DEVELOPING AN INTEGRATIVE MODEL OF CONTROL: IMPLICATIONS FOR PSYCHOLOGICAL FUNCTIONING

WU CHI HANG

Ph.D
The Hong Kong Polytechnic University
2015

The Hong Kong Polytechnic University

Department of Applied Social Sciences

Developing an Integrative Model of Control:

Implications for Psychological Functioning

WU Chi Hang, Wesley

A thesis submitted in partial fulfilment of

the requirements for the degree of Doctor of Philosophy

December 2014

CERTIFICATE OF ORIGINALITY

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

_____(Signed)

___WU Chi Hang, Wesley___(Name of student)

Abstract

The development of control-related constructs have involved different approaches over time, and yet internal and external locus of control are conceptualized as dichotomous factors influencing active versus avoidant coping strategies. While external control is associated with avoidance, a similar belief construct fate control, which denotes that life events are pre-determined and influenced by external forces but predictable and alterable, challenges the assumption of incompatibility between fate and agency. It is hypothesized that external control predicts avoidant coping, which in turn predicts psychological distress. Fate control, in contrast, is hypothesized to predict both active and avoidant coping when dealing with stress. The model was confirmed using a cross-sectional approach in Study 1 (n = 251 university students) and hypothetical stressful scenarios in Study 2 (n = 294 university students). Furthermore, Study 2 identified perceived controllability as a moderator of such relationship, i.e. people high in fate control were more likely to use active coping in more controllable stressors but more likely to adopt avoidant coping in low controllable situations. The moderating effect was observed in self-reported coping behaviours using a diary approach in Study 3 (n = 188 university students and 102 community adults) and actual behaviours using an experimental design in Study 4 (n = 202 university students). Overall, this research has found discriminant validity of fate control and external control. By testing the dynamic theory of control, the findings offer an alternative perspective to the dichotomous view of control and provide implications for coping strategies and psychological health.

Keywords: world-views, social axioms, fate control, locus of control, coping, psychological well-being

Acknowledgements

I want to thank my supervisor, Prof. Sylvia Chen, who provided continues feedback and inputs during my PhD program in the past six years. Her excellent guidance and insights greatly assisted the production of my thesis. Without her encouragement, I would not have started my academic life and finished my thesis.

I also want to thank my previous co-supervisor Prof. Michael Bond, who has taught me more than ten years since I was a freshman in Psychology. His passion in Psychology inspired my interest in this field.

Last but not least, I also want to thank all my current and previous lab-mates, including Ben Lam, Bryant Hui, Jacky Ng, Erin Lu, Hilary Ng, Fiona Cheung, Victor Lau, Shannen Fan and others lab-mates. All the comments, the ideals, the advices, the questions, the challenges at the evening lab-meetings consolidated my thinking and my thesis development.

Table of Contents

Developing an Integrative Model of Control: Implications for Psychological Functioning

There is no fate that cannot be surmounted by scorn.

Albert Camus, The Myth of Sisyphus

Introduction

Control is one of the central constructs in psychology and has received extensive attention in the psychology literature. Theory and research have emphasized the importance of control in personality, social behaviour, mental health, and physical well-being. Due to its broad conceptual bases, however, this generic construct has been studied under diverse theoretical frameworks. Skinner (1996) identified more than 100 constructs that were related to control, such as cognitive control, decision control, learned helplessness, locus of control, relinquishment of control, retrospective control, etc. The main objective of the current research is to propose and test a model of control that integrates constructs from the past and recent research and offers an alternative perspective on the psychological consequences of controllability.

Locus of Control

Since the 1950s, psychologists have found that locus of control varies among individuals as a personality variable and differs across contexts as a situational variable (Phares, 1957; Rotter, 1954). Following the framework of social learning theory emphasizing that an

individual's behaviours are predicted on the basis of the individual's expectations of reinforcement, Rotter (1966) proposed a theory concerning the generalized expectancies about what causes behaviour-outcome contingency. Expectation of reinforcement is an important element in locus of control, which "acts to strengthen the expectancy that a particular behaviour or event will be followed by the reinforcement in the future" (Rotter, 1966, p. 2). Individuals believing that outcomes are contingent upon their own behaviour or dispositional characteristics perceive internal control (labelled *internals*); those expecting reinforcements to be determined by outside forces, such as luck, chance, fate, or other factors beyond one's control perceive external control (labelled *externals*). Although many studies investigated the construct, it was not until the early 1970s that the term locus of control regularly appeared in the psychology literature (Kormanik & Rocco, 2009).

Negative Impact of External Control on Psychological Well-being

Over the years, locus of control has been extended to the study of personality, clinical, developmental, and social psychology (e.g., Lefcourt, 1981, 1983, 1984). Being one of the most extensively explored topics, research on locus of control has been linked to a wide array of personality and behaviour variables, and abounded in the study of attribution process, educational achievement, work performance, job satisfaction, mental health, and psychotherapy outcomes (e.g., Brown, Fulkerson, Furr, Ware, & Voight, 1984; Pittman & Pittman, 1980; Twenge, Zhang, & Im, 2004).

Reviews and meta-analyses supported the positive impact of internal control, such as better academic achievement, favorable task performance and social experiences, greater job motivation, while external control results in negative consequences, including poor school achievement, learned helplessness, ineffective stress management and reduced self evaluations (e.g., Findley & Cooper, 1983; Judge & Bono, 2001; Ng, Sorensen, & Eby, 2006).

A variety of studies show that locus of control is a strong predictor of psychological well-being. Generally speaking, internal control is a protective factor in the prediction of psychological well-being, while external control has negative impact on well-being. For example, when facing stress in life, depression in men was negatively correlated with internal locus of control (Flannery, 1986). In the workplace, external locus of control was negatively correlated with job satisfaction, physical well-being, and psychological well-being among employees in 24 countries around the world (Spector et al., 2002).

Although majority of research has identified the negative impact of external control on psychological well-being, external control showed a buffering effect in specific situations. Specht, Egloff, and Schmukle (2011) tracked widowed individuals in a large-scale longitudinal study for four years after the loss of their spouse. As expected, all widows reported a decline in life satisfaction after losing their spouse. People having high levels of external control reported greater life satisfaction in the first year following the loss and a smaller decline in life satisfaction. The reason was that individuals who generally expected major life events to be

driven mainly by external forces can accept their lack of control and helplessness more easily, and hence they were able to cope with this uncontrollable event more effectively. In addition, individuals' sense of having control over the outcome of an uncontrollable situation (e.g., hurricane) led to more distress when their behaviour was ineffective (Lopez-Vazquez & Marvan, 2003).

The Mediating Effects of Coping Strategies

The afore-mentioned research (e.g., Flannery, 1986; Specht, Egloff, & Schmukle, 2011) identified the relationship between locus of control and psychological well-being. However, the underlying mechanism has not been fully examined in these studies.

Other studies provide insight into understanding such mechanisms. Lefcourt (1976) extended the concept of general expectancies of reinforcement (Rotter, 1966) to the control over unpleasant stimulus. As Lefcourt (1976) put it, "in being forced to hear predictable noise we may stop work and wait until it ceases, or steel ourselves for the onset, minimizing our own responses to the noise. We are not as helpless as we might otherwise be since we can do something to minimize the impact of the predictable noise. It is this perception of the ability 'to do something' that gives rise to the concept of perceived control" (p. 5). Reactions to unpleasant stimuli are not only shaped by individuals' perceptions of the stimuli, but also the ability of individuals to cope with the stimuli. Following this view, Folkman and Lazarus (1980) focused on individuals' abilities to cope with the stimuli. They defined coping as "the cognitive

and behavioural efforts made to master, tolerate, or reduce external and internal demands and conflicts among them" (p.223).

There are different categorizations of coping strategies. One common categorization is problem-focused versus emotion-focused coping (Folkman & Lazarus, 1980). Coping strategies that aim to manage or alter the stressful environment are problem-focused coping, while those aiming to regulate the stressful emotions are emotion-focused coping. Individuals who appraise a situation as unalterable are more likely to use emotion-focused coping, whereas individuals who perceive an event as changeable are more likely to use problem-focused techniques (Folkman & Lazarus, 1980). This idea on appraisal and coping was supported in the three stages of a mid-term examination. Problem-focused coping was more prominent before the examination when students were able to adjust their study effort, while emotion-focused coping was more prominent when waiting for the results to be released.

Other researchers categorized coping using approach-avoidance distinction (e.g., Roth & Cohen, 1986). Active coping strategies are either behavioural or psychological responses designed to change the nature of the stressor itself or how one thinks about it, whereas people using avoidant coping strategies engage in activities (such as alcohol use) or mental states (such as withdrawal) that keep them from directly addressing stressful events (Roth & Cohen, 1986). Active coping strategies, whether behavioural or emotional, are associated with better adjustment when dealing with stressful events, because individuals exert some forms of

personal control over the situation or their emotion. In contrast, avoidance may be functional in the short run, but maladaptive for long periods, exacerbating distress. Thus, uncontrollability induces negative emotions and results in psychological distress (Thompson, Zalewski, & Lengua, 2014; Terreri & Glenwick, 2013).

In Terreri and Glenwick's (2011) study on adolescents, positive religious coping (a type of active coping) was positively correlated with positive affect and life satisfaction, and it was negatively correlated with depressive symptoms at times of stress. In addition, negative religious coping (a type of avoidant coping) was positively correlated with negative affect, depression and anxiety symptoms, while it was negatively correlated with positive affect and life satisfaction.

In the medical domain, the relationship between appraisal and coping strategies in cancer patients was also identified (Franks & Roesch, 2006). Cancer patients who appraised their illness as a threat were more likely to use problem-focused coping (a form of active coping strategy). In contrast, individuals who appraised their cancer as a harm/ loss were more likely to use avoidant coping strategies.

Roesch extended his research with other colleagues and studied coping strategies as mediators of the relation between personality traits and affect. Bartley and Roesch (2011) found that active coping strategies mediated the relation between conscientiousness and positive affect. It was consistently shown that conscientiousness was correlated with internal

locus of control (Abe, 2005; Judge, Erez, Bono, & Thoresen, 2002), probably because both conscientiousness and internal control contain self-control and persistence components. In this light, locus of control may work through coping strategies to affect psychological adjustment.

Empirically, the mediation effect of coping between control belief and adjustment to various stressful life events was supported in various domains (e.g., Folkman, Chesney, Pollack, & Coates, 1993; Frazier, Hortensen, & Steward 2005; Jensen & Karoly, 1991; Macrodimitris & Endler, 2001). For example, patients who received cancer treatment with higher levels of control over their emotional symptoms reported less avoidant coping, predicting lower levels of psychological distress (Manne & Glassman, 2000). Among sexual assault survivors, avoidant coping strategies (social withdrawal and problem avoidance) mediated the relations between control over the recovery process and distress. Specifically, survivors with higher levels of control over the recovery process experienced less distress because they tended to use less avoidant coping strategies (Frazier, Hortensen, & Steward, 2005).

In sum, locus of control is an important factor contributing to psychological well-being. In particular, the negative impact of external control is supported by previous research. Coping strategies can be one possible underlying mechanism explaining such relationship. Therefore, in this research my first set of hypotheses is that coping strategies will mediate the effect of external control on psychological well-being. Specifically,

H1a: External control will be negatively correlated with active coping;

H1b: External control will be positively correlated with avoidant coping.

H2a: Active coping will be positively correlated with psychological adjustment and negatively correlated with psychological distress.

H2b: Avoidant coping will be positively correlated with psychological distress and negatively correlated with psychological adjustment.

H3: Active and avoidant coping strategies will mediate the effect of external control on psychological adjustment and psychological distress.

Generalized Beliefs about the World

While locus of control was proposed sixty years ago, fate control, another control belief which was only developed in the past decade, can also be a predictor of psychological well-being. Leung and colleagues (2002) have proposed a theoretical construct termed "social axioms" (Leung et al., 2002), defined as "generalized beliefs about people, social groups, social institutions, the physical environment, or the spiritual world as well as about categories of events and phenomena in the social world" (Leung & Bond, 2008, p. 198).

Multicultural studies have been conducted in forty nations to identify the factor structure of social axioms (Leung & Bond, 2004). At the culture level, ecological factor analysis has confirmed two dimensions, namely Societal Cynicism and Dynamic Externality (Bond et al., 2004b). They were found to correlate with country-level socio-economic-political and psychological indicators. At the individual level, a five-factor structure has been validated

pan-culturally, namely Social Cynicism, Fate Control, Social Complexity, Reward for Application, and Religiosity (initially labelled Spirituality). Social cynicism represents a negative view of human nature and a biased assessment of social events. Reward for application refers to a belief that efforts invested in human resources will lead to positive outcomes. Social complexity reflects the belief in multiple solutions to social problems and in different ways of achieving various outcomes. Fate control refers to a belief that life events are pre-determined and influenced by impersonal, external forces, but predictable and alterable. Finally, religiosity represents a view of positive effects of religious beliefs and the influences of spiritual forces on human activities.

In recent years, a series of studies have been conducted to examine the construct validity of social axioms and identified their nomological networks. Discriminant validity was established by differentiating social axioms from personality traits, whether assessed by universal or indigenous measures (Chen, Bond, & Cheung, 2006; Chen, Fok, Bond, & Matsumoto, 2006), and from values (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung et al., 2007). With only modest overlap between personality traits, values, and axioms, it was concluded that they are distinct, multi-dimensional concepts.

Worldwide studies have explored their functional utility (e.g., Bond et al., 2004a; Leung & Bond, 2002). Leung and Bond (2004) discussed four functions of social axioms, including value-expressiveness (presenting one’s values), knowledge (helping people understand the

world), instrumentality (facilitating attainment of important goals), and ego-defensiveness (protecting self-worth). Social axioms serve as general knowledge about the world and predict attitudinal and behavioural variables in different domains, such as filial behaviour (Chen, Bond, & Tang, 2007), individuating behaviour (Chen, 2009), political attitudes (Keung & Bond, 2002), paranormal beliefs (Singelis, Hubbard, Her, & An, 2003), vocational interests (Bond et al., 2004a), attitudes toward help-seeking (Kuo, Kwantes, Towson, & Nanson, 2006) and problematic gambling (Tang & Wu, 2010).

As guiding principles for the attainment of important goals in life, different axioms point to ways of achieving given outcomes. Reward for application predicts collaborative and compromising strategies, while social cynicism predicts a competitive orientation when in conflict situation (Bond et al., 2004a; Chen & Zhang, 2002). Similarly, reward for application predicts preference for using persuasive influence tactics, while social cynicism predicts assertive and relationship-based tactics (Fu et al., 2004).

Finally, social axioms significantly predict self-worth and well-being indicators, such as life satisfaction (Chen, Cheung, Bond, & Leung, 2006; Lai, Bond, & Hui, 2007), psychological distress (Kuo, Kwantes, Towson, & Nanson, 2006), negative affect (Tang and Wu, 2010), suicidal ideation (Chen, Wu, & Bond, 2009; Lam, Bond, Chen, & Wu, 2010), and death anxiety (Hui, Bond, & Ng, 2007).

Fate Control

Fate control is the belief that life events are determined by impersonal, external forces; however, there is a possibility for individuals to alter the outcomes by their efforts (Leung & Bond, 2004). Hui and Hui (2009) commented on this axiom, “due to its conceptual complexity, its psychological correlates might not seem to be compatible with each other at first glance” (p. 24). Empirically, the relationship between fate control and well-being measures is mixed. Some studies found that fate control was negatively related to well-being indicators and destructive behaviours, such as perceived stress (Kuo, Kwantes, Towson, & Nanson, 2006), emotional rumination (Chen et al., 2006b), general death anxiety (Hui, Bond, & Ng, 2007), negative mood and problematic gambling (Tang & Wu, 2010). However, fate control was also reported to be positively correlated with self-esteem, interpersonal harmony, and satisfaction about various life circumstances, including general life satisfaction, family situation, financial situation, interpersonal relationships, chosen profession/ career, housing situation (Dinca & Iliesca, 2009; Safdar, Lewis, & Daneshpour, 2006).

Fate Control and External Locus of Control Predicting Avoidant Coping

As beliefs about the nature of the world, external control and fate control both concern forces outside the self and are two central concepts in the current framework. Externals believe that their lives are under the control of powerful others, perceiving outcomes as determined by luck, chance, and fate. Therefore, both control beliefs share similarity in predicting coping responses.

Believing in external control has detrimental effects because perceiving outcomes as uncontrolled by one's responses will generate a sense of helplessness and hence the feeling of hopelessness (e.g., Abramson, Metalsky, & Alloy, 1989; Abramson, Seligman, & Teasdale, 1978; Seligman, 1975). Accordingly, coping efforts will focus on avoidance and detachment from stress. Avoidant coping tactics include venting of emotions (ventilating distress and negative feelings), behavioural disengagement (reducing efforts and even giving up goals), mental disengagement (distracting oneself from thinking about goals and efforts), and restraint coping (holding back and waiting without acting) (Carver, Scheier, & Weintraub, 1989).

