Perceived Control of the Attribution Process:

Measurement and Theory

by

Evan Jacob Fishman

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Graduate Supervisory Committee:

Kathryn Nakagawa, Co-Chair
Jenefer Husman, Co-Chair
Elsie Moore
Steven Graham

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ABSTRACT

The primary objective of this study was to develop the Perceived Control of the Attribution Process Scale (PCAPS), a measure of metacognitive beliefs of causality, or a perceived control of the attribution process. The PCAPS included two subscales: perceived control of attributions (PCA), and awareness of the motivational consequences of attributions (AMC). Study 1 (a pilot study) generated scale items, explored suitable measurement formats, and provided initial evidence for the validity of an event-specific version of the scale. Study 2 achieved several outcomes; Study 2a provided strong evidence for the validity and reliability of the PCA and AMC subscales, and showed that they represent separate constructs. Study 2b demonstrated the predictive validity of the scale and provided support for the perceived control of the attribution process model. This study revealed that those who adopt these beliefs are significantly more likely to experience autonomy and well-being. Study 2c revealed that these constructs are influenced by context, yet they lead to adaptive outcomes regardless of this contextual-specificity. These findings suggest that there are individual differences in metacognitive beliefs of causality and that these differences have measurable motivational implications.

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If you're automatically sure that you know what reality is, and you are operating on your default setting, then you, like me, probably won't consider possibilities that aren't annoying and miserable. But if you really learn how to pay attention, then you will know there are other options…The only thing that's capital-T True is that you get to decide how you're gonna try to see it. This, I submit, is the freedom of a real education, of learning how to be well-adjusted.

~ David Foster Wallace

CHAPTER 1

INTRODUCTION

People are continuously faced with events, situations, and daily stressors that challenge their ability to function adequately within their environment. To deal with these challenges people often engage in internal strategies, actions, or processes. Among these processes is the attribution process, which helps individuals to make sense of the world following stressful events that threaten a perception of control (Heider, 1958; Keinan, 1994; Kelly, 1967). The literature has consistently demonstrated the motivational impact of attributions and the benefits of attributional retraining (see Haynes et al., 2009). However, the way that individuals perceive or believe that they can influence this process has received very little attention.

The attribution process is triggered by daily events that occur in all aspects of life, making it a primary component of one's internal phenomena. The fundamentality of this process warrants inquiries regarding individuals' perceptions of causality. Examining a perceived control of the attribution process could be critical in understanding how to help people self-regulate following control-threatening events. Past research on coping (e.g., Lazarus & Folkman, 1984), emotion regulation (Gross, 1998) and secondary control (Heckhausen & Schulz, 1995; Rothbaum et al., 1982) has addressed similar issues; generally, however, they do not focus on one's belief to influence the process. Introduced here is a construct that targets this

under-examined concept and contributes importantly to the literature on perceptions of internal phenomena. The construct and model of the perceived control of the attribution process (PCAP) are presented.

PCAP consists of two subconstructs that, together, facilitate a perception of control over the attribution process. That perception of control promotes cognitive actions that help one to circumvent the negative motivational consequences produced by maladaptive causal reasoning. The first subconstruct of PCAP is the perceived control of attributions (PCA) which refers to an internal locus of control over determining the cause of outcomes. This internal locus of control implies a perceived capability to make those determinations, or to influence the causal reasoning process. The second subconstruct is the awareness of the motivational consequences of attributions (AMC). AMC refers to an understanding that those determinations (attributions) are linked to psychological and behavioral consequences (Fishman & Husman, 2013). From a lay perspective, these subconstructs are represented by two naïve theories which are, "*I'm the one who determines why things happen* and *those determinations affect me",* respectively. Because these subsconstructs are intrinsically linked within the present theory, hereinafter PCAP refers to both PCA and AMC.

These constructs are considered metacognitive because they embody higher-order beliefs about causal thinking. AMC reflects metacognitive knowledge (about the consequences of causal attributions) and PCA reflects a metacognitive belief about causality. Importantly, the term "metacognitive" does not necessarily imply awareness (Borkowski et al., 1987; Gollwitzer & Schaal, 1998). While the perceived control of the attribution process is metacognitive in nature, the cognitive actions facilitated by the beliefs can be taken automatically. It is proposed

that there are measurable differences in individuals' metacognitive beliefs of causality and those who adopt the PCAP beliefs experience favorable motivational outcomes compared to their counterparts who do not.

Bandura (1994) suggested that peoples' belief in their capability to cope with threatening or difficult situations affects their levels of stress and motivation. However, theories related to this concept, such as secondary control, seem to focus on the strategy use itself rather than the perceived capability to use the strategies. That is, they do not necessarily distinguish between "I can" and "I do". This is not surprising as one's perceived capability to take these actions is inevitably linked to the frequency and quality of the actions. Thus, a construct that specifically reflects a belief of control over an internal process is needed to address this concept and to explore the motivational impact of such a belief. In theory, those that perceive control of their attribution process are more likely to experience autonomy, persistence and subjective well-being. The implications of the model will be detailed in a later section along with the model itself. The following sections will convey the rationale for the existence of PCAP and explore the inconsistencies within the literature on secondary control.

Statement of the Problem

A truly novel contribution to the concept of control was made by Rothbaum and colleagues (1982) who introduced a construct called *secondary control (SC)*. This construct generally refers to the psychological adjustment one makes to "fit in" with his or her environment. The authors labeled this construct as "secondary" because individuals perceive control not only of their environment (*primary control*) but internally bring themselves in line with environmental forces. Since its introduction, SC has been used in several studies. Work of

this kind has inspired new hypotheses, measurement tools, and has been instrumental in much of the literature on coping (Morling & Evered, 2006). However, recent discussion on SC has brought to light the inconsistencies and reinterpretations of the construct that make it difficult to accurately draw conclusions about what it truly is and its influence on behavior (Morling & Evered, 2006; Morling & Evered, 2007; Skinner, 2007).

Another version of secondary control was introduced by Heckhausen and Schulz (1995) who described SC as a mechanism that "targets the self and attempts to achieve changes directly within the individual" (p. 285). This approach focused more on the active attempts to produce internal outcomes and was characterized exclusively by its target (self) regardless of the context of the event. In recent years debate has ensued about whether Rothbaum et al's. *fit-focused* approach has more valid claim to the term "secondary control" than Heckhausen and Shulz's *control-focused* conceptualization, and if either should fall under the label of control. From the perspective of *perceived control* which is generally described as one's belief to influence and predict outcomes, with "perceived" indicating a subjective rather than objective capacity (Perry, 2003), it would seem that a fit-focused conceptualization would be better categorized as "accommodation" (Skinner, 2007) because adjusting one's internal state to "fit-in" with the environment is a mechanism more indicative of an ability and can be achieved without the perception of control. Similarly, some researchers argue that Heckhausen and Shulz's control-focused approach cannot be distinguished from coping strategies, as both consist of active attempts to adjust one's own emotional states or to reappraise situations (Connor-Smith et al., 2000). Also, Skinner (2007) argued that the control-focused approach to SC contains aspects that do not fall under the label of control such as the relinquishing of goals that are no longer feasible. In light of these discrepancies, in a later review Heckhausen and colleagues (2010)

maintained that their conceptualization of secondary control always referred to control strivings rather than perceptions of control. Accordingly, recent studies involving this model have focused on the self-reported strategies associated with the control strivings rather than control beliefs (e.g., Hamm et al., 2013).

Despite the convolution of terms, the importance of this dimension of control was made evident by its growing interest within the literature. As a result, Pallant (2000) developed a measure entitled The Perceived Control of Internal States Scale (PCOISS). In the development of this scale, the author brought together several descriptions of this dimension of psychological control, including Rothbaum et al's secondary control. Items on the PCOISS primarily focused on anxiety coping, such as "Even when under pressure I can usually keep calm and relaxed" and "I have a number of techniques or tricks that I use to stay relaxed in stressful situations." These statements reflect a perceived ability to regulate emotions in stressful situations, but do not necessarily capture the essence of perceived control of internal states. This raises the question, what does it mean to perceive control of internal states?

Internal states have been described as emotions, thoughts, and reactions (Pallant, 2000), however, much of these phenomena have been studied within the field of emotion regulation (Gross, 1998). Perhaps "internal states" is a vague term with regard to the perceived control of internal phenomena. There are other, more specific, internal phenomena that individuals experience over which they can perceive control, such as the attribution process. The attribution process has been described as the underlying mechanism that generates feelings which guide action (Weiner, 2010). Rothbaum et al. (1982) emphasized the critical role that attributions play in each of the four types of secondary control. For example, attributions to chance were

identified as *illusory control*. The authors posited that attributions to fate or luck allow individuals to regain a sense of control by aligning themselves with the more powerful force. However, there is no evidence that attributions of this kind contribute to a sense of control, actually much of the researchers on attributions make the opposite conclusion (Skinner, 2007). More to the point, according to Rothbaum et al. this action derives from an "ability" rather than a perspective that promotes the action. A more accurate description of perceived control would involve an individual who perceives the capability to *choose* which causes to attribute to outcomes. For example, an instance in which one perceived the capability to attribute his success to *either* luck or skill better captures the essence of perceived control.

Another perspective from which to view this concept can be achieved within the framework of attribution theory. For example, imagine a graduate student who recently discovered that his conference proposal was not accepted. In an event such as this, information is sought regarding its cause and the causal beliefs are linked to motivational consequences (Weiner, 2011). Even after receiving feedback from reviewers, the student could attribute the rejection to a bad strategy (e.g., submitted to wrong category). This attribution is considered adaptive because it is linked to positive behavioral and psychological consequences. An attribution to strategy would most likely lead to continued engagement in future conference opportunities. Or, he could attribute the rejection to his lack of ability which would most likely produce negative affect and have deleterious effects on his motivation to persist. Obviously, the former attribution is optimal with regard to the student's motivation. But, if the student understood that it is up to him how to attribute the cause of the rejection he can retain the motivation to persist, focus on what can be controlled in light of the event, and have a greater

sense of agency than a student who does not perceive the control to influence his attributions (Smith et al., 2000).

Of course, as Heider (1958) suggested, the attribution process reflects the desire to seek accurate information about the causal structure of the world. The person as a scientist is an important metaphor for the attribution process, meaning that individuals are in search of the reality of their situations (Weiner, 1991). For example, if one notices another person wearing a green shirt and green hat on St. Patrick's Day it could be difficult to attribute the wardrobe choice to anything but celebration of the holiday. However, one can make the logical attribution while still perceiving control over the process. Bandura (1997) recognized that the mere perception of control is equally as important to one's psychological well-being as objective control (Smith et al., 2000).

Study Purpose

Appropriately, PCAP is presented to address the confusion surrounding secondary control and to explore a construct that more directly targets a perceived control of an internal phenomenon. Given that the attribution process is pervasive in the daily lives of all individuals, a perceived control of this process could play a critical role in one's motivation and subjective well-being. Because school settings, across all ages, involve both learning and social environments it is a fitting backdrop for exploration of this concept. That said, it is proposed that this concept warrants examination into its validity and potential influence on motivation across all domains. The development sound psychometric instrument that measures a perceived control of the attribution process is needed to achieve this aim. Thus, the main objective of the study was to develop a valid and reliable scale that measures a perceived control of the attribution

process. A secondary goal was to test the motivational implications of PCAP and the validity of the PCAP model.

Organization of the Dissertation

This dissertation is structured in the following way: Chaper 2 involves a review of the literature surrounding PCAP, situating the construct within the relevant theoretical and empirical work. Chapter 3 discusses the overarching structure of the study, including the breakdown of Study 1 and Study 2. Chapter 4 details the methods, results, and discussion of Study 1, a pilot study that generated scale items and explored the structureal and contextual nature of PCAP. Chapter 5 presents the methods, results, and discussion of Study 2. Study 2 involved the majority of the scale development. The following research questions guided this study:

1. Are PCA and AMC two distinct constructs? (structural validity)
    a. Can the two-factor structure be supported in three different samples?
2. Does the PCAPS demonstrate internal consistency? (reliability)
    a. Do the PCA and AMC subscales demonstrate reliability in three different samples?
3. Is there evidence for convergent and discriminant validity? (construct validity)
4. Is there evidence for predictive validity? (construct validity)
    a. Does the PCAxAMC interaction explain unique variance in cognitive reappraisal beyond that of PCA and AMC?
5. Does the proposed PCAP model fit the data?
6. Is there evidence for the validity and reliability of the ES (event-specific)-PCAPS?

7. Does the controllability of the event for which attributions are made significantly influence one's PCA or AMC?
8. When considering the controllability of the event, does PCAP predict adaptive outcomes?

Finally, Chapter 6 discusses the general findings of the study and their theoretical, educational, and practical implications. It also discussed the directions for future research in this area, and concluding remarks that summarize the dissertation. Portions of this dissertation have been published in a previous article (Fishman, 2014).

CHAPTER 2

LITERATURE REVIEW

The Attribution Process

From the perspective of PCAP, it is important to understand the foundations of the attribution process. For the past 50 years, the term "attribution" has endured a great deal of discussion within the field of psychology. Consequently, there are many types of attributions. The most common definition refers to the explanations laypersons give for outcomes or behavior; these are known as *causal attributions*. Causal attributions are answers to the "why" questions individuals ask after an event has occurred (Weiner, 1985). For example, "Why did I fail this exam?", "Why did we lose the game?" or "Why didn't I get into that college?" Research has shown that individuals implicitly search for causes to outcomes, especially following failure (Wong & Weiner, 1981). Answers to these "why" questions are influenced by several factors such as past history, social norms, hedonic biasing (Weiner, 2000), implicit theories (Hong et al., 1999) and so on.

Fritz Heider (1958) introduced the concept of attributions to the field of psychology, but initially his "common sense" approach was not taken seriously. Heider's work remained relatively dormant until other researchers such as Jones and Davis (1965) and Kelley (1967) advanced the theory and reignited the discussion. It was Bernard Weiner who took Heider and Kelley's ideas about causal search and developed an attribution-based theory of motivation. Weiner (2010) believed that attribution theory is a field of study rather than a specific conceptual system. Guiding this theory are two metaphors: the person as a scientist and the person as a judge. The person-as-a-scientist metaphor refers to the focus on understanding the causes of

events. Weiner (2011) explained that like other scientists, errors may be made in the process of attributing causes to outcomes; hypotheses are tested and appropriately accepted or discarded. The person-as-a-judge metaphor refers to the desire to discover the intentions of others and label them as good or bad; these judgments are also made by individuals about their own actions and circumstances. These metaphors help to demonstrate that individuals seek to understand the causal structure of their environment (Kelley, 1967) and then innately evaluate that information which helps to organize thought and provide meaning to their experience (Osgood et al., 1957).

Before explaining the attribution process, it is useful to clarify the meaning of a *cause* from within this framework. There is a distinction between a cause and a *reason*. Buss (1978) recognized that the term causal attribution was representing both causes and reasons which led him to clarify that a cause brings about change, whereas a reason is that for which change is brought about. There are other definitions of cause and reason (see Malle, 1999) but regardless of how they are defined, they are indeed distinct. For example, if one is asked why he attended the baseball game, he would likely give a *reason* such as, "I like baseball"; "I had nothing else to do"; or "They were good seats". These are explanations or justifications that make the choice understandable. However, from the perspective of Weiner's attribution theory, one does not ask why he went to the baseball game, but rather why he succeeded or failed in going to the game (Weiner, 2006). Reasons are given in response to intentional actions, while causes are generally associated with unintentional outcomes (e.g., failure of an exam). Many studies have focused on the causal properties of behavior, either of the actor or observer, which would warrant reasons not causes. This convolution of terms may have been brought about by the differences between Heider and Weiner's conceptualizations. According to Heider, all events, including behavior, (e.g., "Why is she wearing a dress?") can lead to attribution search, whereas Weiner limited his

thinking to causes of outcomes. While cause and reason are distinct, the distinction is not relevant for all studies. In some cases the terms can be used interchangeably; it depends on the goal of the study and how causal attribution is operationalized. In the present proposal, the two need not be distinguished.

