The Moderating Effect of Self-Control on the Relationship between Mental Health and Compliance to Government Regulations During the COVID-19 Pandemic

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Abstract

Research supports that self-control is positively related to both compliance and mental health. Though mental health and compliance to general government-implemented regulations (e.g., laws) are typically positively related, research indicates that mental health and compliance to COVID-19 safety regulations are negatively related due to the social isolation required by social distancing protocol. Based on these findings, we hypothesized that self-control would mediate the positive relationship between mental health issues and compliance to COVID-19 safety regulations. The current study gathered data on the relationship between self-control, mental health issues, and compliance to COVID-19 safety regulations. Three hundred and forty-four individuals completed measures that analyzed levels of anxiety, depression, trait self-control, state self-control, and compliance to government-implemented COVID-19 safety regulations. The data was analyzed with a multiple regression on one predictor variable (compliance with COVID-19 safety measures), one response variable (mental health), and one moderating variable (self-control). Results partially supported our original hypothesis. Compliance to COVID-19 safety regulations was significantly, positively related to mental health issues. State self-control significantly moderated this relationship, but trait self-control and overall self-control were not moderating variables. The role of state self-control as a significant moderator could help mental health professionals treat patients as, by minimizing ego-depletion, state self-control could be increased, which would help state self-control to moderate the positive relationship between compliance to COVID-19 safety regulations and mental health issues to a greater extent. More broadly, the field of psychology benefits from this research by identifying the relationships among self-control, mental health, and compliance.

*Key words: self-control, mental health issues, mental illness, pandemic*
The Effect of Trait Self-Control on State Self-Control, Mental Health and Compliance to Government Regulations During the COVID-19 Pandemic

Research suggests that self-control has a positive relationship with both mental health and compliance in general (Laursen et al., 2013; Schwalbe & Koetzle, 2020). Understanding individual self-control is crucial during the COVID-19 pandemic for two reasons: the general public is reporting reductions in mental health and the state of the pandemic depends upon compliance to government safety regulations (Bo et al., 2020; Laursen et al., 2020; Zhang et al., 2020). Research suggests that compliance to public health and safety regulations has a negative impact on individual mental health, which increases the need for further research on this topic (Bo et al., 2020; Zhang et al., 2020; Vindegaard & Benros, 2020). To learn how to best respond to the social impact of the COVID-19 pandemic, it is essential to understand the factors that cause individuals to be affected differently by this time of distress. Analyzing the relationship between self-control, mental health, and compliance to government safety regulations is necessary to promote a greater understanding of how to most effectively respond to these social ramifications.

Self-control is defined as the process of choosing either an immediate, smaller reward or a delayed, larger or more valuable reward (Beran, 2015). Individuals who choose the delayed, larger or more valuable reward are considered to have more self-control than individuals who choose the immediate, smaller reward (Beran, 2015). The selection of the delayed, larger or more valuable reward allows individuals to forego immediate satisfaction in order to achieve long-term goals (Milyayskaya et al., 2019). Higher self-control indicates an increased ability to adapt the self to specific circumstances in order to fit into any given situation (Tangney et al., 2004). Conversely, the selection of the immediate, smaller reward indicates an individual’s propensity to behave according to antisocial impulses that inhibit their ability to achieve long-term goals (Milyayskaya
et al., 2019; Tangney et al., 2004). Because self-control allows individuals to prioritize and achieve their long-term goals, research indicates that individuals with higher self-control have more fulfilling, happy lives (Tangney et al., 2004).

Self-control is a broad concept, and as such, it is essential to define the specific form of self-control an individual is referring to (Milyayskaya et al., 2019). There are two types of self-control: trait self-control and state self-control (de Ridder et al., 2018). Trait self-control refers to the stable ability to exercise self-control to a certain extent in various situations (de Ridder et al., 2018). This type of self-control remains constant throughout an individual’s life and suggests that specific individuals have differing tendencies to use self-control in the decision-making process (de Ridder et al., 2018). On the other hand, state self-control refers to the ability of an individual to exercise self-control at a specific moment in time (de Ridder et al., 2018). An individual’s state self-control fluctuates in response to the previous choices they have made due to ego-depletion, which refers to the limited pool of self-control “resources” available to an individual utilized during the decision-making processes (Baumeister & Alquist, 2009; de Ridder et al., 2018). Choices that cause individuals to exercise state self-control, such as choosing an apple rather than a piece of chocolate cake, further deplete an individual’s state self-control, causing greater ego-depletion to occur in correspondence with the difficulty and number of choices involving state self-control that an individual has to make (de Ridder et al., 2018). Research indicates that individuals with high trait self-control have greater success in many aspects of life (Cheung et al., 2014; Duckworth & Seligman, 2005; Tangney et al., 2004). Multiple studies have found that high trait self-control is a predictive factor of academic success, as high trait self-control is correlated with a higher GPA (Duckworth & Seligman, 2005; Tangney et al., 2004). High trait self-control is also related to less binge eating and alcohol abuse as well as better relationships due to secure
attachment styles (Tangney et al., 2004). Another study found that individuals with high trait self-control also reported higher levels of overall life satisfaction and happiness (Cheung et al., 2014). Individuals with higher levels of trait self-control are less likely to experience mental health issues (Miller-Lewis et al., 2013; Nishida et al., 2014). One study indicated that individuals with lower levels of trait self-control in their adolescence were at a greater risk of having hallucinatory experiences due to mental illness as adults (Nishida et al., 2014). Another study found that self-control was a resilience factor for children with mental health issues, enabling them to recover more easily (Miller-Lewis et al., 2013). All of these studies indicate the benefits of trait self-control (Cheung et al., 2014; Duckworth & Seligman, 2005; Miller-Lewis et al., 2013; Nishida et al., 2014; Tangney et al., 2004).