At the same time, for people believing in fate control, attributing adversity to fate facilitates acceptance. Rothbaum, Weisz, and Snyder (1982) pointed out that rather than relinquishing control, people sometimes adjust themselves to fit in the existing environment (i.e., secondary control). By accepting that the outcome is beyond personal control, these individuals lower their expectation of success as well as the importance of meeting their goals (Morling & Evered, 2006), or by attributing failure to uncontrollable factors (Heckhausen & Schulz, 1995).

DeNeve and Cooper (1998) also pointed out that what is most important to subjective well-being is not simply the tendency to experience positive or negative emotions, but the tendency to attribute one's emotions, others' behaviours, and life events in self-protective ways. Believing in life events as predetermined by fate may incline people toward acceptance and

peace of mind. This coping strategy may be a cultural heritage from the Chinese traditional philosophy of Taoism which promotes accepting one's fate (Lee, 2003). Empirically, Bond and colleagues (2004a) found that people high in fate control were likely to use avoidant coping strategies, such as wishful thinking and distancing in the face of challenging life events. Therefore, I hypothesize that people high in fate control also tend to use avoidant coping, which is similar to external control.

H4a: Fate control will be positively correlated with avoidant coping.

Difference between Fate Control and External Locus of Control

Although fate control reflects the belief that life is influenced by impersonal, external force, fate control encompasses more than fatedness. It also includes the additional component assessing whether events are pre-determined and predictable (Leung et al., 2002), together with the belief that things can be done to modify one's fate. The belief in doing something for one's fate distinguishes fate control from external control.

The distinction between fate control and external control was supported by empirical findings, albeit limited. To the best of my knowledge, only two studies reported the correlation between the two control beliefs (Chen, et al., 2006a; Singelis et al, 2003). Using Internal External Scale (Rotter, 1966), Singelis and colleagues (2003) reported a correlation of .18 between the two beliefs. Using the Chinese Personality Assessment Inventory (CPAI, Cheung et al, 2001), Chen and colleagues (2006a) reported a moderate correlation of .28 between fate

control and external control in Internal versus External Locus of Control personality subscale. The small but positive correlations in these two studies suggested the divergent validity between the two belief constructs.

Fate Control can also Induce Adaptive Coping

Although both external control and fate control predict avoidant coping, their divergence may have implications for coping strategies. People high in external control believe that powerful others (including fate) determine their personal outcomes, and they are likely to relinquish personal agency. However, believing in fate control involves taking actions to improve fated outcomes. While external control is incompatible with personal agency, fate control can be a form of bounded agency, demonstrating personal agency in constrained situations (Au et al., 2011).

Previous research has shown that believing in fate does not always reduce personal agency. In a large-scale community study in Romania, Dinca and Iliesca (2009) found that people high in fate control reported conducting more health-protective behaviours, including higher medication intake and more visitations to doctor, despite the same reported health condition as people low in fate control.

More studies have confirmed the positive linkage between fate control and personal agency in academic setting. For example, Zhou, Leung, and Bond (2009) linked fate control to achievement-related indices at the culture level, and found it positively related to academic

achievement and economic competitiveness. At the individual level, a positive relation between fate control and academic performance was identified among Hong Kong adolescents (Leung, Chen, & Lam, 2010). In addition, students believing in fate control also reported higher intention to study, so as to improve their academic outcomes (Liem, Hidayat, & Soemarno, 2009). These findings are in alignment with a popular Chinese saying that “Knowledge can change one’s fate”.

In the same study, Liem and colleagues (2009) also found that fate control was positively correlated with the intention to donate money to street children to improve the life of these children. While people high in fate control believed that adversity of street encountered by children was fated, they also believed that they could donate money to improve these children’s living conditions. The above studies demonstrate that people believing in fate control also believe in personal agency when changes are possible.

In a study examining the relationship between social axioms and organizational commitment (Kwantes & Karam, 2009), young employees aged 18 to 25 were provided with a list of different human resource practices and were asked to indicate the extent to which each of these practices would make them feel committed to the organization. Five bundles of human resource practices were finally categorized by participants. Fate control predicted human resources practice bundle that focused on career development as well as incentives and recognition, suggesting that people high in fate control believed that organizational efforts (e.g.,

providing more training, developmental opportunities, and other incentives) can contribute to greater commitment from their employees. These results show that people with high levels of fate control believe in not only personal agency, but also agency at the organizational level.

The above research supports that fate control is different from external control because people high in fate control also pay efforts to improve their own lives or others' lives. They do not merely accept one's fate. In this sense, fate control can also be related to primary control (i.e., changing the environment so that it fits one's need) (Rothbaum, Weisz, & Snyder, 1982). Thus, fate control may have adaptive value for psychological functioning, which would explain the mixed findings on fate control and psychological functioning. Therefore, I hypothesize that people high in fate control are more likely to perform active coping.

H4b: Fate control will be positively correlated with active coping.

Similarly to hypothesis H3 that coping strategies will mediate the effect of external control on psychological adjustment and psychological distress, I hypothesize that:

H5: Active and avoidant coping strategies will mediate the effect of fate control on psychological adjustment and psychological distress, respectively.

The Moderating Effect of Perceived Controllability

People high in fate control are hypothesized to engage in both active and avoidant coping. This conceptualization needs further examination to understand how the seemingly paradoxical forces of fate control work with or against each other to produce different

outcomes in coping. Therefore, the next question to address is what factor makes fate control exhibit different coping responses to stressful situations.

Studies on negotiable fate provide us some insights into this question (Au et al., 2011; Au et al., 2012; Chaturvedi, Chiu, & Viswanathan, 2009). Negotiable fate refers to the belief that individuals can negotiate with fate for control and people can exercise personal agency within the limits that fate has determined (Chaturvedi, Chiu, & Viswanathan, 2009). Au and colleagues (2012) found that belief in negotiable fate was positively correlated with avoidant coping strategies among European Americans, while belief in negotiable fate was linked to active coping strategies among Mainland Chinese. The researchers explained that belief in negotiable fate helped individuals adopt active coping strategies to pursue their goals in the environment with more constraints (such as Mainland China). In contrast, in sociocultural context with fewer constraints (such as the United States), belief in negotiable fate relinquished control and could not induce active coping. In another study using a cultural priming paradigm, Au and colleagues (2011) found that Singaporean participants who were primed with Singaporean culture (a cultural context where the meaning of negotiable fate is widely accepted) believed more strongly in negotiable fate and had greater persistence. In contrast, when primed with American culture (a cultural context when the meaning of negotiable fate is less popular), negotiable fate did not predict perseverance.

When comparing low-income women in India with higher literacy and lower literacy,

Chaturvedi, Chiu, and Viswanathan (2009) found that women with lower literacy levels had a stronger belief in negotiable fate and that belief in negotiable fate was linked to a greater tendency to perform better on the absolute judgment task and to engage in rule-based categorization thinking. The belief in negotiable fate changed the thinking style of individuals who faced higher constraints in their sociocultural context (i.e., those with lower literacy) than those who faced fewer constraints (i.e., those with higher literacy).

Drawing on the relationships between negotiable fate and contextual constraint, I propose that the perceived control over stressful situations can moderate the effect of fate control on coping outcomes. Perception of control over a stressful situation arises from whether something can be done in the situation. Previous research shows that one's appraisals of whether the stressful situation is controllable and whether there are sufficient resources to control the situation affect the choice of coping strategies (Compas, Banez, Malcarne, & Worsham, 1991). When an individual appraises a stressful event as controllable, one tends to seek planning, strategize, take preventative efforts, and make direct action. In contrast, appraisal of low control leads to confusion, escape, pessimism, and passivity (Skinner & Wellborn, 1994). Recently, Frazier and colleagues (2011) showed that the perceived control over the current stressful event was negatively correlated with avoidant coping but was positively correlated with positive reinterpretation, a form of active coping.

People high in fate control believe that life events are alterable albeit pre-determined.

When a stressful situation is perceived to be high in controllability, people high in fate control may do something to exercise their control because of the belief that life events are malleable. In contrast, when a stressful situation is difficult to control (i.e., low in controllability), people believing in fate control may adapt to the fate belief and relinquish their personal agency, acting the same way as people who are high in external control. Therefore, avoidant type of coping will be adopted.

In sum, I hypothesize that:

H6: Perceived control will moderate the relations between fate control and coping strategies. Specifically, when perceived control is high, people high in fate control tend to use active coping. In contrast, when perceived control is low, people high in fate control tend to use avoidant coping.

The Present Research

Based on the above conceptualizations, the present research aims to examine a hypothesized model explicating the pathways and consequences of external control and fate control (see Figure 1): fate control positively predicts both active coping and avoidant coping. In contrast, external control positively predicts avoidant coping but negatively predicts active coping. Active coping and avoidant coping positively predict psychological adjustment and psychological distress, respectively. Furthermore, controllability of the stressors moderates these two pathways. This research seeks to test a dynamic theory of control which has not yet

been integrated in the available literature.

In four studies, diverse methods were used to examine the proposed framework. Study 1 adopted a cross-sectional design using a self-report approach to measure the impact of two belief systems on coping styles and general psychological well-being among university students. I expected that external control would predict negative coping strategies and hence negative psychological outcomes. In contrast, fate control would predict both active and avoidant coping strategies.

Study 2 employed hypothetical scenarios to assess coping patterns in specific situations. The same set of hypothetical scenarios was given to university students to respond. As such, the controllability of each scenario was standardized. The moderation effect of perceived controllability on fate control would be observed.

Study 3 extended the sample to include community adults, who might have more diversified stressors than university students, to examine my hypothesized model. A diary approach was adopted to gauge real life stressors and coping responses over time. I expected that controllability of stressors would moderate the effect of fate control, but not external control.

Finally, Study 4 developed an experimental design to examine the causal relationships between control beliefs and coping behaviours using priming technique and behavioural measures. I expected that when dealing with tasks that are more controllable, people with an

evoked fate control belief would perform adaptive coping behaviours. In contrast, when dealing with tasks that are less controllable, people with an evoked fate control belief will perform maladaptive coping behaviours, such as avoidance. There would be no significant difference in the effect of evoked external control belief on coping behaviours between high versus low controllable tasks. In both tasks, people with evoked external control belief would perform maladaptive coping behaviours.

Study 1

To distinguish the two control beliefs (namely fate control and external control) and their divergent effects on coping styles and subjective well-being, I tested the hypothesized framework with self-report measures using a cross-sectional design in the first study.

Method

Participants and Procedure

Two hundred and fifty-one undergraduate students (173 females; M_{age} = 21.05, *SD* = 1.69) from two local universities in Hong Kong (The Hong Kong Polytechnic University and The Chinese University of Hong Kong) responded to recruitment emails and took part in the survey. The questionnaire was administered online in Chinese. Participants were asked to report demographic information at the end of the questionnaire. In all studies reported in this paper, informed consent was obtained, and confidentiality was ensured at the beginning of each survey.

Measures

For all the scales reported in this paper, standard translation and back-translation (Brislin, 1986) were conducted if the Chinese version of a measure was not available.

Fate Control. The 8-item subscale of fate control was extracted from the Social Axioms Survey II (SAS-II; Leung et al., 2012). The Social Axioms Survey is an instrument with pan-cultural factor structure that has been well validated in a large-scale study across 40 cultural groups (Leung & Bond, 2004). The current version is the newly revised version of the

original Social Axioms Survey, which has been validated in 11 cultural groups, including a Hong Kong Chinese sample (Leung et al., 2012). Respondents rated each belief statement on a 5-point Likert scale ranging from 1 (*strongly disbelieve*) to 5 (*strongly believe*). Fate control is a belief that life events are predetermined and that there are some ways for people to influence the outcomes (Leung et al., 2002). The reliability of fate control was satisfactory ($\alpha = .81$).

External control. The Internal-External Scale (Rotter, 1966) was used to measure the extent to which individuals believe that their decisions and life are controlled by environmental factors which they cannot influence. The scale consists of 23 pairs of statements that respondents can choose. In each pair, one statement reflects the belief focusing on personal agency (e.g., “People’s misfortunes result from the mistakes they make”), while another statement reflects the belief focusing on external agency, such as chance, luck, other peoples’ control (e.g., “Many of the unhappy things in people’s lives are partly due to bad luck”). The reliability of external control was acceptable ($\alpha = .74$).

Coping style. The 66-item Ways of Coping Questionnaire, Folkman & Lazarus, 1985) was used to assess the thoughts and behaviours employed by respondents when facing stress. Participates indicated the extent to which they used each strategy in stressful situations and responded on a 4-point Likert scale from 0 (*not used*) to 3 (*used a great deal*). Eight types of coping strategies have been identified, namely problem-focused coping, seeking social support, wishful thinking, detachment, focusing on the positive, self-blame, tension reduction, and

keeping to self. Adopting the approach of a similar study by Au and colleagues (2012), the 11-item problem-focused coping subscale (e.g., “Come up with a couple of different solutions to the problem”) and 7-item seeking social support subscale (e.g., “Talk to someone to find out more about the situation”) were considered as active coping strategy. On the other hand, the 5-item wishful thinking subscale (e.g., “I daydream or imagine a better time or place than the one I am in”) and 6-item detachment subscale (e.g., “I feel that time will make a difference – the only thing to do is to wait”) were regarded as avoidant coping strategy. The reliabilities of these four subscales were satisfactory to moderate (α = .86, .78, .73 and .68 for problem-focused coping, seeking social support, wishful thinking and detachment, respectively).

Self-esteem. Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used to measure self-esteem, one of the three indicators of psychological adjustment. The scale consists of 10 items measuring the positive view about oneself (e.g., “I feel that I have a number of good qualities”). Respondents rated each item on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The reliability of self-esteem was also satisfactory (α = .87).

Subjective happiness. The Subjective Happiness Scale (SHS, Lyubomirsky & Lepper, 1999) was used to assess global happiness and well-being of individuals. The SHS consists of four items that measure the emotional state of individuals (e.g., “Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything.

To what extent does this characterization describe you?"). Respondents rated each item on a 7-point Likert scale ranging from 1 (*very inaccurate*) to 7 (*very accurate*). The reliability of subjective happiness was also satisfactory (α = .85).

Life satisfaction. The third indicator of psychological adjustment was life satisfaction. The five-item Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) together with an additional item from the Delighted-Terrible Scale (D-T Scale; Andrews & Withey, 1976) were used to measure an overall evaluation of one's life. A sample item of the SWLS is "In most ways my life is close to my ideal", and the question of the D-T Scale is "How do you feel about your life as a whole?" Both were anchored on 7-point Likert scales with the SWLS ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and the D-T Scale ranging from 1 (*terrible*) to 7 (*delighted*). The overall reliability of life satisfaction was also satisfactory (α = .89).

Psychological distress. The Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995) was used to assess the negative emotional states of an individual. The DASS consists of 21 items that measure the extent that emotional syndromes appeared over the past week. Respondents rated each item on 4-point Likert scales ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). The DASS consists of three subscales, namely depression (e.g., "I felt that life was meaningless"), anxiety (e.g., "I was aware of the action of my heart in the absence of physical exertion such as sense of heart rate

increase, heart missing a beat") and stress (e.g., "I was intolerant of anything that kept me from getting on with what I was doing"). The reliabilities of the three sub-scales were also satisfactory (α = .88, .84 and .84 for depression, anxiety, and stress, respectively).

Results and Discussion

Descriptive statistics and bivariate correlations of the measures are summarized in Table 1. Fate control was positively correlated with the active coping style of problem-focused coping (r = .13, p = .039) and the two avoidant coping styles, namely wishful thinking (r = .24, p < .001) and detachment (r = .40, p < .001). In contrast, external control was negatively correlated with the two active coping styles (problem-focused coping, r = -.19, p < .001, and seeking social support, r = -.21, p < .001), but was positively correlated with the avoidant coping style of wishful thinking (r = .17, p < .001). It was also marginally correlated with detachment (r = .12, p = .065).

In addition, problem-focused coping was positively correlated with the three indicators of psychological adjustment, namely self-esteem (r = .28, p < .001), subjective happiness (r = .16, p = .010), and life satisfaction (r = .29, p < .001), but not indicators of psychological distress including depression (r = .05, p = .442), anxiety (r = .04, p = .251), and stress (r = .12, p = .059). Similarly, seeking social support was also positively correlated with self-esteem (r = .18, p = .004), subjective happiness (r = .18, p = .005), and life satisfaction (r = .31, p < .001). Neither problem-focused coping nor seeking social support was correlated with any indicators

of psychological distress.