An individual engages in the attribution process after an outcome occurs. A causal search is initiated to explain the outcome. Heider (1958) stated that one engages in a search for causes in order to make sense of one's daily life. As noted earlier, this search is especially likely to occur following failure or an unexpected event (Wong & Weiner, 1981). Events such as these are said to initiate causal search because of their stressful nature. Kelly (1967) maintained that individuals engage in the attribution process to acquire or sustain a sense of control over their environment (Keinan & Sivan, 2001). Stress enhancing events threaten one's sense of control (Friedland et al, 1992); thus, a search for causality following such events is likely to restore feelings of control as it helps to rectify a sense of structure, understandability, and predictability of one's environment (Keinan, 1994). Causal search, in and of itself, can provide individuals with a renewed sense of control following a perceived loss of control. However, simply engaging in causal search is not a sufficient strategy for long-term motivation or successful outcomes. In a study of the precursors of causal search, Stupinsky and colleagues (2011) found that unexpected, negative, and important events predicted more causal search in first year college students. Interestingly, those who engaged in more causal search made more maladaptive attributions and received lower grades than those who engaged in less causal search. These findings suggest that causal search alone is not necessarily an adaptive mechanism; in fact, it may be indicative of one's lost sense of primary control.

In achievement settings the causal attributions most studied are ability, effort, task difficulty and luck. Once a cause or causes have been ascribed to an outcome a categorization of the cause takes place. According to Weiner (2000) all attributions fall into three causal dimensions: locus, stability, and controllability. The locus dimension refers to the location of a cause, which exists either within or outside of the actor. Causes such as effort and ability are considered internal while causes such as luck and task difficulty are considered external. Stability refers to the duration of a cause. Causes such as effort and strategy are usually perceived as temporary or unstable, whereas causes like ability are often perceived as stable. Finally, controllability refers to the degree to which a cause can be volitionally altered. For example, effort and strategy would be considered controllable, while ability and luck may be considered uncontrollable (Weiner, 2000). It is important to note that these causes may fall into different causal dimensions according to how one perceives the cause, but some causes are perceived similarly across individuals, such as effort which is commonly considered internal, unstable, and controllable.

Causal beliefs are linked to motivational consequences, both psychological and behavioral. The locus and controllability dimensions are particularly related to affective states. For example, pride is associated with internal causes of success. A student may experience pride after receiving an acceptance letter from her college of choice if she perceives internal causality for the acceptance; however, if she believes that her acceptance was caused by her powerful friend "calling in a favor" (external), she will likely not experience pride. Controllability is often associated with guilt or shame. For instance, if one fails an exam because of a lack of effort (controllable) he may experience guilt. The stability of a cause can influence the perceived expectancy of future success or failure. If the cause of one's failure on an exam is ability (stable)

then failure will be anticipated for similar exams in the future. Conversely, if the cause of failure is effort (unstable) then future failure is not anticipated (Weiner, 2000). Behavioral consequences are also attached to causal attributions. For example, if a student raises her hand in class and the teacher does not call on her, she is faced with finding the cause of her failure to be called upon. Her future participation in the class may depend on her attribution. If she attributes a stable cause (e.g., "The teacher doesn't like me") she will likely experience negative affect and may not wish to participate any further. Or, if she attributes an unstable cause (e.g., "The teacher didn't see me") she will likely continue to persist and seek help from the teacher. Weiner (2005) suggested that attributions are strongly tied to subsequent behavior. Wolters and colleagues (2013) supported this claim, demonstrating that students' attributions were more strongly associated with psychological and behavioral consequences than with performance outcomes.

These causal ascriptions are made by the actor after an outcome occurs; however a great deal of research demonstrates that these attributions may differ when made by the observer. In fact, neuroimaging studies have observed distinct brain activation in attributions involving self-agency versus external-agency (Sperduti et al., 2011). Accordingly, Weiner (2000) developed two separate yet intermingled theories of motivation from the attribution perspective. First was the *intrapersonal* theory which encompassed self-directed thoughts and feelings about outcomes. This theory was detailed in the previous paragraphs. Second was the *interpersonal* theory which involved other-directed thoughts and feelings about the outcomes of others. This theory explains judgments about responsibility and, like the intrapersonal theory, produces motivational consequences. The common differences between self-directed and other-directed attributions have spawned several attribution-related biases such as the actor-observer hypothesis (e.g., Jones

& Nisbett, 1971), the fundamental attribution error (e.g., Kelly, 1976), and the self-serving bias (see Malle, 2006).

Internal Actions in the Service of Primary Control

Dominant theories such as social cognitive theory (Bandura, 2001), self-determination theory (Deci & Ryan, 2008), and expectancy-value theory (Atkinson, 1957; Wigfield & Eccles, 2000) all involve elements of perceived control making a singular description of the concept difficult to articulate (see Skinner, 1996 for review). However, in a general sense, perceived control refers to the combination of an internal locus and a perceived capability to influence daily events (Thompson, 2002). These daily events represent anything from immediate tasks to future outcomes. This concept has been operationalized and conceptualized in various ways yet its impact on motivation has yielded similar results across studies. The perception of control has a rich history of being associated to well-being, persistence, and effort (Skinner, 2007).

Some researchers contend that perceived control is only beneficial when the situation can be influenced, and that to perceive control over a situation that is not amenable will ultimately cause distress and disappointment. However, some have recognized that individuals search for something to control even when the event or circumstances seem uncontrollable (Folkman, 1984; Wortman & Brehm, 1975). In a study of cancer patients, Thompson and colleagues (1993) found that the type of perceived control that contributed most to the patients successful adjustment was not the belief that one could avoid the cancer, but the belief that one could control the consequences associated with the cancer (i.e., level of pain, symptoms, emotional reactions). Patients who perceived control over the consequences of the cancer were better adjusted even if they were physically or psychologically worse off than their counterparts who

did not perceive this type of control. This notion is similar to what Rothbaum et al. (1982) conveyed in their seminal article regarding secondary control; the idea of exercising secondary actions when primary actions are not possible or fruitless. Although Heckhausen and Shulz's (1995) version of secondary control is fundamentally different from that of Rothbaum et al., both involve the function of retaining a sense of control in situations of uncontrollability. These authors recognized that individuals engage in internal strategies that help to maintain a sense of primary control. This uniquely human capability was exemplified by Viktor E. Frankl (1963) who professed, "When we are no longer able to change a situation, we are challenged to change ourselves." This alludes to the fact that while there are some situations that cannot be controlled, the way one thinks about them can be controlled (Pajares, 1997), and in one's continuing effort to maintain a sense of primary control these internal actions are beneficial. Empirically, this relationship was demonstrated by Hamm and colleagues (2013) who found, in a self-report study, that students' use of secondary control (cognitive) strategies predicted their use of primary control (behavioral) strategies

It is clear that individuals possess strategies to accommodate or cope, but do they differ in their perceived capability to use these strategies? Bandura (1993) suggested that those who feel efficacious in their ability to use self-regulative strategies use the strategies with more regularity and can more easily transfer the strategies across dissimilar situations. He also discussed the influence of self-efficacy on other cognitive processes such as thought control and coping. Bandura (1993) noted that perceived self-efficacy to control thought processes plays an important role in regulating stress that is produced by thought. He further suggested that perceived coping self-efficacy and thought control efficacy operate together to reduce avoidant behavior and anxiety. Benight & Harper (2002) discovered that a coping self-efficacy (perceived

capability to manage posttraumatic recovery demands) predicted fewer symptoms of post-traumatic stress disorder and less general distress following a natural disaster. In a related study, Frazier and colleagues (2011) found that perceived control over one's reactions to a stressful event was associated with smaller increases in binge drinking and lower levels of distress. These studies support Bandura's claim and indicate that the effectiveness of SC or coping strategies are influenced by the individual's perceived capability to use them. This suggests that the effectiveness of the attribution process may also be influenced by one's perceived capability to control the process. Further, these studies differentiate perceptions of control over internal processes from traditional perceptions of control over the environment.

Thus, those who feel capable to think about an event in another way, or to reappraise the situation, are more likely to do just that. From the perspective of PCAP, those who believe they can determine the cause of an event, and understand that determination can affect them, are more likely to alter their causal reasoning about an event. This is an important quality because while one engages in the attribution process to help regain a sense of structure, the process does not always produce adaptive outcomes. This is likely because the process occurs automatically, beyond the individual's awareness (Gilbert, 1989). The use of automatic strategies is not always adaptive as it renders the individual a reactive rather than proactive entity. However, although automatized, the process can be influenced by one's general perception to influence it. For instance, the actions involved in driving one's car to work are taken automatically, yet the actions are likely taken more effectively by one who feels capable of driving to work than by one who does not. Those who adopt the PCAP perspective see themselves as the drivers of the causal reasoning process (as opposed to the process driving them), feel capable of driving the process, and understand the value of driving the process whether they are engaged in it or not.

The Role of Individual Differences in Perceptions of Control

Past research has shown that the strategies individuals use to regain a sense of control in control-threatening circumstances are influenced by individual differences and perspectives. For example, Dweck and Leggett (1988) developed a theory that distinguished between two types of implicit theories; those who view individual traits as fixed entities (entity theorists) and those who view individual traits as malleable (incremental theorists). Studies that involve these implicit theories have found unique differences in goal striving, cognitive strategies, causal attributions, achievement motivation (Dweck et al., 2004), and social perception (Erdley & Dweck, 1993; Molden & Dweck, 2006). Most relevant to the current proposal, however, is that those who adopt an incremental theory of intelligence are more likely to thrive when faced with academic challenges than those who adopt an entity theory of intelligence (Blackwell et al., 2007).

In similar fashion, Kuhl (1984) postulated that individuals who endorse an action-orientation are more able to follow through with their intentions even in the face of repeated failure and other competing tendencies. Action-orientation refers to a metastatic mode of control that facilitates change-oriented intentions; whereas state-orientation is a catastatic mode of control that inhibits change-oriented intentions. It has been suggested that an action-orientation allows individuals to down-regulate negative affect in demanding contexts (Koole & Jostman, 2004), circumvent decreased performance in the face of uncontrollability (Kuhl, 1981), and shield the self against the psychological turmoil produced by external demands (Koole, 2004).

With regard to the attribution process, there is at least one theory that focuses on an individual's perception of the process, the causal uncertainty (CU) model. CU posits that those

who are chronically uncertain in their ability to understand the causes of events are less likely to perceive control (primary control), more likely to experience negative affect and depression, and more likely to take action to determine the cause of events (Weary & Edwards, 2006; Weary et al., 2010). Thus, this model suggests that one's belief about the causal process influences psychological and behavioral outcomes. In this case that belief is one's uncertainty in his or her ability to determine the cause of events. It is not surprising that this perspective is associated with negative affect and depression as it is undoubtedly an unpleasant state. This causal uncertainty may also be an indication of a lack of primary control (Weary & Edwards, 1996; Weary et al., 2010). In an effort to explore ways to minimize the negative impact of CU, Tobin and Raymundo (2010) found that SC (accommodation) helped to protect causally uncertain undergraduate students from negative affect and depression. The authors postulated that accommodation had this effect on CU individuals because it promoted an acceptance and adjustment to the event that allowed them to disengage from the rigorous attempts to determine what caused the event. That is, those who were causally uncertain, or felt incapable of determining the cause of events (to make attributions) fared better affectively when they accepted their limited abilities and disengaged from the causal process.

It is proposed that PCAP also allows individuals to adaptively disengage from the attribution process, but by different mechanisms. In the previous study, CU individuals' disengagement was facilitated by SC/accommodation which was operationalized as harmony control (Morling & Fiske, 1999). Harmony control refers to one's belief in external others (e.g., higher power, other people, luck, etc.). This concept resembles Rothbaum et al's illusory control, aligning one's self with an external source in order to accept the situation and to relinquish a need for action. This can be thought of as an external locus of control over

determining the cause of outcomes. In PCAP, disengagement from the attribution process is facilitated by an internal locus of control (e.g. "I'm the one who determines why events happen"), a belief in the ability to influence the process, and an awareness of the motivational consequences of attributions. Additionally, it is proposed that PCA and AMC promote a sense of autonomy. Whereas, in the previous study, a reliance on external others effectively buffered CU individuals from negative affect, it did not necessarily influence the students' primary control or autonomy. Nevertheless, it supports the idea that certain beliefs can facilitate a disengagement from the attribution process and that disengagement has adaptive qualities.

Perceiving Control of Automatic Processes

Automatic processes such as the attribution process typically occur in the absence of conscious attention, but research has shown that automatic processes can be subject to attentional control (Cohen et al., 1990; Miller & Cohen, 2001). From a psychophysiological perspective, Krusemark and colleagues (2008) found that self-serving attributions (the tendency to attribute success internally and failure externally) occurred less frequently when preceded by enhanced neural activity in the medial prefrontal cortex, a brain region associated with the evaluative component of cognitive control and evaluation of outcome expectancies. Other neuroimaging studies have observed similar results (Kestemont et al., 2012; Seidel et al., 2012). This suggests that it is possible to exercise the cognitive control required to override automatic tendencies.

From a psychological perspective, studies have shown that heightened self-focus has a way to inhibit automatic biases. Macrae et al., (1998) found that self-focus reduced participants' stereotype activation. In a similar study, Dijksterhuis and van Knippenberg (2000) hypothesized that self-focus would eliminate the effects of stereotype activation on behavior. In one

experiment, they primed participants with the stereotype of a politician and in a second experiment they primed participants with either a professor or a soccer hooligan stereotype. Using mirrors to enhance self-awareness, they discovered that these stereotypes did not lead to altered performance (politician primed participants writing longer essays and professor primed participants outperforming counterparts on a knowledge test) for those who were seated in front of a mirror. The authors reasoned that highly self-aware participants consciously considered several possible actions which can disrupt links between priming and behavior. This consideration of alternatives is said to "break the inertia" that exists when one focuses exclusively on evidence consistent with the focal cause or outcome (Koehler, 1991). Research by Hirt and Markman (1995) suggests that simply considering alternatives transforms and improves the quality of the judgment process, even across domains (Hirt et al., 2004). Self-focus has been shown to interrupt the execution of other automatic processes such as, well-practiced motor skills (Baumeister, 1984), prejudiced responses (Monteith, 1993), and attitudes (Greenwald & Banaji, 1995).

Awareness has played a similar role in the field of counseling psychology. A therapeutic method called mindfulness-based cognitive therapy (MBCT) was developed to help those who are vulnerable to depressive relapse (Teasdale et al, 1995). Ma and Teasdale (2004) explained the aim of MBCT as "developing participants' awareness of, and changing their relationship to, unwanted thoughts, feelings, and body sensations, so that participants no longer avoid them or react to them in an automatic way but rather respond to them in an intentional and skillful manner" (p. 32). In MBCT participants are taught how to cultivate their experiential awareness which allows them to observe and disengage from negative thought patterns, seeing them as mental events rather than reflections of reality (Kenny & Williams, 2007). Studies have

demonstrated the effectiveness of MBCT in reducing relapse of depression (Kenny & Williams, 2007; Ma & Teasdale, 2004) as well as reductions in symptoms of generalized anxiety disorder and improvement in quality of life (Roemer & Orsillo, 2007). Similarly, rational-emotive behavior therapy (REBT) is founded on the idea that individuals adopt irrational thoughts that are traditionally outside of conscious awareness. These thoughts are said to influence the emotional and behavioral consequences of an event (Ellis, 2008). Therapists that use this technique help their clients see that their thoughts about an event affect them more than the event itself, and that their thoughts about the event may be irrational. When REBT is successful clients acknowledge that they are complicit in creating their own emotional distress and accept that it is within their power to change their self-defeating beliefs.