Research on state self-control differs from the research on trait self-control in that trait self-control research focuses on the benefits of self-control, whereas state self-control research focuses on the costs of self-control (Baumeister & Alquist, 2009). The research on state self-control analyzes factors that cause state self-control to fluctuate (de Ridder et al., 2018). Ego-depletion has been studied extensively as a factor that causes state self-control to fluctuate (Baumeister & Alquist, 2009; de Ridder et al., 2018). Ego-depletion occurs when an individual makes decisions reliant upon self-control that drains the amount of self-control they possess (Baumeister & Alquist, 2009). This phenomenon is best exhibited by a study conducted by Baumeister et al. (1998) that found that individuals previously exposed to a situation where they had to exhibit self-control, such as eating a vegetable as opposed to a sweet, consistently exhibited less self-control on a subsequent task, such as solving a puzzle or an anagram. such as eating a vegetable as opposed to a sweet. Numerous studies support the findings of Baumeister, et al. (1998) as exhibited by a meta-analysis of 83 studies on ego-depletion that demonstrates how individuals who have exerted self-
control in a previous task perform worse on subsequent self-control tasks (Hagger et al., 2010). Because state and trait self-control measure self-control in different ways as exhibited above, it is essential to understand the literature available on both trait and state self-control to understand how to study self-control in any context (de Ridder et al., 2018; Milyayskaya et al., 2019). Although research has been conducted on the relationship between compliance to general government-implemented regulations (e.g., laws) and self-control, there is no research that investigates if self-control is related to compliance to government-implemented COVID-19 safety regulations specifically (Laursen et al., 2002; Schwalbe & Koetzle, 2020).

The COVID-19 pandemic provides a unique situation in which to study both trait and state self-control due to the way mental health and compliance interact with self-control during a public health crisis (Li et al., 2020; Martarelli & Wolff, 2020; Saleem et al., 2020). Research suggests that trait self-control can moderate individual reactions to COVID-19 (Li, et al., 2020; Saleem et al., 2020). More specifically, one study found that trait self-control explains the negative relationship between perceived severity of COVID-19 and psychosocial strengths as a mediating variable (Saleem et al., 2020). Another study found that self-control acts as a moderating factor of the positive relationship between perceived severity of COVID-19 and mental health issues, which means that individuals with higher self-control will likely experience less of an increase in mental health issues when they perceive the severity of COVID-19 as high than those with lower self-control (Li et al., 2020). Though less studies have been conducted on state self-control and the COVID-19 pandemic, preliminary research indicates that involvement in the COVID-19 pandemic is positively related to emotional exhaustion, which is a form of resource depletion (Caldas et al., 2021). Martarelli and Wolff (2020) hypothesize that studies will yield similar results based on the idea that the COVID-19 pandemic will decrease individual’s state self-control due to the need to
make decisions resulting in exhausting self-control resources and that the resulting ego-depletion will have a negative effect on adherence to pandemic containment measures. Though there is some research on the effect of how self-control effects individual reactions during COVID-19, more research on both state and trait self-control is needed to understand the relationship between the two.

