Does Connectedness Mediate the Relationship Between Self-Efficacy and Self-Control?

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Author's Note

The present study used OpenAI's ChatGPT-4o for the purposes of coding and data analysis assistance, including resolving R code errors and suggesting code visualising a moderation effect. The author holds full responsibility for all decisions regarding analysis and interpretation.

Abstract

The present study aimed to examine the associations between self-efficacy, connectedness and self-control to better understand whether connectedness may support impulse regulation. It was hypothesized that high values of self-efficacy and high levels of connectedness would result in higher levels of self-control. A cross-sectional quantitative study design was employed using data from an international sample of 122 participants (68% female, 82% German) with a mean age of 27.3 years (*SD* = 10.9). The sample was predominantly highly educated. Respondents completed self-report questionnaires measuring self-efficacy, connectedness and self-control. Multiple linear regression was performed to test whether connectedness moderated the relationship between self-efficacy and self-control. Results showed that while self-efficacy was significantly correlated with self-control (b = .38, p = < .01), the interaction between self-efficacy and connectedness was insignificant (b = .002, p = .82). Future research should consider measuring domains such as committed action and values to further expound how connectedness may support self-control.

Key words: self-control, connectedness, self-efficacy, moderation analysis, impulse regulation.

Introduction

Self-control is a construct with far-reaching emotional, behavioural, and psychopathological implications across several domains. Low levels of self-control have been linked to relationship problems, overspending, violence, bullying and loneliness (Baumeister et al., 2007; Moon & Alarid, 2014; Stavrova et al., 2022), while higher levels are associated with academic success, greater psychological well-being and improved interpersonal relations (De Ridder et al., 2011; Duckworth & Seligman, 2017). In addition, self-control is considered a central aspect of numerous psychopathologies including attention deficit hyperactivity disorder (ADHD) (Strayhorn, 2002), bulimia nervosa (Neveu et al., 2018), substance use disorders (SUD) (Yang et al., 2019) and addiction (Tang et al., 2015). Given the far-reaching implications of self-control, this research aims to examine factors influencing self-control. Specifically, the following paper will investigate the extent to which self-efficacy is associated with self-control, and if this relationship is positively moderated by connectedness.

Self-control

Several definitions exist for self-control, owing to the construct's multifaceted and complex nature. Baumsteier et. al (2007) conceptualise a "strength-model" of self-control, in which self-control is a limited resource exerted by individuals to alter or inhibit their behavioural responses that when used results in "ego-depletion", which is a state of depreciated self-control following exertion. This makes it more difficult to use the resource on subsequent tasks which require it such as regulating emotions and overeating. Conversely, Berkman et al. (2017) view self-control as a "value-based choice" which is defined as "the process of selecting a behaviour that is consistent with a focal goal when it conflicts with goal-inconsistent alternatives" (p. 423). Here, attention and environmental factors are central in how individuals construe subjective value of behaviours based on the costs and benefits of available options, dictating the final behavioural outcome as opposed to Baumsteier et. al's view of individuals solely "flexing a muscle" to inhibit behaviours such as unwanted impulses. In contrast, Kotabe and Hofmann (2015) have conceived *integrative self-control theory* (SCT) which assimilates a framework of seven components for analysing self-control. Here, self-control is understood as a process in which behavioural outcomes are determined by conflicting immediate desires and long-term goals involving two key components: activation and exertion. The activation cluster becomes activated when a desire-goal conflict arises, such as momentarily wishing to consume alcohol despite maintaining a long-term goal

of abstaining, triggering self-control. This in turn activates the exertion cluster where control capacity (i.e., mental resources such as inhibition and attention) and control motivation (i.e., one's innate drive to resist temptation) combine to determine control effort. The behavioural outcome is then dictated by whether their desire or control effort are stronger, which is further influenced by environmental factors. As such, successful self-control may depend not only on the presence of desires and goals, but also on the individual's capacity and motivation to exert control effort. This is where self-efficacy may play a role; individuals who feel capable of regulating their actions may be more likely to prolong control when faced with desire-goal conflicts.