On the other hand, avoidant coping was negatively correlated with psychological adjustment and was positively correlated with psychological distress. In particular, wishful thinking was negatively correlated with self-esteem (r = -.24, p < .001) and positively correlated with depression (r = .30, p < .001), anxiety (r = .34, p < .001), and stress (r = .35, p < .001). Detachment was negatively correlated with self-esteem (r = -.15, p = .018), but positively correlated with depression (r = .34, p < .001), anxiety (r = .36, p < .001), and stress (r = .35, p < .001).

Testing the Proposed Model

Path analysis was conducted using structural equation modelling (SEM) because of its advantages that fit the design of the current study. Firstly, SEM enhances correction of measurement errors with latent factors. This is appropriate to test my proposed model which consists of latent factors measured by multiple scales or subscales of a single scale (e.g., active coping was composed of problem-focused coping and seeking social supports, while avoidant coping was composed of wishful thinking and distancing). Secondly, the entire model is estimated together using SEM, while regression analysis can only test one dependent variable at a time. Given the complexity of my proposed model, using SEM is considered better than regression.

Parcelling was used to establish the measurement model (see Little, Cunningham,

Shahar, & Widaman, 2002 for the argument of using item parcelling in structural equation modelling). For fate control and external control, items measuring each of them were randomly grouped into three parcels, each having similar number of items. For active coping, avoidant coping, psychological adjustment, and psychological distress, since there was more than one indicator in each construct, each indicator was used as a parcel. Assessment of model fit was based on multiple criteria. Generally, a model is regarded as having acceptable fit if the Comparative Fit Index (CFI, Bentler, 1990) is greater than 0.90 and Root-Mean-Square Errors of Approximation (RMSEA, Steiger & Lind, 1980) is lower than 0.08 (Hoyle, 1995).

In the present study, the SEM model was tested with external control and fate control as exogenous variables, psychological adjustment and psychological distress as endogenous variables, and active coping and avoidant coping as mediators, respectively. Age and gender were controlled in the model by adding a direct path from age and gender to each mediator (i.e. active coping and avoidant coping) and dependent variables (i.e. psychological adjustment and psychological distress). All testing of measurement and structural models was based on analysis of covariance structures using the EQS program (Bentler, 1995). The two latent factors of fate control and external control were allowed to be correlated, because both are belief measures with the component beyond one’s personal control. The residuals for the two coping variables were allowed to be correlated given that they both measured the construct of coping style. The residuals for the two psychological well-being measures were also allowed to be

correlated for the same reason.

Results of the SEM model are presented in Figure 2. Consistent with the findings from correlation analysis, fate control positively predicted both active coping and avoidant coping (b = 0.13, β = 0.24, p = .004, and b = 0.25, β = 0.48, p < .001, respectively). In additional, external control negatively predicted active coping (b = -0.72, β = -0.35, p < .001) but not avoidant coping (b = 0.13, β = 0.06, p = .225). Active coping positively predicted psychological adjustment (b = 1.15, β = 0.50, p < .001), but not psychological distress (b = -0.09, β = -0.06, p = .301). In contrast, avoidant coping negatively predicted psychological adjustment (b = -0.64, β = -0.31, p = .012), but positively predicted psychological distress (b = 0.74, β = 0.46, p < .001). The model fitted the data well: χ^2 (110, N = 251) = 234.53, p < .001, CFI = .93, NNFI = .90, and RMSEA = .07.

Testing for the Effects of Fate Control on Psychological Well-being

Next I tested the mediation effect of coping style by assessing the direct effect and the indirect effect of fate control on psychological adjustment. First, the direct effect between fate control and psychological adjustment was not significant (b = -0.11, β = -0.10, p = .145). Using Sobel test (Sobel, 1982), the indirect effects from fate control to psychological adjustment through active coping and through avoidant coping were both significant, with z = 2.17, p = .015 and z = -2.01, p = .020, respectively. The results indicated that active coping fully mediated the effect of fate control on psychological adjustment. Similarly, avoidant coping

fully mediated the effect of fate control on psychological adjustment.

Then I tested the indirect effect of fate control on psychological distress. The direct effect between fate control and psychological distress was not significant (b = 0.07, β = 0.09, p = .152). The indirect effects from fate control to psychological adjustment through avoidant coping was significant, with z = 2.91, p = .002. This indicated that avoidant coping fully mediated the effect of fate control on psychological distress.

Testing for the Effects of External Control on Psychological Well-being

Next, I tested the mediation path for external control. The direct effect between external control and psychological adjustment was significant (b = -1.09, β = -0.23, p = .009). The indirect effect from external control to psychological adjustment through active coping was significant, with z = -2.60, p = .005. The results indicated that active coping partially mediated the effect of external control on psychological adjustment.

The mediation path from external control to psychological distress through active coping was not tested because the path from active coping to psychological distress was not significant (b = -0.09, β = -0.06, p = .301). Similarly, the path from external control to psychological distress through avoidant coping was not tested because the path between external control and avoidant coping was not significant (b = 0.13, β = 0.06, p = .225).

The Effects of Fate Control and External Control on Coping

In addition, considering that people believing in fate control hold the belief that fate is

pre-determined without deemphasizing the importance of personal agency, fate control is a more dynamic worldview than external control, conducive to a stronger likelihood of using more coping strategies in general. Using median-split approach, I separated participants who were high in fate control and those who were high in external control (Table 2). Since some participants could belong to both groups, no significant testing was conducted. However, directionally, people who were high in fate control had higher scores in all four types of coping strategies (problem-focused, seeking social support, wishful thinking and distancing) than those who were high in external control.

Taken together, Study 1 confirmed that fate control and external control share some similarities but they are also different in predicting coping strategies and psychological well-being. Individuals endorsing fate control belief are more likely to use both active coping and avoidant coping. However, people endorsing external control belief are less likely to use active coping while individuals. It is noted that although external control showed positive correlation with avoidant coping (significant with wishful thinking, $r = .16$, $p = .009$; marginally significant with detachment, $r = .12$, $p = .06$), the path became not significant when putting in the model. It was possibly due to the strong relationship between fate control and avoidant coping, hence suppressing the effect of external control to avoidant coping.

In addition, active and avoidant coping mediated the relationship between control beliefs and well-being.

Study 2

Although the cross-sectional results in Study 1 have demonstrated the associations among the constructs in my proposed model, Study 1 only investigated the general behavioural tendencies. However, people may adopt different coping strategies when dealing with different stressors (Folkman & Lazarus, 1980). Therefore, Study 2 aimed to control for the stressful situations by presenting the same hypothetical stressful events to all participants, and asked them to report their coping strategies to deal with the same set of events such that the types of stressors can be controlled (Cheng & Cheung, 2005).

Method

Participants and Procedure

Two hundred and ninety-four undergraduate students (213 females, 1 unspecified; M_{age} = 20.35, *SD* = 1.98) from two local universities in Hong Kong (The Hong Kong Polytechnic University and The Chinese University of Hong Kong) responded to recruitment emails and took part in the survey. The questionnaire was administered online in Chinese. Participants were asked to report demographic information at the end of the survey.

Measures

S*tressful scenarios.* The hypothetical stressful scenarios were adopted from the Extended Miller Behavioural Style Scales (EMBSS; Cheng, Chiu, Hong, & Cheung, 2001). The EMBSS was used because this scale consists of a number of hypothetical stressful situations in various domains. The eight scenarios represent stress in different life domains,

including work (Layoff and Business Dinner), health (Dentist, Early Cancer and Terminal Cancer), sports (Ball Game) and even life-and-death situations (Hostage and Plane). Participants were presented with eight stressful scenarios and instructed to answer a list of questions for each scenario afterwards. They were asked to vividly imagine themselves encountering the situation, and then rated each stressful situation along two dimensions, namely perceived stress and perceived controllability, which were measured by single-item questions. Perceived stress was rated on a 6-point Likert scale ranging from 1 (*slightly stressful)* to 6 *(extremely stressful)*. Perceived controllability was also rated on a 6-point Likert scale ranging from 1 (*extremely uncontrollable)* to 6 *(extremely controllable)*.

Intended coping strategies. After reading each stressful scenario, participants were asked to write down what coping strategies they intended to employ to manage (e.g., master, tolerate, reduce, minimize) the stress associated with each scenario. After writing down the coping strategies they intended to employ, they indicated the extent to which their primary goal of their intended coping strategies was a) to directly handle the demands/ problems associated with the event in order to reduce its impact on them (i.e., problem-focused coping), b) to reduce or manage their distress or uncomfortable feelings associated with the event (i.e. emotion-focused coping), and c) to avoid the event (i.e., avoidant coping) on a 6-point Likert scale ranging from 1 (*strongly disagree)* to 6 *(strongly agree)*. Active coping was calculated by averaging the level of agreement with problem-focused coping and emotion-focused coping as

their primary goal to cope with the event, while avoidant coping was measured by that of avoiding the event. Finally, participants were asked to rate the extent to which the adopted coping strategies could reduce their stress, on a 7-point Likert scale ranging from -3 *(largely increase the stress)* to +3 *(largely reduce the stress).*

Fate control and external control. The same instruments used in Study 1 were adopted in this study to measure fate control and external control, namely the Fate Control Subscale of the Social Axioms Survey II (Leung et al., 2012) and Internal External Scale (Rotter, 1966), respectively. The reliabilities of both scales were acceptable, with $\alpha = .69$ and $\alpha = .73$, respectively.

Results and Discussion

Overall scores of active coping, avoidant coping, and stress reduction were calculated by averaging the corresponding scores across all eight scenarios. As such, the coping responses would not be affected by a particular individual stressor.

Descriptive statistics and bivariate correlations of the measures are summarized in Table 3. The results were similar to those in Study 1. Fate control was positively correlated with active coping marginally ($r = .10$, $p = .096$) and was positively correlated with avoidant coping significantly ($r = .19$, $p = .002$). In contrast, external control was negatively correlated with active coping ($r = -.17$, $p = .005$), but was positively correlated with avoidant coping ($r = .26$, $p < .001$). Finally, active coping was positively correlated with stress reduction ($r = .34$,

$p < .001$), while avoidant coping was negatively correlated with stress reduction ($r = -.34$, $p < .001$).

Testing the Proposed Model

SEM with parcelling was performed to test the impact of external control and fate control on active and avoiding coping strategies, in turn predicting stress reduction. Similar to Study 1, age and gender were controlled. The SEM model is presented in Figure 3.

Consistent with Study 1, fate control positively predicted both active coping and avoidant coping ($b = 0.28$, $\beta = 0.26$, $p = .002$, and $b = 0.38$, $\beta = 0.19$, $p = .011$, respectively). External control negatively predicted active coping ($b = -0.79$, $\beta = -0.32$, $p < .001$), but positively predicted avoidant coping ($b = 0.89$, $\beta = 0.20$, $p = .008$). Finally, active coping positively predicted stress reduction ($b = .45$, $\beta = 0.49$, $p < .001$), while avoidant coping negatively predicted stress reduction ($b = -.25$, $\beta = -0.48$, $p < .001$). The model fitted the data well: χ^2 (102, $N = 294$) = 175.65, $p < .001$, CFI = .94, NNFI = .92, and RMSEA = .05.

Testing for Mediating Effect

Next, I tested the mediation effect by assessing the direct effect and the indirect effect of fate control and external control on stress reduction. First, the direct effect of fate control on stress reduction was not significant ($b = -0.10$, $\beta = -0.04$, $p = .126$). Using Sobel test (Sobel, 1982), the indirect effects from fate control to stress reduction through active coping and avoidant coping were significant, with $z = 2.52$, $p = .006$ and $z = -2.07$, $p = .019$, respectively.

This indicated that active coping and avoidant coping fully mediated the effect of fate control on stress reduction.

Similarly, the direct effect of external control on stress reduction was also not significant (b = -0.26, β = -0.14, p = .095). The indirect effects from external control to stress reduction through active coping and avoidant coping were also significant, with z = -2.91, p =.002 and z = -2.17, p = .015, respectively. This indicated that active coping and avoidant coping fully mediated the effect of external control on stress reduction.

In sum, using the hypothetic scenario approach to control the type of stressors, Study 2 supported the mediating role of coping styles in the relations between control beliefs and stress reduction, which is a proxy indicator of psychological well-being.

Differentiating High vs. Low Controllability Stressors

In addition to understanding the mediation relationship, I conducted analysis at the scenario level to test the situational effect of the stressors. First of all, perceived controllability was illustrated by the eight scenarios (Figure 4). Dinner (M = 4.40, SD = 0.89) and ball game (M = 4.38, SD = 0.95) were relatively higher in perceived controllability. In contrast, terminal cancer (M = 2.13, SD = 1.20), plane (M = 2.15, SD = 1.07), and hostage (M = 2.16, SD = 0.89) were relatively lower in perceived controllability.

Therefore, dinner and ball game were combined as high controllability stressors, and the ratings of active coping, avoidant coping, perceived stress, perceived controllability and

stress reduction were averaged across the two scenarios. Likewise, terminal cancer, plane, and hostage were combined as low controllability stressors. Their corresponding measures were also averaged across the three scenarios.

Descriptive statistics of the measures in both high controllability and low controllability stressors are summarized in Table 4. Paired sample *t*-tests were conducted to compare the measures for high controllability and low controllability scenarios. By definition, perceived controllability in high controllability stressors ($M = 4.40$, $SD = 0.71$) was significantly higher than that of low controllability stressors ($M = 2.14$, $SD = 0.77$), with $t = 37.24$, $p < .001$. Perceived stress was significantly lower in high controllability ($M = 4.27$, $SD = 0.86$) than low controllability stressors ($M = 4.92$, $SD = 0.76$), with $t = -11.75$, $p < .001$, which was consistent with other studies (Frazier, 2003; Najdowski & Ullman, 2009).

In addition, people also tended to employ more active coping in high controllability stressors ($M = 4.49$, $SD = 0.64$) than low controllability stressors ($M = 4.08$, $SD = 0.73$), $t = 8.88$, $p < .001$, and less avoidant coping in high controllability stressors ($M = 2.48$, $SD = 0.98$) than low controllability stressors ($M = 3.56$, $SD = 1.09$), $t = -15.27$, $p < .001$.

The above analysis showed that people tend to employ different coping strategies in situations with different controllability. Next, I tested the effects of control beliefs on coping strategies by comparing the differences in correlations between control beliefs and coping strategies in the two controllability conditions. Partial correlations (controlling for age and

gender) of the measures in high and low controllability conditions are presented in Table 5 and Table 6, respectively.

In the high controllability condition, fate control was positively correlated with active coping (r = .12, p = .044), but was marginally correlated with avoidant coping (r = .11, p = .078). In the low controllability condition, however, opposite patterns were observed. Fate control was positively correlated with avoidant coping (r = .17, p = .005), but marginally correlated with active coping (r = .11, p = .080).

On the other hand, external control was negatively correlated with active coping in both high controllability and low controllability conditions, with r = -.19, p = .001, and r = -.14, p = .023, respectively. External control was only positively correlated with avoidant coping in low controllability condition (r = .22, p < .001), but not in high controllability condition (r = .10, p = .118).

No Difference between High vs. Low Perceived Stress

The same procedure was conducted to test the potential moderation effect of perceived stress of the stressors. First, hostage, early cancer and terminal cancer were grouped as high stress scenarios while dentist, plane and dinner were grouped as low stress scenarios. Partial correlation showed that fate control was positively correlated with avoidant coping (r = .21, p = .001) but not active coping (r = .08, p = .18) in high perceived stress scenarios. In low perceived stress scenarios, fate control was also positively correlated with avoidant coping (r

= .17, p = .005) but not active coping (r = .09, p = .13). Since fate control demonstrated the same pattern on coping in both high stress and low stress scenarios, perceived stress may not be a potential moderator for fate control.

Similarly, partial correlation showed that external control was positively correlated with avoidant coping (r = .23, p < .001) but marginally and negatively correlated with active coping (r = -.12, p = .06) in high perceived stress scenarios. In low perceived stress scenarios, external control was also positively correlated with avoidant coping (r = .18, p = .002) but negatively with active coping (r = -.16, p = .008). Since external control demonstrated the same pattern on coping in both high stress and low stress scenarios, perceived stress may not be a potential moderator for external control as well.

Taken together, Study 2 confirmed that the proposed model was not only valid in general tendencies, but also in hypothetical stressors that are less common in everyday life (e.g., hostage, early caner and terminal cancer scenarios). In addition, Study 2 further showed that fate control was positively correlated with active coping in high controllability condition, but positively correlated with avoidant coping in low controllability condition. The differentiation of controllability may explain why people high in fate control were likely to use both active and avoidant coping, indicating controllability as a possible moderator of the relations between fate control and well-being indicators. Hence, the moderating effect of stress controllability was further examined in Study 3.

