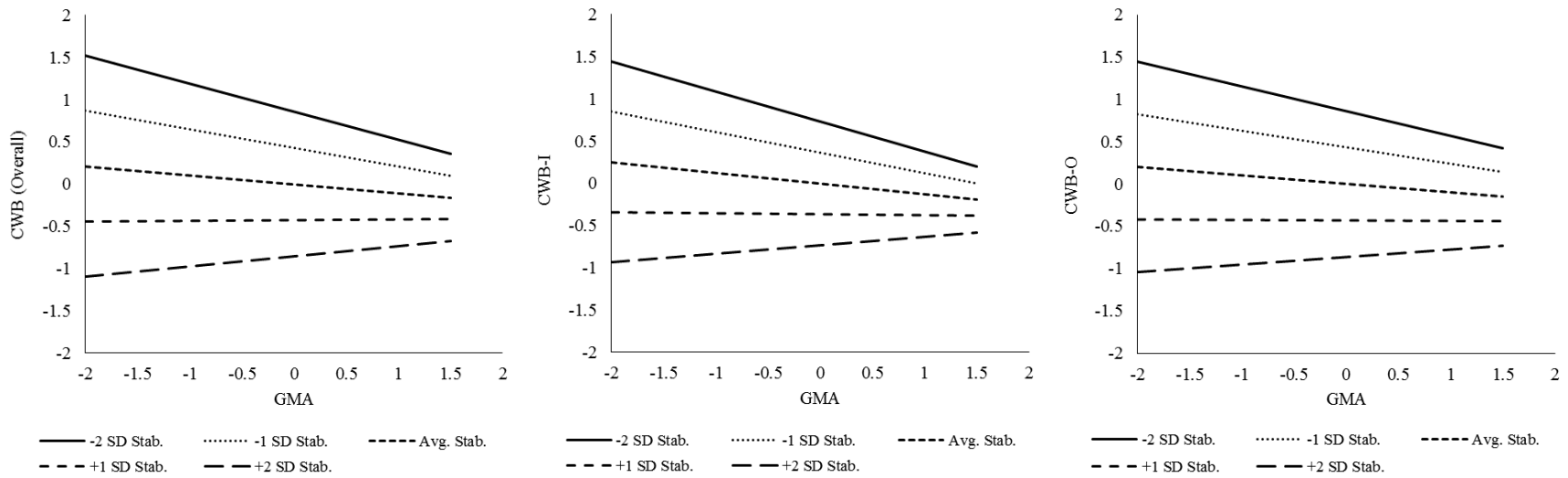
**Figure 6.2**

*Graphs of the interactive effect of stability and GMA on CWB (left), CWB-I (middle), and CWB-O (right) in Study 2*



