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Does self-regulation mediate the relationship between locus of control and resiliency related outcomes?

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Abstract

Locus of control (LOC) has been implicated in predicting mental wellbeing outcomes in a variety of theories and empirical studies, however the mediating mechanisms between the trait and mental wellbeing are not well known. The King and Rothstein (2010) model of resiliency posits self-regulation as the active mechanism that leads to recovery in resiliency related outcomes following significant adversity. This study investigated the mediating role of affective, behavioral, and cognitive self-regulation between locus of control, depression, and anxiety using mediation analysis. The results showed LOC significantly predicted all three self-regulation components, as well both depression and anxiety. behavioral and cognitive self-regulation were found to significantly predict depression and anxiety, suggesting partial mediation for both, but not affective regulation. Results and implications for the resiliency process are then discussed, including the role of self-regulation in recovering from adversity.

Keywords: Locus of Control, Self-Regulation, Depression, Anxiety, Resilience

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Does Self-Regulation Mediate the Relationship Between Locus of Control and Resiliency Related Outcomes?

Researchers have shown a connection between resilience to adversity and an individual's perceived LOC (Heckhausen & Schulz, 1995; Biddle, 1999). A more internal LOC tends to predict better mental health outcomes, for example less depression and anxiety following adversity. Further, control beliefs are thought to be associated with many important work-related outcomes, such as job satisfaction, performance, motivation, and leadership (Judge & Bono, 2001; Ng, Sorenson & Eby, 2006; Spector, 1982). Although many studies and measures of resilience and related constructs have assumed the importance of control beliefs in predicting and/or constituting resilience, few studies have explored in depth how exactly this relationship works.

The theory of planned behaviour (Ajzen, 1988, 1991) argues that control beliefs condition an individual's perception of behavioural control, which in turns moderates the intention to perform a behaviour. Congruent with this theory, one possible mechanism between LOC and the resiliency process is that an internal LOC facilitates an individuals' self-regulation, which in turn is thought to be an important component in achieving positive resilience related outcomes (King & Rothstein, 2010; Halliday, 2018; Rothstein, McLarnon & King, 2016). It is suggested that an internal LOC does this first through the belief that individuals themselves can influence their own recovery in response to adversity, secondly by eliciting the intention to take action towards resolving adversity, and lastly through promoting self-monitoring and discipline in exerting effort and resources throughout the recovery process. The purpose of this study then is to investigate the possible mediating role of self-regulation between LOC and resiliency-

related outcomes. The following sections review important concepts involved, and how this study seeks to expand upon existing work. Hypotheses reflecting the proposed mediating role of self-regulation are then presented.

Resiliency

Resilience is a multidimensional adaptive process that enables individuals to ‘bounce back’ or recover from adverse experiences (Coutu, 2002; King & Rothstein, 2010; Rutter, 2007). It is often referred to as encompassing a series of relatively normal adaptive processes that are activated in response to adverse events. Resiliency has been the subject of a large degree of theoretical confusion (Britt et al, 2016; Kossek & Perrigino, 2016). A major factor in this confusion is that there is strong disagreement on whether resilience is best conceptualised as a trait, outcome, or process. Regardless of this ongoing debate, most researchers of resiliency agree on two main points: 1.) resilience can only be present in response to an adverse experience, and 2.) that there needs to be some form of adaptation to the adversity in such a way that an equilibrium is returned to and/or a positive outcome is achieved (Reich et al, 2010). Individual characteristics (also referred to as internal or personal resources) and external resources (such as social support) that are conducive to positive outcomes following adversity are referred to as protective factors (Masten, 2001; Masten & Wright, 2010).

Although research on resilience as a trait or outcome has generated significant contributions to the field, they have limited contribution to the *how* of resilience and by extension practical interventions for the development and training of resilience. Alternatively, process oriented models of resilience focus on the function of resilience, rather than just identifying what traits may predict positive outcomes following adversity (Richardson, 2002). Masten and Wright (2010) argued that from a process perspective, resiliency can be

conceptualized as a “” (p. 216). The key theme here is that resilience reflects multiple dynamic processes that work to restore equilibrium following an adverse experience. Identifying what exactly these processes are however has generated many different explanations from individual, environmental, social, and cultural perspectives.

Locus of Control

LOC and other related control beliefs are an extensively covered area in psychology from a variety of different backgrounds. For example, Skinner (1996) identified over a hundred different constructs that reflect a similar notion of control (i.e. mastery, agency, fatalism, causal attributions, etc). Over decades, the notion of control beliefs has been associated with a myriad of affective, behavioural, cognitive, and physiological outcomes (e.g. Bandura, 1986; 1987; De Brabander, Boone, & Gerits, 1992; Ng, Sorenson, & Ely, 2006). Control beliefs are generally thought to be developed both through social experiences (Rotter, 1966; Langer, 1983) as well as to be dispositional in nature (Ng et al, 2006).

Rotter (1966) proposed that LOC is best conceptualised as a continuum, with internal LOC on one end and external at the other. A person with a high internal LOC is someone who believes that outcomes and events in their life are highly contingent upon their own behaviour. At the other end of the spectrum, individuals with a high external LOC perceive themselves as having little to no control over their lives. Internally controlled individuals who perceive the success or failure of their goals, for example a student’s examination or an employee’s project, to be contingent upon their own actions will feel that they can influence the outcome of similar future events by regulating their actions to increase or maintain effort and competence. On the other hand, externally controlled individuals will perceive their successes and failures as determined by outside forces such as luck or powerful others and to have little personal control

over outcomes. In this situation, they may be unlikely to devote effort and resources towards a valued end, if they don't believe it will influence the likelihood of achieving it.

Locus of Control and Resiliency

LOC is a construct that could easily be considered a protective factor in the resiliency process (Bolger & Patterson, 2001). The resiliency process is started in response to some sort of stressful event that creates disequilibrium. It's likely that an individual's beliefs whether recovery from a stressful event is in their control or not should condition their intention to begin the recovery process (Ajzen, 1985; Leontopolou, 2006). Strickland (1978) presented multiple studies that showed people with an internal LOC are more likely than people with an external LOC to engage in information seeking when it is relevant to their wellbeing; and to engage in more preventive behaviors, such as building support networks, regular exercise and diet control, or proactively confronting potential stressors. These behaviors are classified as problem focused.

Leontopoulou (2006) found that LOC mediated the relationship between adverse events and recovery. In particular, it was found that high internal LOC predicted action oriented, problem-focused coping styles, which in turn predicted better recovery on resiliency related outcomes (e.g. depression). On the other hand, a high external LOC predicted avoidant, and to some degree help seeking coping styles. In response to stressors, internals tend to react in a more constructive way, such as actively searching for solutions (Gianakos, 2004) rather than relying solely on emotional support. Arslan et al (2009) also found that individuals with strong internal LOC were more likely to engage in problem-focused coping styles than externals, and to be more active rather than passive in resolving challenges. Celik, Cetin, and Tutkun (2015) explored the moderating role of LOC on several protective factors related to resilience and found it

significantly moderated the effect of social support, cultural background, optimism, and achievement motivation on resiliency.

Although studies showing the relationship between LOC and resiliency itself are few, LOC has been implicated in predicting or constituting many constructs related to resiliency. For example, many studies have conceptualized LOC as a predictor of well-being (i.e. Judge et al, 1998; Spector, Cooper, Sanchez, O'Driscoll, & Sparks, 2002). Specifically, an internal LOC is thought to predict more positive wellbeing. Judge and colleagues proposed that LOC is one of four components, along with self-esteem, self-efficacy, and emotional stability, that form a higher order construct they refer to as core self-evaluation (Bono & Judge, 2003; Judge & Bono, 2001; Judge, Locke, Durham, & Kluger, 1998). They propose that individuals that believe they have a strong degree of control over their own fate should have a more favourable self-evaluation, a higher self-worth, and subsequently a more positive sense of wellbeing. The belief that one has a degree of control over one's own fate represents a positive evaluation of self-worth, whereas the belief in a lack of control may result in the experience of stress and lowered self-worth (Langer, 1983).

This relationship between LOC and wellbeing is further highlighted by research showing a strong relationship between an external LOC and psychopathologies such as depression (Presson & Bennassi, 1996) and anxiety (Arslan et al, 2009; Lefcourt, 2014; Spokas & Heimberg, 2009). The Avon Longitudinal Study of Parents and Children (ALSPAC), a study involving over 8,000 children across their lifespan, has associated external LOC in children with a higher likelihood of depression throughout their development. Approximately 34% of the relationship between experienced life adversities and the onset of subclinical depression was accounted for by high rates of external LOC. Internal LOC has also been associated with

increased social support and help-seeking behaviour. For example, internals are more likely to establish and maintain positive relationships with others, as well as to have better social skills in general (Kapoor, Ansari, & Shukla, 1986; Ringer & Boss, 2000).

Self-Regulation and Locus of Control

Bandura (1977) argued that the relationship between LOC and self-regulation was evident. An external LOC (i.e. belief in the role of luck or the influence of powerful others) would lower self-regulation, whereas an internal LOC would increase it. Although the relationship between LOC and various outcomes associated with wellbeing is well established, the ways in which this relationship comes about is less clear. Ng, Sorensen, & Eby (2006) argued that because internals believe they are choice making agents whose attainment of goals and desired outcomes is contingent on their own actions, internals are more likely to dedicate effort and resources to resolving issues through their own efforts, rather than relying on external supports or solutions. It is suggested that this higher perceived control also allows internals to have a more positive and stable perception of the predictability of the effort-outcome link (Parker, 1993; Rotter, 1966). This more favourable perception may translate into a higher likelihood for internals to actively work towards overcoming adversities, rather than accepting them as limitations or relying on external supports.

Yukl and Latham (1978) found that internals have a stronger need for achievement and tend to set more challenging goals for themselves. Phares (1976) suggests that internals are also more willing to defer gratification in achieving goals, as well as actively seek situations in which favourable outcomes are contingent upon their own actions. For example, when presented with a choice between two tasks, one based on luck and the other on skill, Kahle (1980) found that internals were more likely to choose the task based on skill as they perceive a greater control

over the outcome of the task. Mudrack (1990) found that internal control beliefs were negatively associated with Machiavellian traits of manipulation and deception, instead internals rely more on their own actions to achieve their goals. Overall, LOC can be conceptualised as a trait that predicts an individual's motivation to engage in self-regulation as well as their belief in effort-outcome relationships (Ng et al, 2006).