Study 3

Study 1 was based on general behavioural tendencies, while Study 2 was based on a set of hypothetical scenarios. To test whether the model can be applied in actual situations, real-life stressors and coping behaviours were examined in Study 3. A diary approach (Bartley & Roesch, 2011; Nezlek, 2005) was implemented to measure stressors and coping strategies adopted in daily life across multiple days. Thus, the role of coping as a mediator of the relations between control beliefs and well-being could be more rigorously evaluated.

In addition, Study 2 revealed that the controllability of stressors affected coping strategies. Previous research on community samples showed that people of different ages reported different types and frequencies of stressors. For example, younger adults reported higher frequency of interpersonal and home stressors than middle-aged adults and the elderly. Middle-aged adults also reported more work-related stressors than older adults (Neupert, Almeida, & Charles, 2007). Therefore, Study 3 extended the investigation to include community adults who might have more diversified stressors than university students to test my hypothesized model.

Method

Participants and Procedure

One hundred and eighty-eight university students (133 females; M_{age} = 21.69, *SD* = 3.30) and one hundred and two community adults (71 females; M_{age} = 31.46, *SD* = 10.50) were recruited in Study 3. The student sample was recruited from two local universities in Hong

Kong (The Hong Kong Polytechnic University and The Chinese University of Hong Kong) who responded to recruitment emails and took part in the survey. The community sample was recruited from advisements through social networking sites and personal networks.

All questionnaires in the study were administered online in Chinese. This study was divided into two procedural phases: a) The first day; and b) The remaining twelve days. On the first day, participants were asked to complete a battery of questionnaire measuring their social axioms, locus of control, and demographic information. About two weeks after the first session, participants received an email indicating the start of the second phase of the study. Participants were instructed to complete a short questionnaire for twelve days, with approximately two to three days per week for four consecutive weeks. In every session, emails were sent to remind participants to fill in the online questionnaire within two to three days before the next session. On average, participants provided responses for 9.59 sessions out of the maximum of 12 sessions.

Measures

Fate control and external control. The same instruments used in Study 1 were adopted to measure fate control and external control. The reliabilities of both scales were satisfactory, with $\alpha = .78$ and $\alpha = .77$, respectively.

Stressful events. In each session of the second phase, participants were asked to recall and write down the most stressful event that happened to them in the past few days. They were

then asked to rate the stressful event along two dimensions, namely perceived stress and perceived controllability. Similar to Study 2, both perceived stress and perceived controllability were rated on a 6-point Likert scale ranging from 1 (*slightly stressful)* to 6 *(extremely stressful)* for perceived stress and 1 (*extremely uncontrollable)* to 6 *(extremely controllable)* for perceived controllability.

Coping strategies. After describing the stressful event, participants were asked to write down the coping strategies they had employed to manage (e.g., master, tolerate, reduce, minimize) the stress associated with the event. After that, participants selected the primary goal of the coping strategies employed, namely a) to directly handle the demands/problems associated with the event in order to improve the negative impact on them (i.e. problem-focused coping), b) to reduce or manage their distress or uncomfortable feelings associated with the event (i.e. emotion-focused coping), and c) to avoid the event (i.e. avoidant coping). Participants were only allowed to choose one of the three primary goals of their actions. Aligning with the same definition as in other studies (e.g., Au et al., 2012), participants choosing problem-focused coping and emotion-focused coping were combined as active coping, while those choosing to avoid the event were regarded as avoidant coping. It should be noted that I used the intention of adopting active or avoidant strategy (on a 6-point scale) in Study 2, while I used actual coping strategy (single-answer question) in Study 3 due to different focuses in these two studies. In Study 2, stressors were based on hypothetic scenarios

and participants were allowed to write down many coping strategies that they imagined they would employ,\ whereas Study 3 assessed real stressors participants experienced and their actual coping behaviour.

Life satisfaction. Life satisfaction was included in each session in the second phase. To reduce attrition rate, we minimized the length of the weekly questionnaire by adopting the single-item Delighted-Terrible Scale (D-T Scale; Andrews & Withey, 1976), which has been used in Study 1.

Results and Discussion

Overall scores of perceived stress, perceived controllability, active coping, avoidant coping, and life satisfaction were calculated by averaging the corresponding scores across all twelve days.

Descriptive statistics and bivariate correlations of the measures are summarized in Table 7. Due to the single-answer nature of the coping question, active coping and avoidant coping had a perfect negative correlation of -1.00. Therefore, only active coping was used in the subsequent analyses.

Similar to Study 1 and Study 2, external control was negatively correlated with active coping (r = -.13, p = .024). However, fate control was not correlated with active coping (r = -.06, p = .299). Finally, life satisfaction was positively correlated with active coping (r = .27, p < .001).

Testing the Moderating Effect of Controllability

Study 2 showed that people high in fate control were more likely to use active coping strategies in stressors which were high in controllability. In contrast, they were more likely to use avoidant coping strategies when the stressors were less controllable. However, people high in external control were less likely to employ active coping in both conditions. Yet, the limitation of Study 2 is that the type of stressors was pre-determined by the hypothetical scenarios. In Study 3, participants were allowed to write down different daily stressors and hence the moderating effect of perceived controllability could be tested.

To test my hypothesis regarding the differential associations between control beliefs and coping styles across stressors with different levels of perceived controllability, hierarchical multiple regression was conducted with active coping as dependent variable, control beliefs, controllability and their interactions as predictors, and demographics as covariates.

First, three-way interaction was tested using hierarchical multiple regression and the results are presented in Table 8. After controlling for age and gender, the fate control (standardized) × external control (standardized) × controllability (standardized) interaction term was not significant ($b = 0.09$, $\beta = 0.07$, $p = .22$), indicating that three-way interaction was not supported.

Next, I tested the interaction effect of controllability on fate control and external separately. The results of the hierarchical multiple regression with fate control (standardized) ×

controllability (standardized) are presented in Table 9. After controlling for age and gender, fate control × controllability interaction term was significant (b = 0.22, β = 0.15, p = .008), indicating that controllability moderated the effect of fate control on active coping. To check the direction of the moderation, MODPROBE procedure for probing interactions (Hayes & Matthes, 2009) was used to plot the interaction graph and the magnitude of the slope (Figure 5). In high controllability condition, the slope of the line was not significant (b = 0.02, p = .27). The result indicated that fate control is not correlated with active coping when controllability is high. In contrast, in low controllability condition, the slope was significant (b = -0.06, p = .006). This indicated that fate control was negatively correlated with active coping when controllability is low.

In addition to the interaction effect, I also examined the main effect of the independent variables. The main effect of fate control on active coping was not significant (b = -.01, β = -.07, p = .201). However, the main effect of controllability on active coping was significant (b = .04, β = .27, p < .001), indicating that people performed more active coping when the controllability was high.

Similarly, the moderating effect of controllability on the relationship between external control and active coping was also analyzed using hierarchical multiple regression (see Table 10). After controlling for age and gender, external control × controllability interaction term was not significant (b = 0.01, β = 0.03, p = .555). The main effect of external control on active

coping was also not significant (b = -.01, β = -.08, p = .161). Similar to the fate control model, the main effect of controllability on active coping was significant (b = .04, β = .27, p < .001), indicating that people performed more active coping when the controllability was high.

Taken together, the results of Study 3 confirmed my hypothesis that controllability of the stressors moderated the effect of fate control on coping strategy. Specifically, when the stressors are less controllable, people are less likely to use active coping. This interaction effect was significant only for fate control but not for external control.

Study 4: Experimental Study

Studies 1 to 3 are correlational in nature. To validate the theoretical framework with the causal evidence, Study 4 adopted an experimental design to test the casual relationship of the proposed model. In the extant literature, social axioms have been used as individual difference variables rather than being manipulated. This study attempted to use an experimental design to activate control beliefs.

Specifically, a priming method will be adopted to manipulate the levels of fate control, internal control and external control beliefs. In addition, to further examine the effect of controllability that had been found in Study 2 and Study 3, the controllability of stressors was manipulated in Study 4.

It was hypothesized that people being primed with external control belief would be more likely to perform avoidant coping, regardless of controllability of the stressors. In contrast, people being primed with internal control belief would be more likely to perform active coping, in both controllable and uncontrollable tasks. Study 2 and Study 3 showed that people high in fate control were more likely to adopt adaptive coping (i.e., more active but less avoidant coping) when the stressors were high in controllability; while they were more likely to adopt maladaptive coping (i.e., more avoidant but less active coping) when the stressors were low in controllability. Hence, it was hypothesized that people being primed with fate control would be more likely to perform adaptive coping in a controllable task. However, they would be likely to perform maladaptive coping (e.g., avoidance) in an uncontrollable task.

Method

Participants

Two hundred and two university students (129 females; M_{age} = 20.46, *SD* = 1.98) from two local universities in Hong Kong (The Hong Kong Polytechnic University and The Chinese University of Hong Kong) responded to recruitment emails and took part in the survey. Participants were invited to go to a computer room to participate in the present study.

Design and procedure

Study 4 comprised both a between-subject component (primed fate control, external control, internal control, and neutral conditions) and a within-subject component (task controllability: controllable vs uncontrollable).

The experiment was conducted in a computer lab with participants facing a computer screen, where different kinds of stimulus were shown. After giving informed consent, participants were randomly assigned into one of the four conditions, i.e., internal-control-primed (*n* = 50), external-control-primed (*n* = 49), fate-control-primed (*n* = 51), and neutral condition (n = 52).

Manipulation of Control Beliefs

Scrambled sentence task (Srull & Wyer, 1979) was used as the priming tool. In the scrambled sentence task, all eight statements from the fate control subscale in the SAS II (Leung, et al., 2012) were selected. These statements were embedded in a scrambled sentences task that asked participants to arrange the scrambled phrases into a complete sentence.

Similarly, eight statements were used to prime external and internal control beliefs by extracting scrambled sentences from the Internal External Scale (Rotter, 1966). Finally, for the neutral condition, eight statements that were unrelated to any belief were used (e.g., “and mountainous / three quarters of / are covered by water./ The remaining terrain / the land on earth / is hilly.”).

After priming, respondents were given two types of stressful tasks, namely controllable and uncontrollable tasks. The presentation order of these two tasks was counterbalanced to minimize order effect. Participants were randomly assigned to one of the two tasks.

Controllable task. In the controllable task, the participants were told to a) remember a six-digit number and b) make judgment on whether a statement describing a social relationship were positive or negative. They were told to make the judgment as promptly as possible. A total of 32 statements were adopted from the Social Support Appraisals Scale (SS-A; Vaux et al., 1986), which assesses the extent to which respondents perceived themselves as being loved by, respected by, and involved with their family and friends. These statements consisted of 16 positive and 16 negative items. Examples of the statements were, ‘‘My family cares for me very much’’ (positive item) and ‘‘I don’t feel close to my friends’’ (negative item). Participants were told that the accuracy in recalling the six-digit number and the reaction time of the judgment were recorded and their goal was to perform their best in these two areas. This was a controllable task, because improvement of performance is possible with practice.

Uncontrollable task. In the uncontrollable task, the participants were asked to do mental calculations by multiplying as many pairs of three-digit numbers as possible in a period of three minutes. A total of 16 calculations were given. A pilot study was conducted and showed that it is impossible to complete 16 calculations in three minutes. Participants were told to make the most correct calculations as possible. This is an uncontrollable task, because it is impossible to improve performance even with practice.

These two tasks have been used in previous studies on stress induction (e.g., Cheng & Cheung, 2001; Hinton et al., 1992). For each task, five practice trials (i.e., five judgments and five mental calculations) were given to participants, such that they were familiar with the procedure of the tasks.

Behavioural coping response. Upon completion of each task, participants were told that there was a short break for a few minutes and they were given four articles to read during the break, namely ‘Five tips to improve memory’, ‘Five tips to improve intelligence’, ‘Five jokes of the day’, and ‘Five news reviews of the year’. The order of the choices was randomized to minimize order effect. The number of words in each article was controlled between 560 and 568 Chinese words. Participants were only allowed to select one article to read. The choice and time spent on reading the article were recorded by the computer program.

After completion of the two tasks, they were asked to fill out a battery of questionnaires measuring fate control belief, external control belief, and demographic information.

Measures

Performance of controllable task. The controllable task required participants to memorize a 6-digit number and made judgment on statements describing social relationships. The accuracy of whether participants could record the 6-digit number and the average time spent on making judgment of each statement were recorded.

Performance of uncontrollable task. The uncontrollable task required participants to do mental calculations by multiplying as many pairs of 3-digit numbers as possible. The number of correct calculations was recorded.

Behavioural coping response. After each task, participants were allowed to choose different articles to read. The choices 'Five tips to improve memory' and 'Five tips to improve intelligence' were considered as active coping because these choices indicated that participants made effort to improve the performance of the tasks. The choices 'Five jokes of the day' and 'Five news reviews of the year' were considered as avoidant coping because they diverted respondents' attention from the stressful tasks. In addition to the choice of article, the time spent on the article content was also recorded. While the choice of article indicated the intended coping response that participants made, the time spent on the article indicated the extent of effort that participants were willing to make. Therefore, both measures were indicated as the behavioural coping responses to the stressful tasks.

Fate control and external control. The same instruments used in Study 1 were adopted

in this study to measure fate control and external control as manipulation check, namely the Fate Control Subscale of the Social Axioms Survey II (Leung et al., 2002) and Internal External Scale (Rotter, 1966), respectively.

Results and Discussion

Manipulation Check

First, manipulation check was conducted to examine the effects of priming. Descriptive statistics of fate control and external control in each priming condition are summarized in Table 11. One-way ANOVA test showed that there was no significant difference in fate control belief and external control belief among those being primed by fate control belief, external control belief, internal control belief, and neutral statements, with $F(3, 198) = .57$, $p = .633$ and $F(3, 197) = 1.23$, $p = .301$, respectively. The results indicated that the priming procedures did not change participants' default level of the control beliefs.

Hence, in the subsequent analyses, I analyzed the self-reported fate control and external control beliefs. The reliability of fate control and external control were both satisfactory ($\alpha = .83$, and $\alpha = .78$, respectively).

The Effect of Beliefs on Controllable Task

Descriptive statistics and bivariate correlations of the measures on the controllable task are summarized in Table 12. Among the participants, 42% chose either 'Five tips to improve memory' or 'Five tips to improve intelligence', which were regarded as active coping choices.

On the other hand, 58% chose either ‘Five jokes of the day’ or ‘Five news reviews of the year’, which were regarded as avoidant coping choices. Almost all participants (94%) accurately recalled the 6-digit number after all judgment tasks, suggesting that the tasks were highly controllable.

Fate control was negatively correlated with time spent in reading articles reflecting avoidant coping (r = -.27, p = .003). Hence, multiple regression was conducted with fate control as an independent variable and time spent in reading articles reflecting avoidant coping, controlling for age, gender, and order of the task (Table 13). After controlling the covariates, fate control negatively predicted time spent on reading articles reflecting avoidant coping (b = -8.83, β = -0.23, p = .013). Taken together, the results suggested that people high in fate control were less likely to engage in avoidant coping during the controllable task.

Although this study failed to confirm the relationship between fate control and active coping, the negative relationship between fate control and avoidant coping partially support my hypothesis.

External control was not correlated with either selection of coping articles or time spent reading them. Therefore, no regression analysis using external control as a predictor was conducted.

The Effect of Beliefs on Uncontrollable Task

Descriptive statistics and bivariate correlations of the measures in the uncontrollable

task are summarized in Table 14. Among the participants, 41% chose active coping choices, while 59% chose avoidant coping choices. Participants only made 3.43 correct out of 16 available calculations, suggesting that this task was low in controllability.

Contrasting with the results of the controllable task, fate control was negatively correlated with time spent in reading articles reflecting active coping (r = -.22, p = .047). Similarly, multiple regression was conducted to examine the effect of fate control on time spent on reading articles reflecting active coping, controlling age, gender, and order of the task (Table 15). After controlling for age, gender, and order of the task, fate control negatively predicted time spent on reading articles reflecting active coping (b = -9.07, β = -0.23, p = .047). The results suggested that people high in fate control were less likely to engage in active coping during the uncontrollable task. Similarly, the results partially supported my hypothesis that people high in fate control tend to use avoidant coping behaviours in a situation with low controllability.

External control was not correlated with either selection of coping articles or time spent on reading them, and hence no further analysis was conducted.

To conclude, Study 4 failed to prime control beliefs using scrambled sentence task. In addition, both control beliefs failed to predict the choice of coping responses. It is observed that ‘Five jokes of the day’ (defined as avoidant coping) dominated the coping selections. Around half respondents in both controllable task (47%) and uncontrollable task (46%) chose

reading ‘Five jokes of the day’. Therefore, lack of variability may contribute to the lack of significant correlation between control beliefs and choice of behavioural coping response.