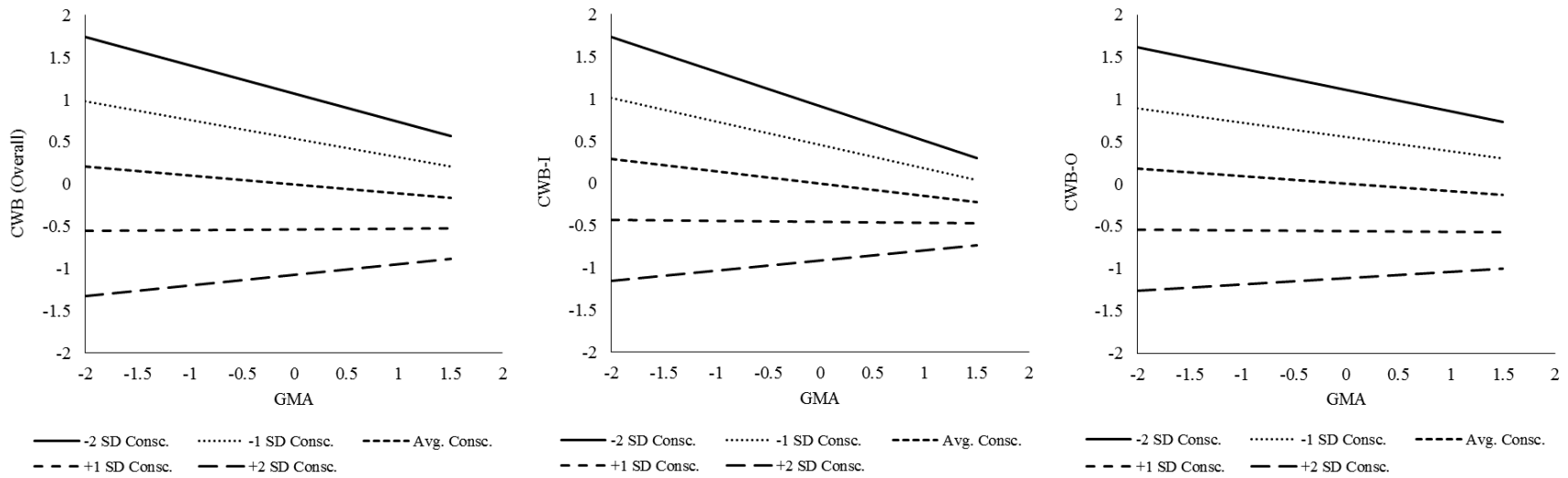
**Figure 6.3**

*Graphs of the interactive effect of stability and (spatial) GMA on CWB (left), CWB-I (middle), and CWB-O (right) in Study 2*



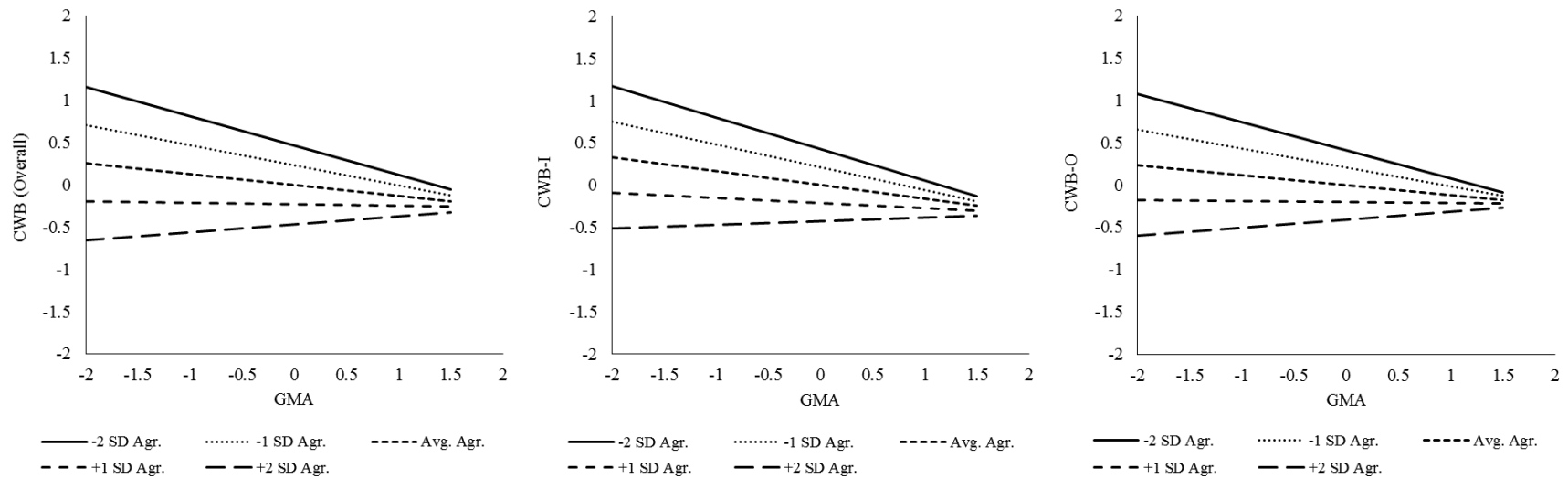
**Figure 6.4**

*Graphs of the interactive effect of stability and (verbal) GMA on CWB (left), CWB-I (middle), and CWB-O (right) in Study 2*