Self-efficacy

Self-efficacy refers to an individual's general belief of the extent to which they can confidently demonstrate abilities and skills across varying situations (Bandura, 1977); the greater one's self-efficacy, the more likely they are to perform a given behaviour (Bandura, 2002). The construct has been seen to directly influence motivation and behavioural outcomes (Bandura & Locke, 2003), yielding benefits in areas such as academic performance, stress reduction, and overall well-being (Talsma et al., 2017; Schönfeld et al., 2015; Milam et al., 2018).

Though little research has been performed solely on the relationship between self-efficacy and self-control, the association may be understood in several ways. Students exhibiting greater levels of self-efficacy have been seen to exhibit enhanced effort (Trautner & Schwinger, 2020), a key component of integrative self-control theory on tasks requiring motivation (Kotabe & Hoffman, 2015). Moreover, self-efficacy has been negatively associated with desire-goal conflict (Slocum et al., 2002; Presseau et al., 2011), suggesting that elevated self-efficacy may reduce the severity of desire-goal conflicts arising in the activation cluster of SCT, thus increasing the likelihood of successful self-control execution. In addition, Schunk (1995) denotes that self-efficacy predicts motivation and task performance. Self-efficacy has been shown to predict self-control. Du and Zhang (2022) outline that self-efficacy plays a key role in the development of individuals' self-control and that self-efficacy can directly affect self-control, with it being demonstrated that self-efficacy can address smartphone addiction through self-control. Moreover, results from Chen et al. (2019) support their hypothesis that self-efficacy is significantly associated with self-control. In addition, findings from (Graham & Bray, 2015) support this view, with results highlighting

interdependence between self-efficacy and self-control. Thus, it may be seen that fostering self-efficacy may enhance self-control by possibly reducing desire-goal conflicts and increasing control effort and control motivation. Therefore, investigating means of strengthening this relationship may hold value in further amplifying self-control outcomes.

Connectedness

Connectedness is a multidimensional construct defined by Watts et al. (2022) as "a felt sense of connection to self, others, and the wider world." Each subdomain reflects distinct but related areas of connectedness. Connectedness to self (CTS) captures how aligned individuals feel with their internal states such as emotions and sensations. Connectedness to others (CTO) reflects aspects such as how interpersonally or socially related one feels with those surrounding them, while Connectedness to world (CTW) refers to individuals' ability to transcend their ego in both transpersonal and interpersonal contexts, such as connecting with a spiritual ideal. Connectedness is considered by Watts et al. (2022) to hold transdiagnostic value. Diminished connectedness has been associated with several psychopathologies including depression (Arango et al., 2018), eating disorders (Huemer et al., 2011), and addiction (Clements et al., 2022). Conversely, increased connectedness has been linked to enhanced well-being (Cervinka et al., 2011; Saeri et al., 2017).

Connectedness may play a supporting role in reinforcing committed action and values (Watts & Luoma, 2020). By fostering a sense of alignment with the self, others, and the world, connectedness may help individuals persist in value-driven behaviour in the face of discomfort or conflicting desires and goals by means of committed action (McCracken, 2013). This capacity to stay anchored to values may, in turn, support more consistent self-control in goal-relevant contexts. Connectedness may therefore strengthen the relationship between self-efficacy and self-control. While self-efficacy reflects one's beliefs about their ability to successfully behave in specific ways (Bandura, 1977), connectedness' could strengthen these beliefs when they are challenged during desire-goal conflicts through committed action and making personal values more salient, while simultaneously enhancing control capacity through more salient values and committed action (Watts & Luoma, 2020; McCracken, 2013). This may result in more successful self-control outcomes in individuals who express both high levels of self-efficacy and connectedness. As such, the present study hypothesises that higher levels of connectedness and higher levels of connectedness will result in higher levels of self-control.

Methods

Participants

Ethical approval was granted for this research on March 20th, 2025 by the Humanities and Social Sciences Ethical Committee of the University of Twente under the application number 250591. A total of 122 participants provided informed consent to participate in the research. Following the exclusion of 19 respondents due to incomplete responses, the remaining sample of 103 participants featured 33 male (31%), 72 female (68%), and 1 non-binary or third gender (1%) respondents. The age of participants ranged from 18 to 67 (M = 27.3, SD = 10.9). 7 respondents were Dutch (6.6%), 87 were German (82.1%), 9 were from other unspecified EU nations (8.5%), while 3 were from unspecified non-EU nations (2.8%). In addition, participants were asked to denote their primary occupational status. Sixty-five were students (61.3%), 2 were training in an apprenticeship (1.9%), 34 were in employment (32.1%), 1 was unemployed (1%) and 4 preferred not to say (3.8%). Participants were primarily recruited using snowball sampling through the researchers contacting friends and family. In addition, 37 participants were recruited using the University of Twente's online "SONA" system, whereby students are obliged to participate in research as a graduation requirement. Participants had to be at least 18 years of age and provide informed consent to participate in the research.