Scoffer, Paquette, and D'Arrippe-Longueville (2010) found in their study of self-regulation of eating disorders that although the influence of internal LOC on anorexia nervosa was sometimes positive, sometimes not; there was a consistent strong positive relationship between LOC and self-regulation, and that self-regulation tended to mediate between LOC and mental health outcomes. Other studies (i.e. Caggiulo & Watson, 1992; Saturnino-Springer & Bogue, 1994) found a similar mediating effect. Toushi & Ghanizedeh (2012) found in their study of English teachers that LOC and self-regulation had a correlation of $r = .48$, with higher internal LOC predicting more self-regulation. Sitzmann and Ely (2010) argued that prompting self-regulation in learning may induce a state internal LOC by informing trainees that they have control over their performance in the course. Similarly, Shell and Husman (2001) argued that the association between LOC and studying behaviour may indicate that contingency beliefs motivate aspects of students' self-regulation by affecting the general amount of time and effort they put forth in their studying. In a later study, Shell & Husman found a correlation of $r = .16$ between LOC and the use of self-regulation strategies, and $r = .25$ between LOC and the attribution of learning success to personal effort and ability (2008). Although the number of studies reporting correlation sizes between LOC and Self-Regulation is relatively small, of those available there is suggestion that the true correlation is likely moderate (i.e. $r = .20$ to $.40$).

The common theme underlying this line of research is that internals are 1.) more active rather than passive in their approach to solving problems, 2.) are more likely to dedicate effort and resources to achieving their goals, 3.) have a stronger belief in the effort-outcome link, and 4.) focus more on regulating their own actions, efforts, and resources towards achieving their goals. All this implies self-regulation as the mechanism through which internals achieve more positive states of wellbeing. Problem focused coping strategies, the effort-outcome belief, and the belief in one's own actions as the main determinant in overcoming adversity are all in line with the notion of self-regulation as the means to recovering from adversity. In contrast, avoidant focused coping styles in response to adversity often imply a disengagement or escape response, a response that is not congruent with internal control beliefs (Solomon, 1988) as well as an assumption that the initial stressor and their response to it is beyond the individual's ability to manage.

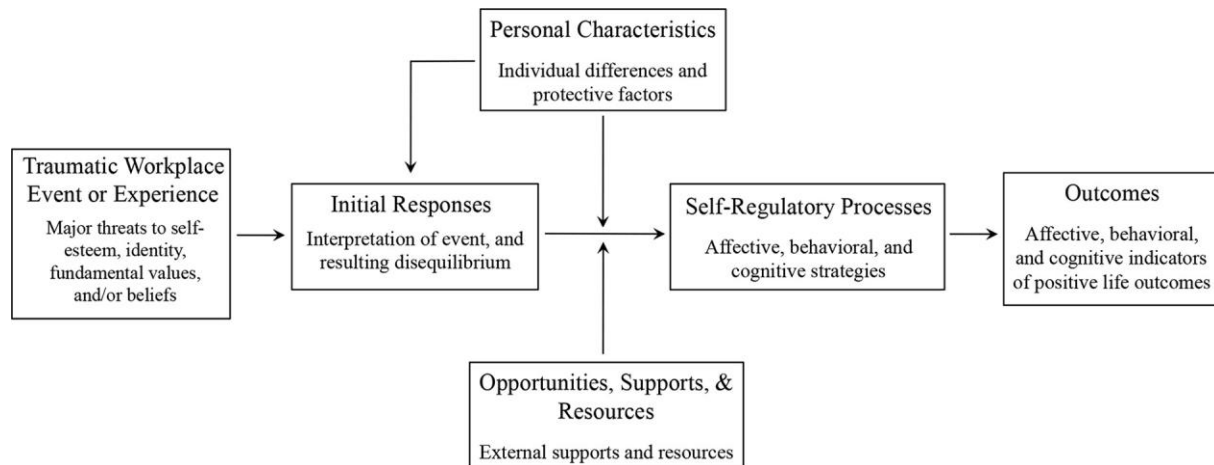
Self-Regulation as a Mechanism of Resiliency

Self-regulation refers to the various processes that enable an individual to guide, adapt, and maintain their goal-related behaviour over time and across changing circumstances, including moderating affect, thought, and behaviour (Porath & Bateman, 2006; Zimmerman, 2001). Self-regulation is a feedback process which enables individuals to monitor some current state (i.e. behaviour, mood, etc.) and make self-corrective changes to reduce the discrepancy between a current state and a desired one (Bandura, 1991; Koole & Aldao, 2016).

In the present study, King and Rothstein's model of resiliency (King & Rothstein, 2010; McLarnon & Rothstein, 2013; Rothstein, McLarnon & King, 2016) is adopted. This model defines resiliency as a dynamic process that unfolds over time, and involves self-regulatory and protective processes and situational variables as well as individual difference variables. In

addition to broad affective, behavioural, and cognitive characteristics of the individual that facilitate the resiliency process, King and Rothstein specify three categories of self-regulation involved in their model of resiliency: affective regulation involve strategies to exert control over emotional responses to stressors; behavioural regulation refers to strategies that provide a sense of self-efficacy; and cognitive strategies that imbue meaning and provide motivation (see figure 1).

Figure 1: General model of Resiliency (McLarnon & Rothstein, 2013).



Many authors have identified self-regulation processes with resiliency (Bandura, 1991; Blocke and Kremen, 1996; Bonano & Burton, 2013; Maston, 2014). Despite this, few models of resilience theorise self-regulation as a core mechanism of resilience. King and Rothstein (2010) argue that self-regulation is an essential mechanism in their model of resiliency. This model draws on conservation of resource theory (Hobfoll, 1989, 2011) to specify that ‘bouncing back’ to a state of equilibrium requires the use of one’s personal resources, and that individuals may acquire and develop these capabilities. This focus on self-regulatory processes is meant to address the “laundry list” (Haase, 2007, p. 350) issue of the multitude of individual characteristics, processes, external supports, and risk factors associated with the resiliency

process. Rather than focus on traits or endpoints, the King & Rothstein model conceptualizes resiliency as the process by which well-being is restored, rather than the end point one arrives at following an adverse event. The process dimensions of the model seek to explain how it is that an individual's positive sense of well-being (e.g., low levels of subclinical depression, low levels of anxiety, and high levels of overall life satisfaction) is restored following significant adversity. The process dimensions of the model may therefore be considered predictors of resiliency related outcome variables (e.g., depression, perceived stress, and life satisfaction).

Further, the self-regulatory process of forming a desired state, monitoring a current state, measuring the discrepancy between these two points, and adjusting one's affect, behavior, and cognition to reduce this discrepancy is instrumental to the process of achieving a positive resilience-related outcome (King & Rothstein, 2010). Similarly, self-regulatory processes are thought to underscore similar concepts to resilience such as coping strategies and cognitive appraisal (Feder, Nestler, Westphal, & Charney, 2010), and how well people manage challenges and frustration (Maranges & Baumeister, 2016). In a recent meta-review, Tangney, Baumeister, and Toone (2018) found that self-regulation was a predictor of many different positive outcomes across job performance, mental health, academic success, and physical health domains. Given the implications of internal LOC in many wellbeing outcomes that reflect a successful, positive resiliency process, as well as the role of external LOC in negative mental health outcomes, it is reasonable to assume that LOC will also be a significant predictor of the processes involved in achieving resilient outcomes.

Taking the previous literature into account, this study sought to examine the influence of LOC on depression and anxiety as mediated by self-regulation of resiliency. It was expected that an external LOC, with control attributed to luck or an unfavorable powerful other, would have a

negative influence on the capacity for self-regulation of resiliency following an adverse event. The King & Rothstein model of resiliency distinguishes between 3 different self-regulatory processes thought to contribute to achieving positive resiliency-related outcomes: affective, behavioural, and cognitive. It is expected that high internal LOC should be predictive of high self-regulation in each dimension.

H1: LOC will be positively correlated with self-regulation.

- *H_{1a}* LOC will be positively correlated with affective regulation
- *H_{1b}* LOC will be positively correlated with behavioural regulation
- *H_{1c}* LOC will be positively correlated with cognitive regulation

Locus of Control in the King and Rothstein Model

The King & Rothstein model includes affective, behavioural, and cognitive ‘Personal Characteristics’ as a series of composite constructs thought to reflect individual traits that are predictive of self-regulation (King & Rothstein, 2010). Although agency, self-efficacy, and other control related beliefs have been theoretically acknowledged within the King and Rothstein (2010) model of resiliency, it is argued that the role of LOC has been under-represented in the model. McLarnon and Rothstein (2013) define personal characteristics that promote resiliency as “Individual characteristics and protective factors that provide a sense of agency or personal control; the content of this domain includes self-efficacy, diligence, self-discipline, aspiring for challenging goals, striving to attain goals, and being competent and capable of dealing with challenges.” As a relatively broad domain, the personal characteristics are convenient for coverage of multiple protective factors, but this convenience may come at a cost to the accuracy of predicting subsequent resiliency processes. Further, a review of the items included in the

Workplace Resiliency Inventory (WRI) may not in fact represent LOC, or at least may not do so in isolation of related constructs.

An issue with scales that include broad personality factors, particularly those that aggregate conceptually distinct concepts for grand scores such as the WRI, is that the facets are not fully correlated and may have trait specific variance (Paunonen, Haddock, Forsterling, & Keinonen, 2003). This trait specific variance may in fact be important in predicting behavioural outcomes, for example engagement in the affective, behavioural, and cognitive resiliency processes outlined in the King and Rothstein (2010) model. In broad personality domains, such trait specific variance is sidelined as error in the variance common to the broader factor (Ashton, 1998). From this perspective, broad personality domains limit both the predictive ability and understanding of personality characteristics by loss of specificity (Ashton, Jackson, Paunonen, Helmes, & Rothstein, 1995; Paunonen, Rothstein, & Jackson, 1999). A secondary objective of this study then is to establish incremental variance predicted by LOC over the different components of the WRI to more fully detail the King & Rothstein model. With this in mind, it is expected that:

H2: Locus of Control will explain incremental variance in each Self-Regulation component beyond Personal Characteristics and Organisational Supports and Resources.