With respect to the attribution process, many studies have involved attributional retraining (AR) interventions that are aimed at transforming students' maladaptive attributions (e.g., teacher quality, lack of ability) into adaptive attributions (e.g., effort, strategy). Typically, ARs illustrate to students the difference between adaptive and maladaptive attributions and the influence of such attributions. Occasionally as part of the consolidation process students are provided with a handout that lists maladaptive and adaptive attributions (see Perry et al., 2010). The AR process is effective in producing change in students' attributions as well as their general perceived control (Haynes et al., 2006). One could argue that educating students about an automatic process such as the attribution process promotes a self-awareness that may have previously been beyond attentional control. The AR program also educates students about their causal choices which may indirectly promote a perception of control over the attribution process.

Studies such as these demonstrate that techniques are available to assist individuals in exercising control over automatic internal processes. The evidence suggests that it is possible to become aware of internal processes and that such awareness could lead to a perceived control of the internal process. Thus, past studies suggest that individuals can perceive control of their own attribution process and that methods can be taken to foster the perspective. Similarly, these studies suggest that those who do perceive control over the attribution process benefit psychologically and behaviorally from the perspective.

Development of the Perceived Control of the Attribution Process (PCAP) construct

Perceived Control of Attributions (PCA). The *perceived control of the attribution process (PCAP)* is made up of two constructs. The first is *perceived control of attributions (PCA)* which refers to individuals' internal locus and perceived capability to influence their attributions. It is conceptualized as a perspective in which individuals possess an internal locus of control over determining the causes of events, or reasons as to why events occur. Those who perceive control over their attributions believe it is "up to them" to determine why things happen. The proposed construct is a psychological perspective that promotes cognitive action. These actions can eventually develop into more efficient and adaptive automatic tendencies. The attribution process is often initiated following a loss of primary control (e.g., failed midterm); thus, it is proposed that those who perceive control over their attributions are able to perceive control over a cognitive aspect of the event.

Given the strong context and event-specific nature of attributions (Bernsten & Rubin, 2006), PCA is considered event-specific. That is, the trait can be influenced by context (e.g., actor vs. observer perspective) and event type (e.g., success vs. failure; controllable vs.

uncontrollable). For instance, some may believe that it is "up to them" to determine why they received a low grade because the event itself is controllable, while they may not believe it is "up to them" to determine why a storm caused damage to their house (objectively uncontrollable). Thus, it is proposed that the context of the event will influence the PCA construct. However, those who adopt PCA will likely believe that they can influence their attributions in most situations because they recognize it is not the event they are trying to influence but the attribution process elicited by the event. Not only can PCA be influenced by the context of the event, it can also be influenced by low-control circumstances. Typically, low-control circumstances are situations in which perceptions of control are threatened or diminished. These circumstances refer to any situation that reduces perceptions of control such as living with cancer (Thompson et al., 1993) or the first year of college (Perry, 2003). Because PCA is the perceived control of an internal process, a low-control circumstance in this case refers to situations in which cognitive load is high or attentional control is limited.

The perceived control of attributions perspective is relevant in all types of situations in which attributions are made, including self and other-related events. To illustrate PCA in a self-related event, imagine a student who failed a test. He is likely to make several attributions in the search for the cause of his failure (Forsyth et al., 2009). If there is no obvious reason for his failure (e.g., forgot to bring a calculator) he might consider both adaptive (e.g., didn't eat breakfast) and maladaptive causes (e.g., not smart enough). If he does not perceive control over this process his attribution will be driven by past history or automatic tendencies (Weiner, 2000). However, if he feels capable to influence his attributions he can more easily disengage from the process and avoid the maladaptive attribution by considering other causes or foregoing the

attribution process all together and focus on what can be controlled. The specific actions involved in this cognitive process are detailed in a later section.

Another way the perceived control of attributions can be illustrated is from the interpersonal theory of motivation (attributions about others). One implication of this model is that when observers attribute the actor's failure to controllable causes, negative affect such as anger may follow (Weiner, 2000; 2005). This type of social transaction was observed by White and colleagues (2006) who studied individuals with chronic fatigue syndrome (CFS) and their close others. They found that the close others who made internal attributions for the acquisition of the CFS reported giving less support which was associated with depression and anxiety in those with CFS. From the present perspective, suppose a student observes a classmate who she believes is obese. If she attributes the classmate's obesity to a controllable cause such as lack of effort, she is likely to experience anger toward this classmate which can lead to teasing or unfriendly behavior. However, if she understands that it is "up to her" to attribute the cause of the classmate's obesity, she can disengage from the attribution process avoiding feelings of anger which could lead to a higher likelihood of friendly behavior toward the classmate. Whether it is a strange look from a friend or something someone said, the actions of others often initiates the attribution process. It is proposed that PCA is beneficial in these types of situations.

Awareness of the Motivational Consequences (AMC) of Attributions. Within the PCAP construct is a subconstruct named *awareness of the motivational consequences (AMC)* of attributions. AMC is defined as an understanding that attributions have subsequent psychological and behavioral consequences. Individuals who adopt the AMC perspective are more likely to understand that how they determine the cause of an event will influence how they

behave in response to the event (Weiner, 2000). Those who understand this principle will likely place greater value on the consequences of the attributions and focus more on what can be controlled following an event; whereas those who do not understand this principle will more likely dwell on the event itself and prolong the negative consequences following the event. Unlike PCA, the proposed AMC subconstruct is considered event-independent. That is, individuals' AMC is not likely to be influenced by context.

Conceptually, the proposed PCA and AMC constructs are distinct because while some may feel that it is within their control to determine a cause, it does not mean that they are aware of the potential motivational consequences of their attributions. Thus, it is proposed that these constructs are stronger and more accurately predictive of outcomes when used in tandem. Take an earlier example: if a student raises her hand in class and the teacher does not call on her, she is faced with finding the cause of her teacher's actions. If the student perceives control of her attributions, she feels capable of attributing the teacher's action to a stable cause (e.g., "The teacher doesn't like me") or an unstable cause (e.g., "The teacher didn't see me"). However, if the student is not aware that her causal beliefs have motivational consequences she may choose the less adaptive causal belief. Although she perceived control of her attributions, she could suffer negative motivational consequences by choosing the less adaptive attribution. This is not to say that individuals must be knowledgeable about the attribution literature to benefit from their PCAP, but simply to understand that each causal attribution is linked to subsequent behavior. If this type of awareness is high then individuals can proceed with the attribution process knowing that each causal belief influences their behavior.

In fact, when PCA and AMC are adopted, individuals do not necessarily have to make an attribution at all. If the aforementioned student perceived control of her attributions and understood that they carry motivational consequences she could simply decide that it is pointless to find a cause for her teacher's actions (e.g., "I don't know why my teacher didn't call on me, but since it's up to me to decide I'm not going to worry about it"). This inaction circumvents the negative consequences of attributions by avoiding the maladaptive cause. The actions facilitated by these constructs are assumed to be engaged primarily when there is no obvious cause for the event. However, the perceived control of the attribution process can also be beneficial in situations where causes are obvious and easily identified. For example, if a woman is told by the doctor that she most likely inherited her serious illness, an exhaustive search for the cause of the illness is not likely to occur given the cause is objectively apparent. As Heider (1958) and Weiner (2010) suggested, the causal search is a mechanism that satiates one's yearning to make sense of the world, thus if the cause of the event is obvious there is little need to engage in causal search. In this example, even though the event has an obvious cause the woman can benefit from PCAP as her perception of control to influence her attribution process is still present. Because she adopts these perspectives she perceives control over a cognitive aspect of the control-threatening event, enabling her to retain a sense of autonomy (e.g., "I could find another reason for my illness, but I already have a suitable reason"). Additionally, in events such as this there are attributions associated with the consequences of the event that have no obvious cause. Thus, if she perceives control of her attribution process it is proposed that she will feel capable to focus on what *can* be influenced and perceive control over attributions related to the consequences of the illness (e.g., "Why did I deserve to inherit this illness?", "Why am I not receiving support from my loved ones?").

The PCAP Model

This model is not unlike other models of motivation that are devised to explain behavior in a rationalistic and deterministic manner and assume that individuals choose their actions so as to maximize the benefits they receive both immediately and eventually (Heckhausen, 1977). The PCAP model describes the underpinnings of the construct and illustrates the series of cognitive processes undertaken by those who perceive control of their attribution process.

There are two ways that PCAP can be obtained. The first avenue to the adoption of PCAP comes from one's past history. This past history involves anything from culture, past experiences to schematic beliefs (e.g., religious beliefs). Something as simple as reading a certain book or watching a certain movie can lead to one's belief that he or she is capable of determining why things happen. Once this perspective is adopted it is reinforced by subsequent events that support it. Conversely, those who have certain religious beliefs may not believe that it is "up to them" to determine why things happen, but instead believe that it is for a higher power to determine. For example, Morling and Fiske (1999) argued that those from Eastern cultures are more likely to cope by aligning themselves with external forces or fate, whereas Anglos are encouraged to be agentic and independent.

The second way to adopt PCAP is through intervention into one's life. These interventions refer to substantive interactions such as attributional retraining, therapeutic counseling, good advice from a friend, and so on. As discussed earlier, some interventions and therapeutic techniques are designed to help the individual become aware of the thoughts that are causing them distress and to gain a sense of control over such thoughts If these types of interventions are successful, they can produce substantial and transformative realizations for the

individual that usher in a renewed sense of control. Specifically, this sense of control refers to the belief that one is able to alter his or her cognitive patterns; this includes the process of attributing causes to outcomes.

Action Mode: Intentional and Automatic Actions. After first adopting the perspective, the actions promoted by PCAP are most likely intentional rather than automatic. It takes cognitive resources to intervene and override the automatic responses that are typically engaged during the attribution process. One who recently adopts the PCAP perspective is likely to make an intentional plan of action such as, "Because it's up to me to determine what caused an event, I will be aware of future events that cause me distress and try to change how I think about them." This intentional plan makes it easy for the individual to detect relevant situations and attend to them. It also cognitively links the behavior to the relevant situation (Gollwitzer, 1999). These types of intentional plans have been especially effective in situations where action intention is difficult to initiate (Gollwitzer & Brandstatter, 1997). Imagine, for example, a woman who recently went on a date with a man and despite her repeated attempts to contact him has not heard from him in several days. She is likely to experience negative affect which could be exacerbated by her attribution for his behavior. Before adopting PCAP she may have automatically assumed, "He doesn't call because he thinks I'm unattractive", but because she perceives control over her attribution process she can take the opportunity to cognitively intervene (e.g., "I don't know why he hasn't called so I won't rush to conclusions"). This illustrates how the woman anticipates situations in which she can influence the attribution process.

These intentional actions reinforce the PCAP perspective and with time can become the automatic response following events that initiate the attribution process. In his cognitive model

of motivation, Heckhausen (1977) posited that appraisal of a situation can lead to the formulation of plans and the intention to follow them; or, if ready-made plans have been formed, they can be initiated without intentionality. This transformation of action mode is beneficial to the individual because it enables the action to be taken with minimal cognitive resources. Ultimately, PCAP-relevant cues elicit cognitive processes without conscious intent and these processes facilitate the intended action (Gollwitzer, 1999). However, even after the action mode has transitioned into automatic, the conscious intention to take the action is always available to the individual and may be required in novel, yet relevant situations (Fernandez-Duque et al., 2000).

The actions associated with PCAP are most likely used when the event in question has no obvious cause. That is, the actions that influence the attribution process are not likely to occur when a rationally acceptable cause is present. For example, the woman who did not hear back from her date would not likely be cued to influence her attribution process if she had convincing evidence that the cause of the man's behavior is due to the fact that he is traveling abroad. However, if the woman does perceive control of her attribution process it is assumed that her perceived control over the cognitive aspect of the event would help her retain a sense of autonomy despite the event's outcome. Additionally, while an event may have an obvious cause, there are other attributions associated with the event that may not have an obvious cause such as, "Why didn't he tell me he was traveling abroad?" "Why didn't I wait for him to call me?" PCAP can be applied to these "why" questions as they do not necessarily have an apparent cause or reason.

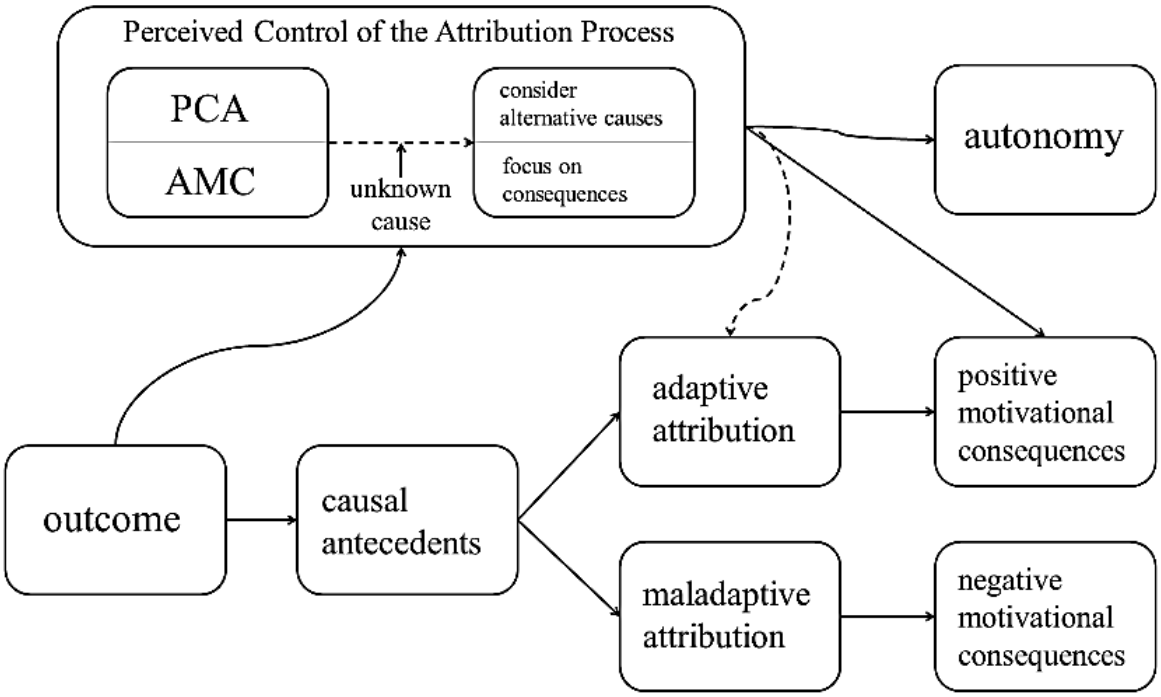

Figure 1. A conceptual model of the perceived control of the attribution process. PCA = perceived control of attributions, AMC = awareness of the motivational consequences of attributions.