Compliance to government-implemented COVID-19 safety regulations is a social issue that has risen to prominence during the pandemic that research indicates may be positively related to self-control (Clark et al., 2020; Laursen et al., 2002; Schwalbe & Koetzle, 2020; Wescoe, 2020). Research suggests that there are many factors influencing compliance to government-implemented COVID-19 safety regulations (Clark et al., 2020). One study found that individuals who believed that taking the recommended precautions would be effective were more likely to comply with them (Clark et al., 2020). Women were also found to be more likely to engage in safe social practices, such as wearing a mask or social distancing (Clark et al., 2020). Although the relationship between compliance and self-control has been investigated by researchers, there is limited research on the relationship between self-control and government-implemented safety regulations specifically (Laursen et al., 2002; Schwalbe & Koetzle, 2020). As previously stated, the research available on these specific variables suggests that government-implemented COVID-19 safety precautions are positively related to emotional exhaustion, which indicates a depletion in state self-control (Caldas et al., 2021). Research supports that self-control in childhood is associated with agreeableness in adulthood (Laursen et al., 2002). Another study found that individuals under the age of eighteen were more likely to comply to the conditions of their probations if they had greater emotional self-control (Schwalbe & Koetzle, 2020). Research also supports that younger individuals are less likely to comply than older individuals (Hadji et al., 2016). The relationship between self-control
and compliance indicates that self-control may be related to compliance to safety regulations during the COVID-19 pandemic (Laursen et al., 2002; Schwalbe & Koetzle, 2020).

Research on compliance during the pandemic indicates that there is a negative relationship between mental health and compliance to COVID-19 safety regulations (Bo et al., 2020; Salari et al., 2020; Vindegaard & Benros, 2020; Zhang et al., 2020). The COVID-19 pandemic has a significant impact on the mental health of those who are not infected with the virus due to pandemic containment measures (Zhang, et al., 2020; Vindegaard & Benros, 2020). Zhang et al. (2020) conducted a study on the mental health effects of individuals who had to stop working due to the pandemic, and they reported greater distress as well as worse mental and physical health conditions than those who did not have to stop working. A systematic review of the studies on COVID-19 and mental health issues found that multiple studies supported that health care workers experienced increased depression, anxiety, and distress and that the general public scored lower on measurements of psychological well-being and higher on measurements of depression and anxiety than before COVID-19 (Vindegaard & Benros, 2020). Females, students, those with poor self-rated health status, and those who have relatives who test positive for COVID-19 are at a greater risk to be affected by mental health issues during this time (Özdin & Bayrak Özdin 2020; Vindegaard & Benros, 2020; Wang et al., 2020). Research on the effect of COVID-19 government regulations on various minority groups, such as individuals who identify as a part of the LGBTQIA+ community, indicates that minority groups may experience a greater increase in mental health issues (Hawke et al., 2021). There is conflicting evidence on whether individuals from an urban or rural setting fare better (Özdin & Bayrak Özdin 20020; Zhang et al., 2020). Salari et al. (2020) conducted a systematic review on the levels of stress, anxiety, and depression experienced by the general population and found similar results to Vindegaard and Benros (2020),
indicating that the general population as a whole is struggling with mental health during this time due to the pandemic containment measures.

The relationship between mental health and compliance during the COVID-19 pandemic differs from research on mental health and compliance to general government-implemented regulations (e.g., laws) (Gustavsson & Beckman, 2020; Manchak et al., 2014; Rintala et al., 2019; Shoshani & Kanat-Mavmon, 2018). Research suggests that there is typically a positive relationship between mental health and compliance (Gustavsson & Beckman, 2020; Manchak et al., 2014; Rintala et al., 2019; Shoshani & Kanat-Mavmon, 2018). One study found that there was a positive relationship between mental health and compliance among children with varying stages of cancer (Shoshani & Kanat-Mavmon, 2018). Another study found that there was a negative relationship between individuals with psychosis and compliance (Rintala et al., 2019). However, research suggests that the relationship between mental health and compliance to government-implemented safety precautions during the COVID-19 pandemic is reversed (Gustavsson & Beckman, 2020). While the two previous studies support that mental health and compliance are positively related, one study found that in the COVID-19 pandemic individuals with a high rate of compliance also experienced a decrease in mental health due to the isolation the compliance required, suggesting that COVID-19 might create a unique social situation where individual mental health and compliance are complicatedly intertwined (Gustavsson & Beckman, 2020). The findings from this study are supported by the previously cited research that indicates that mental health and adherence to pandemic containment measures are negatively related (Bo et al., 2020; Salari et al., 2020; Vindegaard & Benros, 2020; Zhang et al., 2020).

Research supports that self-control could have a moderating effect on the negative relationship between mental health and compliance to COVID-19 safety regulations (Bo et al.,
Self-control is positively related to both compliance and mental health (Gustavsson & Beckman, 2020; Manchak et al., 2014; Miller-Lewis et al., 2013; Nishida et al., 2014; Rintala et al., 2019; Salari et al., 2020; Shoshani & Kanat-Mavmon, 2018; Vindegaard & Benros, 2020; Zhang et al., 2020). Though mental health and compliance are typically positively related, research indicates that mental health and compliance to COVID-19 safety regulations are negatively related due to the isolating effects of the measures (Bo et al., 2020; Gustavsson & Beckman, 2020; Manchak et al., 2014; Rintala, et al., 2019; Salari et al., 2020; Shoshani & Kanat-Mavmon, 2018; Vindegaard & Benros, 2020; Zhang, et al., 2020). Based on these findings, we hypothesized that self-control would have a moderating effect on the negative relationship between mental health and compliance to COVID-19 safety regulations. As compliance to COVID-19 safety regulation increased, we hypothesized that mental health would subsequently decrease but that individuals with high levels of self-control would experience this decrease to a lesser extent than those with low levels of self-control.