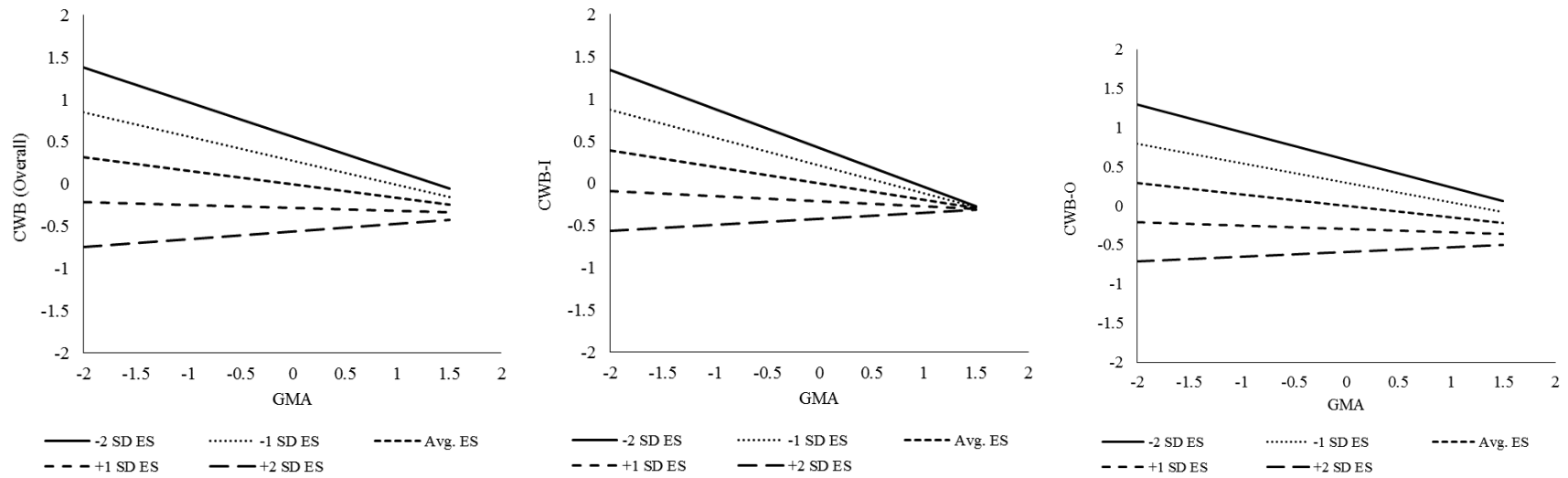
**Figure 6.5**

*Graphs of the interactive effect of conscientiousness and GMA on CWB (left), CWB-I (middle), and CWB-O (right) in Study 2*