Actions Associated with PCAP. There are two general actions that are facilitated by the perceived control of the attribution process; these actions can also be referred to as strategies. The first action is *considering alternative attributions* as potential explanations for a cause or behavior. In past studies, the consideration of alternatives has been an effective strategy for interrupting and overriding automatic responses such as overconfidence (Hoch, 1985), the explanation effect (Sanna et al., 2002), and hindsight bias (Hirt & Markman, 1995). Of course, some research has demonstrated that when individuals are presented with too many alternatives they can become overwhelmed and experience negative affective and behavioral consequences (Iyengar & Lepper, 2000). As a part of the attribution process, individuals typically explore

several possible causes for an outcome regardless of their perceived control over the process (Forsyth et al., 2009; Weiner, 1985). The difference is, those who do not perceive control over their attribution process are either not aware that they can influence their attribution process or do not feel capable of influencing it which renders them unintentionally committed to their attribution. On the other hand, those who do perceive control over their attribution process can exercise their option to consider alternative causes of the outcome. This consideration allows the individual to interrupt and disengage from the attribution process. Consider the previous example, the woman who did not hear back from her date likely engaged in a causal search to explain the man's behavior. As a result of this search the woman chose an attribution that satisfied her rational perception of the event (e.g., "He doesn't find me attractive"). However, if the woman perceives control of her attribution process she feels capable to and understands the value of considering other possible explanations for the man's behavior (e.g., "Maybe he lost his phone"; "Maybe he's already in a relationship"). It is proposed that simply considering alternative causes for an outcome facilitates a disengagement from the attribution process. If this action is taken, the individual is no longer at the mercy of her automatic responses that could lead to maladaptive consequences.

The second action facilitated by PCAP is *focusing on the consequences of the attribution*. Attribution theorists emphasize the unique affective and behavioral consequences of attributions (Weiner, 2010). Because of these consequences, the AMC subsconstruct is an important component of the perceived control of the attribution process. Those who are aware of the motivational consequences of attributions are more likely to focus on and evaluate their futures based on their causal reasoning for events. Consider again the woman who did not hear back from her date. If she perceives control of her attribution process and is aware of the motivational

consequences of her attribution, her causal search can involve the evaluation of the consequences of her attribution. Focusing on how her attribution would affect her enhances the causal reasoning process. She is not likely to intentionally explain his behavior in a manner that would negatively affect her (e.g., "He thinks I'm annoying") if she feels capable of avoiding it. It is proposed that this strategy allows the individual to override and forego the attribution process (e.g., "I don't know why he hasn't called, but since it's up to me to decide I won't assume the worst). Depending on the subjective importance of this event, this action would likely promote the continued effort to determine the cause of the man's behavior or the reduction of effort to deal with the stressor which Carver and colleagues (1989) referred to as behavioral disengagement.

PCAP as Self-Regulation

How can one perceive control of the attribution process if it takes place automatically? As detailed previously, there is evidence to suggest that individuals can exercise control over automatic processes. Automatic tendencies can be overridden by weaker task-relevant responses when top-down processing is engaged. These weaker task-relevant responses are driven by intentions and goal-directed behavior (see Miller & Cohen, 2001). In fact, researchers in the field of self-regulation are devoted to studying the exertion of control over automatic tendencies. According to Baumeister and Heatherton (1996), self-regulation is a matter of interrupting automatic responses and preventing them from running their normal course. Self-regulation (or self-control) has been described as the exertion of control over the self by the self in an attempt to change the way one would typically think, feel, or behave (Muraven & Baumeister, 2000). These actions are designed to serve the best interest of the individual. Because these self-

regulative actions are intentional rather than automatic they consume cognitive resources, which means that one's capacity to self-regulate is not infinite. However, with time, these intentional actions can become more efficient and automatic actions that are less taxing on one's cognitive resources. Because automatic tendencies are continuously and gradually developed through practice, top-down processing can initiate the development of new, more adaptive, automatic tendencies (Cohen et al., 1990). For example, a student who successfully completes an attributional retraining program will likely engage in intentional goal-directed behavior in an effort to override and deconstruct existing, less adaptive, automatic tendencies related to attributions.

Additionally, as seen in other frameworks, a lay theory or perspective can influence one's attributions, perceptions of control, and engagement in strategies. Thus, the perspective "it's up to me to determine why things happen" is likely to promote feelings of control and influence over the attribution process. One who adopts this perspective considers him or herself the one who determines the cause(s) of events. This perspective also implies that the individual feels capable to determine why an event or situation occurred. Therefore, although metacognitive awareness is advantageous it is not a required characteristic of PCAP.

Traditionally, models of self-regulation involve elements of metacognitive monitoring or control (Winne & Hadwin, 1998). However, researchers have recognized the importance of motivational variables as factors in one's self-regulated behavior (Schunk & Zimmerman, 2008, Zimmerman, 1995). Bandura (1993) posited that even if metacognitive awareness is present it does not guarantee that self-regulative strategies will be used. He further suggested that motivational beliefs play a key role in determining one's self-regulated behavior. Most

prominently, in the academic domain, control beliefs such as self-efficacy have been linked to self-regulated behavior (Pajares, 2008). Conceptually, this makes sense as those who feel capable to achieve an outcome are more likely to use adaptive strategies to help them achieve the outcome. Further, some research has focused not only on traditional control beliefs but on the perceived capability to use self-regulated strategies. Studies of this kind have found that self-efficacy for self-regulated learning is positively related to self-efficacy for academic achievement and strategy use (Joo et al., 2000; Zimmerman et al., 1992). As discussed earlier, a perceived capability to cope following a stressful event was a key factor in reducing the distress caused by the event.

From this perspective, perceived control of the attribution process is a perceived capability to internally adjust or accommodate following an event; however, PCAP is specific to the attribution process, that is, it deals with the "why" of the event or the belief that one can determine what caused the event. Those who adopt this belief are more likely to employ the cognitive actions (associated with the causal process) that allow the individual to adjust or accommodate following the event. In this way PCAP is different from primary control which involves the perceived capability to achieve an external outcome rather than an internal outcome.

Because the attribution process plays an integral part in producing emotions which drive action, it is useful to consider how PCAP can temper one's emotional reaction following an event. Studies of emotion regulation have cited cognitive reappraisal as an effective strategy for regulating one's emotions (Gross, 1998; Gross & John, 2003; McRae et al., 2011). Cognitive reappraisal is described as a type of cognitive change that involves interpreting a potentially emotion-eliciting situation in a way that changes its emotional impact (Lazarus & Alfert, 1964).

Those who use this strategy would likely endorse a statement such as, "When I want to feel less negative emotion, I change the way I'm thinking about the situation" (Gross & John, 2003). This type of reappraisal occurs early in the process and intervenes before the emotional response has been fully generated making it an effective strategy for reducing negative emotion. PCAP is likely to have a similar influence on emotional reactions as those who perceive control over the attribution process are able to think about the event in a way that allows them to feel more positively about the situation. For example, if a teacher believes that her student fell asleep during class because she is a boring teacher she is likely to experience negative emotion. However, if she adopts the PCAP perspective she feels capable of changing her causal thinking to consider other causes for the student's behavior (e.g., "Maybe he was up too late last night"). In this situation, while she is likely to still experience negative emotion, she will be less likely to dwell on it reducing the psychological impact of the negative emotion.

Implications of the Proposed PCAP Construct

The perceived control of the attribution process is deeply rooted in attribution theory; however, the guiding theory of the construct is perceived control. The driving force of PCAP is the *perceived control* of the attribution process. It is the perceived control that should promote subjective well-being, persistence, and autonomy. This is not to say that individuals who adopt the perspective cannot benefit from adaptive attributions. But, it is the perceived control and awareness of the motivational consequences of attributions that will allow individuals to exercise agency. This agency is facilitated by the conscious control and intervention in one's environment that has been shown to result in self-regulation (Winne & Hadwin, 2008).

Autonomy has a rich history within the educational psychology literature and has been studied from a number of perspectives (Ryan, Kuhl & Deci, 1997). The basic definition has been adjusted and reconstructed throughout the field of educational psychology; consequently, the concept of autonomy has been conceptualized in a number of ways. From within self-determination theory (SDT), Ryan and Deci (2006) asserted that autonomy retains its primary etymological meaning of self-governance, or rule by the self. SDT maintains that feelings of autonomy can be undermined by demanding external environments. In light of this, some have argued that there are person variables that facilitate strategies that shield against the autonomy threatening demands of the environment such as action-orientation (Koole, 2004). With regard to internal actions, Morling and Fiske (1999) asserted that the relationship between primary and secondary control (accommodation) enables individuals to express goals and assert their need for autonomy. The authors believed that this process establishes individuals as agents by aligning themselves with their environment.

The attribution process, or causal search, is often initiated following autonomy threatening events (e.g., "Why is my teacher watching me?"). Thus, it is proposed that PCAP promotes feelings of autonomy as it neutralizes the negative consequences produced by maladaptive attributions. A perceived control of the attribution process also allows individuals to retain a sense of control following autonomy-threatening events; because individuals who adopt PCAP perceive influence over the cognitive aspects of the event, even if the event itself is considered uncontrollable. Those that perceive control of their attribution process may feel a greater sense of self-authorship as they see themselves having choices and as the ones who ascribe causes to outcomes. This perspective can be considered autonomy supporting. Autonomy supporting circumstances have been linked to satisfaction, well-being (Ryan & Deci,

2001), vitality, depression (Vansteenkiste et al., 2006a) social competence (Soenens & Vansteenkiste, 2005) and class engagement (Stefanou et al., 2004).

Perceived control also has a fundamental role in the health and well-being of individuals (see Chipperfield & Greenslade, 1999). Bandura (1989) proposed that people's belief in their capability to influence events affects the levels of stress and depression they experience. The impact of perceived control on well-being has been observed across several domains such as academic development (Perry et at., 2001), work environment (Tetrick & LaRocco, 1987; Thompson & Prottas, 2006); and personal factors such as age differences (Lang & Heckhausen, 2001), social class (Lachman & Weaver, 1998), and physical disability (Schulz & Decker, 1985). Perceived control is associated with higher levels of emotional health, regardless of how it is operationalized (Lachman et al., 1994; Skinner, 1995). Additionally, experiments that involve control enhancing activities have shown that there is a causal link between improved personal control and higher levels of psychological well-being (see Rodin et al., 1985). Like primary control, perceived control over an internal process (the attribution process) is likely to produce higher levels of well-being.

The fit-focused version of secondary control has been featured in studies on coping that have revealed associations between SC and well-being. This type of SC has been shown to help people accept or adjust to negative life events (see Morling & Evered, 2006). Additionally, Hall and colleagues (2006) discovered the significant impact that SC has on students' overall health during the typically stressful first year of college. The benefits of SC in this capacity are indicative of the "accommodation" mechanism. As stated earlier, this accommodation is characterized as an ability rather than a perspective that promotes action. It is proposed that a

perceived control of the attribution process will have a similar influence on well-being because individuals who adopt PCAP can not only "accommodate" but perceive control over the process of accommodating. If a student fails an exam, he can accommodate by internally adjusting to his situation (e.g., "It's not the end of the world"). However, if the student perceives control of his attribution process he understands that his attributions are made by him and that they have motivational consequences; he can accommodate *and* perceive control (e.g., "My feelings about this midterm depend on how I think about it…"). This concept reflects the understanding that, with respect to well-being, the cause of the failure is not necessarily as important as the judgments made about the failure.

Persistence has been linked to adaptive causal reasoning such as attributions to a lack of effort following failure (Andrews & Debus, 1978; Craske, 1985). A perceived control over the attribution process is likely to promote persistence as well, whether it leads to an adaptive attribution or not. Consider for example a student who is walking the halls of her school and hears laughter as she passes another group of female students. This ambiguous event could cause distress and interrupt action. If she perceives control of her attribution process she may think, "They might be laughing at me, or they might not. It's up to me to decide." She could then continue on her way, or even approach the group of females to discover why they had laughed.

Perceived control has been shown to predict effort and persistence in the face of challenges (Bandura, 1986; Ryan & Connell, 1989; Weiner, 1985). Secondary control has been shown to facilitate persistence as well. Hall and colleagues (2006) found that students who were high in SC were more likely to persist and perform well academically over the long-term than

were students high in primary control and low in SC. This is not surprising considering its reciprocal and complementary relationship with primary control. For instance, a student who failed an exam could experience a reduced perception of control for later exams; however, the student can rely on an attitude "adjustment" to place himself in a manageable position for future success (e.g., "It's not the end of the world, I'll just have to do better on the final"). With regard to PCAP and persistence, take an earlier example. The graduate student whose conference proposal was not accepted is more likely to persist in future conference opportunities if his attribution of the event is not driven by automatic tendencies, but by his own intentions. If he feels capable to alter his causal reasoning of the event and understands the motivational value of doing so, he can more easily avoid an attribution that would deter his persistence in future conference opportunities.

CHAPTER 3

THE PRESENT STUDY

The primary goal of this study was to develop a valid and reliable scale that measures individuals' perceived control of the attribution process. The development of a scale will help to empirically ground the construct and allow for investigation into its relationship to other psychological constructs and influence on motivation. As illustrated in the literature above, control beliefs play a pivotal role in determining the outcomes that individuals experience. In fact, the strive for control is so fundamental it has been described as the central motive that guides human behavior (Heckhausen & Shulz, 1995; Thompson, 2002). The present research makes a unique contribution to this field of study by examining a perceived control of an internal process, rather than exclusively focusing on outward-oriented perceptions of control.

The perceived control of the attribution process scale (PCAPS) consists of two subscales, the perceived control of attributions (PCA) subscale and the awareness of motivational consequences (AMC) subscale. Study 1 (a pilot study) generated and evaluated scale items, assessed suitable measurement formats, and explored the contextual dependency of the proposed constructs. Study 2 aimed to provide evidence for the internal consistency, factor structure, convergent, divergent, and predictive validity of the scale. Appropriately, the following research questions were addressed in Study 2:

1. Are PCA and AMC two distinct constructs? (structural validity)
    a. Can the two-factor structure be supported in three different samples?
2. Does the PCAPS demonstrate internal consistency? (reliability)

    a. Do the PCA and AMC subscales demonstrate reliability in three different samples?

3. Is there evidence for convergent and discriminant validity? (construct validity)
4. Is there evidence for predictive validity? (construct validity)
    a. Does the PCAxAMC interaction explain unique variance in cognitive reappraisal beyond that of PCA and AMC?

In addition to the development of the PCAPS, four research questions regarding the nature of the PCAP construct were addressed.

5. Does the proposed PCAP model fit the data?
6. Is there evidence for the validity and reliability of the ES-PCAPS?
7. Does the controllability of the event for which attributions are made significantly influence one's PCA or AMC?
8. When considering the controllability of the event, does PCAP predict adaptive outcomes?

CHAPTER 4

STUDY 1

Plan of Analysis

This pilot study involved the first steps toward design and evaluation of the scale. This stage addressed four main objectives: item generation, instrument format, the factor structure and context-specificity of the constructs. Context experts were asked to evaluate the generated items on several criteria. Because the proposed constructs span both the perceived control and attribution frameworks, multiple approaches were used to explore the most effective measurement strategy. Three different types of instruments were included in the pilot study; a self-described event (event-specific), a hypothetical scenario, and a general PCA measure. Because attributions are by nature event-specific, an event-specific instrument was used to explore the constructs. In past studies, event-specific measures have been more strongly related to outcomes than general measures (Bennett et al, 1991; Frazier et al., 2011). Past studies on attributions have examined both experienced and hypothetical events. Stupinsky et al. (2011) found that the two types of situations yielded nearly identical results. Thus, a hypothetical measure was included in the study to assess its effectiveness in measuring the proposed constructs. In addition, a general measure of PCA was used to measure general (event-independent) perceptions of PCA.