However, this study found that fate control was negatively related to avoidant coping behaviours in a controllable task while it was negatively related to active coping behaviours in an uncontrollable task. This suggested that people high in fate control belief made flexible responses depending on the controllability of the situation.

General Discussion

Control is one of the central constructs in psychology and has received extensive attention in the psychology literature. The present research aims to understand the relationship between control and response to stress in the prediction of well-being. In psychological theories of personal control, believing in external control appears to be at odds with personal agency and have detrimental effect on psychological well-being (e.g., Folkman & Lazarus, 1980; Judge & Bono, 2001; Ng, Sorensen, & Eby, 2006) while believing in internal control appears to be adaptive (e.g., Kerr & Gross, 1997; McCullough, Ashbridge, & Pegg, 1994). However, this dichotomous view of control may not be applied to all kinds of control beliefs. This research offers an alternative perspective to the dichotomous view of control by introducing the worldview of fate control, which was found to induce both active and avoidant responses in the face of negative events in certain situations.

Differentiating External Control and Fate Control

As beliefs about the nature of the world, both external control and fate control denote that life events are determined and controlled by forces outside the self. In fact, fate is one of the determining forces in external control belief, together with chance, luck and powerful others (Levenson, 1981). Both external control and fate control were hypothesized to predict avoidant coping, leading to psychological distress.

However, the belief of fate control is more than fatedness or fatalism, which holds that

all events are predetermined and unalterable (Kalichman, Kelly, Morgan, & Rompa, 1997). Empirically, past studies have shown that fate control shares a slight positive correlation with external control, ranging from r =.18 (Singelis et al., 2003) to r = .28 (Chen et al, 2006a). Aligning with these studies, a slight positive correlation was also observed across the first three studies of the present research (r = .25, .24, and .25, ps < .001, in Studies 1, 2, and 3, respectively), with the exception that a moderate positive correlation was found in Study 4 (r = .37, p < .001).

The findings from the cross-sectional design in Study 1 and the hypothetical scenarios design in Study 2 confirm my hypothesized model linking the two control beliefs and coping strategies. Individuals endorsing fate control belief and external control belief are more likely to use avoidant coping, However, positive linkage between fate control and active coping are also identified, differentiating fate control from external control.

Another unique characteristic of fate control is that it exhibits different behavioural responses depending on situations. This viewpoint was proposed before (e.g., Hui & Hui, 2009) but not yet supported with empirical evidence. As a summarizing note about fate control, Hui and Hui (2009) raised the question in their review on social axioms, “if fate control really captures the idea of individuals exercising control to influence the predetermined trajectories of fate, what are the personal strengths and situational affordances that would allow the shift from being a victim of fate to a coauthor of fate?” (p. 25). The current research suggests a possible

answer to this question, which is controllability of the stressors.

By comparing different hypothetic stressors in Study 2 and daily hassles in Study 3, fate control is positively correlated with active coping in the high controllability condition, In contrast, in the low controllability condition, fate control is positively correlated with avoidant coping. This moderation effect is only observed for fate control but not for external control.

After establishing divergent effects of fate control on coping strategies, Study 4 attempts to examine the causal relationships between control beliefs and coping behaviours using priming method. Although Study 4 fails to demonstrate the priming effect on control beliefs using the scrambled sentence task, correlational analysis shows that people high in fate control are less likely to engage in maladaptive coping behaviours in a controllable task, while people high in fate control are less likely to engage in adaptive coping behaviours in an uncontrollable task.

In sum, both fate control and external control induce avoidant coping. However, fate control also induces active coping and that controllability moderated the relationship of fate control with coping styles but not that of external control, supporting the discriminant validity of fate control.

A New Understanding of Fate Control

Since the development of social axioms, fate control has received relatively less attention than other axioms, such as social cynicism and reward for application, because of its

ambiguity (Safdar, Lewis, Greenglass, & Daneshpour, 2006) and lower reliability (Bond, 2009). However, fate control is still an important axiom factor to understand how people conceive of the world. As Bond (2009) pointed out, “as one might expect with humans striving to maximize their outcomes in a contingent world, the outcomes believed to be controlled by fateful forces are themselves influenceable through individual practices. Such a conflation of belief types into the ambiguous construct of fate control may seem illogical, but is nonetheless ‘psychological’. Fate control is not merely control by fate; it is control of that fate through practice.” (p. 335).

The concept that a belief composing of both “life events are predetermined” (determinism) and yet “there are ways that individuals can exert influence over or shape their outcomes” (alterability) seems counter-intuitive. However, such “conflation of belief types” co-exists. Burrus and Roese (2008) showed that 75% people believe in fate, and 85% further believe that it is possible for events to be determined jointly by fate and individual action.

Previous research found that fate control leads to avoidance (Bond et al., 2004a) and that fate control induces personal agency (e.g., Liem, Hidayat, & Soemarno, 2009; Zhou, Leung, & Bond, 2009). These studies demonstrated either the determinism aspect or the alterability aspect of fate control. The present research has reconciled these opposing effects in a single model and found that people high in fate control tended to use both active and avoidant coping.

Secondly, people believing in fate control score higher in both active and avoidant coping, suggesting that they tend to use various coping strategies in their daily life. Ability to adapt different coping strategies across situations is one kind of coping flexibility (Cheng, Lau, & Chan, 2014). Coping flexibility reflects individual's attitude on how to cope effectively in situations and his/ her intentions to display behaviours that are appropriate to the situation (Cheng, Chiu, Hong, & Cheung, 2001). The present research found that people high in fate control tend to use different strategies, depending on how they perceive the stressors. Specifically, when the stressors are more controllable, they prefer active coping; in contrast, when the stressors are less controllable, they prefer using avoidant coping. Compared with fate control believers, people high in external control have stronger preference for avoidant coping but not active coping, regardless of the controllability of the stressors.

Enriching the Understanding of Control Belief and Personal Agency

The relationship between control belief and personal agency has been well studied in the literature. Internals perceive that their actions can lead to desired outcomes, and hence they are more likely to solve problems directly (Lazarus & Folkman, 1984). In contrast, externals do not believe that their actions bring desired outcomes, and therefore they are more likely to relinquish control and avoid stressful events.

The linkage between external control and avoidance has been established in various domains. In research on workplace stress, an internal locus of control predicts help-seeking and

positive thinking, while external locus of control predicts the use of avoidant coping. In particular, powerful others predicts avoidance/ resignation and chance predicts alcohol use (Gianakos, 2002). Similar results were found among mid-level managers as well. Managers who reported higher external locus of control were more likely to have the wish to quit their jobs while those reported higher internal locus of control were more likely to develop citizenship behaviours (Hoffi-Hofstetter & Mannheim, 1999).

Such relationship was also found among people facing more traumatic stress, such as natural disasters. Studying the impact of hurricane in Florida, Scott and colleagues (2010) revealed that participants who believed in external locus of control endorsed higher levels of avoidant coping, but not active coping (including both problem-focused and emotion-focused coping). In addition, avoidant coping was also identified to be the mediator partially explaining the relationship between external locus of control and level of worry.

The present research provides an alternative perspective to this linkage between externality belief and personal agency. Although people endorsing fate control belief think that life is pre-determined, they believe that there are ways for people to influence the negative impact of fate. High level of fate control is positively correlated with having a lucky number and reading one's horoscope (Singelis, Hubbard, Her, & An, 2003), both aiming to increase a sense of control over one's future.

Some researchers argued that believing in a lucky number or preferring a lucky number

is an illusion of control (Langer, 1975). In lottery, people prefer to choose their own random number instead of having others choose for them. Langer (1975) allowed half of the participants to choose their own lottery ticket while the other half was randomly given a lottery ticket. When asked about repurchasing the ticket before the lottery outcome was announced, those who were allowed to choose their own numbers demanded more money than those who were given a random lottery ticket. Other researchers proposed that the illusion of control increased when the game were related to skills (Thompson, Armstrong, & Thomas, 1998; Wortman, 1975). In sum, people high in fate control are likely to have a lucky number (Singelis, Hubbard, Her, & An, 2003), which increases the sense of control.

On the other hand, the goal of reading horoscope is to attract good fortune and to avoid bad luck, which is similar to the *Feng Shui* practice in Chinese culture. According to *Feng Shui*, one's destiny is fixed but predictive in nature. *Feng Shui* is aligned with one's destiny and annual fortune, and yet it enables one to exert control and agency (Wang, Jo, & Sherry, 2013). Furthermore, many people, even those who do not believe in fate, refuse to "tempt fate", which is to conduct some actions that presumptuously lead to bad luck (e.g., cross paths with a black cat). Although people believe that "there is no such thing" as bad luck, they have a strong intuition, or "feeling," that bad things happen to people who tempt fate (Risen & Gilovich, 2008). For example, students who were asked to respond rationally stated that an exchanged lottery ticket was no more likely to win than any other ticket. Students who were asked to

respond intuitively, however, reported that exchanging a ticket made it more likely to win (Risen & Gilovich, 2007).

The above research shows that people take actions to promote fortune (e.g., picking a lucky number) or to avoid bad luck (e.g., not to tempt fate) whenever the situation is controllable and action is possible. Given that people high in fate control are more likely to perform these behaviours, they are likely to exhibit personal agency when the situation is controllable. Hence, fate control is more than merely "illusion of control". It also induces actions to foster personal control. For example, people high in fate control have higher intention to study to improve their academic performance and to donate money to street children to improve the lives of these children (Liem, Hidayat, & Soemarno, 2009).

Another fate construct, namely negotiable fate, also provides similar views about fate determinism and personal agency. People living in a sociocultural context with more constraints (e.g., Indian women with lower literacy levels) have a stronger belief in negotiable fate than those experiencing fewer constraints (e.g., those with higher literacy) (Chaturvedi, Chiu, & Viswanathan, 2009). At the cultural level, in country with higher constraint (e.g., Mainland China), people believing in negotiable fate are more likely to exercise active coping than those in country with fewer constraint (e.g., United States) (Au et al., 2012). While the research on negotiable fate focuses on sociocultural context from a macro perspective, the present research on fate control illustrates that individuals' perception of the situation is also

important in the exercise of personal agency.

Enriching the Understanding of Control and Psychological Adjustment

The present research demonstrates that external control is negatively correlated with psychological adjustment (e.g., self-esteem, subjective happiness, and life satisfaction) and is positively correlated with psychological distress (e.g., depression, anxiety, and perceived stress). In addition, such relationship between external control and psychological adjustment is mediated by active coping and avoidant coping.

The negative linkage between external control and negative psychological functioning has been discussed in psychological theories and supported by empirical studies. For example, Deci and Ryan's (1985, 2000) self-determination theory (SDT) explains the beneficial effects of internal control on motivating people to achieve their needs for competence. If the environment facilitates the expression of these needs, human beings are intrinsically motivated to learn, act, and grow. Lack of intrinsic motivation conduces toward negative consequences, including poor performance, not persistence, lack of creativity, lower vitality, self-esteem, and well-being, compared with internally controlled motivation (e.g., Deci & Ryan, 1991, 1995; Nix, Ryan, Manly, & Deci, 1999; Ryan, Deci, & Grolnick, 1995; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997).

On the other hand, Seligman's (1975) learned helplessness theory explains the detrimental effects of external control because it reduces people's propensity to engage in

problem-solving activities and elicits depressive symptoms. Depressed people tend to perceive life events as uncontrollable and future action as futile (Presson & Benassi, 1996). As Maier and Seligman (1976) pointed out, helplessness does not arise from the traumatic events per se, but from beliefs about whether the organism can do something about them. It is not adversity itself but learning its uncontrollability that causes a sense of helplessness.

Empirically, meta-analyses have revealed moderately strong correlations between external locus of control and depression (Benassi, Sweeney, & Dufour, 1988). In addition to depression symptoms, a recent meta-analysis by Cheng, Cheung, Chio, and Chan (2012) also identified the moderately positive linkage between external locus of control and anxiety symptoms based on 152 studies in non-clinical populations.

However, compared with external control, the relationship between fate control and psychological adjustment is not as straightforward.

Firstly, fate control predicted both active coping and avoidant coping. However, since active coping positively predicted psychological adjustment while avoidant coping negatively predicted psychological adjustment, the overall effect of fate control to psychological adjustment becomes neutral. In Study 1, the total indirect effect from fate control to psychological adjustment was not significant (b = -0.03, β = -.03, p = .34). Similarly, in Study 2, the total indirect effect from fate to stress reduction was not significant (b = 0.06, β = .03, p = .29).

In the same vein, in Study 1 and Study 3, fate control was not correlated with life satisfaction. This non-significant correlation between fate control and life satisfaction was also found in previous research (e.g., .08 in Chen et al, 2006b; .01 in Lai, Bond, & Hui, 2007). To the best of my knowledge, previous research in the psychology field did not provide full explanation for the lack of correlation between fate control and life satisfaction. However, philosophical works provided us some insights to explain such phenomenon. In his famous novel *The Unbearable Lightness of Being*, Milan Kundera (1984) challenged Nietzshe's belief about the "heaviness" of life, which represents a fate determinism belief that one's life is fixed and events recur according to what have already occurred. The determinism of fate is a burden and thus it is "heavy". Kundera (1984) proposed an alternative belief that one's life is dependent on one's decision. It does not have the burden by fate, and thus life is "light". However, realising that life is being responsible by one's own decision, such freedom (from fate) has become too great for one to bear, and thus it is "unbearable".

Fate control belief denotes that life events are pre-determined but predictable and alterable. In this sense, fate control also emphasises the "lightness" of life that can be "unbearable". When giving cognitive judgment about their lives (i.e. life satisfaction), they may inevitably evaluate their lives from past experience. Research on counterfactual thinking, which captures the belief in mutability of past events (Roese, 1997), demonstrated that people have less life satisfaction if they think that they could have done differently to attain a better

life. In Olympic Games, silver medallists who had counterfactual thoughts think that they could have performed differently in order to have achieved the gold medal. This explains why silver medallists are often less satisfied than bronze medallists, although they have higher achievement than bronze medallists (Gilovich, Madey, & Medvec, 1995). Similarly, fate control can foster the sense of personal agency but also increase the burdens if the outcomes of some life events are not consistent with one's wish. In this light, fate control can be both beneficial and detrimental to life satisfaction, yielding to a non-significant relationship.

Significance, Limitations, and Future Studies

In sum, the present research proposed a model to differentiate two control belief systems, i.e., external control and fate control, and predict their behavioural and psychological consequences in stressful situations. While external control is positively correlated with avoidant coping, fate control is positively correlated with both active and avoidant coping. In addition, controllability of the stressors moderates such relationship. Specifically, facing stressors that are high in controllability, people high in fate control are more likely to adopt adaptive coping. However, when the stressors are less controllable, they are more likely to adopt maladaptive coping. This interaction is only significant for fate control but not external control.

Conceptually, this model distinguishes external control, which is generally maladaptive and elicits distress, from fate control, which can induce adaptive coping and facilitate

adjustment in certain situations. This research advances a new understanding about fate control and offers an alternative perspective to the dichotomous view of control and provides evidence for discriminant validity of the two seemingly similar constructs. This new knowledge about fate control can also reconcile mixed findings in previous research on personal control and adjustment.

Practically, this research can illuminate the cognitive processes conducive to adaptive coping and inform about appropriate coping strategies in different circumstances. In the long run, the implications of functional social beliefs can be far-reaching. The utility of fate control can stimulate research on learning performance, stress and coping, conflict resolution, health-promoting behaviour, subjective well-being, and political involvement.

Despite the theoretical and conceptual significance, there are some limitations in this research, and future directions should be noted.

Firstly, the research aimed to create an integrative model linking control beliefs, coping and well-being through perceived stress as moderator. However, due to complexity of the construct, it is difficult to connect all constructs together at once. Study 1 tested model without including the moderation effect of perceived controllability because this cross-sectional design did not aim to test specific stressors. In Study 2 to Study 4, the focus was on how perceived stress moderated the effect of coping strategies, hence well-being measures were not tested directly. Therefore, in future studies, a comprehensive design that

linking all constructs and moderated mediation analysis can be conducted to test whether the hypothesized model all at once.

Secondly, the major limitation of this research is that the priming task failed to work in Study 4. Scrambled sentence task (Srull & Wyer, 1979) is widely used to activate cooperative behaviours (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001), spirituality and authority (Shariff & Norenzayan, 2007). However, with the complexity of the control beliefs, statements of control beliefs are longer and the numbers of statements are fewer than those used in previous studies. For example, there were 15 sets of five-word scrambled sentences and 30 sets of five-word scrambled sentences in Chartrand and Bargh 1996) and Bargh, Gollwitzer, Lee-Chai, Barndollar, and Trotschel (2001), respectively. In this research, there are only eight sets of 15-20 word scrambled sentences. The complexity of the belief constructs may make them difficult to be activated in a scrambled sentence task. In future studies, other priming procedures can be considered. For example, Au and colleagues (2011) asked participants to write an essay on the assigned theme to evoke negotiable fate belief. This procedure requires participants to cognitively process the belief, so that it can be more salient.