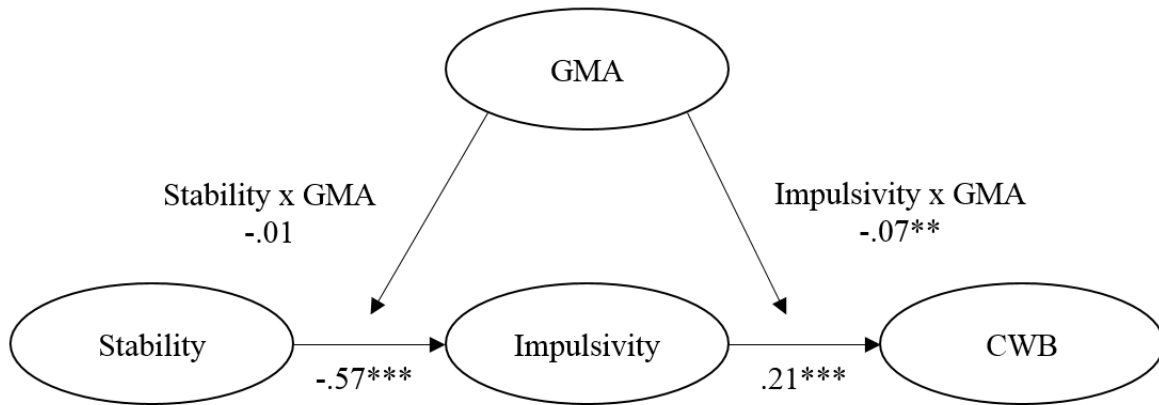
**Figure 6.6**

*Graphs of the interactive effect of agreeableness and GMA on CWB (left), CWB-I (middle), and CWB-O (right) in Study 2*



**Figure 6.7**

*Graphs of the interactive effect of emotional stability and GMA on CWB (left), CWB-I (middle), and CWB-O (right) in Study 2*



Indirect Effect of Stability on CWB Conditioned on GMA at:  
 -1 SD:  $b = -.16$ , SE = .03, 95% CI [-.22, -.10]  
 mean:  $b = -.12$ , SE = .02, 95% CI [-.16, -.09]  
 +1 SD:  $b = -.08$ , SE = .02, 95% CI [-.12, -.05]

**Figure 6.8**

*Regression coefficients and path estimates for the conditional indirect effect of stability on CWB*

## Chapter 7

### GENERAL DISCUSSION

Although researchers have commonly theorized that GMA *should* predict CWB, little to no research has supported this relationship empirically. Lack of empirical support for the GMA-CWB relationship is particularly surprising given the widespread support for a link between GMA and deviance generally. In the current study, I aimed to clarify the relationship between GMA and CWB by reframing the inhibitory effect of GMA on CWB as an inhibitory interactive effect with the meta-trait stability. Results of the current studies support both hypotheses and suggest that GMA shows a negative relationship with CWB only among individuals with low stability, or alternatively, high impulsivity. That is, GMA only inhibits CWB among individuals who have dispositional tendencies to engage in CWB.

Additionally, in the current study, I investigated whether an interactive effect may differ by CWB subdimensions given that some prior research has suggested GMA may show differential relationships with CWB-I and CWB-O. However, interactive effects of stability and GMA were significant for both CWB subdimensions in both studies and exhibited approximately the same form. Although results of Study 1 showed some evidence of possible differential interactive effects at the lower-trait level dependent on CWB-subdimensions, these results were not replicated in Study 2. Moreover, interactive effects did not appear to differ by the type of GMA measure. Thus, results across both studies suggest that the interactive effect of stability and GMA on CWB is relatively robust across CWB subdimensions, lower-level traits, and GMA type.

Overall, results suggest that GMA does exhibit the frequently proposed *inhibitory* effect of GMA on CWB but that this effect is most appropriately interpreted as a moderating influence of GMA on other risk factors. Results show that GMA only exhibits a negative GMA-CWB relationship among those with low levels of stability. Intriguingly, Study 1 results tentatively suggest that the GMA-CWB relationship may in fact be positive among individuals with high stability. Study 2 results also showed some evidence of a positive GMA-CWB relationship, but only for those with very high levels (e.g., two SD above the mean) of stability. Such results may help explain why prior studies have often reported a zero-order GMA-CWB relationship overall.