A preliminary exploratory factor analysis (EFA) was conducted to explore the factor structure of the items. Then, information was sought regarding the contextual dependency of the proposed PCA and AMC constructs. In this case, context referred to the controllability of the event. Controllability (primary control) was chosen because like secondary control, PCAP

would likely be relevant following a loss of primary control. It was anticipated that the controllability of the event/situation for which attributions were made would play a significant role in individuals' level of PCA. That is, individuals would be more likely to perceive control over their attributions for an event that is controllable, as opposed to an event that is beyond their control. However, AMC and the PCAxAMC interaction were not expected to be influenced by the controllability of the event. To explore the predictive validity of the constructs, regression analyses were conducted to examine the interaction effect of the event-specific PCA and AMC variables and to assess the amount of variability accounted for in autonomy when controlling for general-PCA.

Methods

Participants

The sample consisted of 143 students from a large Southwestern University. Students were recruited from a participant pool administered by the university's school of education. The majority of the participants were female (70%). The sample was primarily Caucasian (59%) with 13% Hispanic/Latino, 11% Asian, 6% African American, 3% American Indian/Alaska Native, and 12% reported other/biracial. The sample consisted of both undergraduate (92%) and graduate students (8%) ranging in age from 17 to 63. Three participants were excluded from analysis due to outlying responses that were not measurable on the PCAP and AMC scales.

Procedure

Students within the participant pool who chose to participate in the study were directed to the online survey. Those who completed the survey were anonymously entered into a raffle to

win a gift card to a large online retail vender. The online survey took approximately thirty minutes to complete. The study was approved by the Institutional Review Board at the university and all participants consented before taking the survey.

Item Generation

The PCAPS began with 41 items that were generated to measure the PCA and AMC constructs. These items were carefully conceived using theory based knowledge and existing measures of perceived control and attribution questionnaires. Items were modified to specifically address the type of event for which it was related (i.e., event-specific vs. hypothetical). These 41 items were evaluated by 6 content experts who rated the items on the clarity of the statement and the quality of fit in its intended subscale. The content experts were also asked to classify the items in accordance with which subscale it was designed to measure. They were also given the opportunity to provide general feedback on the items in an open-ended response at the end of the survey. Based on the experts' feedback, items were revised and eliminated. 35 items remained and were used in the subsequent analysis.

Instrument Formatting

The hypothetical scenario instrument provided participants with hypothetical situations such as recently getting fired from a job, or not receiving a scholarship. Following each situation were two items from both the PCA (e.g., It's up to me to determine why I was fired) and AMC (e.g., My decisions about why I was fired will affect how I react to the situation) subscales. This instrument yielded non-interpretable results with regard to the factor structure of the scale. This non-interpretability appeared to have been due to differences in the context of the situation. In other words, items related to uncontrollable events loaded separately from controllable events

regardless of their intended factor (e.g., a storm caused damage to your house vs. you failed a test). While this approach provided critical information about how respondents think about their attributions, it was deemed an insufficient measurement format and was eliminated from this stage of analysis.

The event-specific instrument contained two separate measures. The first measure asked participants to describe an unexpected event (*unexpected-event* measure):

"Sometimes we experience things in our lives that are unexpected. Think about the past few weeks of your life. Please describe a situation where something unexpected happened. Preferably a situation that made you think or that you're still thinking about."

The second measure asked participants to describe a situation in which they failed at something important (*failure-event* measure):

"Sometimes we do poorly or fail at something that is important to us. Think about the past few weeks of your life. Please describe a situation where you failed or did poorly at something important. Preferably a situation that made you think or that you're still thinking about."

Unexpected and failure events were chosen based on past studies that show these types of events often elicit attributions (Stupinksy et al., 2011). Both measures included items from the PCA and AMC subscales that addressed the events they described. For example, "I'm the one who determines why it happened" (PCA scale) and "My decisions about why the event happened affect how I react to it" (AMC subscale). Also, items were written to specifically address either the unexpected or failure-event (e.g., I'm the one who determines why it happened vs. I'm the

one who determines why I failed). Both measures used a six point Likert-type scale. An even numbered scale was chosen to avoid undecided responses and promote clear subscription to either low or high scores. An EFA was conducted separately on both the unexpected and failure-event measures (see measure description for details). Both measures contained clear PCA and AMC factors, thus both were retained for analysis.

Measures

Event-specific perceived control of the attribution process scale (ES-PCAPS). This instrument contained an unexpected and failure-event measure, both included subscales for the PCA and AMC constructs. The participants responded to 35 items that were later reduced to 9 on each measure (5 PCA, 4 AMC) following an EFA using principle axis factoring and a direct oblimin (oblique) rotation.

For the unexpected-event measure, the Scree plot indicated two factors were present (PCA and AMC). The two factors accounted for 55.20% of the common variance. Items were retained if they loaded above 4.0 and did not cross-load above 3.2 (Tabachnick, & Fidell, 2001) onto the other factor (see Table 3 for items and factor loadings). The Cronbach's alpha of the resulting 9-item scale was .88 (PCA $\alpha = .89$; AMC $\alpha = .75$).

For the failure-event measure, the Scree plot also indicated two factors were present. The two factors accounted for 50.19% of the common variance. Items were retained if they loaded above 4.0 and did not cross-load above 4.0 onto the other factor (see Table 4 for items and factor loadings). The Cronbach's alpha of the resulting 9-item scale was .81 (PCA $\alpha = .87$; AMC $\alpha = .70$).

*General perceived control of attributions***.** This measure contained two-items that were rated on an eleven-point Likert-type scale. The items were, "In general, I have control over determining why things happen in my life" and "In general, it's up to me to determine the cause or causes of events in my life". Cronbach's alpha was .83.

*Autonomy***.** The General Causality Orientations Scale (GCOS) was used to measure autonomy orientation (Deci & Ryan, 1985). It consists of 12 vignettes about problems or situations that occur in life. Following each vignette is an autonomy related item rated on a 7-point Likert-type scale. Cronbach's alpha was .85.

Results

Descriptive Statistics

Descriptive statistics for the study variables were assessed. The unexpected-AMC had a relatively high skewness coefficient which could suggest that the distribution on that scale was not normal. All of the other variables yielded data that supported the normality assumption (see Table 1). Correlation statistics revealed that autonomy was strongly and positively related to failure-PCA and general-PCA (see Table 2). The unexpected and failure-PCA variables were strongly and positively related, as were the unexpected and failure-AMC variables. The interaction terms were created from centered variables, thus they were excluded from descriptive analyses.

Table 1

Descriptive statistics for study variables.

Variable	Min	Max	*M*	SD	Skew
Unexpected-PCA	1.00	6.00	3.33	1.33	.18
Unexpected-AMC	1.00	6.00	4.47	1.04	-1.01
Failure-PCA	2.00	6.00	4.47	1.02	-.32
Failure-AMC	1.75	6.00	4.52	.95	-.53
General PCA	1.00	10.00	7.13	1.88	-.72
Autonomy	3.00	7.00	5.70	.79	-.69

Note. N = 140

Table 2

Correlations among study variables.

Variable	1	2	3	4	5
1. Unexpected-PCA	-				
2. Unexpected-AMC	.48**	-			
3. Failure-PCA	.46**	.30**	-		
4. Failure-AMC	.08	.37**	.32**	-	
5. General PCA	.24*	.15	.44**	.13	-
6. Autonomy	.11	.12	.34**	.15	.37**

Note. ** $p < .01$, *$p < .05$. N = 140

Table 3

Pattern matrix factor loadings of the unexpected-PCA and AMC subscales.

Item	PCA	AMC	*M*	*SD*
I'm the one who determines why it happened.	**.990**	.112	3.36	1.83
Decisions about why it happened are under my control.	**.842**	.058	3.22	1.90
I have a great deal of control over determining why it happened.	**.796**	.022	3.48	1.80
It's up to me to decide why it happened.	**.570**	.286	3.34	1.72
I'm the one who determines what caused the event.	**.559**	.224	3.17	1.64
My decisions about why the event happened affect how I react to it.	.025	**.761**	4.20	1.41
The way I think about the event affects how I react in similar events that happen in the future.	.079	**.635**	4.66	1.16
Changing my mind about what caused the situation can change how I react to it.	.005	**.615**	4.23	1.58
I believe the way I explain the event can impact how I feel.	.025	**.603**	4.67	1.37

Note. PCA = Perceived control of attributions. AMC = Awareness of the motivational consequences of attributions. Bolded text indicates the items intended factor.

Table 4

Pattern matrix factor loadings of the failure-PCA and AMC subscales.

Item	PCA	AMC	*M*	*SD*
I'm the one who determines why I failed.	**.802**	.144	4.50	1.27
I have a great deal of control over determining why I failed.	**.787**	.287	4.36	1.23
Decisions about why I failed are under my control.	**.577**	.234	4.44	1.31
Whether or not I caused this failure is ultimately my decision.	**.722**	.368	4.35	1.36
It's up to me to determine why I failed.	**.873**	.274	4.49	1.19
I believe the way I explain this failure can impact how I feel.	.207	**.417**	4.65	1.15
How I react to the failure depends on why I failed.	.196	**.660**	4.65	1.41
The way I feel about this failure depends on why it happened.	.105	**.634**	4.25	1.35
The reason why I failed strongly influences how I react to the failure.	.393	**.738**	4.56	1.11

Note. PCA = Perceived control of attributions. AMC = Awareness of the motivational consequences of attributions. Bolded text indicates the items intended factor.

Context-Specificity Analysis

A one-way ANOVA was conducted to assess the differences in PCA and AMC with respect to the objective controllability of the event described by the participants. Two trained raters coded the events as either controllable or uncontrollable on a four-point scale. Using weighted kappa, the interrater agreement was .83. For the unexpected-event measure, 34 events were coded as controllable, while 92 were coded as uncontrollable (17 participants were excluded from this analysis because their described event was unintelligible or absent). Also of note, 68% of the unexpected-events and 94% of the failure-events were related to academia. 92% of the failure-events were coded as controllable making analysis of the differences between controllable and uncontrollable events difficult. Thus, the failure-event measure was excluded from this analysis. The following ANOVA results pertain to the unexpected-event measure.

As anticipated, results showed that the differences between controllable and uncontrollable events were significant for levels of PCA [$F (1, 124) = 30.669$, $p < .01$], but not for AMC [$F (1, 122) = .001$, $p = .975$]. The mean for controllable PCA events (M = 4.45) was significantly higher than the mean for uncontrollable PCA events (M = 3.00), and this effect had a large practical significance ($d = 1.14$). The mean for controllable AMC events (M = 4.46) was practically the same ($d = .01$) for uncontrollable events (M = 4.67). This indicates that individuals are more likely to feel as if they can control their attributions if the event itself is controllable; whereas AMC was not influenced by such context. Also as expected, there were no significant differences in levels of PCAxAMC between controllable and uncontrollable events [$F (1, 122) = 1.173$, $p = .282$].

Predictability of Autonomy

A regression analysis was conducted to examine the predictability of the PCAP variables on autonomy. Separate analyses were run for the unexpected-event and failure-event measures. For the unexpected-event measure, the PCA [F (1, 139) = .700, p = .405] and AMC [F (2, 138) = .585, p = .559] variables did not significantly predict autonomy. However, when adding unexpected-PCAxAMC variable the model was significant [F (3, 137) = 4.831, $p < .01$] and the interaction accounted for an additional 14% ($\Delta R^2 = .14$) of the variance in autonomy. The full model explained 12% (adj. $R^2 = .119$) of the variance in autonomy. In a separate regression analysis, general-PCA was added to the model as a control variable. General-PCA was a significant predictor of autonomy [F = (1, 139) = 8.858, $p < .01$] accounting for 10% of the variance (adj. $R^2 = .095$). After adding unexpected-PCA [b = .032, t(137) = .037, p = .971] and unexpected-AMC [b = .482, t(137) = .403, p = .688] to the model (which were both nonsignificant factors), the unexpected-PCAxAMC explained an additional 11% of the variance in autonomy ($\Delta R^2 = .106$) and was significant [F (4, 136) = 5.189, $p < .01$]. The full model accounted for 17% of the variance in autonomy (adj. $R^2 = .165$). In both analyses, the unexpected-PCAxAMC interaction accounted for unique variance in autonomy over and above the PCA and AMC variables.

The same process was conducted with regard to the failure-event measure. In this case, failure-PCA was a significant predictor of autonomy [F = (1, 139) = 13.142, $p < .01$] and accounted for 11% of the variance (adj. $R^2 = .113$). Failure-AMC did not significantly account for any additional variance in autonomy [b = .575, t(137) = .523, p = .603]. Adding the failure-PCAxAMC interaction did not significantly account for additional variance in autonomy [b = -

1.090, $t(136) = -1.144$, $p = .256$]. The full model was significant [$F(3, 137) = 4.166$, $p < .01$] and explained 11% of the variance in autonomy (adj. $R^2 = .109$). In a separate analysis controlling for general-PCA, the failure-PCA variable [$b = 1.913$, $t(138) = 1.916$, $p = .058$] did not explain a significant amount of variance in autonomy ($\Delta R^2 = .03$) over and above general-PCA; the same was true for failure-AMC [$b = .763$, $t(137) = .735$, $p = .464$]. When added to the model, the failure-PCAxAMC interaction did not significantly account for additional variance in autonomy [$b = -.479$, $t(142) = -.520$, $p = .604$]. The full model with general-PCA was significant [$F(4, 136) = 6.960$, $p < .01$] and explained 20% of the variance in autonomy (adj. $R^2 = .201$).

Taken together, the results varied with respect to the type of event that was analyzed. The unexpected-PCA and AMC variables did not significantly account for variance in autonomy, yet, the unexpected-PCAxAMC interaction significantly explained unique variance in autonomy, even when controlling for general-PCA which also was significantly associated with autonomy. The story was different with respect to the failure-event measure. The failure-PCA variable was a significant predictor of autonomy, whereas failure-AMC was not. The failure-PCAxAMC interaction did not significantly explain any additional variance in autonomy over and above the failure-PCA and AMC variables. When adding general-PCA to the model, failure-PCA did not significantly account for additional variance in autonomy.

Discussion

Study 1 involved the generation of scale items and gathered information regarding the factor structure, contextual dependency, and predictive nature of the construct. The results revealed important aspects of the proposed PCAP construct that will inform the next stage of analysis and the further development of the PCAPS.

A preliminary EFA was conducted on both measures of the event-specific instrument (failure and unexpected events). Both EFAs clearly demonstrated that the PCA and AMC factors were present. These results provided initial support for the structural validity of the proposed PCAP construct. These results also inform the further development of the PCAPS by illustrating which items strongly represent their intended factors. This makes the generation of additional items a more informed and direct process.

The results of the analysis exploring the context-dependency of the PCAP indicated that the proposed PCA construct is significantly influenced by the context of the event, which in this case referred to its objective controllability. Specifically, using the unexpected-event measure, participants reported higher levels of PCA for events that were objectively controllable than events that were uncontrollable. AMC was not influenced by the controllability of the event which suggests that AMC is context-independent. Similarly, the unexpected-PCAxAMC interaction was not influenced by the controllability of the event.

It is important to note that these events were coded on their objective controllability; however, there is a difference between objective and subjective control. While some events are objectively controllable and considered controllable by most, what is more important to one's motivation is the subjective controllability of an event. An event may be perceived differently by different individuals, which may explain why in past studies perceived control has been more strongly associated to outcomes that objective control (Weems & Silverman, 2006). Accordingly, for similar analyses in Study 2, participants reported their subjective perceptions of how much control they had over the event they described.