Self-regulation is inherently an agentic concept. It stands to reason that for an individual to engage in self-regulation, they must first have some belief that by exercising control over their own affect, cognitions, and behaviors (i.e. internal LOC), they will subsequently exercise a degree of control over their outcomes. Further, individuals with strong external control beliefs may not engage in self-regulation. If externals have a weak belief in the effort-outcome link or perceive little volitional control over achieving desired outcomes, they will not engage in self-

regulation tactics with the goal of restoring equilibrium and achieving positive mental wellbeing. Following this line of logic, it is predicted that:

H₃ Self-regulation will mediate the relationship between LOC, Depression, and Anxiety

- *H_{3a}*: The relationship between LOC and Depression will be mediated by Self-regulation
- *H_{3b}*: The relationship between LOC and Anxiety will be mediated by Self-Regulation

Method

Participants

300 participants for this study were recruited using Amazon Mechanical Turk. Participants were asked to fill out a short demographic questionnaire, the Short Adversity Severity Scale (SASS), the Adult Nowicki-Strickland Internal-External Control Scale (ANSIE), the WRI, The Center for Epidemiology Studies-Depression (CES-D) scale, and the Generalized Anxiety Disorder-7 scale (GAD-7). After removing cases for failing the careless response test and missing data, 284 participants were retained (Male = 183, Female = 100, Other = 1, $M_{age} = 33$) (see appendix G, table 1 for descriptives). Data from a pilot of 84 undergraduate psychology participants was gathered and analysed prior to this study to demonstrate the feasibility and value of a larger study. Initial findings showed significant relationships between LOC, Self-Regulation, and Depression and Anxiety. Based on these results it was decided to continue the study on a larger scale.

Measures

short adversity severity scale.

The Short Adversity Severity Scale (SASS) was used to measure participant's subjective perception of the severity of the adverse event they report as a prime. The SASS consists of 9 items, and was found to have strong internal reliability with a Cronbach's a of .90, and to have sufficient discriminant validity from all facets of the WRI (Halliday, 2018).

adult nowicki-strickland internal external.

The college-form Adult Nowicki-Strickland Internal External (ANSIE) was used to measure participants' LOC. The ANSIE consists of 40 items that are forced-answer yes or no, items are scored 1 or 0, with a higher score indicating external direction. The college form ANSIE is the most widely used measure of LOC (Beretvas et al, 2008). Nowicki and Duke (1974) report split-half reliabilities in the .60s for college ($N = 156$) and community samples ($N = 33$), with a test retest reliability for college subjects over a six-week period to be .83 ($N = 48$). In the same report, two samples of university students ($N = 48$, $N = 68$) were asked to complete the Marlowe-Crowne Social Desirability scale, ANSIE scores were not found to be related to scores from the social desirability measure ($r = .10$, $df = 47$, $r = .06$, $df = 67$).

workplace resiliency inventory.

The WRI (McLarnon & Rothstein, 2013) encompasses an individual's personal characteristics, social support network, initial responses to a significant and life changing event, and self-regulatory processes. In total there are 8 dimensions, including affective, behavioural

and cognitive personal characteristics, social support and resources, initial reactions to the adversity, and affective, behavioural, and cognitive self-regulatory processes, and is composed of 60 items overall. Items are rated on a 1 to 5 Likert scale, ranging from 1-strongly disagree to 5-strongly agree. Cronbach's α for the dimensions ranged from .76 to .96, with no intercorrelations greater than $r = .50$, showing good internal consistency and independence of factors.

center for epidemiological studies-depression.

The CES-D (Radloff, 1977) was used to provide a measure of depression. The CES-D comprises of 20 items, response options range from 1 (rarely or none of the time) to 4 (most or all of the time). The CES-D is one of the most widely used indexes for depression, and typically shows Cronbach's alphas of .80 or above (i.e. Berkman et al, 1986; Ross & Mirowsky, 1986)

generalised anxiety disorder-7.

Anxiety symptoms were measured using the GAD-7 scale (Spitzer, Kroenke, Williams, & Lowe, 2006). The GAD-7 consists of 7 response items that ask for the frequency of experiencing symptoms related to anxiety over the previous two weeks (i.e. "over the last two weeks, how often have you been bothered by feeling nervous, anxious or on edge"). Responses range from 1-not at all to 5-nearly every day. Cronbach's alpha for the GAD-7 found by Spitzer et al (2006) was .92. Test-retest correlation was $r = .83$. Comparison of scores derived from the self-report scales with those gathered from mental health professional administration of the same scales showed similar findings ($ICC_1 = 0.83$), indicating good procedural validity.

Results

Prior to conducting hierarchical analyses, the relevant assumptions were tested. First, a power analysis was performed using MedPower (Kenny, 2018) to estimate the required sample size. A sample size of 250 was deemed adequate given 5 independent variables, a power level of .8, and expected moderate correlations based on what was found in previous studies ($r = .25$) (Fritz & MacKinnon, 2010; Tabachnik & Fidell, 2001). Skew and Kurtosis values for all variables were well within accepted thresholds for normality, residual and scatter plots showed linearity and heteroscedasticity assumptions were met, and no extreme cases were found. No curvilinear effects were found for any of the hypothesised relationships. All independent variables (LOC, Affective, Behavioural, and Cognitive Characteristics, and OSRs) were found to be significantly related to each other (see appendix G, table 2), however this was not deemed an issue as this was expected based on previous literature (King & Rothstein, 2010; Leontopolou, 2006; McLarnon & Rothstein, 2013). Missing data was addressed using list wise deletion, and all regression and mediation analyses were performed with a bootstrap N of 5000. All variables were entered as total scores on their respective measures, not as latent variables. Model fit indices were acquired using the software package MPlus using the default estimation technique of robust maximum likelihood (Muthén & Muthén, 2010).

Table 1: *Descriptives for all Variables*

	<i>M (SD)</i>
Age	33 (10.92)
Experienced Adversity	26.65 (11.21)
Locus of Control	53.83 (5.75)
Affective Characteristics	29.12(5.75)
Behavioural Characteristics	34.37(6.16)
Cognitive Characteristics	26.77 (6.64)
Affective Regulation	17.42(2.82)
Behavioural Regulation	35.16(6.77)
Cognitive Regulation	27.41(7.60)
Depression	43.68(12.19)

Anxiety 14.00(4.96)
 Support & Resources 19.21(4.6)

N = 283

Table 2: Correlations for all Variables

	<u>Experienced Adversity</u>	<u>Locus of Control</u>	<u>Characteristics</u>			<u>Organisational Support and Resources</u>	<u>Self-Regulation</u>			<u>Depression</u>
			<u>Affective</u>	<u>Behavioural</u>	<u>Cognitive</u>		<u>Affective</u>	<u>Behavioural</u>	<u>Cognitive</u>	
Experienced Adversity (SASS Total Score)	1									
Locus of Control (ANSIE Total Score)	-0.326**	1								
Affective Characteristics	0.120*	0.347**	1							
Behavioural Characteristics	-0.056	0.420**	0.341**	1						
Cognitive Characteristics	-0.139*	0.443**	0.266**	0.485**	1					
Organisational Support and Resources	-0.147*	0.251**	0.144*	0.417**	0.228**	1				
Affective Regulation	.107	0.396**	0.224**	0.354**	0.300**	0.089	1			
Behavioural Regulation	.092	0.363**	0.443**	0.574**	0.371**	0.341**	0.402**	1		
Cognitive Regulation	.149*	0.479**	0.558**	0.499**	0.459**	0.222	0.261**	0.682**	1	
Depression	-0.210**	0.477**	-0.500**	-0.403**	-0.312**	-0.327**	-0.266**	-0.542**	-0.642**	1
Anxiety	-0.271**	0.449**	-0.488**	-0.285**	-0.299**	-0.239**	-0.143**	-0.438*	-0.581**	0.734**

N = 283, * significant at $p = <.05$, ** significant at $p = <.001$

The internal consistency reliabilities are presented in Table 3. The reliabilities for most of the variables used in this study were found to be acceptable according to the guidelines discussed by George and Mallery (2003), with internal consistency alpha coefficients less than .60 being considered dubious. Most of the scales used in this study had acceptable levels of internal consistency. Two facets of the WRI were found to have poor Cronbach’s a: affective characteristics ($\alpha = .59$), and affective self-regulation ($\alpha = .44$), which are below the minimally acceptable threshold (George and Mallery, 2003). Previous studies using these two facets had

found Cronbach's α scores between .8 and .9 (McLarnon & Rothstein, 2013; Halliday, 2018). An exploration of item loadings and effect on Cronbach's α suggests that in this study, the negatively and positively keyed items did not load on single factors for affective characteristics and self-regulation. This may have had an impact on analyses, including lowering correlation and regression coefficients. To further assess the reliability of the scales used in this study, a CFA was conducted to retrieve model fit indices. The model was found to have overall acceptable fit, however the CFI score was below the conventionally acceptable threshold of .7 ($X^2(4145) = 10058.36, p = <.05, RMSEA = .071, CI: .069, .073, CFI = .495, SRMR = .127$) (Awang, 2012; Hair et al. 2010).