**Methods**

**Participants**

The participants \((N = 344)\) in our study were individuals affiliated with Carroll College as a student, faculty, or staff member, 18 years of age or older. All students, faculty, and staff were permitted to participate and were not excluded based on demographic features aside from age. There were 271 students, 34 faculty, and 39 staff who participated in the study. Eighty-seven participants identified as male, 255 participants identified as female, and two participants did not identify as either male or female. In the category of religion, 145 participants identified as Catholic, 109 participants identified as Protestant, 85 participants identified with no religion, and 6
participants identified with a religion other than those previously mentioned. The majority of the participants (N = 265) were 18-24 years of age, and 79 participants were 25 years of age or older. Information was also gathered on the type of community the participant was raised in (rural, urban, or suburban), socioeconomic status, and political affiliation, but these categories yielded no significant demographic contributions. The study was approved by the Institutional Review Board prior to data collection to ensure that all ethical guidelines set forth by the APA were followed.

**Materials and Procedure**

All Carroll College student, faculty, and staff received a mass recruitment email sent out by Carroll College administration encouraging them to participate in the survey. Participation in the survey was incentivized by entrance into a drawing for one of three $50 Amazon gift cards. Each participant was assigned a number rather than using their names in order to ensure that all information remained anonymous and confidential.

A link to participate in the survey was attached to the mass recruitment email sent to all Carroll College student, faculty, and staff (See Appendix 7). When they clicked on the link, they were directed to a page on Survey Monkey that contained the consent form, introductory script, survey, and the debriefing script (See Appendices 8 and 9). Individuals were granted access to the introductory script, survey, and the concluding script only after they signed the consent form. The introductory script appeared before any survey questions to ensure that participants understood the directions prior to completing the survey. The survey took participants approximately 10-15 minutes to complete. Once individuals were done with the survey, they were directed to the concluding script. After reading the debriefing script, they were given the opportunity to enter their email address in order to enter into the drawing for an Amazon gift card. No email addresses were not linked to the survey information, as they were entered through a separate Google Form.
For all of the following measures, items were reverse coded as needed and measured on a 7-point Likert scale. Participants recorded the extent to which they agreed with given statements by selecting “strongly disagree, disagree, somewhat disagree, neutral, somewhat agree, agree, or strongly agree” on the trait self-control, state self-control, and compliance measures and indicated how often they had experienced specific symptoms in the last two weeks by selecting “not at all, one or two days, several days, more than half of the days, more than three-quarters of the days, or nearly every day” on the anxiety and depression measures (See appendix 2, 3, 4, 5, and 6).

**Trait self-control** (Tangney et al., 2004). The Brief Self-Control Scale is a 13-item measure used to measure trait self-control. Both the brief and full version of the Self-Control Scale have been used in numerous studies to measure trait self-control, providing researchers with a consistent, reliable way to collect data on the benefits of trait self-control (Cheung et al., 2014; Duckworth & Seligman, 2005; Tangney et al., 2004). Higher averaged composite scores on the Brief Self-Control Scale indicated greater levels of trait self-control (13 items, $\alpha = .836$).

**State self-control** (Bertrams et al., 2011). The Brief State Self-Control Capacity Scale is a 10-item measure used to measure state self-control. Both the brief and full versions of the State Self-Control Scale have been utilized in multiple studies on state self-control, and one study by C. Lindner et al. (2018) confirmed the validity of the Brief State Self-Control Capacity Scale (Bertrams et al., 2011; Ciarocco et al. 2007; C. Lindner et al., 2018; Lindner et al., 2018). Higher averaged composite scores on the Brief Self-Control Scale indicated greater levels of state self-control (10 items, $\alpha = .894$).

**GAD-7** (Spitzer et al., 2006). The GAD-7 is a widely used 7-item measure that evaluates levels of anxiety. Higher averaged composite scores on the GAD-7 indicated greater levels of anxiety (7 items, $\alpha = .938$).
The PHQ-9 (Kroenke et al., 2001). The PHQ-9 is a widely used 9-item measure that evaluates levels of depression. Higher averaged composite scores on the PHQ-9 indicated greater levels of depression (9 items, α = .923).

Compliance to government-implemented COVID-19 safety regulations (Gustavsson and Beckman, 2020). Higher averaged composite scores on the Compliance Scale indicated greater levels of compliance to government-implemented COVID-19 safety regulations (10 items, α = .825).