Materials

Connectedness was measured using the Watts Connectedness Scale which features subscales for Connectedness to Self, Connectedness to Others, Connectedness to World and General Connectedness (Watts et al., 2022). Nineteen items were included such as "I have felt connected to all humanity." Participants indicated their level of agreement with items from 0 – 100 on a visual analogue scale, with 0 indicating "not at all" agree and 100 indicating "entirely" agree. The scale has demonstrated good composite reliability, (CR = .86), in addition to strong construct validity (Watts et al., 2022). Furthermore, the present study showed good reliability (α = .86.).

Self-efficacy was measured using the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995). The scale was comprised of 10 items including "It is easy for me to stick to my aims and accomplish my goals." Level of agreement with statements was indicated by respondents using a 4-point Likert Scale ranging from "not at all true" to "exactly true." Results from Lazić et al. (2018) have shown strong internal consistency, with Cronbach's α

ranging from between .84 to .90 across different time points. The same study also found both good construct and convergent validity, while the present study's sample also found high reliability (α = .89).

The Brief Self-control Scale was used to measure self-control (Tangney et al., 2004). The questionnaire contained 13 items such as "I am good at resisting temptation." Respondents provided answers on a 5-point Likert scale with 1 meaning "not at all like me" and 5 meaning "very much like me." Manapat et al. (2019) have reported excellent internal consistency (α = .91) and strong convergent validity with scores negatively correlating with factors including impulsivity and alcohol use. Furthermore, the scale showcased good reliability in the present study (α = .81).

Procedure

Participants accessed the survey through Qualtrics (https://www.qualtrics.com) using a smart phone or computer where they were informed that survey results would be used to examine if connectedness moderates the relationship between self-efficacy and self-control, and that completing the survey would take approximately 30 minutes. Following this, informed consent was provided before beginning data collection.

After providing informed consent, participants began the survey by answering demographic questions before completing the connectedness, self-efficacy and self-control questionnaires, in addition to several other questionnaires as part of broader research projects. Thirty-seven participants received 0.25 SONA credits from the University of Twente for participating in the research. Data were collected from March 25th 2025 until April 17th 2025. Following the conclusion of data collection, collected data was stored in the University of Twente's OneDrive where it is to be held for a minimum of 10 years.

Data Analysis

Data analysis was performed using version R Studio version 2024.12.1-563 with the packages "psych", "dplyr", "corrr", "ggplot2", "jtools", "interactions", "moderndive" and "car." First, mean scores were calculated for each participant on the self-control, self-efficacy and connectedness scales. Subsequently, descriptive statistics were performed whereby the standard deviations and mean scores for each scale across participants was calculated, in addition to Pearson's correlations between variables. Procedures were then performed to assess linearity assumptions. These included visual inspections of scatterplots to evaluate linearity and homoscedasticity, a Q-Q plot to assess the normality of residuals, and a calculation of Variance Inflation Factors (VIF) to examine multicollinearity. The scatterplots

and Q-Q plot showed that the assumptions of linearity, homoscedasticity and normality of residuals were met, while the VIF values indicated no multicollinearity concerns. Finally, to test if connectedness moderates the relationship between self-efficacy and self-control, a moderation analysis was conducted using multiple linear regression. An interaction term was calculated between the mean centred scores of self-efficacy and connectedness. This resulted in three predictor variables for self-control: the interaction term, connectedness, and self-efficacy. In addition, an interaction plot was used to visualise the moderation effect.

Results

Descriptive Statistics

Participants reported self-control scores slightly above the scale midpoint, while self-efficacy scores were moderately high. Connectedness scores were centred around the scale's midpoint. All correlations were significant (see Table 1).