Table 3: *Model Fit Indices for CFA and Mediation*

	<u>X^2</u>	<u>RMSEA</u>	<u>CFI/TLI</u>	<u>SRMR</u>	<u>α</u>
CFA	10058.34	.071 CI: .069, .073**	.495, .479	.127	
Depression Model	209.1**	.493 CI: .437, .550**	.373, -1.09	0.245	
Anxiety Model	209.09**	.493 CI: .437, .550**	.346, -1.18	0.241	
Subjective Adversity Severity Scale					.91
Adult Nowicki-Strickland Internal External					.79
Personal Characteristics- Affective					.59
Personal Characteristics- Behavioural					.80
Personal Characteristics- Cognitive					.82
Organisational Support and Resources					.89
Self-Regulatory Process- Affective					.44
Self-Regulatory Process- Behavioural					.71
Self-Regulatory Process- Cognitive					.80
Center for Epidemiological Studies-Depression					.92
Generalized Anxiety Disorder-7					.89

$N = 283$, * significant at $p = <.05$, ** significant at $p = <.001$

A means comparison analysis was performed to find any significant differences in the variables as a result of gender. No significant differences in means were found, and the η^2 values were all below .15 suggesting respondents did not differ in their response based on gender. A similar analysis was performed with age. Respondents were grouped in 10-year categories (i.e. 18-28, 29-39...62+), no significant mean differences were found, and all η^2 were below .10

Correlation and regression analyses provided support for H_1 (see table 2) LOC was found to be moderately correlated with all three components of self-regulation: affective ($r = -.396, p = < .001$), behavioural ($r = -.363, p = < .001$), and cognitive ($r = -.479, p = < .001$). LOC was also found to be significantly correlated with depression ($r = .477, p = < .001$) and anxiety ($r = .449, p = < .001$) as well. All correlations were in the direction hypothesised. Individuals that reported high internal LOC also reported engaging in more self-regulation following an adverse event, and reported less depression and anxiety symptoms two weeks after the event. Scatter plot graphs indicated the direction was as expected; internal LOC predicted greater engagement with self-regulation. H_1 was supported.

A 3-stage hierarchical regression was performed for each self-regulatory category. The personal characteristics (affective, behavioural, cognitive) were entered first, followed by organisational support and resources to control for participants' social support network. LOC was added in stage 3. The variables were entered in this order to establish incremental variance prediction for LOC. Intercorrelations between the variables are reported in appendix G, table 2, and the regression coefficients in appendix H, table 5 to 7. The hierarchical multiple regression revealed that when entered in stage 3, LOC contributed significantly to the incremental variance explained in the affective and cognitive regression models, but not the behavioural regression model.

For affective self-regulation (appendix H, table 5), the personal characteristics accounted for 15.3% of the variance ($F(3,278) = 52.41, p = <.001$). Introducing the OSRs did not significantly add to the model ($F(4,277) = 12.976, p = <.001$) and did not significantly change the R^2 . Adding LOC to the model did have a significant R^2 change ($F(5,276) = 15.012, p = <.001$). LOC accounted for 6.1% of the variance after controlling for personal characteristics and OSRs ($F(1, 281) = 19.48, p = <.001$) (see table 3). Together, the five variables predicted 21.5% of the variance in affective self-regulation.

Table 4: *Affective Self-Regulation Hierarchical Regression Summary*

	<i>b</i>	<i>t</i>	<i>R</i>	<i>R</i> ² (<i>R</i> ² change)	<i>Adjusted R</i> ²	<i>F</i> (<i>F</i> change)
Step 1			0.391	.153(.153)	0.144	23.492(15.767)**
Affective Characteristics	.101	1.712				
Behavioural Characteristics	.244**	3.745**				
Cognitive Characteristics	.151*	2.378*				
Step 2			0.397	0.158(.005)	0.146	12.976 (1.510)
Affective Characteristics	0.101	1.710				
Behavioural Characteristics	0.274**	3.941**				
Cognitive Characteristics	0.154*	2.420*				
OSRs	-.075	-1.229				
Step 3			0.462	.214(.056)	0.200	15.012(19.660)**
Affective Characteristics	0.045	.776				
Behavioural Characteristics	0.223*	3.266*				
Cognitive Characteristics	0.073	1.143				
OSRs	-.097	-1.652				
Locus of Control	-0.281**	4.434**				

$N = 283$, * significant at $p = <.05$, ** significant at $p = <.001$

For behavioural self-regulation (see table 5), step 1 accounted for 40.3% of the variance ($F(3,278) = 62.482, p = <.001$). Introducing the OSRs explained an additional 1.2% of the variance ($F(4,277) = 49.079, p = <.05$). Adding LOC to the model did not have a significant R^2 change (see table 5). Together, the five variables predicted 41.7% of the variance in behavioural self-regulation.

Table 5: Behavioral Self-Regulation Hierarchical Regression Summary

	<i>b</i>	<i>t</i>	<i>R</i>	<u>R^2(R^2 change)</u>	<u>Adjusted R^2</u>	<u>F(F change)</u>
Step 1			0.635	0.403(.403)	0.396	62.482(62.482)**
Affective Characteristics	0.270**	5.444**				
Behavioural Characteristics	.439**	8.027**				
Cognitive Characteristics	.085	1.598				
Step 2			0.644	.415(.012)	0.406	49.079(5.699)*
Affective Characteristics	0.271**	5.495**				
Behavioural Characteristics	0.391**	6.744**				
Cognitive Characteristics	0.081	1.530				
OSRs	.121*	2.387*				
Step 3			0.646	.417(.002)	0.406	39.478(1.045)
Affective Characteristics	0.260**	5.149**				
Behavioural Characteristics	.381**	6.476**				
Cognitive Characteristics	0.065	1.179				
OSRs	.116*	2.289*				
Locus of Control	-.056	-1.022				

$N = 283$, * significant at $p = <.05$, ** significant at $p = <.001$

For cognitive self-regulation (see table 6), step 1 accounted for 45.8% of the variance ($F(3,278) = 78.434, p = <.001$). Introducing the OSRs did not significantly add to the model and did not significantly change the R^2 . Adding LOC to the model did have a significant R^2 change

($F(5,276) = 51.573, p = <.001$). LOC accounted for 2.5% of the variance after controlling for personal characteristics and (see table 6). Together, the five variables predicted 48.3% of the variance in cognitive self-regulation.

Table 6: *Cognitive Self-Regulation Hierarchical Regression Summary*

	<i>b</i>	<i>t</i>	<i>R</i>	<i>R</i> ² (<i>R</i> ² change)	<i>Adjusted</i> <i>R</i> ²	<i>F</i> (<i>F</i> change)
Step 1			.677	.458(.458)	.453	78.434(78.434)**
Affective						
Characteristics	0.416**	8.784**				
Behavioural						
Characteristics	.246**	4.714**				
Cognitive						
Characteristics	.227**	4.471**				
Step 2			0.677	.458(.000)	0.451	58.631(0.037)
Affective						
Characteristics	0.416**	8.770**				
Behavioural						
Characteristics	0.242**	4.339**				
Cognitive						
Characteristics	.227**	4.454**				
OSRs	.009	.193				
Step 3			0.695	.483(.025)	0.474	51.573(13.099)**
Affective						
Characteristics	0.379**	7.796**				
Behavioural						
Characteristics	.208**	7.760**				
Cognitive						
Characteristics	.174**	3.340**				
OSRs	-.006	-.120				
Locus of		-				
Control	-.186**	3.619**				

$N = 283$, * significant at $p = <.05$, ** significant at $p = <.001$

Although not part of the hypothesis, 4 step regression analyses were also performed on the outcome variables depression and anxiety to further explore the relationship between the variables. LOC was also found to be a significant predictor of both outcome variables, depression ($b = .184, p = <.05$) and anxiety ($b = .236, p = <.001$) in step 4, after accounting for

the personal characteristics, OSRs, and self-regulation processes. The results are reported in tables 10 and 11.

A second set of hierarchical analyses were performed reversing the order of entry such that LOC was entered first, followed by the OSRs, and the Personal Characteristics (see tables 9 to 11). The results showed that LOC continued to be significantly predictive in entry 3 (LOC, OSR, and personal characteristics) for both affective ($b = -.281, p = <.001$) and cognitive ($b = -.189, p = <.001$), but still was not predictive of behavioural self-regulation ($b = -.056, ns$). In regard to depression and anxiety, LOC continued to be a significant predictor in step 4 of the reverse ordered hierarchical regressions as well: depression ($b = .184, p = <.05$), anxiety ($b = .236, p = <.001$).

For affective self-regulation, LOC accounted for 15.9% of the variance ($F(1,280) = 53.04, p = <.001$) (see table 7). Introducing the OSRs did not significantly add to the model ($F(2,279) = 26.45, ns$) and did not significantly change the R^2 . Adding the personal characteristics to the model did have a significant R^2 change of ($F(5,276) = 15.012, p = <.001$). The personal characteristics accounted for an additional 5.4% of the variance after controlling for LOC and the OSRs. Together, the five variables predicted 21.5% of the variance in affective self-regulation.

Table 7: *Affective Self-Regulation Hierarchical Regression Summary (Reverse Ordered)*

	<i>b</i>	<i>t</i>	<i>R</i>	<i>R²(R² change)</i>	<i>Adjusted R²</i>	<i>F(F change)</i>
<i>Step 1</i>			0.399	.159(.156)	0.156	53.037(53.037)**
<i>Locus of Control</i>	-.399**	7.283**				
<i>Step 2</i>			0.399	0.159(.000)	0.153	26.448 (.041)
<i>Locus of Control</i>	-.402**	7.089**				
<i>OSRs</i>	-.011	-.202				
<i>Step 3</i>			0.462	.214(.054)	0.200	15.012(6.370)**

<i>Locus of Control</i>		-
	-.281**	4.434**
<i>OSRs</i>	-.097	-1.652
<i>Affective Characteristics</i>	0.045	.776
<i>Behavioural Characteristics</i>	.223**	3.266**
<i>Cognitive Characteristics</i>	0.073	1.143

N = 283, * significant at $p = <.05$, ** significant at $p = <.001$

For behavioural self-regulation, LOC accounted for 13.3% of the variance ($F(1,280) = 42.83, p = <.001$) (see table 8). Introducing the OSRs explained an additional 7% of the variance ($F(2,279) = 34.726, p = <.001$). Adding the personal characteristics to the model had a significant R^2 change of .218 ($F(5,276) = 39.478, p = >.001$), explaining an additional 21.8% of the variance. Together, the five variables predicted 41.7% of the variance in behavioural self-regulation.