Demographics. Participants reported their age range; gender; religious affiliation; status as a student, faculty, or staff; community raised in (rural, urban, or suburban); socioeconomic status; and political affiliation (See Appendix 1).

Results

Data Analysis

The data were analyzed with a multiple regression on one predictor variable (compliance with COVID-19 safety measures), one response variable (mental health), and one moderating variable (self-control). All significant levels were maintained at 0.05.

Relationship Between Compliance to COVID-19 Safety Regulations and Mental Health

Compliance to COVID-19 safety regulations was positively correlated with levels of anxiety ($r = .161; p < .005$) and depression ($r = .119; p < .05$) (See Table 1 and Figure 1). Both the anxiety and depression variables, measured by the GAD-7 and PHQ-9 respectively, were averaged to determine overall mental health issues. The average of these measures, categorized as overall mental health issues, was positively correlated with compliance to COVID-19 safety regulations ($r = .151; p < .005$), meaning that increased compliance to COVID-19 safety regulations is related to worse mental health outcomes (See Table 1 and Figure 1).
**Relationships Between Mental Health and Self-Control**

Anxiety, measured by the GAD-7, was positively correlated with trait self-control \( (r = .281, p < .001) \) and state self-control \( (r = .616, p < .001) \), measured by the Brief Self-Control Scale and the Brief State Self-Control Scale, respectively (See Table 1). The average of these measures, categorized as overall self-control, was positively correlated with anxiety \( (r = .531, p < .001) \). Depression, measured by the PHQ-9, was positively correlated with trait self-control \( (r = .443, p < .001) \), state self-control \( (r = .709, p < .001) \), and overall self-control \( (r = .670, p < .001) \) (See Table 1). Overall mental health was also positively correlated with trait self-control \( (r = .376, p < .001) \), state self-control \( (r = .376, p < .001) \), and self-control overall \( (r = .631; p < .001) \) (See Table 1).

**Relationships Between Compliance to COVID-19 Safety Regulations and Self-Control**

Compliance to COVID-19 safety regulations was negatively correlated with levels of state self-control \( (r = -.029, p > .05) \) and trait self-control \( (r = -.036, p > .05) \), though neither relationship was statistically significant (See Table 1). Both the state and trait self-control variables were averaged to determine overall self-control. Overall self-control was negatively correlated with levels of overall self-control \( (r = -.036, p > .05) \), but this relationship was not statistically significant either (See Table 1).

**Moderating Effect of State Self-Control on the Relationship between Compliance to COVID-19 Safety Regulation and Mental Health**

State self-control significantly moderated the positive relationship between compliance to COVID-19 safety regulations and mental health \( (\beta = 0.077, t = 2.051, p = .041) \) (See Figure 2). Overall self-control \( (\beta = 0.0448, t = 1.174, p = .241) \) and trait self-control \( (\beta = 0.018, t = .328, p \)
= .743) did not significantly moderate the positive relationship between compliance to COVID-19 safety regulations and mental health.

**Discussion**

The purpose of this study was to determine the effect of self-control on the relationship between mental health and compliance to COVID-19 safety regulations. Based on the current literature that suggests that mental health issues and compliance to COVID-19 safety regulations are positively related due to the isolating effects of COVID-19 safety regulations, we hypothesized that mental health issues would be positively related to compliance to COVID-19 safety regulations (Bo et al., 2020; Gustavsson & Beckman, 2020; Manchak et al., 2014; Rintala, et al., 2019; Salari et al., 2020; Shoshani & Kanat-Mavmon, 2018; Vindegaard & Benros, 2020; Zhang, et al., 2020). The current study supported this hypothesis, as overall mental health issues were significantly, positively related to compliance to COVID-19 safety regulations. Research also indicated that self-control could have a moderating effect on this relationship since self-control is positively related to compliance and negatively related to mental health issues (Gustavsson & Beckman, 2020; Manchak et al., 2014; Miller-Lewis et al., 2013; Nishida et al., 2014; Rintala et al., 2019; Shoshani & Kanat-Mavmon, 2018). Based on this literature, we hypothesized that overall self-control would have a moderating effect on the relationship between mental health issues and compliance to COVID-19 safety regulations. The data from this study partially supported this hypothesis. Overall and trait self-control were not significant moderating variables of the relationship between mental health issues and compliance to COVID-19 safety regulations. However, state self-control did significantly interact with these two variables, indicating that state self-control decreasing the negative relationship between compliance to COVID-19 safety regulations and mental health issues.
These results demonstrate that people may be experiencing decreases in mental health due to compliance to COVID-19 safety regulations, which suggests that this global pandemic may create a unique relationship between compliance and mental health issues. Previous literature supports that higher levels of compliance to general government-implemented regulations (e.g., laws) are negatively related to mental health issues (Gustavsson & Beckman, 2020; Manchak et al., 2014; Rintala et al., 2019; Shoshani & Kanat-Mavmon, 2018). The COVID-19 pandemic creates a situation where compliance to COVID-19 safety regulations process an isolating effect that may increase mental health issues (Bo et al., 2020; Salari et al., 2020; Vindegaard & Benros, 2020; Zhang et al., 2020). The results from this study support that isolating safety precautions during this global pandemic may create a unique situation where compliance to COVID-19 safety regulations is positively related to mental health issues, a result that is in juxtaposition to the previous literature regarding the relationship between compliance and mental health issues (Bo et al., 2020; Gustavsson & Beckman, 2020; Manchak et al., 2014; Rintala, et al., 2019; Salari et al., 2020; Shoshani & Kanat-Mavmon, 2018; Vindegaard & Benros, 2020; Zhang, et al., 2020).