Table 1

Means, Standard Deviations, Ranges, and Correlations Between Variables (N = 103)

Variable	M	SD	Range	1	2
1. Self-control	3.18	0.35	1.46 – 4.54	-	
2. Self-efficacy	2.94	0.52	1.10 – 4.00	**.40***	-
3. Connectedness	50.70	10.90	22.68 – 79.11	**.29***	**.48***

Note. *$p < .01$. Correlations are Pearson's *r*.

Moderation Analysis

The outcomes of the multiple linear regression analysis showed that the overall model was significant, $F(3, 99) = 6.82$, $p < .001$, and explained approximately 17% of the variance in self-control scores ($R^2 = .17$, adjusted $R^2 = .15$).

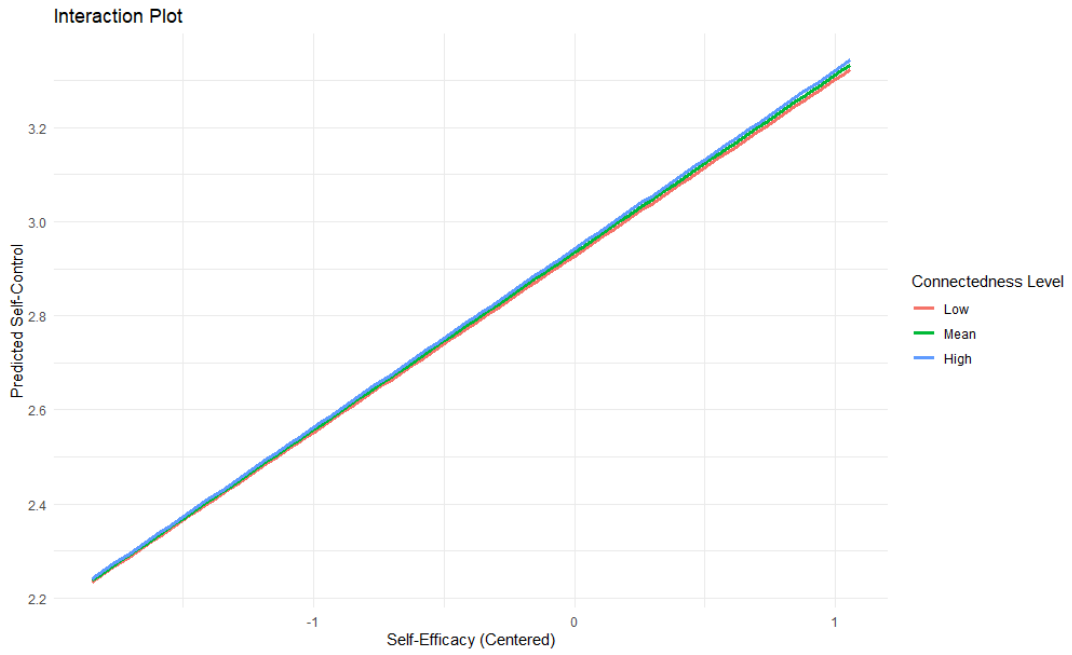
Self-efficacy was a significant positive predictor of self-control, $b = .38$, $\beta = .33$, $SE = .12$, $t(99) = 3.17$, $p = .002$. Connectedness was not a significant predictor, $b = .007$, $\beta = .14$, $SE = .006$, $t(99) = .23$, $p = .192$. The interaction between self-efficacy and connectedness was

also not significant, $b = .002$, $SE = .01$, $p = .822$. This contradicts the hypothesis that higher levels of self-efficacy and connectedness would result in higher levels of self-control.

As visualised in Figure 1, the slopes of the regression lines for low, mean, and high connectedness run almost entirely parallel, indicating further that connectedness did not moderate the relationship between self-efficacy and self-control.

Figure 1

Interaction between self-efficacy and connectedness on predicted self-control scores



Discussion

The present study hypothesised that higher levels of self-efficacy and connectedness would be associated with elevated self-control scores. Results showed that while self-efficacy was significantly associated with self-control, connectedness did not significantly moderate the relationship between self-efficacy and self-control.

The observed association between self-efficacy and self-control may be interpreted through the lens of Bandura's (2002) conceptualisation of self-efficacy and integrative self-control theory (Kotabe & Hofmann, 2015). As previously outlined, individuals exhibiting higher self-efficacy are more likely to persist in goal-directed behaviour when they believe in their behavioural capacities, particularly because such individuals are more likely to exhibit enhanced effort (Trautner & Schwinger, 2020). This is consistent with previous

findings which have demonstrated associations between self-efficacy and self-control (Du & Zhang, 2022; Chen et. al, 2019). These findings suggest that self-efficacy may serve as an important determinant in improving behavioural regulation in contexts involving goal-desire conflicts.