Thirdly, belief in negotiable fate is positively correlated with avoidant coping strategies among European Americans, while belief in negotiable fate is linked to active coping strategies among Mainland Chinese (Au et al., 2011). Interestingly, using samples from Hong Kong, this research finds that fate control is positively correlated with both active and avoidant coping.

With the fact that the majority of Hong Kong population are Chinese and that Hong Kong has been colonized by British for 150 years, Hong Kong people are exposed to both Western and Chinese cultures. Further research can be conducted to examine which cultural characteristics make Hong Kong samples demonstrate the above relationships, which only appear in either Western or Chinese culture.

Finally, future research is needed to investigate the origin of fate control belief. Chaturvedi, Chiu, and Viswanathan (2009) suggested that people suffer from immutable constraints (e.g. countries in lower GDP and people in lower literacy levels) develop higher levels of negotiable fate, implying that socio-cultural context affects the prevalence of belief in fate. However, this research found that there are variances in fate control across university students in Hong Kong. Hence, future research can be conducted to explore which individual factors, apart from socio-cultural factors, affect the development of fate control. Chen and colleagues (2009) found that endorsement of reward for application and social cynicism is associated with experiences of family dysfunction. Other psychological factors can be explored to understand the origin of belief in fate control.

References

Abe, J. A. A. (2005). The predictive validity of the five-factor model of personality with preschool age children: A nine year follow-up study. *Journal of Research in Personality, 39*, 423-442.

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review, 96*, 358-372.

Abrahamson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87,* 49-74.

Andrews F. M. & Withey S. B. (1976). *Social indicators of well-being Americans perceptions of life quality.* New York: Plenum Press.

Au, E. W. M., Chiu, C-y., Zhang, Z-h., Mallorie, L., Chaturvedi, A., Viswanathan, M., & Savani, K. (2011). Negotiable fate: Social ecological foundation and psychological functions. *Journal of Cross-Cultural Psychology, 43*, 931-942.

Au, E. W. M., Chiu, C-y., Zhang, Z-h., Mallorie, L., Chaturvedi, A., Viswanathan, M., & Savani, K. (2012). Maintaining faith in agency under immutable constraints: Cognitive consequences of believing in negotiable fate. *International Journal of Psychology, 46*, 463–474.

Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Troetschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of*

Personality and Social Psychology, 81, 1014-1027.

Bartley, C. E., & Roesch, S. (2011). Coping with daily stress: The role of conscientiousness. *Personality and Individual Differences, 50*, 79-83.

Benassi, V. A., Sweeney, P. D., & Dufour, C. L. (1988). Is there a relation between locus of control orientation and depression? *Journal of Abnormal Psychology, 97*, 357–367

Bentler, P. M. (1995). *EQS: Structural Equations Program Manual.* Encino, CA: Multivariate Software, Inc.

Bond, M. H. (2009). Believing in Beliefs: A scientific but personal quest. In K. Leung & M. H. Bond (Eds.), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 319-342). New York: Springer SBM.

Bond, M. H., Leung, K., Au, A., Tong, K. –K., & Chemonges-Nielson, Z. (2004a). Combining social axioms with values in predicting social behaviours. *European Journal of Personality, 18*, 177-191.

Bond, M. H., Leung, K., Au, A., Tong, K. K., de Carrasquel, S. R., Murakami, F. et al. (2004b). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology, 35*, 548-570.

Brislin, R. W. (1986). The wording and translation of research instruments. In W. L. Lonner and J. W. Berry (Eds.), *Field Methods in Cross-Cultural Research*. Newbury Park, CA: Sage.

Brown, D., Fulkerson, K. F., Furr, S., Ware, W. B., & Voight, N. L. (1984). Locus of control, sex role orientation, and self-concept in black and white third- and sixth-grade male and female leaders in a rural community. *Developmental Psychology*, *20*, 717-721.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: a theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267-283.

Chaturvedi, A., Chiu, C-y., & Viswanathan, M. (2009). Literacy, negotiable fate, and thinking style among low income women in India. *Journal of Cross-Cultural Psychology, 40*, 880-893.

Chartrand, T. L., & Bargh, J. A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology, 71*, 464-478.

Chen, S. X. (2009). Explaining individuating behavior across cultures: The contributions of values and social axioms. In K. Leung & M. H. Bond (Eds.), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 293-315). New York: Springer SBM.

Chen, S. X., Bond, M. H., & Tang, D. (2007). Decomposing filial piety into filial attitudes and filial enactments. *Asian Journal of Social Psychology, 10*, 213-223.

Chen, S. X., Cheung, F. M., Bond, M. H., & Leung, J. P. (2005). Decomposing the construct of ambivalence over emotional expression in a Chinese cultural context. *European Journal*

of Personality, 19, 185-204.

Chen, S. X., Bond, M. H., & Cheung, F. M. (2006a). Personality correlates of social axioms: Are beliefs nested within personality? *Personality and Individual Differences, 40,* 509-519.

Chen, S. X., Cheung, F. M., Bond, M. H., & Leung, J. P. (2006b). Going beyond self-esteem to predict life satisfaction: The Chinese case. *Asian Journal of Social Psychology, 9,* 24-35.

Chen, S. X., Fok, H. K., Bond, M. H., & Matsumoto, D. (2006c). Personality and beliefs about the world revisited: Expanding the nomological network of social axioms. *Personality and Individual Differences, 41*, 201-211.

Chen, S. X., Wu, W. C. H., & Bond, M. H. (2009). Linking family dysfunction to suicidal ideation: The mediating roles of self-views and world-views. *Asian Journal of Social Psychology, 12,* 133-144.

Chen, L., & Zhang J. (2004). Relation between general social beliefs and interpersonal conflict resolution styles. *Chinese Journal of Clinical Psychology, 12,* 151-153. (in Chinese)

Cheng, C., & Cheung, S-f. (2013). Cultural meaning of perceived control: A meta-analysis of locus of control and psychological symptoms across 18 cultural regions. *Psychological Bulletin, 139,* 152-188.

Cheng, C., & Cheung, M. W. L. (2005). Cognitive Processes underlying coping flexibility: Differentiation and integration. *Journal of Personality, 73*, 859-886

Cheng, C., Chiu, C.-y., Hong, Y.-y., & Cheung, J. S. (2001). Discriminative facility and its role in the perceived quality of interactional experiences. *Journal of Personality, 69*, 765–786.

Cheng, C., Lau, H-P., B., & Chan, M-P., S. (2014). Coping flexibility and psychological adjustment to stressful life changes: A meta-analytic review. *Psychological Bulletin, 140*, 1582-1607.

Cheung, F. M., Leung, K., Zhang, J. X., Sun, H. F., Gan, Y. Q., Song, W. Z., et al. (2001). Indigenous Chinese personality constructs: Is the five-factor model complete? *Journal of Cross-Cultural Psychology, 32*, 407–433.

Compas, B. E., Banez, G. A., Malcarne, V., & Worsham, N. (1991). Perceived control and coping with stress: A developmental perspective. *Journal of Social Issues, 47*, 23-34.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln, NB: University of Nebraska Press.

Deci, E. L., & Ryan, R. M. (1995). Human autonomy: The basis for true self-esteem. In M. Kemis (Ed.). *Efficacy, agency, and self-esteem* (pp. 31-49). New York: Plenum.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268.

DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124,* 197-229.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49,* 71-75.

Dinca., M., & Iliescu, D. (2009). Linking social axioms with behavioral indictors and personality in Romania. In K. Leung & M. H. Bond (Eds.), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 145-162). New York: Springer SBM.

Findley, M. J., & Cooper, H. M. (1983). Locus of control and academic achievement: A literature review. *Journal of Personality and Social Psychology, 44,* 419-27.

Flannery, R., Jr. (1986). Personal control as a moderator variable of life stress: Preliminary inquiry. *Psychological Reports, 58,* 200-202.

Folkman, S., Chesney, M., Pollack, L., & Coates, T. (1993). Stress, control, coping, and depressive mood in human immunodeficiency virus-positive and -negative gay men in San Francisco. *Journal of Nervous and Mental Disease, 181,* 409–416.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21,* 219-239.

Folkman, S., & Lazarus, R. S. (1985). Methodological issues in stress research. In A. Eichler, M. M. Silverman, & D. M. Pratt (Eds.), *How to define and research stress.* Rockville,

MD: National Institute of Mental Health.

Franks, H. M., & Roesch, S. C. (2006). Appraisals and coping in people living with cancer: A meta-analysis. *Psycho-Oncology, 15,* 1027-1037.

Frazier, P. A. (2003). Perceived control and distress following sexual assault: A longitudinal test of a new model. *Journal of Personality and Social Psychology, 84,* 1257–1269.

Frazier, P. A., Mortensen, H., & Steward, J. (2005). Coping strategies as mediators of the relations among perceived control and distress in sexual assault survivors. *Journal of Counseling Psychology, 52,* 267-278

Frazier, P. A., Keenan, N., Anders, S., Perera, S., Shallcross, S., & Hintz, S. (2011). Past, present, and future control and adjustment to stressful life events. *Journal of Personality and Social Psychology, 100,* 749-765.

Fu, P. P., Kennedy, J., Yukl, G., Bond, M. H., Peng, T. K., Srinivas, E. S., et al. (2004). Exploring the effect of cultural values on the relationship between social beliefs and managerial influence strategies in twelve cultures: A meso approach using HLM. *Journal of International Business Studies, 35,* 284-305.

Gianakos, I. (2002). Predictors of coping with work stress: The influences of sex, gender roles, social desirability, and locus of control. *Sex Roles, 46,* 149–158.

Gilovich, T., Madey, S. F., & Medvec, V. H. (1995). When less is more: counterfactual thinking and satisfaction among Olympic medallists, *Journal of Personality and Social*

Psychology, 69, 603-610.

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behaviour Research Methods, 41*, 924-936.

Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review, 102*, 284–304.

Hinton, J. W., Burton, R. F., Farmer, J. G., Rotheiler, E., Shewan, D., Gemmell, M., Berry, J., & Gibson, R. (1992). Relative changes in salivary Na+ and K+ concentrations relating to stress induction. *Biological Psychology, 33*, 63-71.

Hoffi-Hofstetter, H., & Mannheim, B. (1999). Managers' coping resources, perceived organizational patterns, and responses during organizational recovery from decline. *Journal of Organizational Behavior, 20*, 665–685.

Hoyle, R. H. (Ed.). (1995). *Structural equation modelling: Concepts, issues, and applications.* Thousand Oaks, CA: Sage Publications.

Hui C. M., & Hui, N. H. H. (2009). The Mileage from Social Axioms: Learning from the Past and Looking Forward. In Leung, K., & Bond, M. H. (Eds.). (2009). *Psychological aspects of social axioms: Understanding global belief systems*. New York: Springer SBM.

Hui, V. K. Y., Bond, M. H., & Ng, T. S. W. (2007). General beliefs about the world as defensive mechanisms against death anxiety. *Omega, 54,* 199-214.

Jensen, M., & Karoly, P. (1991). Control beliefs, coping efforts, and adjustment to chronic pain. *Journal of Consulting and Clinical Psychology, 59*, 431–438.

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A metaanalysis. *Journal of Applied Psychology, 86*, 80–92.

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct? *Journal of Personality and Social Psychology, 83,* 693-710

Kalichman, S. C., Kelly, J. A., Morgan, M., & Rompa, D. (1997). Fatalism, current life satisfaction, and risk for HIV infection among gay and bisexual men. *Journal of Consulting and Clinical Psychology, 65*, 542-546.

Kantes, C. T., Karam, C. M. (2009). Social axioms and organizational behavior. In K. Leung & M. H. Bond (Eds.), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 31-50). New York: Springer SBM.

Kerr, G. A., & Goss, J. D. (1997). Personal control in elite gymnasts: The relationship between locus of control, self-esteem, and trait anxiety. *Journal of Sport Behavior, 20*, 69-83.

Keung, D. K. Y., & Bond, M. H. (2002). Dimensions of political attitudes and their relations with beliefs and values in Hong Kong. *Journal of Psychology in Chinese Societies, 3,* 133-154.

Kormanik, M. B., & Rocco, T. S. (2009). Internal versus external control of reinforcement: A review of the locus of control construct. *Human Resource Development Review, 8,* 463-483.

Kundera, M. (1984). *The Unbearable Lightness of Being*. New Work: Harper & Row.

Kuo, B. C. H., Kwantes, C. T., Towson, S., & Nanson, K. M. (2006). Social beliefs as determinants of attitudes toward seeking professional psychological help among ethnically diverse university students. *Canadian Journal of Counselling, 40,* 224-241.

Lai, J. H., Bond, M. H., & Hui, N. H. (2007). The role of social axioms in predicting life satisfaction: A longitudinal study in Hong Kong. *Journal of Happiness Studies, 8,* 517-535.

Lam, B. C. P., Bond, M. H., Chen, S. X., & Wu, C. H. (2010). Examining the main and moderating effects of worldviews on suicide: The role of social axioms. *European Journal of Personality, 24*, 602-622.

Langer, E. (1975). The illusion of control, *Journal of Personality and Social Psychology, 32*, 311-328.

Lee, Y. T. (2003). Doaistic humanism in ancient China: Broadening personality and counseling theories in the 21st century. *Journal of Humanistic Psychology, 43,* 64-85.

Lefcourt, H. M. (1976). Locus of control. New York: Lawrence Erlbaum Associates.

Lefcourt, H. M. (1981). *Research with the locus of control construct*: *Vol. 1. Assessment*

methods. New York: Academic Press.

Lefcourt, H. M. (1983). *Research with the locus of control construct*: *Vol. 2. Developments and social problems.* New York: Academic Press.

Lefcourt, H. M. (1984). *Research with the locus of control construct*: *Vol. 3. Extensions and Limitations.* New York: Academic Press.

Leung, C. H. Y., Chen, S. X., & Lam, B. C. P. (2010). Where there's a will, there's a way: The mediating effect of academic aspiration between beliefs and academic outcomes. *Journal of Psychology in Chinese Societies, 11*, 53-72.

Leung, K., Au, A., Huang, X., Kurman, J., Niit, T., & Niit, K. K. (2007). Social axioms and values: A cross-cultural examination. *European Journal of Personality, 21*, 91-111.

Leung, K., & Bond, M. H. (2004). Social axioms: A model for social beliefs in multi-cultural perspective. *Advances in Experimental Social Psychology, 36,* 119-197.

Leung, K., & Bond, M. H. (2008). Psycho-logic and eco-logic: Insights from social axiom dimensions. In F. van de Vijver, D. van Hemert, & Y. P. Poortinga (Eds.), *Individuals and cultures in multilevel analysis* (pp. 197-219). Mahwah, NJ: Erlbaum.

Leung, K., Bond, M. H., de Carrasquel, S. R., Munoz, C., Hernandez, M., Murakami, F., Yamaguchi, S., Bierbrauer, G., & Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology, 33,* 286-302.

Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., III, Gornick, L. J., Amponsah, B., … Zhou, F. (2012). Developing and evaluating the Social Axioms Survey in eleven countries: Its relationship with the Five-Factor Model of personality. *Journal of Cross-Cultural Psychology, 43,* 833-857.

Levenson, H. (1981). Differentiating among internality, powerful others, and chance. In H. M. Lefcourt (Ed.), *Research with the locus of control construct* (Vol. 1, pp. 15-63). New York: Academic Press.

Liem, A. D., Hidayat, S. S., & Soemarno, S. (2009). Do general beliefs predict more specific behavioral intentions in Indonesia? The role of social axioms within the theory of planned behavior. In K. Leung, & M. H. Bond (Eds.), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 145-162). New York: Springer SBM.

Little, T. D., Cunningham, W. A., Shahar, G. (2002). To parcel or not to parcel: Exploring the question, weighting the merits. *Structural Equation Modeling, 9,* 151-173.

López-Vazquez, E., & Marvan, M. L. (2003). Risk perception, stress and coping strategies in two catastrophe risk situations. *Social Behavior and Personality, 31*, 61-70.

Lovibond, S.H. & Lovibond, P.F. (1995) *Manual for the Depression Anxiety Stress Scales* (2nd ed.). Sydney: Psychology Foundation.

Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research, 46,* 137-155.

Macrodimitris, S., & Endler, N. (2001). Coping, control, and adjustment in Type 2 diabetes. *Health Psychology, 20*, 208–216.