Analyses assessing the proposed constructs predictability of autonomy yielded informative results. The predictive implications of PCA, AMC, and PCAxAMC interaction differed between the failure and unexpected events. The unexpected-PCAxAMC had a significant relationship with autonomy over and above the PCA, AMC and general-PCA variables. On the other hand, the failure-PCAxAMC did not significantly predict autonomy. Interestingly, failure-PCA significantly explained variance in autonomy but not after controlling for general-PCA.

The different results between the failure and unexpected events could be explained by the context of the event. Nearly all of the failure-events were coded as controllable, whereas the majority of the unexpected-events were coded as uncontrollable. As seen in the previous analysis, the controllability of the event had a significant impact on one's PCA. That is, when an event was controllable participants reported higher levels of PCA. Given that virtually all of the failure-events were controllable it makes sense that the failure-PCAxAMC did not account for unique variance in autonomy because controllable events are likely to have obvious causes that the individual is unlikely to reappraise. It would seem then, that the PCAxAMC interaction is more relevant in situations where the event for which attributions are made is uncontrollable and the cause is ambiguous. Like secondary control, which is said to most benefit those with low primary control (e.g., Hall, 2006), PCAxAMC allows the individual to retain a sense of control in situations of uncontrollability. The results indicate that this control belief leads to a higher likelihood of autonomy.

Also of interest, when students were asked to describe an event in which they had failed, they overwhelmingly described a controllable event. This indicates that students think about

failure as an outcome with which they could have controlled but did not. Thus, in order to obtain both controllable and uncontrollable events described by the participants, Study 2 used the unexpected-PCAP measure and excluded the failure-PCAP measure.

The general-PCA variable was positively and strongly related to autonomy. In both regression analyses, it significantly predicted autonomy. The only variable to account for significant variance in autonomy beyond general-PCA was unexpected-PCAxAMC. The failure-PCA and general-PCA were strongly correlated, and in the regression analysis, failure-PCA failed to contribute significantly to the variance in autonomy. This indicates that general-PCA may be a stronger predictor of autonomy. Based on the results of this study, PCA is event-specific; however, because of this event-specificity, it would appear that a general approach to measuring the construct is a stronger and more accurate representation of one's overall PCA perspective. These results suggest that a general, rather than event-specific, measurement approach is preferred. It should be noted that the general-PCA measure contained only two items and did not include an AMC subscale. Thus, Study 2 involved the development of a scale that assesses general PCAP beliefs.

Overall, this pilot study provided important information about the nature of the proposed PCAP construct. An EFA showed that the items generated to measure the PCA and AMC factors did represent their intended factor, providing initial evidence for the validity of the PCAP construct. Additionally, the controllability of the event for which attributions were made significantly impacted participants' perceived control of their attributions. The results demonstrated that the PCAP variables predicted autonomy, and that a general PCAPS, rather than an event-specific PCAPS, may be a more appropriate approach to measuring the construct.

Study 2 will be informed by the results from Study 1, strengthening the continued development of the PCAPS.

CHAPTER 5

STUDY 2

Plan of Analysis

The primary goal of Study 2 was to develop a valid and reliable PCAPS that measures individuals' general PCAP beliefs. Study 2a involved gathering evidence regarding the factor structure, internal consistency, and construct validity (convergent and discriminant) of the scale.

1. Are PCA and AMC two distinct constructs? (structural validity)
    a. Can the two-factor structure be supported in three different samples?
2. Does the PCAPS demonstrate internal consistency? (reliability)
    a. Do the PCA and AMC subscales demonstrate reliability in three different samples?
3. Is there evidence for convergent and discriminant validity? (construct validity)

The aim of Study 2b was to gather evidence regarding the predictive validity of the PCAPS and the validity of the PCAP model.

4. Is there evidence for predictive validity? (construct validity)
    a. Does the PCAxAMC interaction explain unique variance in cognitive reappraisal beyond that of PCA and AMC?
5. Does the proposed PCAP model fit the data?

Study 2c examined the differences between the PCAP and ES-PCAP constructs with regard to their factor structure and predictive properties. This study also examined the contextual dependency of the PCAP constructs.

6. Is there evidence for the validity and reliability of the ES-PCAP?

7. Does the controllability of the event for which attributions are made significantly influence one's PCA or AMC?
8. When considering the controllability of the event, does PCAP predict adaptive outcomes?

Methods

Participants

A total of 800 students participated in this study. Participants were drawn from a participant pool administered by the school of education at a large southwestern university. Students from other large classes at the university were allowed to participate if permitted by their instructor. The majority of participants were female (76%). The sample was primarily Caucasian (61%), with 15% Hispanic/Latino, 9% Asian, 8% Biracial, 4% African American, 2% American Indian/Alaska Native, and 1% reporting other/biracial for ethnicity. While most of the students were undergraduates (97%), some were graduate students. The age of the participants ranged from 18-59. 55% were 18-22 years old, and the mean age was 24.70.

Procedures

Students who chose to participate in the study were given a website link that directed them to the online survey. Based on instructor preference, those who completed the self-report survey were given either course credit or a $4 gift card to a large online retail vender. The online survey took approximately thirty-five minutes to complete. The study was approved by the Institutional Review Board at the university and all participants consented before taking the survey.

Study 2a

The proposed two-factor structure was assessed in three unique samples (randomly drawn without replacement), as was the reliability of the subscales. Scale items were generated and adapted based on the findings of Study 1. This resulted in a pool of 30 PCAPS items. Following an EFA and item-selection criteria, these items were reduced to 11 (6 PCA, 5 AMC). To further assess structural validity, a second EFA and a confirmatory factor analysis (CFA) were conducted on this 11-item scale. The following research questions were addressed to guide these analyses:

1. Are PCA and AMC two distinct constructs?
    a. Can the two-factor structure be supported in three different samples?
2. Does the PCAPS demonstrate internal consistency?
    a. Do the PCA and AMC subscales demonstrate reliability in three different samples?
3. Is there evidence for convergent and discriminant validity?

Expected Results

Based on the literature above, it was expected that the factor analyses would provide evidence for the structural validity of the PCAPS; demonstrating the independence of the PCA and AMC constructs in three different samples. The same was expected with regard to the internal consistency of the subscales; demonstrating their reliability across three different samples. It was also anticipated that this study would yield evidence for the construct validity of the PCAPS. PCA and AMC were expected to relate to their convergent variables and not relate

to their discriminant variables. These specific relationships with the convergent and discriminant variables are detailed in a later section.

Measures

Perceived control of the attribution process. The 11-item perceived control of the attribution process scale (PCAPS) was used to measure participants PCA (6 items) and AMC (5 items). For each item, participants rated their agreement on a six-point Likert scale (1 = strongly disagree, 6 = strongly agree). A six-point scale was used to promote clear subscription to either the low or high end of the scale. An even-numbered response scale is psychometrically preferred as it eliminates "middle-ground" responses and helps to fulfill the linearity assumption (Dawis, 2000). Participants were given the following instructions:

"Sometimes when things happen we think about why they happened. The following statements have to do with your life IN GENERAL. Use the scale to indicate how much you agree or disagree with the statement."

Internal attributions. The Attributional Style Questionnaire (ASQ; Peterson et al., 1982) was used to assess an internal attribution style. Participants were presented with 12 hypothetical events (6 positive and 6 negative). Following each event, participants identified a *cause* for the event and rated this cause on three different dimensions: internality (due to me vs. due to other people or circumstances), stability (will always be present vs. will never be present), and globality (influences all situations in my life vs. influences only this particular situation). Each cause was rated on a 7-point Likert scale. Only the internality scale was used for this portion of the study.

Interpersonal orientation. The GCOS was used to assess an interpersonal orientation which reflects an individual's belief that desired outcomes are beyond control and that achievement is determined by luck or fate (Deci & Ryan, 1985). It consists of 12 vignettes about problems or situations that occur in life. Following each vignette is an interpersonal related item rated on a 7-point Likert-type scale.

Mastery. The six-item Mastery Scale (Pearlin & Schooler, 1978) was used to measure participants' beliefs about their ability to influence and control their general life experiences (e.g., "I can do just about anything I really set my mind to do"). Each item was rated on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree).

Connectedness. To measure connectedness, a subscale of the Future Time Perspective Scale (FTPS; Husman & Shell, 2008) was used. Participants rated six-items (e.g., "One should be taking steps today to help realize future goals") on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree).

Causal importance. A six-item Causal Importance Scale (Tobin & Weary, 2008) was used to assess participants' perceived value in finding a cause for an event (e.g., "It is important to know the causes for a person's behavior"). Each item was rated on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree).

Personality traits. To assess participants' extroversion and agreeableness traits the Goldberg's Mini-Markers (Saucier, 1994) was used. Each trait corresponded with eight adjectives. Participants rated how accurately each adjective described them, on a 9-point scale (1 = extremely inaccurate, 9 = extremely accurate).

Social desirability. The Marlowe-Crowne Social Desirability Scale-Short Form (Reynolds, 1982) was used to gauge participants' tendency to endorse unlikely statements. Participants rated these 13-items as either true or false. This measure is commonly used in scale development to help identify faulty items or scales.

Results

Table 5

Descriptive statistics of study variables.

Measure	*M* (SD)	Cronbach's α	PCA *r*	AMC *r*
Study 2a				
Mastery	2.98 (.81)	.67	.21**	.06
ASQ (internal attributions)	5.15 (.65)	.76	.14*	.01
Connectedness	4.30 (.65)	.78	.00	.21**
Causal importance	4.15 (.98)	.84	.40**	.47**
Social desirability	5.99 (2.72)	.68	.06	-.16**
Interpersonal orientation	3.54 (1.05)	.80	.02	.02
Extroversion	5.85 (1.49)	.85	.02	.01
Agreeableness	7.19 (1.25)	.83	-.08	.05
Study 2b				
COPE (cognitive reappraisal)	3.40 (.58)	.81	.13**	.18**
Autonomy	5.64 (.73)	.77	.15**	.38**
ASQ (adaptive attribution style)				
Well-being			.13**	.10**
Positive affect	3.69 (.74)	.86	.11**	.14**
Negative affect	2.62 (.82)	.85	-.03	.06
SWLS	4.78 (1.29)	.87	.16**	.16**
Study 2c				
PCA (full sample)	3.82 (1.01)	.84		
AMC (full sample)	4.51 (.83)	.79	.38**	
ES-PCA	2.85 (1.58)	.92	.35**	.17**
ES-AMC	4.32 (1.17)	.76	.19**	.40**

Note. PCA = Perceived control of attributions; AMC = Awareness of the motivational consequences of attributions; ASQ = Attribution Style Questionnaire; SWLS = Satisfaction with life scale; ES-PCA = Event-specific perceived control of attributions; ES-AMC = Event-specific awareness of the motivational consequences of attributions.

Item Selection

An EFA was conducted with all 30 items. It was performed on a random third (approximate) of the sample (N = 286) using principle axis factoring and a direct oblimin (oblique) rotation. The two strongest factors represented the PCA and AMC constructs. The first factor accounted for 33.7% of the common variance while the second factor accounted for 7.4% of the common variance. Using the procedures discussed by Dawis (2000) as a guide, the following item-selection criteria were used to reduce the PCAPS from 30 to 11 items. First, items were required to load above 4.0 on their intended factor without cross-loading above 3.2 (Tabachnick, & Fidell, 2001) on the other factor. Second, the contribution of each item to the reliability of the subscale was assessed. Items that contributed most to the reliability of the subscale were favored. Lastly, items that correlated most strongly to their relevant convergent and discriminant validity measures were retained. This iterative item reduction process was repeated until all items met each of these criteria. The result was the 11-item (6 PCA, 5 AMC) measure. A minimum of 4 to 5 items per subscale is suggested to achieve adequate internal consistency reliability (Dawis, 2000).

Structural Validity

Exploratory Factor Analysis

A second EFA was conducted using another random third of the sample (N = 272). Prior to this analysis, tests were used to determine the number of factors to extract. The scree plot indicated the presence of two factors underlying the items, as did the minimum average partial (MAP) test (Velicer, 1976). A parallel analysis (O'Connor, 2000) based on random data

generation also suggested extracting two factors (see Appendix B for results). The two-factors accounted for 47% of the common variance (see Table 6 for items and factor loadings).

Table 6

Pattern matrix factor loadings of the PCAPS items (PCA and AMC subscales).

Item	PCA	AMC
7. The reasons why things happen in my life are for me to decide.	**.801**	-.005
11. Ultimately, I'm the one who determines why things happen.	**.793**	-.022
1. I have control over determining why things happen in my life.	**.682**	.056
5. I have a great deal of control over determining why events happen.	**.661**	-.069
9. Whether or not something happened for a greater reason is for me to decide.	**.601**	.043
3. Whether or not I caused an event is ultimately my decision.	**.542**	.037
2. My feelings about an event depend on my thoughts about the event.	-.085	**.877**
10. My thoughts about what caused an event will influence how I react to it.	-.020	**.799**
4. The reasons I give for what happens in my life affect how I feel and what I do about it.	.107	**.629**
6. Changing my mind about what caused a situation can change how I react to it.	.003	**.539**
8. When I fail at something, my feelings about it depend on why it happened.	.024	**.470**

Note. PCA = Perceived control of attributions. AMC = Awareness of the motivational consequences of attributions. Numbers to the left of the items indicate their order. Bolded text indicates the items intended factor.

Confirmatory Factor Analysis

To further examine the two-factor solution, a CFA was conducted on the last random third of the sample (N = 242). Mplus 6 (Muthen & Muthen, 2012) was used for this analysis. A

robust maximum likelihood estimator (MLR) was used to adjust for non-normality and accommodate the data that were missing at random (MAR). The fit of each model was evaluated using the chi-square significance test, the root mean square error of approximation (RMSEA), the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the standardized root mean square residual (SRMR). The cut-off criteria suggested by Hu and Bentler (1999) were used as a means to determine quality of fit (i.e., CFI & TLI $\geq .95$, SRMR $\leq .08$, RMSEA $\leq .06$). To determine whether a single factor was underlying the PCA and AMC items, a one-factor solution was tested as an alternative. This one-factor solution did not adequately fit the data (see Table 7 for model fit indices). The fit indices showed a marked improvement with the addition of the second factor. The modification indices indicated that it may be necessary to allow items AMC2 and AMC10 to covary. The similar wording of these items warranted this modification. Table 8 displays the standardized parameter estimates for each item. A chi-square difference test (Satorra & Bentler, 2001) showed that the respecified model was a significantly better fit of the data, $\Delta\chi^2$ (1) = 12.67, $p < .001$. This, and the overall fit indices, suggests that the respecified two-factor model is preferred.

Table 7

Goodness-of-Fit Indices for CFA models, PCAPS

Model	χ^2	*df*	CFI	TLI	SRMR	RMSEA (90% CI)	AIC
One-factor model	293.270*	44	.621	.526	.124	.155 (.138, .172)	7917.930
Two-factor model	93.357*	43	.923	.902	.048	.070 (.051, .090)	7667.353
Two-factor model (AMC2 with AMC10)	61.757*	42	.970	.961	.042	.045 (.016, .067)	7627.848

Note. CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; 90% CI = Confidence Interval for RMSEA; TLI = Tucker-Lewis Index; AIC = Akaike Information Criterion; AMC = Awareness of the motivational consequences of attributions. *p <.01. (Respecifications to the previous model are parenthesized underneath the model name).

Table 8

Standardized parameter estimates for final PCAPS CFA model.