The absence of a significant interaction between self-efficacy and connectedness in explaining variation in self-control may be attributable to several factors. While it was hypothesised that connectedness may enhance self-control outcomes in conjunction with self-efficacy, this was based on the theoretical idea that connectedness could strengthen one's ability to behave in line with personal values and committed action as outlined by Watts and Luoma (2020) and McCracken (2013), thereby reinforcing motivational processes initiated by self-efficacy. However, this mechanism, which involves committed action and values, was not measured directly in this study. Connectedness as measured in this study encompasses a broad range of relational, existential and spiritual domains (Watts et. al, 2022). While these areas may contribute to regulatory capacities indirectly, they do not specifically target mechanisms such as committed action or goal-directed persistence. Therefore, the absence of a moderating effect may reflect the indirect nature of connectedness' influence on self-control as opposed to an outright lack of relevance.

Limitations and Suggestions for Future Research

The present study featured several limitations which should be considered when interpreting findings. First, while connectedness in conjunction with self-efficacy was hypothesised to reinforce self-control through committed action and values, these mechanisms were not directly measured in this study. As such, conclusions regarding the relationship observed remain speculative. Secondly, characteristics of the sample used may limit the generalisability of findings. The observed sample was largely composed of young, highly educated individuals from Western Europe, which may limit the generalisability of findings. Finally, use of a cross-sectional study design and self-report measures also impact the interpretation of findings. This study cannot conclude any causal inference and may suffer from self-report bias, obscuring the objectivity of data.

Given the exploratory nature of this study and its limitations, future research is needed to further explore the moderating role of connectedness. Future research should include measures of committed action and values to examine whether connectedness reinforces self-control, such as with the Committed Action Questionnaire (McCracken et al., 2014) and the Valuing Questionnaire (Smout et al., 2014) to examine whether such mechanisms help

explain how connectedness may strengthen the association between self-efficacy and self-control. Furthermore, examining a clinical population may reveal additional insights. While this study's hypothesis was tested using data from the general population, examining the same model in samples experiencing conditions such as addiction or ADHD may yield different results. Previous research has linked connectedness to such populations (Clements et al., 2022; Arango et al., 2018), suggesting that connectedness' role in enhancing the relationship between self-efficacy and self-control may alternatively be detected in populations marked my greater emotional dysregulation (Aldao et al., 2009). Moreover, as the Watts Connectedness Scale features three subscales (CTO, CTW, CTS), future studies may choose to explore whether these specific domains distinctively moderate the relationship between self-efficacy and self-control. While the present study focussed on connectedness generally due to the findings that it may reinforce acting with committed action and values (Watts & Luoma, 2020; McCracken, 2013) thereby potentially strengthening self-control, examining specific dimensions of connectedness may aid in further identifying mechanisms which promote self-regulation.

Conclusion

The present study examined whether high levels of both self-efficacy and connectedness would be associated with higher levels of self-control. Results of a moderation analysis using multiple linear regression showed that while self-efficacy was found to be significantly associated with self-control which supports previous findings, the interaction between self-efficacy and connectedness showed no moderating effect on self-control. To the best of the author's knowledge, there are no previously published studies which examine the extent to which connectedness moderates the relationship between self-efficacy and self-control. While self-efficacy's association with self-control has been well-explicated, connectedness has not yet been studied in the context mechanisms underpinning impulse regulation and pursuit of goals. Consequently, this study offered an initial attempt to explore connectedness' potential role in such a context, though results did not reveal significant findings. This may reflect a more indirect role of connectedness in supporting self-control, rather than a direct influence on self-regulatory mechanisms. Notwithstanding this, the present study did not directly measure domains such as committed action and values. As such, future research should consider measuring such constructs to further explicate how connectedness may support self-control, potentially within clinical populations to better understand whether connectedness reinforces self-control through motivational pathways

such as value alignment and goal persistence. Despite the lack of significant findings, the present study contributes to initial efforts to clarify whether relational constructs like connectedness play a direct or indirect role in supporting self-regulation.

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