Maier, S. F., & Seligman, M. E. P. (1976). Learned helplessness: Theory and evidence. *Journal of Experimental Psychology: General, 105*, 3-46.

Manne, S., & Glassman, M. (2000). Perceived control, coping efficacy, and avoidance coping as mediators between spouses' unsupportive behaviors and cancer patients' psychological distress. *Health Psychology, 19*, 155–164.

McCullough, P. M., Ashbridge, D., & Pegg, R. (1994). The effect of self-esteem, family structure, locus of control, and career goals on adolescent leadership behavior. *Adolescence, 29*, 605-611.

Morling, B., & Evered, S. (2006). Secondary control reviewed and defined. *Psychological Bulletin, 132*, 269–296.

Najdowski, C. J., & Ullman, S. E. (2009). PTSD symptoms and self-rated recovery among adult sexual assault survivors: The effects of traumatic life events and psychosocial variables. *Psychology of Women Quarterly, 33*, 43–53.

Neupert S. D., Almeida, D. M., Charles, S. T. (2007). Age differences in reactivity to daily stressors: The role of personal control. *Journal of Gerontology: Psychological Science, 62*, 216-225.

Nezlek, J. B. (2005). Distinguishing affective and non-affective reactions to daily events.

Journal of Personality, 73, 1539-1568

Ng, T. W. H., Sorensen, K. L., & Eby, L. T. (2006) A theoretical integration of the roles of locus of control at work and in careers. *Journal of Organizational Behavior, 27*, 1057-1087. Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods and prescriptions. *Multivariate Behavioral Research, 42*, 185–227.

Nix, G., Ryan, R. M., Manly, J. B., & Deci, E. L. (1999). Revitalization through self-regulation: The effects of autonomous and controlled motivation on happiness and vitality. *Journal of Experimental Social Psychology, 35*, 266-284.

Phares, E. J. (1957). Expectancy changes in skill and chance situations. *Journal of Abnormal Psychology, 54*, 339-342.

Pittman, N., & Pittman, T. (1979). Effects of amount of helplessness training and internal-external locus of control on mood and performance. *Journal of Personality and Social Psychology, 37*, 39-47.

Presson, P. K., & Benassi, V. A. (1996). Illusion of control: A meta-analytic review. *Journal of Social Behavior and Personality, 11*, 493-510.

Risen, J. L., & Gilovich, T. (2007). Another look at why people are reluctant to exchange lottery tickets. *Journal of Personality and Social Psychology, 93*, 12–22.

Risen, J. L., & Gilovich, T. (2008). Why people are reluctant to tempt fate. J*ournal of*

Personality and Social Psychology, 95, 293-307.

Roese, N. (1997). Counterfactual thinking. *Psychological Bulletin, 121*, 133–148.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, NJ: Princeton University Press.

Roth. S, & Cohen, L. J. (1986) Approach, avoidance, and coping with stress. *American Psychologist, 41*, 813-819.

Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two process model of perceived control. *Journal of Personality and Social Psychology, 42*, 5–37.

Rotter, J. B. (1954). *Social learning and clinical psychology*. New York: Prentice-Hall.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*, 1-28.

Ryan, R. M., Deci, E. L., & Grolnick, W. S. (1995). Autonomy, relatedness, and the self: Their relation to development and psychopathology. In D. Cicchetti, & D, J. Cohen (Eds.). *Developmental psychopathology: Theory and methods* (pp. 618-655). New York: Wiley.

Safdar, S., Lewis, J. R., & Daneshpour, M. (2006). Social axioms in Iran and Canada: Intercultural contact, coping and adjustment. *Asian Journal of Social Psychology, 9,* 123-131.

Scott, S., L., Carper, T. M., Middleton, M., While, R., Renk, K., & Grills-Taquechel. (2010).

Relationships among locus of control, coping behaviors, and levels of worry following exposure to hurricanes. *Journal of Loss and Trauma, 15,* 123-137.

Cross-role variation in the Big Five traits and its relations with authenticity and subjective well-being. *Journal of Personality and Social Psychology, 73,* 1380-1393.

Seligman, M. E. P. (1975). *Helplessness.* San Francisco, CA: Freeman.

Shariff, A. M., & Norenzayan, A. (2007). God is watching you: Priming god concepts increases prosocial behaviour in an anonymous economic game. *Psychological Science, 18,* 803-809.

Sheldon, K. M., Ryan, R. M., Rawsthorne, L., & Ilardi, B. (1997). Trait self and true self:

Singelis, T. M., Hubbard, C., Her, P., & An, S. (2003). Convergent validation of the Social Axioms Survey. *Personality and Individual Differences, 34,* 269-282.

Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology, 71,* 549-570.

Skinner, E. A., & Wellborn, J. G. (1994). Coping during childhood and adolescence: A motivational perspective. In D. Featherman, R. Lerner, & M. Perlmutter (Eds.), *Life-span development and behaviour* (pp. 91-133). Hiiisdale, NJ: Erlbaum.

Specht, J., Egloff, B., & Schmukle, S. C. (2011). The benefits of believing in chance or fate: External locus of control as a protective factor for coping with the death of a spouse. *Social Psychological and Personality Science, 2,* 132-137.

Spector, P., Cooper, C. L., Sanchez, J. L., O'Driscoll, M., Sparks, K., Bernin, P., et al. (2002). Locus of control and well-being at work: How generalizable are Western findings? *Academy of Management Journal, 45,* 453-466.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological Methodology* (pp. 290-312). Washington DC: American Sociological Association.

Srull, T. K., & Wyer, R. S. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology, 37,* 1660-1672.

Steiger, J. H., & Lind, J. C. (1980). *Statistically based tests for the number of common factors.* Paper presented at the Psychometric Society Annual Meeting, Iowa City, IA.

Tang, C.S., & Wu, A. M. S. (2010). Direct and indirect influences of fate control belief, gambling expectancy bias, and self-efficacy on problem gambling and negative mood among Chinese college students: A multiple mediation analysis. *Journal of Gambling Studies, 26,* 533-543.

Terreri, C. J., & Glenwick, D. S. (2011). Relationship of religious coping and general coping to adolescent adjustment. Paper presented at American Psychological Association annual convention, Washington, DC.

Terreri, C. J., & Glenwick, D. (2013). The relationship of religious and general coping to

psychological adjustment and distress in urban adolescents. *Journal of Religion & Health, 52*, 1188-1202.

Thompson, S. C., Armstrong, W., & Thomas, C. (1998). Illusions of control, underestimations, and accuracy: A control heuristic explanation. *Psychological Bulletin, 123*, 143–161

Thompson, S. F., Zalewski, M., & Lengua, L. J. (2014). Appraisal and coping styles account for the effects of temperament on pre-adolescent and adjustment. *Australian Journal of Psychology, 66*, 122-129.

Twenge, J. M., Zhang, L., & Im, C. (2004). It's beyond my control: A cross-temporal meta-analysis of increasing externality in locus of control, 1960-2002. *Personality and Social Psychology Review, 8*, 308-319.

Wang, J., Joy, A., & Sherry, J. (2013). Creating and sustaining a culture of hope: *Feng shui* discourses and practices in Hong Kong, *Journal of Consumer Culture, 13*, 241-263.

Wortman, C., B. (1975). Some determinants of perceived control. *Journal of Personality and Social Psychology, 31*, 282-294.

Vaux, A., Philips, J., Holly, L., Thomson, B., Williams, D., & Stewart, D. (1986). The social support appraisals (SS-A) scale: Studies of reliability and validity. *American Journal of Community Psychology, 14*, 195-219.

Zhou, F., Leung, K., & Bond, M. H. (2009). Social axioms and achievement across cultures: The influence of reward for application and fate control. *Learning and Individual*

Differences, 19, 366-371.

Table 1

Descriptive Statistics and Bivariate Correlations among the Measures in Study 1

	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11
1. FATC	3.13 (0.61)	-										
2. ELOC	13.50 (4.15)	.25***	-									
3. PFC	1.64 (0.45)	.13*	-.19**	-								
4. SS	1.49 (0.51)	.08	-.21**	.51***	-							
5. WT	1.57 (0.56)	.24***	.17**	.18**	22***	-						
6. DT	1.39 (0.48)	.40***	.18†	.28***	.27***	.51***	-					
7. SE	2.72 (0.41)	-.21**	-.30***	.28***	.18**	-.24***	-.15*	-				
8. SH	4.46 (1.13)	-.13*	-.35***	.16*	.18**	-.22***	-.03	.59***	-			
9. LS	4.45 (1.07)	-.07	-.33***	.29***	.31***	-.10	.10	.55***	.64***	-		

10. DEP	0.75 (0.64)	.27***	.31***	.05	-.01	.30***	.34***	-.56***	-.46***	-.34***	-	
11. ANX	0.61 (0.56)	.30***	.30***	.04	.08	.34***	.36***	-.54***	-.40***	-.24***	.80***	-
12. STR	0.95 (0.62)	.28***	.34***	.12	.110	.35***	.35***	-.46***	-.41***	-.25***	.76***	.81***

Note. FATC = Fate control; ELOC = External control; PFC = Problem-focused coping; SS = Seeking social support; WT = Wishful thinking; DT = Distancing; SE = Self-esteem; SH = Subjective happiness; LS = Life satisfaction; DEP = Depression; ANX = Anxiety; STR = Stress.
†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Table 2

Descriptive Statistics among People High in Fate Control (Using Median-split) and External Control (using Median-split) in Study 1

Mean (SD)	High in fate control	High in external control	Low in external control (i.e. internals)
1. PFC	1.67 (0.45)	1.56 (0.42)	1.72 (0.46)
2. SS	1.54 (0.48)	1.41 (0.49)	1.58 (0.51)
3. WT	1.66 (0.55)	1.61 (0.57)	1.53 (0.54)
4. DT	1.52 (0.47)	1.44 (0.50)	1.33 (0.45)

Note. PFC = Problem-focused coping; SS = Seeking social support; WT = Wishful thinking; DT = Distancing.

Table 3

Descriptive Statistics and Bivariate Correlations among the Measures in Study 2

	Mean (SD)	1	2	3	4	5	6
1. FATC	3.10 (0.52)	-					
2. ELOC	12.85 (4.07)	.24***	-				
3. STR	4.64 (0.56)	.11†	.15*	-			
4. CTRL	3.24 (0.50)	-.10	-.35***	-.27***	-		
5. ACT	4.33 (0.52)	.10†	-.17**	.28***	.18**	-	
6. AV	3.12 (0.85)	.19**	.26***	.34***	-.25***	.05	-
7. SR	4.64 (0.56)	-.14*	-.30***	-.07	.38***	.34***	-.34***

Note. FATC = Fate control; ELOC = External control; STR = Perceived stress; CTRL = Perceived controllability; ACT = Active coping; AV = Avoidant coping; SR = Stress reduction.

The scores of ACT, AV and SR were averaged across the eight scenarios.

†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Table 4

Descriptive Statistics among the Measures between High and Low Controllability Stressors in Study 2

Mean (SD)	High controllability stressors Mean (SD)	Low controllability stressors Mean (SD)	*t*	*p*
1. STR	4.27 (0.86)	4.92 (0.76)	-11.75***	$p < .001$
2. CTR	4.40 (0.71)	2.14 (0.77)	37.24***	$p < .001$
3. ACT	4.49 (0.64)	4.08 (0.73)	8.88***	$p < .001$
4. AVO	2.48 (0.98)	3.56 (1.09)	-15.27***	$p < .001$
5. SR	0.99 (1.18)	0.89 (1.05)	1.08***	$p = .280$

Note. STR = Perceived stress; CTR = Perceived controllability; ACT = Active coping; AVO = Avoidant coping; SR = Stress reduction.
***$p < .001$.

Table 5

Partial Correlations among the Measures (Controlling for Age and Gender) in High controllability Scenarios in Study 2

	1	2	3	4
1. FATC	-			
2. ELOC	.23***	-		
3.ACT	.12*	-.19**	-	
4. AVO	.11	.10	-.24***	-
5. SR	-.15*	-.27***	.30***	-.24***

Note. FATC = Fate control; ELOC = External control; ACT = Active coping; AVO = Avoidant coping; SR = Stress reduction.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 6

Partial Correlations among Measures (Controlling for Age and Gender) in Low controllability Scenarios in Study 2

		1	2	3	4
1.	FATC	-			
2.	ELOC	.22***	-		
3.	ACT	.11	-.14*	-	
4.	AVO	.17**	.22***	.90	-
5.	SR	-.10	-.09	.11	-.14*

Note. FATC = Fate control; ELOC = External control; ACT = Active coping; AVO = Avoidant coping; SR = Stress reduction.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 7

Descriptive Statistics and Bivariate Correlations among the Measures in Study 3

	Mean (SD)	1	2	3	4	5	6
1. FATC	3.05 (0.57)	-					
2. ELOC	13.00 (4.37)	.25***	-				
3. STR	4.28 (0.56)	.05	.08	-			
4. CTRL	3.79 (0.65)	-.04	-.21***	-.26***	-		
5. ACT	0.91 (0.14)	-.06	-.13*	-.07	.26***	-	
6. AVO	0.09 (0.14)	.06	.13*	.07	-.26***	-1.00***	-
7. LS	4.35 (0.79)	-.04	-.17**	-.38**	.51***	.27***	-.27***

Note. FATC = Fate control; ELOC = External control; STR = Perceived stress; CTRL = Perceived controllability; ACT = Active coping; AVO = Avoidant coping; LS=Life satisfaction.

*p < .05, **p < .01, ***p < .001.

Table 8

Three-way Interaction Using Hierarchical Multiple Regression Analysis Predicting Active Coping in Study 3

	Active Coping (*n*=287)	
Predictor	ΔR^2	β
Step 1	.003	
Gender	.	.02
Age		.05
Step 2	.09***	
Gender		.05
Age		.10
Fate control		-.05
External control		-.07
Controllability		.27***
Step 3	.02	
Gender		.05
Age		.11
Fate control		-.06
External control		-.07
Controllability		.27***
Fate control × Controllability		.15**

External control × Controllability		.01
Fate control × External control		-.001
Step 4	.005	
Gender		.05
Age		.11
Fate control		-.05
External control		-.07
Controllability		.25***
Fate control × Controllability		.16**
External control × Controllability		.01
Fate control × External control		.01
Fate control × External control × Controllability		.07
Total R^2	.12	

**$p < .01$, ***$p < .001$.

Table 9

Two-way Interaction Using Hierarchical Multiple Regression Analysis Predicting Active Coping in Study 3

	Active Coping (*n*=287)	
Predictor	ΔR^2	β
Step 1	.003	
Gender	.	.02
Age		.05
Step 2	.08***	
Gender		.04
Age		.11
Fate control		-.06
Controllability		.28***
Step 3	.02**	
Gender		.04
Age		.12*
Fate control		-.07
Controllability		.28***
Fate control × Controllability		.15**
Total R^2	.11	

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

Table 10

Two-way Interaction Using Hierarchical Multiple Regression Analysis Predicting Active Coping in Study 3

	Active Coping (*n*=286)	
Predictor	ΔR^2	β
Step 1	.003	
Gender	.	.02
Age		.05
Step 2	.09***	
Gender		.05
Age		.10
External control		-.08
Controllability		.27***
Step 3	.001	
Gender		.05
Age		.10
External control		-.08
Controllability		.27***
External control × Controllability		.03
Total R^2	.09	

* ***p* < .001.

Table 11

Descriptive Statistics and F-test among the Measures in Study 4

	Priming external control Mean (SD)	Priming fate control Mean (SD)	Priming internal control Mean (SD)	Neutral priming Mean (SD)	*F*	*p*
Fate control	3.09 (0.66)	3.04 (0.76)	2.99 (0.72)	2.92 (0.65)	0.57	$p = .63$
External control	13.16 (4.81)	13.22 (4.35)	11.88 (4.10)	12.12 (4.48)	1.23	$p = .30$

Table 12

Descriptive Statistics among the Measures of Controllable Task in Study 4

	Mean (SD)	1	2	3	4	5	6	7	8
1. Fate control	3.01 (0.70)	-							
2. External control	12.59 (4.45)	.38***	-						
3. Accuracy in recalling the 6-digit number	0.94 (0.24)	-.15*	-.11	-					
4. Time used in each judgment task	1.59 sec. (0.47)	.03	.01	-.26***	-				
5. Selecting choices of active coping	0.42 (0.49)	-.07	.01	.09	-.04	-			
6. Selecting choices of avoidant coping	0.58 (0.49)	.07	-.01	-.09	.04	-1.00***	-		
7. Time spent in articles related to active coping	54.29 sec. (34.62)	-.01	-.07	.12	.16	NA	NA	-	
8. Time spent in articles related to avoidant coping	67.78 sec. (27.65)	-.27	-.03	-.17	.37***	NA	NA	NA	-

Note. The correlations between selecting active or avoidant coping choice and time spent in the coping articles were not computed because selecting coping choice was constant.