Item	Estimate	S.E.
PCA		
7. The reasons why things happen in my life are for me to decide.	.786	.044
11. Ultimately, I'm the one who determines why things happen.	.760	.047
3. I have control over determining why things happen in my life.	.742	.057
5. I have a great deal of control over determining why events happen.	.684	.045
9. Whether or not something happened for a greater reason is for me to decide.	.670	.050
3. Whether or not I caused an event is ultimately my decision.	.442	.076
AMC		
2. My feelings about an event depend on my thoughts about the event.	.591	.077
10. My thoughts about what caused an event will influence how I react to it.	.605	.072
4. The reasons I give for what happens in my life affect how I feel and what I do about it.	.816	.049
6. Changing my mind about what caused a situation can change how I react to it.	.755	.047
8. When I fail at something, my feelings about it depend on why it happened.	.498	.078

Note. N = 242. S.E. = Standard error; PCA = Perceived control of attributions. AMC = Awareness of the motivational consequences of attributions. All estimates were statistically significant at $p < .001$. Numbers to the left of the items indicate their order.

Construct Validity

To examine whether the PCA and AMC subscales measure two distinct and valid constructs, a number of hierarchical regression analyses were conducted. These were conducted using centered PCA and AMC scores as predictors of a dependent variable. In each model, either PCA or AMC was controlled for to determine the unique variance explained in the dependent variable by the constructs. To achieve this, the magnitude (β) and statistical significance of the relationship was examined, along with the amount of variance in the dependent variable accounted for by the independent variable (ΔR^2). These analyses were conducted on the first random third of the data. Because AMC was related to social desirability (see Table 5), each of these regression analyses were conducted twice, once controlling for social desirability and once without. The outcome of these approaches did not differ; thus, the results without the social desirability control are presented.

Regarding convergent validity, it was predicted that the PCA subscale would significantly and positively relate to mastery (Pearlin & Schooler, 1978) and internal attributions (Peterson et al., 1982). These predictions were made because PCA represents an internal locus of control and a general perception of control. Because AMC involves future-oriented thinking that promotes perceived value in causal ascriptions, the AMC subscale was expected to significantly and positively relate to connectedness (Husman & Shell, 2008) and causal importance (Tobin & Weary, 2008). With regard to discriminant validity, it was predicted that PCA would not relate to connectedness and causal importance, while AMC would not relate to mastery and internal attributions. Both PCA and AMC were not expected to relate to the

extroversion and agreeableness personality traits. Additionally, it was expected that PCA and AMC would be unrelated to an interpersonal orientation.

Convergent and Discriminant Validity

Table 9

Indicators of Convergent and Discriminant Validity

Measure	PCA		AMC	
	β	ΔR^2	β	ΔR^2
PCA convergent/AMC discriminant				
Mastery	.144**	.041**	-.026	.001
ASQ (internal attributions)	.133*	.021*	-.059	.003
AMC convergent/PCA discriminant				
Connectedness	-.069	.009	.202**	.053**
Causal importance	.231**	.046**	.444**	.112**
PCA and AMC discriminant				
Interpersonal orientation	.020	<.001	.017	<.001
Extroversion	.027	<.001	.001	<.001
Agreeableness	-.148	.012	.150	.008

Note. PCA = Perceived control of attributions; AMC = Awareness of the motivational consequences of attributions; ASQ = Attribution Style Questionnaire.

Regarding convergent validity all of the expected relationships were supported by the results (see Table 9). PCA related to mastery and internal attributions above and beyond AMC. Comparably, AMC related to connectedness and causal importance above and beyond PCA.

With regard to discriminant validity, the results supported all but one of the expected outcomes. PCA did not relate to connectedness; however, it did predict causal importance. This may indicate that beliefs about causality are closely related despite the nature of the belief. AMC did not predict mastery or internal attributions as expected. Likewise, both PCA and AMC were unrelated to interpersonal orientation, extroversion and agreeableness.

Psychometric Properties of the PCA and AMC Subscales

The means and standard deviations of the PCA and AMC subscales were comparable across the three unique samples (see Table 10). Scores for AMC were consistently higher than scores for PCA. The Cronbach's alpha was used to assess reliability for both subscales, in each sample, and for all items (see Table 11). PCA was consistent at .84 in each sample, whereas AMC ranged from .78 to .80. Both subscales were stable across samples and demonstrated respectable levels of reliability (DeVellis, 2003). Only in the third sample did the results suggest that deleting items would increase the alpha (PCA3 and AMC8). Nonetheless, these items were retained because the increase in alpha would have been trivial.

PCA and AMC were significantly correlated in each of the three samples (.43, .38, .36, respectively). This relationship is not surprising given that both the PCA and AMC items refer to metacognitive beliefs of causality. That is, although the constructs are separate, they reflect a specific aspect of one's internal phenomena, which suggests that they would be related. As seen in Study 1, when participants reported PCA and AMC in regard to a specific event, the constructs were strongly related. Despite the relatively strong correlation, structural and construct validity analysis suggest that PCA and AMC are separate constructs.

The additional variables in this study, used to assess the convergent, discriminant, and predictive validity of the PCA and AMC subscales are presented in Table 5. This table displays the means, standard deviations, and reliability of these variables. Additionally, their zero-order correlation with PCA and AMC subscales is presented.

Table 10

Descriptive statistics for the PCAP items on each sample.

Item	1st third of sample (N = 286)		2nd third of sample (N = 272)		3rd third of sample (N = 242)	
	M	SD	M	SD	M	SD
PCA						
The reasons why things happen in my life are for me to decide.	3.95	1.27	4.10	1.27	4.09	1.27
Ultimately, I'm the one who determines why things happen.	3.55	1.36	3.78	1.34	3.44	1.43
I have control over determining why things happen in my life.	3.90	1.31	4.05	1.32	3.83	1.34
I have a great deal of control over determining why events happen.	3.87	1.30	3.95	1.26	3.75	1.33
Whether or not something happened for a greater reason is for me to decide.	3.99	1.41	4.03	1.37	3.73	1.45
Whether or not I caused an event is ultimately my decision.	3.65	1.43	3.72	1.37	3.50	1.39
AMC						
My feelings about an event depend on my thoughts about the event.	4.51	1.09	4.51	1.14	4.58	1.20
My thoughts about what caused an event will influence how I react to it.	4.44	1.15	4.52	1.07	4.57	1.18
The reasons I give for what happens in my life affect how I feel and what I do about it.	4.36	1.17	4.42	1.08	4.57	1.01
Changing my mind about what caused a situation can change how I react to it.	4.55	1.13	4.51	1.14	4.59	1.17
When I fail at something, my feelings about it depend on why it happened.	4.48	1.12	4.46	1.15	4.67	1.17

PCA composite	3.80	1.01	3.93	.99	3.73	1.02
AMC composite	4.47	.82	4.49	.82	4.59	.86

Note. PCA = Perceived control of attributions. AMC = Awareness of the motivational consequences of attributions.

Table 11

Reliability results for the PCAP items on each sample.

Item	1st third of sample (N = 286)		2nd third of sample (N = 272)		3rd third of sample (N = 242)	
	Item-total correlation	α if item deleted	Item-total correlation	α if item deleted	Item-total correlation	α if item deleted
PCA						
The reasons why things happen in my life are for me to decide.	.66	.81	.72	.79	.69	.80
Ultimately, I'm the one who determines why things happen.	.60	.82	.70	.80	.70	.80
I have control over determining why things happen in my life.	.69	.80	.64	.81	.67	.80
I have a great deal of control over determining why events happen.	.64	.81	.57	.82	.64	.81
Whether or not something happened for a greater reason is for me to decide.	.61	.82	.57	.82	.61	.81
Whether or not I caused an event is ultimately my decision.	.53	.84	.50	.84	.41	.85
AMC						

My feelings about an event depend on my thoughts about the event.	.63	.71	.68	.71	.61	.76
My thoughts about what caused an event will influence how I react to it.	.63	.71	.65	.73	.65	.75
The reasons I give for what happens in my life affect how I feel and what I do about it.	.56	.73	.61	.74	.67	.75
Changing my mind about what caused a situation can change how I react to it.	.46	.77	.48	.78	.63	.75
When I fail at something, my feelings about it depend on why it happened.	.49	.76	.45	.79	.40	.82
PCA scale Cronbach's α	.84		.84		.84	
AMC scale Cronbach's α	.78		.79		.80	

Note. PCA = Perceived control of attributions. AMC = Awareness of the motivational consequences of attributions.

Discussion

RQ1: Are PCA and AMC two distinct constructs? Based on the results, the PCA and AMC items represented their respective factors. The two-factor structure (PCA and AMC) was supported in three separate analyses, each with different samples (**RQ1a: Can the two-factor structure be supported in three different samples?**). This provides strong evidence for the structural validity of the PCAPS.

RQ2: Does the PCAPS demonstrate internal consistency? The results also revealed that the PCAPS had acceptable reliability. Both the PCA and AMC subscales demonstrated respectable internal consistency, in three separate samples (**RQ 2a: Do the PCA and AMC subscales demonstrate reliability in three different samples?**). These results provide strong evidence for the reliability of PCAPS, given that both subscales were reliable in all three samples.

RQ3: Is there evidence for convergent and discriminant validity? The results indicated that PCA and AMC accounted for unique variance in convergent variables, as expected; and did not relate to discriminant variables, generally as expected. This provides strong evidence for the construct validity of PCAP. It also addresses RQ1 and provided additional evidence that PCA and AMC are separate constructs. Overall, AMC was more strongly related to its convergent variables than PCA.

Study 2b

The goal of Study 2b was to examine the motivational implications of PCAP and the validity of the PCAP model. The PCAP model posits that PCA and AMC facilitate coping mechanisms

(or cognitive reappraisals) that help circumvent maladaptive attributions. These coping mechanisms were operationalized as *positive reinterpretation* (Carver et al., 1989). According to the authors, positive reinterpretation reflects one's tendency to construe stressful events in a positive way. While these strategies are not exact reflections of the cognitive actions proposed in the PCAP model, they do represent a tendency to cognitively intervene following stressful events. The PCAP model also posits that these cognitive reappraisals mediate a path from the PCAP variables to autonomy and positive motivational consequences; these positive motivational consequences were operationalized as subjective well-being. This study used the entire sample (N = 800) and addressed the following research questions:

4. Is there evidence for predictive validity?
    a. Does the PCAxAMC interaction explain unique variance in cognitive reappraisal beyond that of PCA and AMC?
5. Does the proposed PCAP model fit the data?

Expected Results

According to the literature above, it was expected that both PCA and AMC would predict self-reported cognitive reappraisal, an adaptive attribution style, autonomy, and well-being. Additionally, it was expected that the PCAxAMC interaction would explain unique variance in cognitive reappraisal beyond that of PCA and AMC alone. Thus, evidence for the predictive validity of the scale was anticipated. Similarly, an empirical model that represents the conceptual PCAP model was expected to fit the data. The anticipated results with respect to the specific relationships within this model are detailed in a later section.

Measures

Perceived control of the attribution process. The PCAPS was used to measure participants PCA and AMC.

Adaptive attribution style. The ASQ was used to assess an adaptive attribution style. A composite score, across dimensions (internality, stability, and globality), was computed for only the positive events. Higher scores indicated a more adaptive attribution style.

Autonomy. As in Study 1, the GCOS was used to measure autonomy orientation (Deci & Ryan, 1985).

Cognitive reappraisal. To assess the use of coping mechanisms the four item positive reinterpretation scale from the COPE (Carver et al., 1989) was used. Participants were instructed to report how frequently they use the strategies (e.g., "I look for something good in what is happening") in stressful events. Each item was rated on a four-point Likert scale (1 = "I usually don't do this at all", 4 = "I usually do this a lot").

Subjective well-being. Consistent with the approach used by Vansteenkiste and colleagues (e.g., 2006), three measures were used to assess well-being. The Positive Affect Negative Affect Schedule (PANAS; Watson et al., 1988) includes 10 positive (e.g., proud) and 10 negative (e.g., irritable) mood items. Participants reported how frequently they had experienced the mood in the past month. Each item was rated on a 5-point scale (1 = very slightly or not at all, 5 = extremely). The five-item Satisfaction with Life Scale (SWLS; Diener, et al., 1985) asked participants to rate their life satisfaction (e.g., "The conditions of my life are excellent"). Each item was rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). To obtain an overall well-being score, a composite was computed by standardizing and summing positive affect and SWLS and then subtracting negative affect.

Results

Predictive Validity

A series of regression models were conducted to examine the unique contribution (β and ΔR^2) of each independent variable on the dependent variables. In each regression model, either PCA or AMC was controlled for to determine their unique contribution. Both PCA and AMC were controlled for in models that assessed the unique contribution of PCAxAMC. Importantly, each of these regression models included gender, age, and ethnicity as control variables but were not presented in Table 12 (see Appendix A for demographic variable results).

Table 12

Indicators of Predictive Validity, PCAP

Measure	PCA		AMC		PCAxAMC	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Autonomy	.018	<.001	.302**	.098**	.042	.003
Well-being	.230**	.010**	.127	.002	.060	.001
COPE (cognitive reappraisal)	.048*	.005*	.095**	.015**	.068**	.014**
ASQ (adaptive attribution style)	.066*	.008*	.053*	.004*	.035	.003

Note. PCA = Perceived control of attributions; AMC = Awareness of the motivational consequences of attributions; ASQ = Attribution Style Questionnaire. *$p < .05$; **$p < .01$.

With the exception of two outcomes, the anticipated results were obtained (Table 12). AMC predicted autonomy whereas PCA did not. Conversely, PCA predicted well-being whereas AMC did not. This suggests that PCA and AMC are separate yet integral parts of PCAP that influence different outcomes. Thus, when examining the impact of PCAP, it is important to consider both PCA and AMC as they have distinct predictive properties.

Validation of the PCAP Model

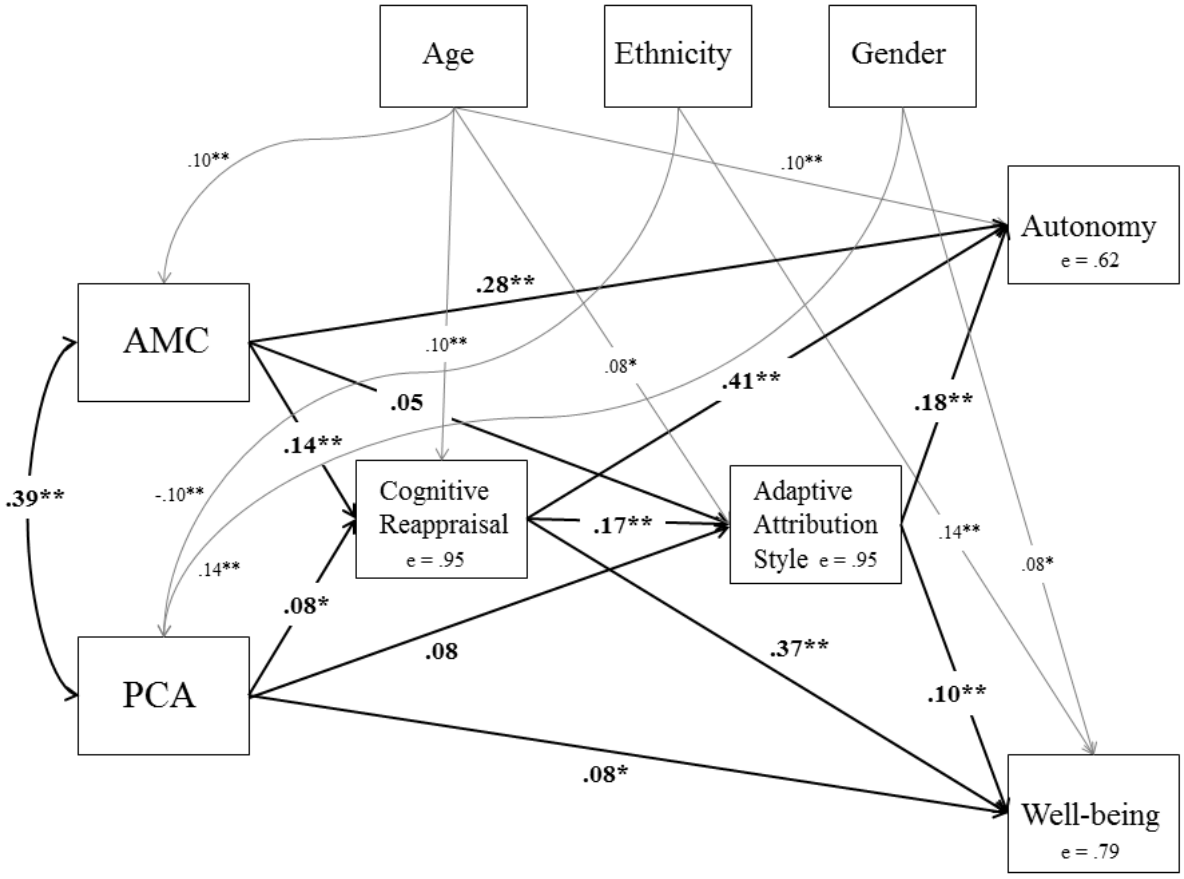

Figure 2. Empirical PCAP path model. PCA = Perceived control of attributions, AMC = Awareness of motivational consequences of attributions. **p* < .05; ***p* < .01. Only statistically significant relationships with the demographic variables are shown.