Our results indicated that, although overall self-control did not significantly moderate the positive relationship between compliance to COVID-19 safety regulations and mental health issues, state self-control did significantly interact with this relationship. By probing this interaction, it was determined that state self-control moderated the relationship between these two variables, but that trait self-control did not. This could be a result of the impact of ego-depletion on mental health issues. Research indicates that state self-control decreases when an individual experiences ego-depletion (Baumeister & Alquist, 2009; de Ridder et al., 2018). By preventing ego-depletion and thus increasing state self-control, the positive relationship between compliance to COVID-19 safety regulations and mental health issues may be minimized.
The results of this study may be limited in several ways. The participant age group, primarily those between ages 18 and 25, and the students at Carroll College, may respond differently to the COVID-19 pandemic than other populations, limiting the generalizability of the results. Further studies should be conducted with randomly selected samples in order to determine if these results can be generalized. Another potential limitation is the scale used to measure compliance to COVID-19 government regulations, as it has not been extensively tested to ensure the reliability and validity of the measure due to the recent development of the COVID-19 pandemic. As future research develops on the COVID-19 pandemic, a widely tested measure may emerge that may be used in future studies.

Despite these limitations, the current study yielded important information about the relationship between self-control, compliance, and mental health. The results of this study supported that compliance to COVID-19 safety regulations and mental health issues are positively related, which could serve to inform mental health professionals of the gravity of this global pandemic on mental health. By understanding this relationship, mental health professionals can work to reduce the impending mental health crises posed by this pandemic by increasing access to mental health services. Though overall self-control did not moderate this relationship, state self-control did. State self-control regularly fluctuates in individuals based on their level of ego-depletion (Baumeister & Alquist, 2009; de Ridder et al., 2018). By minimizing ego-depletion, state self-control could be increased, which would help state self-control to moderate the positive relationship between compliance to COVID-19 safety regulations and mental health issues to a greater extent. By providing mental health professionals with this information, they could modify their practices to help increase state self-control during this unusual time by educating the public on how to minimize ego-depletion related to compliance to COVID-19 safety regulations, such as
by advocating for socially distanced activities, increasing the availability of masks, and transitioning to online platforms for work and school-related activities. This research could serve to reduce the mental health crisis developing as a result of the COVID-19 pandemic by informing mental health professionals how to best respond to the negative social impact of the pandemic by shedding light on state self-control as a moderating factor of the negative relationship between mental health and compliance to COVID-19 government regulations. Furthermore, the study could benefit the field of psychology by uncovering novel information about self-control, compliance, and mental health, as well as the relationship among these variables.
References


## Tables and Figures

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Key: CS = Compliance Scale; GAD7 = Generalized Anxiety Disorder-7; Patient Health Questionnaire-9; Brief (Trait) Self-Control Scale; Brief State Self-Control Scale; Self-Control; MHI = Mental Health Issues

**Table 1.** Correlations between Variables.
The relationship between compliance to COVID-19 safety regulations and mental health issues.

Key: GAD7 = Generalized Anxiety Disorder-7; Patient Health Questionaire-9; MHI = Mental Health Issues

**Figure 1.** The relationship between compliance to COVID-19 safety regulations and mental health issues.
Figure 2. The moderating effect of state self-control on the positive relationship between mental health issues (measured by the average of scores on the GAD-7 and PHQ-9) and compliance to COVID-19 safety regulations (measured on a seven-point Likert scale where participants recorded the extent to which they agreed with given statements).
Appendices

Appendix 1. Demographics.

Age Range
- 18-24
- 25-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70+

Sex: ____________________________

Religious affiliation: ____________

Are you a student or a faculty member?
- Student
- Faculty

If you are a student, what year are you in your studies?
- Freshman
- Sophomore
- Junior
- Senior

In what type of community did you spend most of your life?
- Rural
- Urban
- Suburban

How would you classify your socioeconomic status?
- Lower class
- Working class
- Middle class
- Middle-upper class
- Upper class

On a scale of 1-7, one meaning extremely liberal and nine meaning extremely conservative, indicate where you align yourself politically.