Table 8: *Behavioural Self-Regulation Hierarchical Regression Summary (Reverse Ordered)*

	<i>b</i>	<i>t</i>	<i>R</i>	<u>R^2 (R^2 change)</u>	<u>Adjusted R^2</u>	<i>F</i> (<i>F</i> change)
<i>Step 1</i>			0.364	.133(.133)	0.130	42.834(42.834)**
<i>Locus of Control</i>	-.364**	6.545**				
<i>Step 2</i>			0.446	0.199(.067)	0.194	34.726 (23.22)**
<i>Locus of Control</i>	-.297**	5.375**				
<i>OSRs</i>	.267**	4.819**				
<i>Step 3</i>			0.646	.417(.218)	0.406	39.478(34.345)**
<i>Locus of Control</i>	-.056	-1.022				
<i>OSRs</i>	.116*	2.289*				
<i>Affective Characteristics</i>	0.260**	5,149**				
<i>Behavioural Characteristics</i>	.381	6.476**				
<i>Cognitive Characteristics</i>	0.065	1.179				

N = 283, * significant at $p = <.05$, ** significant at $p = <.001$

For cognitive self-regulation, LOC accounted for 23.1% of the variance ($F(1,280) = 42.834, p = <.001$) (see table 9). Introducing the OSRs significantly added to the model and significantly changed the R^2 ($F(2,279) = 44.624, p = <.05$). Adding the personal characteristics to the model also had a significant R^2 change ($F(5,276) = 51.573, p = <.001$). The personal characteristics accounted for an additional 24% of the variance after controlling for personal characteristics and (see table 5). Together, the five variables predicted 48.3% of the variance in cognitive self-regulation.

Table 9: *Cognitive Self-Regulation Hierarchical Regression Summary (Reverse Ordered)*

	<i>b</i>	<i>t</i>	<i>R</i>	<i>R</i> ² (<i>R</i> ² change)	<i>Adjusted R</i> ²	<i>F</i> (<i>F</i> change)
<i>Step 1</i>			0.481	.231(.231)	0.229	42.834(42.834)**
<i>Locus of Control</i>	-.481**	8.435**				
<i>Step 2</i>			0.492	0.199(.011)	0.237	44.624 (4.023)*
<i>Locus of Control</i>	-.454**	8.435**				
<i>OSRs</i>	.108*	2.006*				
<i>Step 3</i>			0.695	.483(.241)	0.474	51.573(42.826)**
<i>Locus of Control</i>	-.186**	3.619**				
<i>OSRs</i>	-.006	-.120				
<i>Affective Characteristics</i>	0.379**	7.976**				
<i>Behavioural Characteristics</i>	.208**	3.760**				
<i>Cognitive Characteristics</i>	0.174**	3.340**				

$N = 283$, * significant at $p = <.05$, ** significant at $p = <.001$

In terms of the outcome variables depression and anxiety, a second set of hierarchical analyses were also performed to ensure order effects did not significantly affect the results. For the reversed ordered regressions, LOC was entered first, followed by the self-regulation components, then the OSRs, and lastly the personal characteristics. LOC continued to explain

incremental variance after controlling for the personal characteristics, organisational supports and resources, and the self-regulatory mechanisms.

For depression, step 1 accounted for 32% of the variance ($F(3,278) = 43.274, p = <.001$). Adding OSRs led to an R^2 change of .029 ($F(4,277) = 36.922, p = <.001$). The addition of affective, behavioural, and cognitive self-regulation had an R^2 change of .139 ($F(7, 274) = 37.094, p = <.001$). Finally, LOC had an R^2 change of .021 and predicted 2.1% of the variance in depression scores (see table 6) beyond the other IVs combined ($F(8, 273) = 35.167, p = <.05$). Together, the five variables predicted 50.8% of the variance in depression scores.

Table 10: *Depression Hierarchical Regression Summary*

	<i>b</i>	<i>t</i>	<i>R</i>	<i>R</i> ² (<i>R</i> ² change)	<i>Adjusted R</i> ²	<i>F</i> (<i>F</i> change)
Step 1			0.481	.231(.231)	0.229	84.316(84.31)**
		-				
Locus of Control	-.364**	6.545**				
Step 2			0.446	0.199(.067)	0.194	34.726 (23.22)**
		-				
Locus of Control	-.297**	5.375**				
OSRs	.267**	4.819**				
Step 3			0.646	.417(.218)	0.406	39.478(34.345)**
Locus of Control	-.056	-1.022				
OSRs	.116*	2.289*				
Affective Characteristics	0.260**	5,149**				
Behavioural Characteristics	.381	6.476**				
Cognitive Characteristics	0.065	1.179				
		-				
OSRs	-.179**	3.691**				
Affective Self-Regulation	-.073	-1.498				
Behavioural Self-Regulation	-.090	-1.343				
Cognitive Self-Regulation	-.441**	6.521**				
Step 4			.712	.508(.021)	.493	35.167(11.614)**

Affective Characteristics	-.170*	-3.268*
Behavioural Characteristics	.037	.631
Cognitive Characteristics	.059	1.134
OSRs	-.158*	-3.283*
Affective Self-Regulation	-.025	-.496
Behavioural Self-Regulation	-.118	-1.786
Cognitive Self-Regulation	-.383**	5.558**
Locus of Control	.184*	3.408*

N = 283, * significant at $p < .05$, ** significant at $p < .001$

Table 11: *Depression Hierarchical Regression Summary (Reverse Ordered)*

	<i>b</i>	<i>t</i>	<i>R</i>	<i>R</i> ² (<i>R</i> ² change)	<i>Adjusted R</i> ²	<i>F</i> (<i>F</i> change)
Step 1			.478	.228(.228)	.225	82.732(82.73)**
Locus of Control	.478**	9.096**				
Step 2			0.683	.467(.239)	0.459	84.316(84.31)**
Locus of Control	.210**	3.956**				
Affective Self-Regulation	-.003	-.053				
Behavioural Self-Regulation	-.179*	-2.825*				
Cognitive Self-Regulation	-.419**	-6.518				
Step 3			0.696	.484(.017)	0.475	51.803 (9.075)**
Locus of Control	.180*	3.378*				
Affective Self-Regulation	-.020	-.398				
Behavioural Self-Regulation	-.123	-1.898				
Cognitive Self-Regulation	-.436**	6.845**				
OSRs	-.141*	-3.012*				
Step 4			0.712	.508(.023)	0.493	35.167(4.322)**
Locus of Control	.184*	3.408*				
Affective Self-Regulation	-.025	-.496				

Behavioural Self-Regulation	-.118	-1.786
Cognitive Self-Regulation	-.383**	5.588**
OSRs	-.158*	-3.283*
Affective Characteristics	-.170*	-3.268*
Behavioural Characteristics	.037	.631
Cognitive Characteristics	.059	1.134

$N = 283$, * significant at $p = <.05$, ** significant at $p = <.001$

For anxiety, step 1 accounted for 27.2% of the variance ($F(3,278) = 34.611, p = <.001$). Adding OSRs led to an R^2 change of .016 ($F(4,277) = 28.038, p = <.05$). The addition of affective, behavioural, and cognitive self-regulation had an R^2 change of .108 ($F(7, 274) = 25.690, p = <.001$). Finally, LOC had an R^2 change of .034 and predicted 3.4% of incremental variance in depression scores (see table 7) beyond the other IVs combined ($F(8, 273) = 25.813, p = <.001$). Together, the five variables predicted 43.1% of the variance in anxiety scores.

Table 12: *Anxiety Hierarchical Regression Summary*

	<u>b</u>	<u>t</u>	<u>R</u>	<u>R²(R² change)</u>	<u>Adjusted R²</u>	<u>F(F change)</u>
Step 1			.521	.272(.272)	.264	34.611(34.611)**
Affective Characteristics	-.425**	7.748**				
Behavioural Characteristics	-.065	-1.080				
Cognitive Characteristics	-.154*	-2.609*				
Step 2			0.537	.288(.016)	.278	28.038(6.329)*
Affective Characteristics	-0.425**	.4209**				
Behavioural Characteristics	-0.105	1.631*				
Cognitive Characteristics	-.055	-.972				
OSRs	-.127*	.2.410*				

Step 3			0.629	.396(.108)	0.381	25.690(16.346)**
Affective Characteristics	-.241**	4.209**				
Behavioural Characteristics	.105	1.631				
Cognitive Characteristics	-.055	-.972				
OSRs	-.127*	-2.410*				
Affective Self-Regulation	.032	.607				
Behavioural Self-Regulation	-.059	-.813				
Cognitive Self-Regulation	-.414**	5.546**				
Step 4			.656	.431(.034)	.414	25.813(16.501)**
Affective Characteristics	-.221**	3.967**				
Behavioural Characteristics	.127*	2.017*				
Cognitive Characteristics	-.011	-.200				
OSRs	-.100*	1.925*				
Affective Self-Regulation	.094	1.752				
Behavioural Self-Regulation	-.095	-1.339				
Cognitive Self-Regulation	-.339**	4.609**				
Locus of Control	.236**	4.062**				

N = 283, * significant at *p* = <.05, ** significant at *p* = <.001

Table 13: Anxiety Hierarchical Regression Summary (Reverse Ordered)

	<i>b</i>	<i>t</i>	<i>R</i>	<i>R</i> ² (<i>R</i> ² change)	Adjusted <i>R</i> ²	<i>F</i> (<i>F</i> change)
Step 1			.449	.202(.202)	.199	70.831(70.83)**
Locus of Control	.449**	8.416**				
Step 2			0.622	.386(.185)	0.459	43.617 (27.77)**
Locus of Control	.254**	4.474**				
Affective Self-Regulation	-.108*	-1.990*				
Behavioural Self-Regulation	-.106	-1.566				

Cognitive Self-Regulation	-			
Step 3	-.414**	6.000**		
Locus of Control	.240**	4.155**	0.625 .390(.004)	0.379 35.331 (1.727)
Affective Self-Regulation	.100	1.829		
Behavioural Self-Regulation	-.080	-1.133		
Cognitive Self-Regulation	-.422**	6.098**		
OSRs	-.067	1.314*		
Step 4			0.656 .431(.040)	0.431 25.813(6.457)**
Locus of Control	.236**	4.062**		
Affective Self-Regulation	.094	1.752		
Behavioural Self-Regulation	-.095	-1.339		
Cognitive Self-Regulation	-.339**	4.609**		
OSRs	-.100	-1.925		
Affective Characteristics	-.221**	-3.967*		
Behavioural Characteristics	-.127*	.2.017*		
Cognitive Characteristics	-.011	-.200		

$N = 283$, * significant at $p = <.05$, ** significant at $p = <.001$

In sum, it was found that LOC predicted significant variance over and above the personal characteristics and OSRs in both affective and cognitive self-regulation, but not behavioural, H_2 was partially supported. On its own, LOC was found to significantly predict each component of self regulation, as well as both depression and anxiety. The results suggest the possibility of a causal-outcome relationship partially-mediated via self-regulation, meaning it was deemed acceptable to move on to H^3 .