Nonetheless, support for a positive GMA-CWB relationship among high-stability individuals is somewhat surprising and, to my knowledge, inconsistent with most prior theorizing regarding the relationship between GMA and CWB. One possible explanation for the positive GMA-CWB relationship among high stability individuals is the stressor-emotion model of contextual performance proposed by Spector and colleagues (Spector & Fox, 2002). Although CWB is typically thought of as a maladaptive outcome, this model suggests that CWB may at times function as an *adaptive* strategy for responding to emotional stressors. Indeed, several studies have found that CWB may be a reaction to stressors (e.g., Bowling & Eschleman, 2010; Krischer et al., 2010; Fox, Spector, & Miles, 2001). It is possible that among high stability individuals (i.e., people who are less likely to engage in CWB overall), GMA may be related to one's ability to recognize and adopt effective stress-reducing behaviors. For example, wasting time or intentionally taking long breaks may be interpreted as useful strategies for reducing strain. Still, these positive GMA-CWB relationships and the explanation offered here should be interpreted with great caution, particularly given that Study 2 only showed evidence of a positive GMA-CWB relationship among those with very high levels of stability. Further research that

directly incorporates the role of workplace stressors into study design should be conducted to further explore this explanation.

Although the greatest contribution of the current study is its theoretical implications for the fundamental relationship between GMA and CWB, results do have some practical implications. First, results suggest that GMA is a meaningful predictor of CWB and therefore may be of interest to some selection practitioners. However, in all interactions, personality still demonstrated a stronger effect on CWB than did GMA. Individuals with low and high levels of stability only reported similar levels of CWB at very high GMA levels. Thus, practitioners interested in predicting and limiting CWB are still likely to be most interested in the personality traits comprising stability.

### **Limitations and Future Directions**

There are two key limitations to the current study. First, the current study uses self-report measures of CWB. The use of self-reports was an intentional choice in study design to prevent confounding differential engagement in CWB with differential detection of CWB. Generally, self-reported engagement in CWB is unlikely to be problematic (Berry et al., 2007), particularly given the anonymity safeguards afforded by the use of MTurk to collect data in the current study. Whereas research conducted in partnership with specific organizations may lead respondents to believe their data could be shared with a superior, MTurk participants have no reason to believe that their information will be shared with employers. Thus, I believe the current results suggest that GMA has an inhibitory effect on actual *engagement* in CWB. Still, regarding self-reported *detection* of CWBs, individuals may not be the most accurate informants. Thus, future research should be conducted that considers the influence of a stability-GMA interaction in self- vs. other-reported CWBs.

The second limitation is the use of a sample with heterogeneous occupational contexts. As discussed above, sample heterogeneity is one rationale that has been commonly proposed for the zero-order GMA-CWB relationship found in prior empirical studies (Dilchert et al., 2007). However, as noted, the rationales for why, when, and how the GMA-CWB relationship should vary by occupation has been generally inconsistent. Thus, although the use of a variety of occupational contexts in the current study was an appropriate strategy to increase generalizability of results, future research should still consider the sample heterogeneity explanation. The current study design may have obscured occupational differences in the GMA-CWB relationship.

Finally, future research should also consider the potential influence of a GMA-CWB interaction in deviance generally. Theoretically, the interpretation of the inhibitory effect of GMA as moderating influence should also apply to deviance generally. Indeed, as noted above, researchers have found that self-control is an important predictor of deviance (Gottfredson & Hirschi, 1990). Thus, future research should consider a possible personality-GMA interaction in deviance broadly, as well as more carefully delineate a theoretical rationale for why the main effect versus interactive effect of GMA may differ dependent on the type or domain of deviance.

## **Conclusion**

By reinterpreting the common *inhibitory effect* rationale for a GMA-CWB relationship as an interactive effect, I have offered a theoretical explanation for why GMA has not demonstrated the commonly theorized negative GMA-CWB relationship to date. Results of the current studies suggest that GMA only demonstrates a negative relationship among those with dispositional tendencies to engage in CWB. Specifically, GMA inhibits impulsivity among those with low but not high levels of the meta-trait stability. Future research should consider whether this interactive effect also influences the *detection* of CWB and whether the form of the interaction varies by

occupation. Finally, future research should explore the implications of a stability-GMA interaction in deviance generally in order to further delineate the relationship between CWB and broader types of deviance.

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