On a scale of 1-7, one meaning extremely Democratic and nine meaning extremely Republican, indicate where you align yourself politically.
Appendix 2. Compliance Measure (Gustavsson and Beckman, 2020).

Please rate the following statements on a scale of one to seven, with one meaning strongly disagree and with seven meaning strongly agree.

In relation to the COVID-19 pandemic:
1. Recommendations from government authorities are clear and concise.
2. I take the recommendation from government authorities very seriously.
3. I know how to act to avoid infection.
4. I have changed my daily routines.
5. I avoid public gatherings of more than ten people.
6. I spend all of my time at home.
7. I do grocery shopping as usual.
8. I do grocery shopping, but at hours when I think no one is there.
9. I always wear a mask in situations where social distancing (6 feet of separation between people) is not possible.
10. If I have any symptoms of COVID-19 (cough, sore throat, fever), I do not go out in public.

*Italicized measures are changed for this study*
Appendix 3. Anxiety Measure, GAD-7 (Spitzer et al., 2006).

Please rate the following statements on a scale of one to seven, with one meaning “not at all”, three meaning “several days,” five meaning “more than half the days,” and seven meaning “nearly every day.”

Over the last 2 weeks, how often have you been bothered by the following problems.

1. Feeling nervous, anxious or on edge
2. Not being able to stop or control worrying
3. Worry too much about different things
4. Trouble relaxing
5. Being so restless that it is hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid as if something awful might happen
Appendix 4. Depression Measure, PHQ-9 (Kroenke et al., 2001).

Please rate the following statements on a scale of one to seven, with one meaning “not at all”, three meaning “several days,” five meaning “more than half the days,” and seven meaning “nearly every day.”

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless
3. Trouble falling or staying asleep, or sleeping too much
4. Feeling tired of having little energy
5. Poor appetite or overeating
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down
7. Trouble concentrating on things, such as reading the newspaper or watching television
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual.
9. Thoughts that you would be better off dead, or of hurting yourself.
Appendix 5. Trait Self-Control Measure (Tangney et al., 2004).

Please rate the following statements on a scale of one to seven, with one meaning strongly disagree and with seven meaning strongly agree.

1. I am good at resisting temptation.
2. I have a hard time breaking bad habits.
3. I am lazy.
4. I say inappropriate things.
5. I never allow myself to lose control.
6. I do certain things that are hard for me, if they are fun.
7. People can count on me to keep on schedule.
8. Getting up in the morning is hard for me.
9. I have trouble saying no.
10. I change my mind fairly often.
11. I blurt out whatever is on my mind.
12. People would describe me as impulsive.
13. I refuse things that are bad for me.
15. I keep everything neat.
16. I am self-indulgent at times.
17. I wish I had more self-discipline.
18. I am reliable.
19. I get carried away by my feelings.
20. I do many things on the spur of the moment.
21. I don’t keep secrets very well.
22. People would say that I have iron self-discipline.
23. I have worked or studied all night at the last minute.
24. I’m not easily discouraged.
25. I’d be better off if I stopped to think before acting.
27. I eat healthy foods.
28. Pleasure and fun sometimes keep me from getting work done.
29. I have trouble concentrating.
30. I am able to work effectively toward long-term goals.
31. Sometimes I can’t stop myself from doing something, even if I know it is wrong.
32. I often act without thinking through all the alternatives.
33. I lose my temper too easily.
34. I often interrupt people.
35. I sometimes drink or use drugs to excess.
36. I am always on time.
Appendix 6. State Self-Control Measure, Translated from German (Bertrams et al., 2011).

Please rate the following statements on a scale of one to seven, with one meaning strongly disagree and with seven meaning strongly agree.

1. I feel mentally exhausted.
2. I have a hard time concentrating on anything right now.
3. I need something good to make me feel better.
4. I am motivated.
5. If I was given a difficult task now, I would quickly give up.
6. I feel exhausted.
7. I have a lot of energy.
8. I feel weary.
9. If I was being led into investigation right now, I would find it very difficult to resist.
10. I would want to give up every difficult task I was given.
11. I feel balanced.
12. I can no longer take in any information.
13. I feel listless.
14. At the moment, I am having a hard time making plans for the future.
15. I feel alert and focused.
16. I want to give up.
17. This would be a good time for me to make an important decision.
18. I feel like I have run out of willpower.
19. I find it difficult to focus right now.
20. At the moment, I am able to concentrate well.
21. My mental battery is empty.
22. At the moment, a new challenge would appeal to me.
23. I would like to relax for a while.
24. I find it difficult to control my needs right now.
25. I feel discouraged.
Appendix 7. Recruitment Email.