For H_3 , two mediation analyses were performed to assess the mediation effect of self-regulation between LOC, depression, and anxiety. The fit indices did not show good model fit for both the depression and anxiety mediation models, so the results should be interpreted with

caution (see table 4). That said, the results indicated that LOC was a significant predictor of all three self-regulation variables: affective ($b = -.202, SE = 1.51, p < .001$), behavioural ($b = -.444, SE = .068, p < .001$) and cognitive ($b = -.660, SE = 3.91, p < .001$). Both behavioural and cognitive self-regulation were found to significantly predict depression (see figure 2): behavioural ($b = -.324, SE = .114, p < .005$), cognitive ($b = -.667, SE = .102, p < .001$) as well as anxiety (see figure 3): behavioural ($b = -.078, SE = .050, p < .05$), cognitive ($b = -.270, SE = .045, p < .001$). Affective self-regulation was not found to significantly predict either depression or anxiety.

Figure 2: *Mediation Model for Depression*

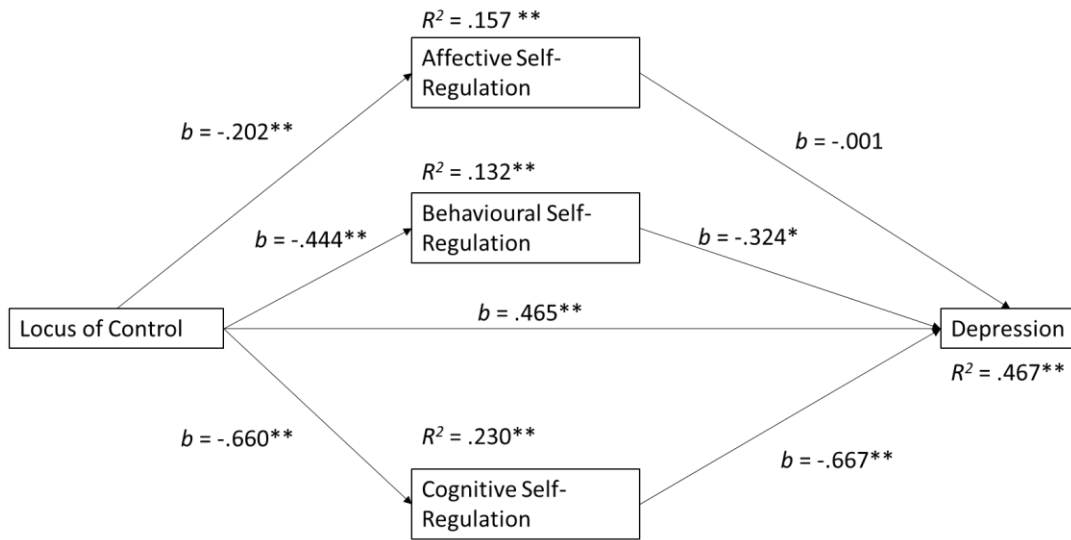
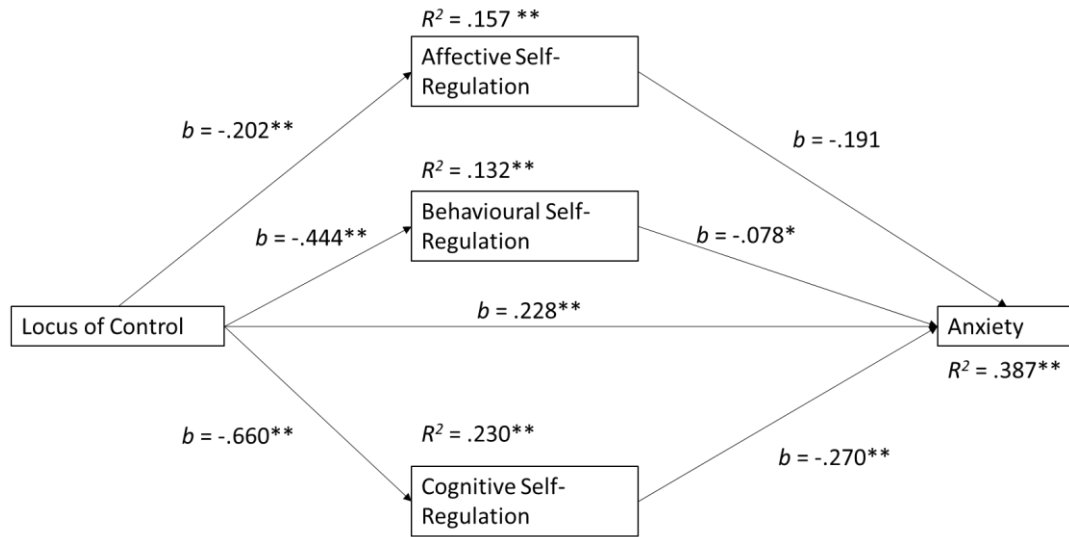


Figure 3: *Mediation Model for Anxiety*



In addition to the mediation analyses, the direct effects of LOC on the outcome variables are reported. In terms of depression, a significant direct effect between LOC and depression was found ($b = .465, SE = .116, 95\% CI = .237, .693, p < .001$), supporting a partial mediation model. The indirect effect was tested using a bootstrap estimation approach with 5000 samples (Preacher & Hayes, 2004). The results indicated the indirect effect was significant for behavioural and cognitive self-regulation, but not affective: Affective ($b = -.000, SE = .048, 95\% CI = -.092, .098$), behavioural ($b = .144, se = .061, 95\% CI = .042, .280, p < .001$), cognitive ($b = .440, SE = .087, 95\% CI = .278, .614, p < .001$) H_{3a} was partially supported.

For anxiety, a significant direct effect between LOC and anxiety was also found ($b = .228, SE = .051, 95\% CI = .123, .328, p < .001$), supporting a partial mediation model. The results for the anxiety mediation model supported a significant indirect effect for cognitive self-regulation only, however both affective and behavioural were near significance: affective ($b = -.386, SE = .021, CI = -.082, .003$), behavioural ($b = .035, SE = .026, CI = -.016, .089$), cognitive ($b = .178, SE = .040, CI = .104, .261, p < .001$). H_{3b} was partially supported.

Discussion

This study examined the influence of LOC on depression and anxiety outcomes through the mediating role of self-regulation. As expected, a high internal LOC predicted more engagement in self-regulatory processes following an adverse event (King & Rothstein, 2010; McLarnon & Rothstein, 2013; Schaffer et al, 2010). There is a general trend in the literature that those with a high internal LOC are more likely to expend effort and resources towards recovery from adversity (Arslan, 2009; Leontopolou, 2006; Schaffer et al, 2010) as they are more likely to believe in the reward-effort link, and to perceive a degree of control over life outcomes. (Ng et al, 2006; Rotter, 1992). A high internal LOC is also strongly associated with other constructs that predict engagement in self-regulation, such as Self-efficacy (Phillips & Gully, 1997), setting more challenging goals (Sitzmann & Ely, 2010), and persistence (Zimmerman, 2008).

One of the contributions of this study is to add to the relative lack of empirical support linking LOC and self-regulation. Although the link between LOC and self-regulation has received much theorising (i.e. Bandura, 1977; Ajzin, 1985; Zimmerman, 2008), the empirical evidence of this relationship is limited. Of what data is available, the direction and strength of the relationship between LOC and self-regulation found in this study is consistent with the literature (i.e. Caggiula & Watson, 1992; Scoffer et al, 2010; Toushi & Ganazedah, 2015). On this basis, it is reasonable to conclude that LOC is a significant predictor of self-regulation.

A potential downside of using broad, composite variables such as the Personal characteristics found within the WRI is that there is an inevitable loss of trait-specific variance when predicting outcome variables. Although convenient, composite variables may not adequately capture the same degree of variance that a series of narrow trait measures might. In this study significant variance was accounted for by LOC in affective and cognitive regulation, even after controlling for the personal characteristics and external supports. In the case of

affective regulation, LOC accounted for a large percentage of the overall variance. Surprisingly, the affective characteristics facet was not found to significantly predict affective regulation, and when LOC was entered into the hierarchical regression model, cognitive characteristics stopped being a significant predictor as well. This may indicate an issue with the relationship between the two facets. Although the affective personal characteristics tend to reflect emotional volatility, the affective regulation component seems to reflect the individual's ability to separate emotionality from decision making processes.

Although there is clearly some spill over as indicated by the moderate correlation between affective personal characteristics and affective self-regulation, there may be a disconnect between the focus on emotionality and rational decision processes. For example, an individual may be highly emotional, yet still able to separate their emotionality from reasoning. This may also be why LOC contributed so highly to affective self-regulation. High internals that perceive greater control over their emotionality should also be able to exercise some degree of control in separating it from decision making. The effects of emotional self-regulation on decision making are well known (i.e. Heilman, Crisan, & Houser, 2010; Lowenstein, 2000; Zimmerman, 2008), and an internal LOC may promote emotional (affective) regulation by promoting an individual's intention and capacity to exert control over emotional states.