*$p < .05$, ***$p < .001$.

Table 13

Hierarchical Multiple Regression Analysis Predicting Time Spent in Avoidant Coping Articles in Controllable Task in Study 4

	Time spent avoidant coping articles	
Predictor	ΔR^2	β
Step 1	.08*	
Age	.	.15
Gender		.03
Order of the task		-.26**
Step 2	.05*	
Age		.16
Gender		-.00
Order of the task		-.25**
Fate control		-.23*
Total R^2	.14	
n	110	

*$p < .05$, **$p < .01$.

Table 14

Descriptive Statistics among the Measures of the Uncontrollable Task in Study 4

	Mean (SD)	1	2	3	4	5	6	7	8
1. Fate control	3.01 (0.70)	-							
2. External control	12.59 (4.45)	.38***	-						
3. Number of correct calculation	3.43 (1.61)	-.14*	-.18*	-					
4. Number of trials made	5.26 (1.97)	.01	-.07	.20**	-				
5. Selecting choice of active coping	0.41 (0.49)	-.05	-.14	.02	-.01	-			
6. Selecting choice of avoidant coping	0.59 (0.49)	.05	.14	-.02	.01	-1.00***	-		
7. Time spent in articles related to active coping	48.79 sec. (28.78)	-.22*	-.11	.11	.02	NA	NA	-	
8. Time spent in articles related to avoidant coping	66.23 sec. (33.03)	-.03	.07	-.06	-.17	NA	NA	NA	-

Note. The correlations between selecting active or avoidant coping choice and time spent in the coping articles were not computed because selecting coping choice was constant.

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

Table 15

Hierarchical Multiple Regression Analysis Predicting Time Spent in Articles Related to Active Coping in the Uncontrollable Task in Study 4

	Time spent active coping articles	
Predictor	ΔR^2	β
Step 1	.02	
Age	.	-.06
Gender		.05
Order of the task		.13
Step 2	.05*	
Age		-.06
Gender		.04
Order of the task		.15
Fate control		-.23*
Total R^2	.07	
n	76	

*$p < .05$

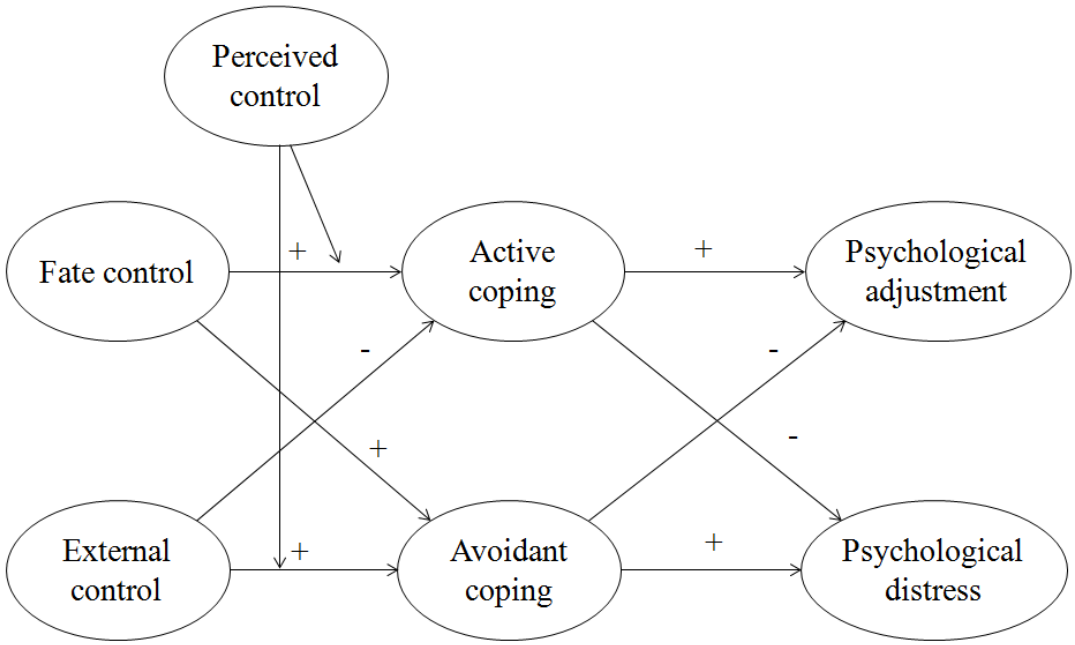

Figure 1. The proposed model of the present research.

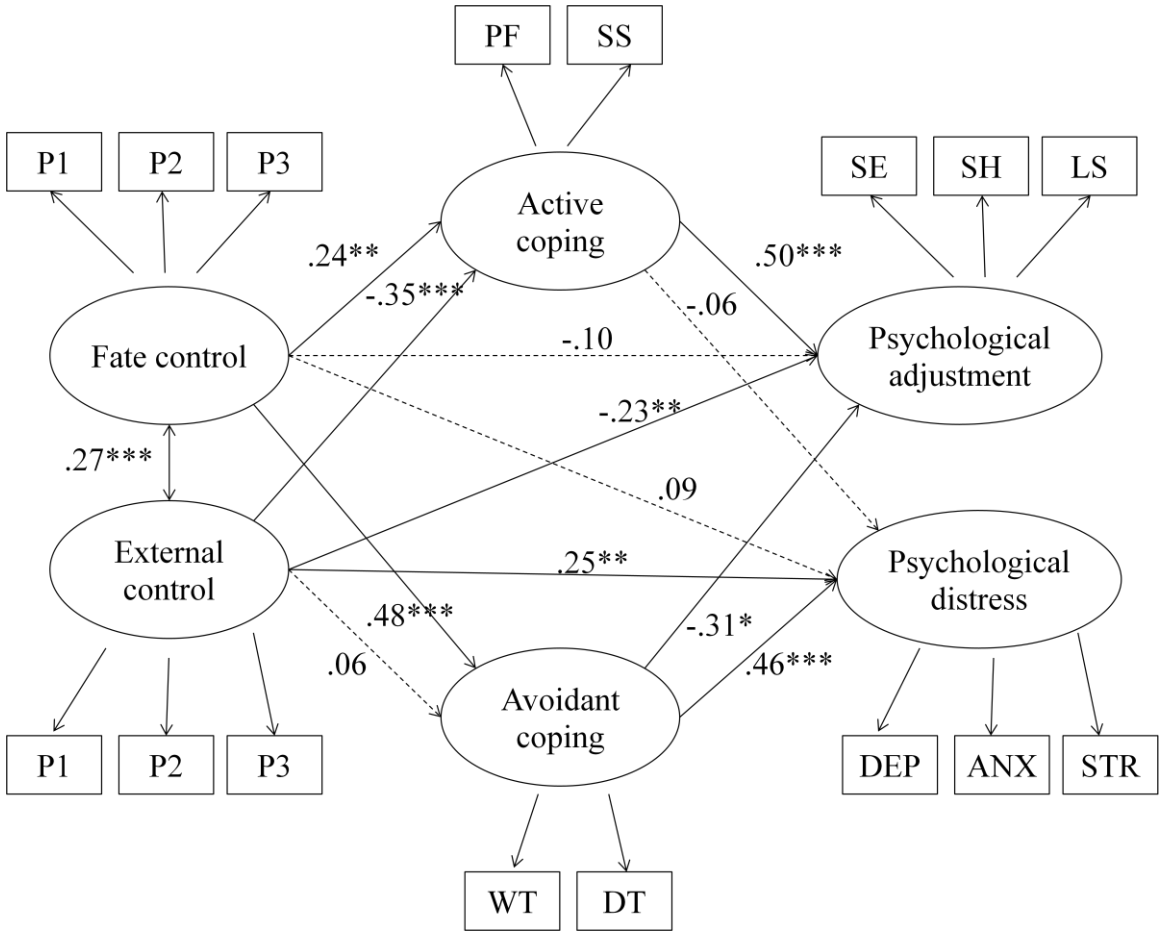

Figure 2. Structural equation model in Study 1.

Note. PF = Problem-focused coping; SS = Seeking social support; WT = Wishful thinking; DT = Distancing; SE = Self-esteem; SH = Subjective happiness; LS = Life satisfaction; DEP = Depression; ANX = Anxiety; STR = Stress.

The standardized coefficients from gender to Active coping, Avoidant coping, Psychological adjustment and Psychological distress were -.05, .01, .03 and -.04 respectively.

The standardized coefficients from age to Active coping, Avoidant coping, Psychological adjustment and Psychological distress were .03, .09, .09 and -.04 respectively.

Dashed lines represent non-significant paths.

*p < .05, **p < .01, ***p < .001.

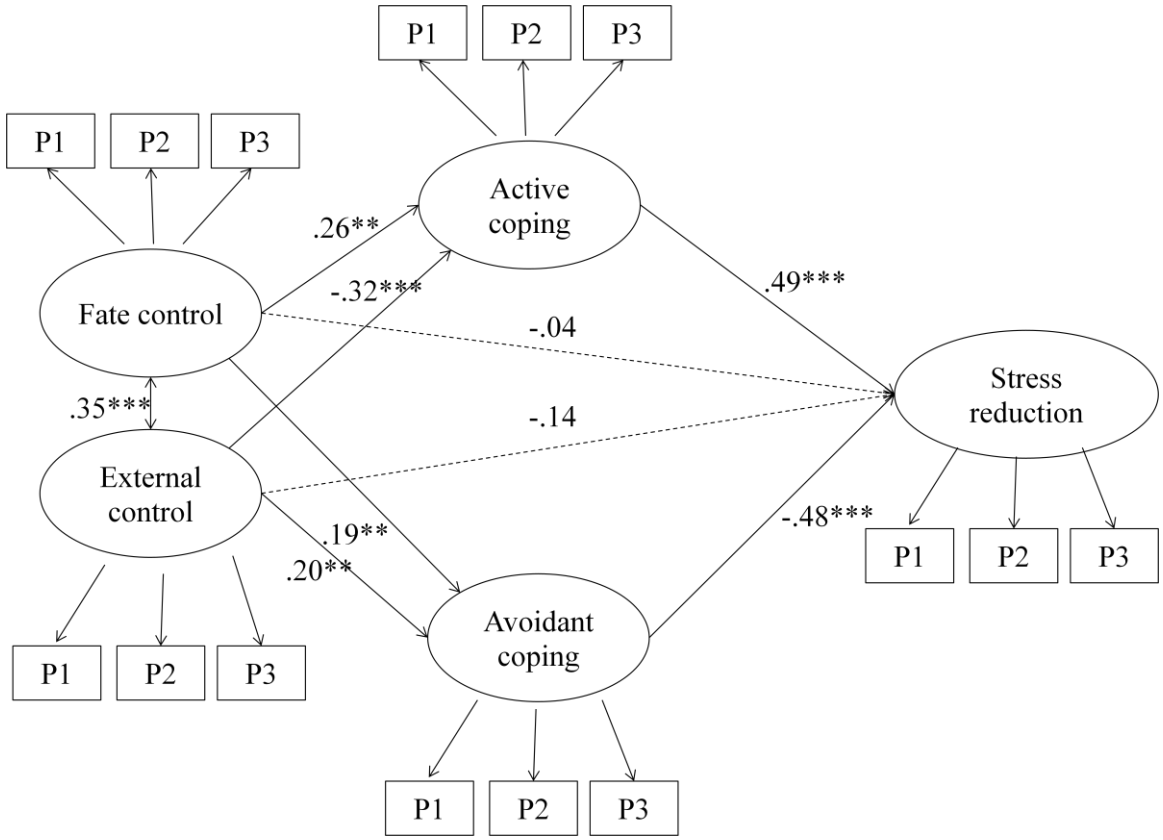

Figure 3. Structural equation model in Study 2.

Note. The standardized coefficients from age to Active coping, Avoidant coping and Stress reduction were .14**, -.01, and .06 respectively.

Note. The standardized coefficients from gender to Active coping, Avoidant coping and Stress reduction were .19**, .10, and .10 respectively.

**$p < .01$, ***$p < .001$.

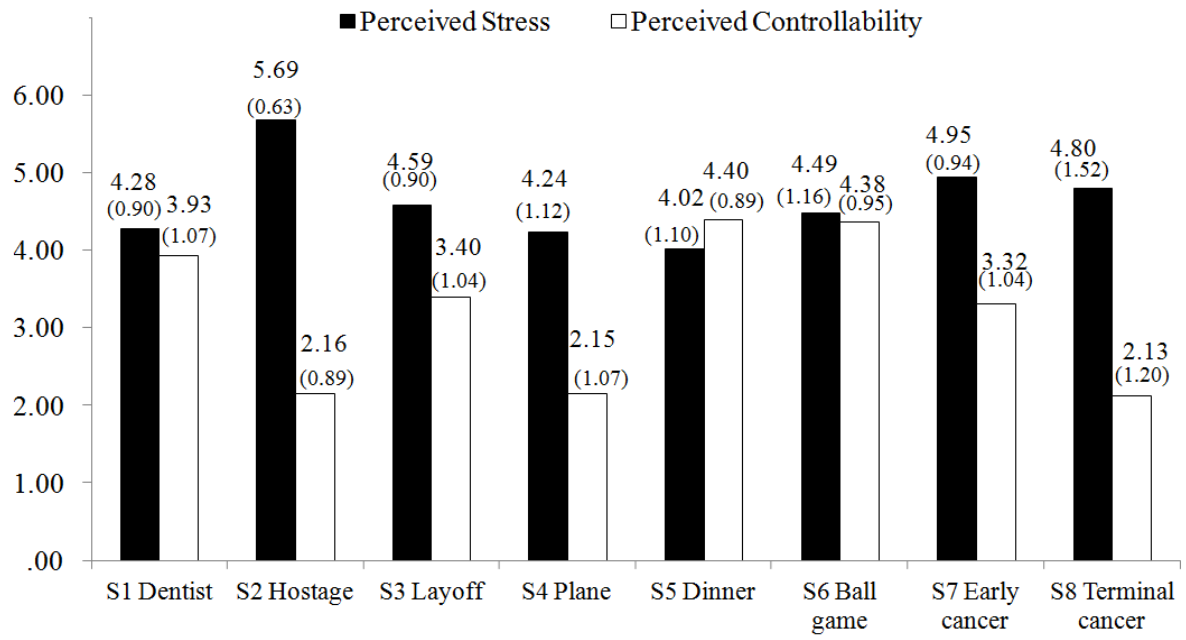

Figure 4. Means and standard deviations (in brackets) of perceived stress and perceived controllability in Study 2.

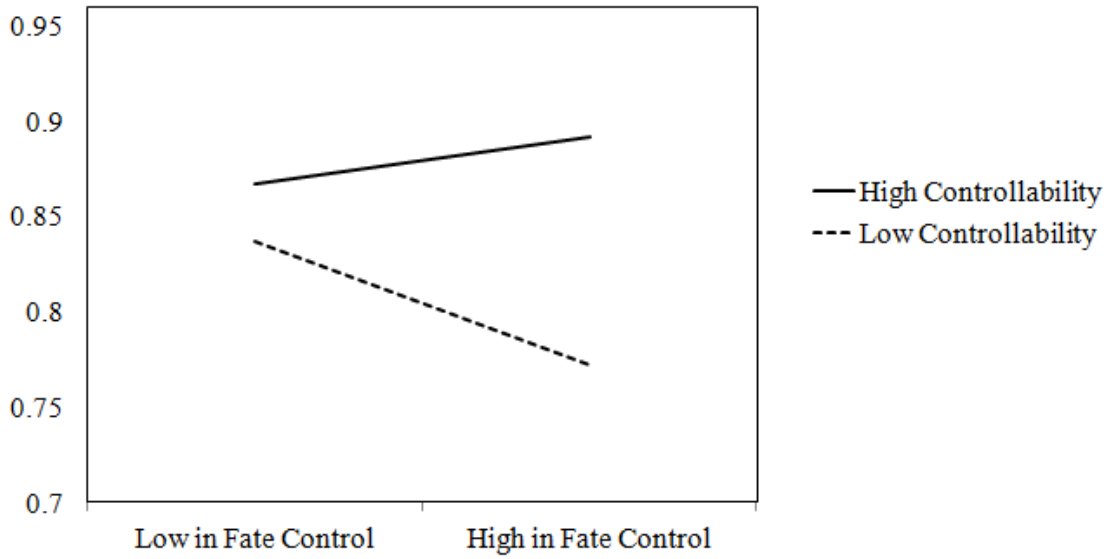

Figure 5. Moderation effect of controllability on the relationship between fate control and active coping in Study 3