Dear Carroll College Students,

I hope you all are doing well during this strange and uncertain time. My name is Anna Wurzer, and I am a senior in the Psychology Department. As a part of my Honors thesis, I am conducting a study on self-control, compliance to COVID-19 safety regulations, and mental health under the guidance of Dr. Leslie Angel. I would like to kindly ask you to participate in my study. This research is important because it has the potential to help us understand the best way to respond to the current mental health crisis that has arisen due to the COVID-19 pandemic. Participants will be asked to fill out an anonymous questionnaire that consists of five surveys, which should only take around fifteen minutes total. All participants must be 18 or older. As a way of showing my appreciation, individuals who participate in the study will be entered into a drawing for an Amazon gift card. I would love to have you as a part of this study. If you are interested, please sign up through Moodle as directed below. Thank you for your time and consideration, and I hope to work with you in the future!

Kind regards,
Anna Wurzer
Appendix 8. Debriefing Script.

Thank you for participating in this study. From this study, the investigators are hoping to determine if self-control moderates the relationship between compliance to COVID-19 safety regulations and mental health. The purpose of this study is to understand if self-control is a moderating factor for the negative relationship between compliance to COVID-19 safety regulations and mental health. Two surveys assessed your current mental health by analyzing levels of anxiety and depression. Two surveys assessed state and trait self-control. One survey assessed compliance to COVID-19 safety regulations. These surveys were chosen in order to help us understand more about the relationship between self-control, compliance to COVID-19 safety regulations, and mental health. Our hypothesis states that people with higher levels of self-control will be more likely to comply to COVID-19 safety regulations to a greater extent and experience less of a change in their mental health due to their compliance.

Participants are students of Carroll College. Participation is voluntary. You may withdraw from the study at any time. Refusal to participate will result in no penalty. If you have any questions regarding the study, you can email me at awurzer@carroll.edu. If you have questions about your rights as a participant, you can email the Dr. Gerald Schafer, the Chair of Carroll College’s IRB, at gschafer@carroll.edu.
Appendix 9. Consent Form.

Carroll College

Subject Consent Form
For Participation in Human Research

Title of Study: The Moderating Effect of Self-Control on the Relationship between Mental Health and Compliance to Government Regulations During the COVID-19 Pandemic

You are being asked to participate in a research study about self-control, compliance to COVID-19 safety regulations, and mental health. From this study, the investigators are hoping to determine if self-control moderates the relationship between compliance to COVID-19 safety regulations and mental health.

You have been selected to participate in this study because you are a Carroll College student and you are over the age of 18. If you agree to participate, you will be asked to complete five questionnaires that should take approximately 15 minutes to complete. The study is expected to involve 200 participants and will be conducted over the fall semester of 2020. Participation is voluntary. You may withdraw from the study at any time. Refusal to participate will result in no penalty.

Participation in this study may involve certain risks, including anxiety or fatigue while answering the questions. The study may contain unanticipated risks and we will do our best to make accommodations at that time. If you experience any anxiety or fatigue as a result of this survey, you are encouraged to contact Carroll College’s Counseling Services, located in the Wellness Center in the lower level of Guadeloupe Hall, or at 406-447-5441. Cost to the participant includes time. All individuals have the opportunity of benefitting from the study by being entered into a drawing for one of three $25 Amazon gift cards.

Your privacy is important to in this study. Confidentiality of records identifying you will be maintained by Dr. Leslie Angel. All of the information collected in the study will be kept confidential as specified by Carroll College. No information will be gathered that is not electronic. Any information on the computer will be protected by a password. Only official investigators certified by the IRB will have access to the data. All individual responses to the survey will be assigned a randomized participant number that is not linked with any identifiable information. The only identifiable information will be on the consent form, which is not associated with the data collected. Individual participant names will be gathered from the consent form in order to enter individuals into the drawing for one of three $25 Amazon gift cards. This signed consent form will be stored separately from all data and cannot be linked to any data collected.

Further information about this research study may be obtained by calling Anna Wurzer at 701-200-2531. Additional questions about the rights of human subjects can be answered by the Chair of the Institutional Review Board, Dr. Gerald Schafer, IRB at gschafer@carroll.edu.

I, ______________________ (name of subject) agree to participate in this research. The investigator has thoroughly explained the nature and process of this research to me. I have read the above risks involved with this study. I understand that I have the right to refuse to participate in this study and that
refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled. I also understand that I may withdraw from the study at any time without penalty or loss of benefits to which I am otherwise entitled. To the best of my knowledge, I have no physical or mental condition that would be adversely affected by my participation. I have received a copy of this consent form for my own records.

I, _______________________ (name of subject) certify that I am 18 years old.

Electronic signature: __________
Date: ________________________