Although many studies and measures of resilience and related constructs have assumed the importance of control beliefs in predicting and/or constituting resilience, few studies have explored in depth how exactly this relationship works. On a similar note, the association of high internal LOC and many mental health outcomes have been established, yet the mediating mechanisms between have not received as much attention. It was found here that both behavioural and cognitive self-regulation were significant mediators between LOC, and

depression and anxiety. Although LOC was a significant predictor of affective self-regulation, affective regulation was not a significant predictor of either depression or anxiety scores; however, the relationship was nearly significant and trending towards predicting lower scores on both depression and anxiety. This may be due to theoretical and measurement overlap with the other self-regulation components. Emotional (affective) regulation is difficult to separate from cognitive self-regulation, and that this may lead to some loss in variance explained. It is also important to note that King and Rothstein (2010) argue that the different forms of self-regulation are likely not independent from each other, and that individuals use the self-regulation skills they have interchangeably. For example, if an individual is lacking in affective regulation skills, they may instead reframe the issue to be less upsetting (cognitive regulation) or remove themselves from the stressful environment (behavioural regulation).

Previous research found that a high internal LOC predicted problem-focused coping styles, which in turn predicted better mental health outcomes (Leontopolou, 2006), and that individuals with a high internal LOC tend to actively seek out situations where problems are within their control, where they perceive a link between their level of effort and goal attainment, and to actively confront stressful events as problems to be solved, rather than take avoidant approaches to coping (Lefcourt, 2014; Phares, 1978; Rotter, 1966; Zimmerman, 2008). All this suggests self-regulation in terms of affect, behaviour, and cognition is a considerable factor to reaching the goal of returning to equilibrium following adversity. Although previous research has found a significant mediation effect of LOC, self-regulation, and anorexia nervosa (e.g. Scoffer et al 2010), research on this relationship has been limited. This study contributes to the empirical support for LOC having an indirect effect on mental wellbeing through self-regulation.

Further, it lends support to the theory that self-regulation is a large contributor to mental wellbeing (King & Rothstein, 2010).

This study has limitations that need to be taken into account. First, the data was self-reported, which suggests that social desirability may have been a bias. Another possible limitation of this study is its conceptualisation of LOC as an internal-external continuum. Recent literature (e.g. Paquet, 2009; Paquet, Berjot, & Gillett, 2009) argue that LOC is in fact more nuanced than a unidimensional continuum. Particularly on the external end, LOC may be subdivided into belief in chance, belief in hostile powerful others, and belief in beneficial powerful others as the main loci of control in an individual's life, with differing outcomes for each. Further subdivision of external LOC may lead to better and more focused predictive ability in specific situations. In addition, the study used correlational methods, which may limit the predictive ability of the relationships demonstrated between the variables. That said however, the majority of the instruments used (i.e. SASS, GAD-7, WRI, etc.) were deliberately chosen as non-sample or situationally specific, and all variables included were general cross-domain constructs. Rotter (1966) pointed out in the introductory article for LOC that a unidimensional scale was most appropriate broad behavioural outcomes, such as a general inclination towards self-regulation, regardless of specific situations. For example, Ng. et al (2006) found that work-specific measures of LOC did not significantly predict variance incrementally over generalised measures, and the same was found for academic specific measures (Kalechstein & Nowicki, 1997). Another possible limitation of this study was the mediocre reliability of the affective personal characteristics and self -regulation components of the WRI. Although these facets have received strong support for their reliability in other studies (McLarnon & Rothstein, 2013; 2018).

Future research on the link between LOC and self-regulation may benefit from the use of behavioural reports of instances of self-regulation. LOC is a trait that effects how much control individuals perceive over outcomes, and therefore those with high internal LOC may perceive themselves as being better at self-regulation than they actually are. One potential method would be to use diary studies to record instances of self-regulation. This would also address a second issue; that resiliency is a process enacted over long periods of time. A single time frame study, such as the one used here, may not encapsulate all the nuances of that process, and may be subject to issues such as the different ways an individual may frame an adverse event and their response at different time points or the effects of cognitive resource exhaustion on self-regulation immediately following an adverse event.

A second avenue of potential future research should aim to replicate the results with a larger sample. Although moderate significant effects were found throughout the mediation model presented here, to explore the potential for a better fitting model in future studies, a separate moderated mediation analysis which sought to test the full King & Rothstein model of resilience was performed aside from the results presented here. The only significant moderation effect was on the experienced adversity-affective regulation relationship, however there was indication it was a better fitting model. This may have been due to an issue of low power for a model with a large number of parameters. Further work of any kind is certainly needed both to replicate the LOC and self-regulation findings, as well as to further delve into the complexities of the resiliency model. For instance, the personal characteristics components of the WRI are developed as composites to broadly reflect a host of traits that predict self-regulation. It would be interesting to explore which traits, for example neuroticism, conscientiousness, or self-efficacy, are responsible for variance in self-regulation.

Despite being a narrow trait, LOC out predicted each of the personal characteristics in the depression and anxiety hierarchical regressions, as well as affective regulation. Further, the regression analyses showed that the characteristics-self-regulation pairs (i.e. affective-affective, behavioural-behavioural, cognitive-cognitive) were not necessarily independent of each other. This finding replicated others in the past using the King & Rothstein model. There have been a few suggested explanations for this, including that people use the different forms of self-regulation interchangeably, depending on their strengths and weaknesses. For example, someone who is ineffective at regulating their emotions may instead regulate cognition that elicits negative emotions, or reframe stressful events in a way to mitigate their emotional effect. Further exploration of these possible explanations may be a fruitful path for future research. In particular, affective characteristics were not a significant predictor of affective self-regulation, and both behavioural and cognitive characteristics explained more variance. Affective characteristics did however explain a large portion of the variance in behavioural and cognitive self-regulation, more so than cognitive in the latter. All of this suggests that although the idea personal traits should moderate the relationship between experienced adversity and self-regulation is intuitive, how this is manifested in terms of which constructs are important, and the item structure of the WRI may need to be more closely examined.

The lack of significant relationships between experienced adversity and each self-regulation component may indicate that although theoretically some form of initial event that creates disequilibrium is necessary for the recovery process to begin, the severity of the adversity may not matter to how intensely individuals engage in the self-regulation of recovery. Within the King and Rothstein model of resiliency, LOC falls under the personal characteristics that moderate the relationship between an adverse event, and subsequent self-regulation processes

intended to restore equilibrium. As follow up to this study, a moderated mediation analysis was performed to assess the moderating effect of LOC on the relationship between experienced adversity and self-regulation. The only significant effect found however was between experienced adversity and affective regulation. As noted above the severity of adversity experienced did not significantly predict engagement in self-regulation, and this moderating effect may actually reflect the effect of LOC on affective regulation.

In light of the mediation model, where both behavioural and cognitive self-regulation significantly mediated the relationship between LOC and depression and anxiety; One possible explanation for these results is that although self-regulation may be triggered by disequilibrium, the severity of disequilibrium does not itself effect the amount of self-regulation engaged in nearly so much as related traits of the individual like LOC. This is reflected in the correlations as well. Cognitive self-regulation was the only self-regulatory process found to be significantly related to experienced adversity, and the correlation was small. Alternatively, it is possible that a highly stressful event may overwhelm the individual and exhaust cognitive resources required to successfully engage in self-regulation. Future studies may uncover a nonlinear effect that by nature of eliciting low self-regulation on both the high and low extremes of severity, effectively balance each other out and obscure a significant relationship.

The use of LOC and self-regulation of recovery as concurrent variables may be useful to clinical practitioners in their work with patients. For instance, these findings may indicate that promoting an internal LOC will predict more problem-focused coping styles. This could be especially effective in a goal-driven program of recovery where individuals are largely responsible for planning and self-regulating their own progress towards recovery. In a more proactive sense, these results also highlight the protective factor role of a high internal LOC on

subclinical rates of depression and anxiety. This may have implications for mitigating the effects of everyday stress and harmful outcomes such as experiencing burnout, incivility, and other stress related issues both in and outside the workplace.

In a workplace context, the results of this study may indicate the value of identifying the LOC, preferred coping style, and self-regulatory skills of employees experiencing stress-related illness. Promoting an internal LOC and self-regulatory skills has been a part of many stress management interventions in the workplace, and a healthy, rational LOC has been an important part of many cognitive-behavioural interventions, as its part of the cognitive reframing process wherein people are encouraged to identify the ways in which they are in control of or can at least influence stressors, or to let go of stressful events outside of their control. For example, in stress inoculation training (Michenbaum, 1988), a program of intervention for preparing for and responding to stressors encountered in the workplace, a major component is identifying preferred coping styles for different people in different situations. The results of this study could contribute to this program in a few ways. First, identifying an individual's perceived LOC is likely to help in identifying which coping styles they prefer and why. Problem focused, emotional focused, and help seeking coping styles all require a degree of self-regulation. Promoting an internal LOC may help employees engage in and persist through recovery from stress, regardless of the coping style used.

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Appendix A

Letter of Information and Consent

All potential participants are invited to participate in this research study on the relationship between Locus of Control, Self-Regulation and positive mental wellbeing. Before you give your consent to be a volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

Purpose of the Study:

The relationship between how much control over our own lives we perceive and positive mental health is a well-established one. The specific thoughts and behaviours that manifest this relationship however is unclear. The purpose of this study is to investigate the possible mediating effect of self-regulation between control beliefs and mental wellbeing.

Description of the Study:

As a participant in this study, you will be asked to fill out a questionnaire which will take approximately 40 minutes. You will not be asked to provide any identifying information (meaning any information that could someone could use to figure out who you are). However, you will be asked to provide some demographic information. Please remember that:

- Your participation is completely voluntary. If you feel uncomfortable with any questions, you can choose not to answer

- You can withdraw from the study at any time without penalty.

- Your name will not be included in any of the research material or publications resulting from the information provided.

- Information gathered in this study will not be seen by anyone other than the researchers.

Risks:

The questionnaires included in this study ask only about how you responded to a recent stressful event in your life, the stress you experienced, and how you coped with it. It is not expected that there are any risks for participating in this study.

Benefits of the Study:

Understanding the ways in which control beliefs are translated into positive coping behaviours and subsequent better mental health outcomes is important for developing best practice for stress management training and interventions. By participating in this study, you are helping contribute to what we know about stress management, resiliency to adversity, and promoting positive mental health.

Confidentiality:

In this study, we will not ask for any identifying information such as your name or date of birth. While we do our best to protect your information there is no guarantee that we will be able to do so. If data is collected during the project which may be required to report by law we have a duty to report it.

Your survey responses will be collected anonymously through a secure online survey platform called Qualtrics. Qualtrics uses encryption technology and restricted access authorizations to protect all data collected. In addition, Western's Qualtrics server is in Ireland, where privacy standards are maintained under the European Union safe harbour framework. Representatives of Western University Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research. Data gathered from this study will be kept in a secure and confidential location for a minimum of 7 years following completion of the study. Given the nature of this study, there is no likelihood that reportable information will be collected.

Voluntary Nature of Participation:

Participation in this study is voluntary. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits. At any point in the study, you may refuse to answer any particular question or stop participation altogether. If you choose not to participate or to leave the study at any time there will be no repercussions. Please note that once responses are submitted, they cannot be withdrawn due to the anonymous nature of the data. You do not waive any legal right by consenting to this study.

Compensation:

You will be compensated with \$1 USD for completion of the study.

Appendix B**9 item Subjective Adversity Severity Scale**

Please indicate the level of your agreement with each of the following statements from 1 (strongly agree) to 7 (strongly disagree)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Looking back, I would rate this as one of my most challenging experiences							
At the time, the adverse experience seemed unbearable							
At the time, the adverse experience seemed insurmountable							
This event had the power to drastically impact my life							
The experience impacted many aspects of my life							
The amount of damage this adversity could have caused was enormous							
That was a really rough time in my life							
I struggled through that experience							
That experience could be described as torturous							

Appendix C

Workplace Resiliency Inventory

Please indicate the degree to which you agree with the following statements from 1 (strongly agree) to 5 (strongly disagree).

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
I can control my emotions					
I am not easily bothered					
I rarely get mad					
I get stressed out easily					
I get upset easily					
My mood changes frequently					
I am often overwhelmed by my emotions					
I get easily caught up with my emotions					
I push myself very hard to succeed					
I am exacting in my work					
I complete tasks successfully					
I stop working when it becomes too difficult					
I set high standards for myself					
I am a goal oriented person					
I maintain my focus on completing tasks					
I don't complete tasks that I start					
I know how to get things done					
I enjoy reading challenging material					
I find political discussions interesting					
I am interested in a broad range of things					
I avoid reading difficulty material					
I am not interested in abstract ideas					
I try to avoid complex people and issues					
I try to avoid philosophical discussions					
I am not interested in discussing theoretical issues					
Following the event, I was afraid I would not be able to cope with the change					
I was more anxious than usual					
I was more stressed than usual					
I was unusually depressed					
I was unable to maintain a positive outlook on things					
I felt as if my world was falling apart					
I know there is someone I can depend on when I am troubled					
I know there is someone that I can go to for advice					
I know there is someone that I can count on to be there for me					
I feel that there is somebody I can talk to that will listen to my problems and concerns					

Since the event, I have more often based my goals in life on feelings,
rather than logic
I have preferred to plan my life based on how I feel
I have planned my life logically and rationally
I have preferred to make decisions based on facts, not feelings
I ha rarely overindulged
I have often jumped into things without thinking them through
I have often liked to act on a whim
I have often made last minute plans
I have been a highly disciplined person
I have been able to refrain from doing things that may be bad for me in
the long run, even if they might make me feel good in the short term
I have tended to start tasks right away
I have found myself procrastinating from work more often
I have need more of a push to get started on a project
I have tended to be discouraged easily
I have been disappointed with my shortcomings
It has been easy for me to look on the brightside
I have had a dark outlook for the future
I have tended to see potential difficulties everywhere
I have questioned my ability to do my work properly
I have been filled with doubts
I have been afraid I will do the wrong thing
I have found it easy to control my thoughts

Appendix D

Adult Nowicki-Strickland Scale Internal External

We are trying to find out what people your age think about certain things. We want you to answer the following questions the way you feel. There are no right or wrong answers. Don't take too much time answering any one question, but please try to answer them all. Each question can be answered 'yes' or 'no'. If you are unsure how you feel about a question, please choose whichever one best fits your understanding.

	<u>Yes</u>	<u>No</u>
D you believe most problems will solve themselves if you don't fool with them		
Do you believe you can stop yourself from catching a cold		
Are some people just born lucky		
Most of the time, do you feel that getting good grades is important to you		
Do you often get blamed for things that are not your fault		
Do you believe if someone studies hard enough, they can pass any subject		
Do you feel that most of the time, it doesn't pay to try hard because things never turn out anyways		
Do you feel that if things start out right in the morning, its going to be a good day no matter what you do		
do you feel that most of the time, parents listen to what their children have to say		
do you believe that prayer can make good things happen		
When you are criticised, does it usually seem like there is no good reason		
Do you find it hard to change a friend's opinion		
Do you think that cheering, more than luck, helps a team win		
Do you find it nearly impossible to change your parent's mind about anything		
Do you believe your parents should allow you to make most of your decisions		
do you feel that when you do something wrong, there's little you can do about it		
Do you believe some people are just born good at sports		

Are most of the other people your age and sex stronger than you
Do you feel one of the best ways to handle a problem is to just not think about it
Do you feel you have a lot of choice in deciding who your friends are
If you find a four leaf clover, do you believe it brings good luck
Do you feel that whether or not you do your homework affects your grades?
Do you feel that when someone is angry at you, there's little you can do about it
Have you ever had a good luck charm
Do you believe that whether someone likes you or not depends on how you act
Will your parents usually help you if you ask them too
Have you ever felt that when people are angry at you, its fro no reason at all
Most of the time, do you feel that what you do today will effect what happens tomorrow
Do you believe that when bad things are going to happen, there is little you can do to stop them
Do you believe people can get their own way if they just keep trying
Most of the time, do you feel like it is useless tot ry and get your own way
Do you feel that when good things happen to people, its because they worked hard for it
Do you feel that when someone wants to be your enemy, there's nothing you can do about it
Do you feel its easy to get your friends to do what you want them too
Do you feel you have little choice in deciding where you go with your friends (restaurants, bars, etc)
Do you feel that when someone doesn't like you, there's not much you can do about it
Do you feel it is sometimes useless to try in university because the other students are smarter than you
Do you believe that planning things ahead makes things turn out better

Most of the time, do you feel that you have
little say in what your friends and family
think of you
Do you think it is better to be smart, or lucky

Appendix E

Center for Epidemiologic Studies Depression Scale (CES-D)

Instructions: Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way **during the past week.**

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with help from my family or friends.				
4. I felt I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				

11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could not get "going."				

Appendix F

Generalized Anxiety Disorder 7-item (GAD-7) scale

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it's hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
<i>Add the score for each column</i>	+	+	+	
Total Score (<i>add your column scores</i>) =				

Appendix G

Debriefing Letter

Project Title: Does self-regulation mediate the relationship between locus of control and resiliency related outcomes?

Thank you for participating in this study on control beliefs, self-regulation and positive wellbeing. What we believe we can control or not has important implications for how we react to adversity and recover from stress. In this study, we measured how much control you perceive you have over your own life, how you reacted to a recent adverse event, any stress you experienced as a result, and how you recovered from it. We expected that those who perceive more control over their own lives will engage in more and better recovery responses to adversity and therefore show better wellbeing following the adversity.

If you would like to know more about Locus of Control or the Resiliency process here are some references:

Locus of Control:

<https://www.psychologytoday.com/blog/moments-matter/201708/locus-control>

Lefcourt, H. M. 1992. Durability and impact of the locus of control construct. *Psychological Bulletin* 112:411–414.

Resiliency:

King, G. Rothstein, M. (2010). Resilience and Leadership: The Self-Management of Failure

In Rothstein, M.G., Burke, R.J. (eds) *Self-Management and Leadership Development* 361-394, Cheltenham, UK: Edward Elgar Publishing Limited. URL: http://ebook.umaha.ac.id/E-BOOK%20ABOUT%20ORGANIZATION,%20MANAGEMENT%20&%20LEADERSHIP/LEADERS%20_%20LEADERSHIP/SELF%20MANAGEMENT%20_%20LEADERSHIP.pdf#page=372

Appendix H Curriculum Vitae

EDUCATION

- 2016-Present **Western University, London, ON, Canada**
M.Sc., Industrial/Organizational Psychology
- 2011-2016 **Saint Thomas University, Fredericton, NB, Canada**
B.A. with Double Honours, Psychology, Sociology

POSITIONS HELD

- 2017-Present **Western University, London, ON, Canada**
Research Assistant, DAN Management and Organizational Studies
- 2016-Present **Western University, London, ON, Canada**
Teaching Assistant, Department of Psychology
- 2013-2016 **Saint Thomas University, Fredericton, NB, Canada**
Research Assistant, Department of Sociology

AWARDS AND SCHOLARSHIPS

- 2016-Present
- Western University, London, ON, Canada**
Western Graduate Research Scholarship
\$26,000
- 2016 **Middle Eastern Technical University, Ankara, Turkey**
Erasmus Plus Scholarship
\$7,000
- 2016 **Middle Eastern Technical University, Ankara, Turkey**

	Mevlana Scholar 1 st Class Scholarship	
	\$2,800	
2016	Saint Thomas University, Fredericton, NB, Canada George Vanier Travel Award	
	\$2,100	
2013-2016	Saint Thomas University, Fredericton, NB, Canada Dean's List Award	
	\$8,000	

CONFERENCE PRESENTATIONS

Verbal

McGregor, A.J. (2016). Protests of the 21st Century: From Montreal to Gezi Park. Presented at the 18th International Conference on The Politics of Social Protest and Movements, Istanbul, Turkey.

Poster

McGregor, A.J. (2017). A Cross Cultural Comparison on Bullying Behaviour Conceptions: Canada and Turkey. Presented at the Canadian Psychological Association Conference, Toronto, Canada.

TEACHING EXPERIENCE

Courses Assisted

2016-Present Western University PSYC 1000 Introduction to Psychology

PROFESSIONAL ORGANIZATIONS AND MEMBERSHIPS

Association for Psychological Science

Canadian Psychology Association

Canadian Society of Industrial/Organizational Psychologists

Canadian Sociological Association