To verify the sequence of the measured variables in the proposed PCAP model, a path model was assessed using structural equation modeling in Mplus (Figure 2). Based on the results of the predictive validity analyses, the expected relationships were refined. PCA was expected to predict well-being, and cognitive reappraisal. AMC was expected to predict autonomy and cognitive reappraisal. The conceptual model also posits that the PCAP beliefs are not likely to influence attributions unless cognitive actions are cued. Thus, only cognitive reappraisal was expected to predict attribution style. Further, it was expected that cognitive reappraisal would mediate the relationship between PCA and AMC to autonomy and well-being. It was also expected that an adaptive attribution style would mediate the relationship between cognitive reappraisal to autonomy and well-being.

In this path model, age, gender and ethnicity were included as control variables (Figure 2). The model had excellent fit, χ^2 (6, N = 800) = 9.09, CFI = .994, TLI = .976, RMSEA = .025, SRMR = .016. All but two paths were statistically significant: adaptive attributions on AMC and PCA. Although these paths were non-significant, a chi-square difference test revealed that this model was not statistically different from a model that held the paths equal to 0 ($\Delta\chi^2$ (2) = 5.82.39, p = .054); and the fit indices of the more constrained model [χ^2 (8, N = 800) = 15.70, CFI = .986, TLI = .955, RMSEA = .035, SRMR = .022] suggests the model with the paths is preferred. These non-significant paths were expected, as the PCAP beliefs are not likely to influence attributions unless cognitive actions are taken.

With regard to the demographic variables, age was significantly associated with AMC, cognitive reappraisal, adaptive attribution style, and autonomy. Age was the most impactful

demographic variable. Ethnicity and gender were significantly associated with PCA and well-being (see Appendix A for details on demographic variables).

Indirect Effects and Mediation

The indirect effects of the expected mediated paths were examined using the Sobel test (Sobel, 1982). The results showed that each of the anticipated mediated paths were statistically significant. The indirect effect of PCA to autonomy as mediated by cognitive reappraisal was significant ($z = 2.01$, $p = .037$), as was the relationship between AMC to autonomy as mediated by cognitive reappraisal ($z = 3.24$, $p = .001$). Similarly, cognitive reappraisal mediated the relationship between PCA and well-being ($z = 2.10$, $p = .036$), and the relationship between AMC and well-being ($z = 3.08$, $p = .002$).

Also as expected, an adaptive attribution style played a mediating role in the second tier of the proposed variable sequence. An adaptive attribution style mediated the relationship between cognitive reappraisal and autonomy ($z = 3.45$, $p = .001$), and cognitive reappraisal and well-being ($z = 2.45$, $p = .015$).

Discussion

RQ4: Is there evidence for predictive validity? Study 2b demonstrated that PCA and AMC significantly predicted outcomes as expected. Where PCA failed to predict autonomy, AMC did; and where AMC failed to predict well-being, PCA did. This provides further evidence for their uniqueness as constructs, and for the construct validity of PCAP. Additionally, the PCAxAMC interaction significantly predicted cognitive reappraisal beyond both constructs alone (**RQ4a: Does the PCAxAMC interaction explain unique variance in**

cognitive reappraisal beyond that of PCA and AMC?). This indicates that cognitive reappraisal is more likely to take place when individuals adopt both of the PCAP perspectives.

RQ5: Does the proposed PCAP model fit the data? This study demonstrated that the PCAP model did fit the data. Using the full sample, and controlling for demographic variables, the PCAP model demonstrated excellent fit. Neither PCA nor AMC significantly predicted an adaptive attribution style; however, cognitive reappraisal did. This aligns with the model which posits that attributions are not likely to be influenced unless cognitive mechanisms are engaged.

The results also revealed that cognitive reappraisal significantly mediated the relationship between the PCAP variables and autonomy; and the relationship between the PCAP variables and well-being. Similarly, in the second tier of the model, an adaptive attribution style played a significant role in mediating the relationship between cognitive reappraisal and the dependent variables. With respect to the demographic variables, age had the most impact on the model. The results indicated that individuals are more likely to adopt the AMC perspective as they age. This makes sense, as experience is a likely source of that kind of metacognitive knowledge. Overall, the results suggest that those who adopt the PCAP beliefs are more likely to engage in cognitive mechanisms that promote adaptive attributions, autonomy and subjective well-being.

Study 2c

This study examined the contextual dependency of the PCAP beliefs. As in Study 1, this study assessed how the controllability of the event for which attributions are made impacted levels of PCA and AMC. However, this study acquired participants' subjective controllability of the event, rather than objectively rating controllability as in Study 1. To achieve this goal, this study used the event-specific PCAPS (ES-PCAPS), the unexpected-event measure developed in

Study 1. Because this analysis examined the influence of context on the PCAP beliefs, an event-specific measure was needed to gather information about the subjective controllability of the event. In other words, ES-PCAPS assesses the PCAP beliefs at the event-level, whereas PCAPS assess the beliefs at the general-level.

To strengthen the argument that ES-PCAPS and PCAPS measure the same construct at different levels, further analysis is needed to examine their convergence. Thus, further analyses were conducted that examined the validity of the ES-PCAPS and its relationship to general-PCAPS. Study 2c addressed the following research questions:

6. Is there evidence for the validity and reliability of the ES-PCAPS?
7. Does the controllability of the event for which attributions are made significantly influence one's PCA or AMC?
8. When considering the controllability of the event, does PCAP predict adaptive outcomes?

Expected Results

Based on the results of Study 1, it was expected that this study would yield strong evidence for the structural and predictive validity of the ES-PCAPS. To help disentangle the PCAP beliefs at the event versus general level, a CFA with all scale items from both measures was conducted. This analysis also helped to examine the relationships among the PCAP factors at the event versus general level. Evidence for the reliability of the ES-PCAPS was also anticipated. Regarding RQ7, it was expected that the controllability of the event would significantly influence levels of PCA, but not levels of AMC. This prediction was made based on the results of Study 1 and the assertions made in the PCAP literature. Lastly, it was expected

that the PCAP variables would predict autonomy, well-being, cognitive reappraisal, and an adaptive attribution style even when controlling for the controllability of the event.

Measures

Event-specific PCAP. The 9-item unexpected-event scale (ES-PCAPS) developed in Study 1 was used to measure PCA and AMC at the event-level. Participants responded to the items in reference to their described event.

Controllability of the event. To assess the controllability of the event described by the participants, a single-item measure was used. Following their described event, participants were asked, "How much control did you have over the event you described above?" They responded using the following options, 1 = no control, 2 = a little control, 3 = some control, 4 = a lot of control, 5 = total control.

After addressing the controllability item, participants were given the following instructions: "Now, think about what CAUSED that event or situation. Why did it happen? The following statements have to do with the situation/event you described above. Please choose the response that best describes how you feel about each statement." The ES-PCAPS items followed these instructions.

Autonomy, cognitive reappraisal, attribution style, subjective well-being, and (general) PCAP were assessed using the measures in the previous studies.

Results

CFA of the Event-Specific and General PCAPS Items

To further investigate the PCAP constructs at the event versus general level, a CFA was performed on the ES-PCAPS and PCAPS items. This analysis also provided further information regarding the structural validity of the ES-PCAPS. This analysis was conducted using the same parameters as the previous CFA, and used the same method for evaluating model fit. A four-factor solution (ES-PCA, ES-AMC, PCA, AMC) was expected to best fit the data. A two-factor solution (with all PCA items underlying one factor, and all AMC items underlying one factor) was tested as a reasonable alternative. This two-factor solution did not adequately fit the data (see Table 13 for fit indices). The four-factor model did adequately fit the data and an overall improvement in model fit was evident. As in Study 2a, the modification indices revealed that allowing items AMC2 and AMC10 to covary may be necessary, as well as items ES-PCA7 and ES-PCA9. The similar wording of these ES-PCAPS items warranted this modification. A chi-square difference test (Satorra & Bentler, 2001) showed that the respecified model was a significantly better fit of the data, $\Delta\chi^2$ (2) = 61.10, $p < .001$. This, and the improved fit indices, suggests that the respecified four-factor model is preferred. This final model is presented in Figure 3.

Table 13

Goodness-of-Fit Indices for CFA models, PCAPS and ES-PCAPS

Model	χ^2	*df*	CFI	TLI	SRMR	RMSEA (90% CI)	AIC
Two-factor model	2071.442*	169	.658	.616	.128	.119 (.114, .123)	50829.293
Four-factor model	448.559*	164	.949	.941	.038	.047 (.041, .052)	48864.637
Four-factor model (AMC2 with AMC10) (ES-PCA7 with ES-PCA9)	335.133*	162	.969	.964	.032	.037 (.031, .042)	48729.046

Note. CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; 90% CI = Confidence Interval for RMSEA; TLI = Tucker-Lewis Index; AIC = Akaike Information Criterion; AMC = Awareness of the motivational consequences of attributions. *p <.01. (Respecifications to the previous model are parenthesized underneath the model name).

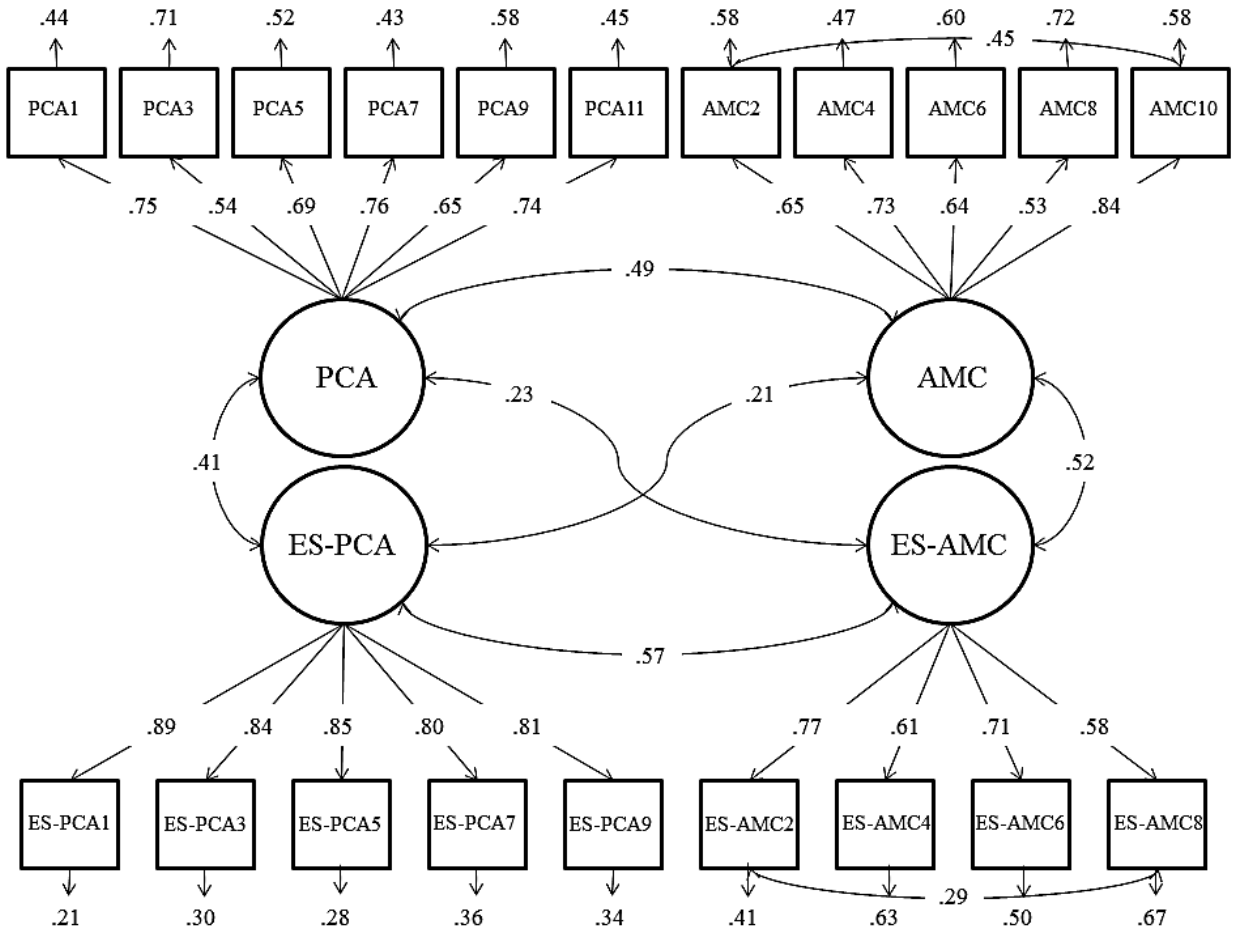

Figure 3. CFA model with the PCAPS and ES-PCAPS items. PCA = Perceived control of attributions, AMC = Awareness of motivational consequences of attributions. ES = Event-specific. All coefficients are standardized estimates and were significant at $p < .01$.

Regarding the construct validity of the ES-PCAPS, the correlations among the factors were examined. ES-PCA and ES-AMC were strongly correlated (Figure 3). This is not surprising given that participants responded to all of these items with a single event in mind. PCA and ES-PCA were also strongly correlated which indicates that they are closely related but not identical representations of PCA. Similarly, AMC and ES-AMC had a large correlation. The cross correlations (PCA with ES-AMC and AMC with ES-PCA) were only moderate in strength. This supports the argument that ES-PCAP and PCAP represent different levels of the perceived control of the attribution process.

With respect to the reliability of the scale, both the ES-PCA and ES-AMC subscales demonstrated acceptable reliability in this sample (see Table 5). These reliability coefficients were comparable to the results yielded in Study 1.

Context-Specificity Analysis

As in Study 1, a one-way ANOVA was conducted to assess the differences in levels of PCA and AMC between controllable and uncontrollable events. Using the participants' responses to the single-item regarding the subjective controllability of the event (M = 2.28, SD = 1.36), their described events were separated into two categories: controllable events (one standard deviation above the mean) and uncontrollable events (one standard deviation below the mean). According to these parameters, participants described more uncontrollable events (N = 329) than controllable events (N = 176). Those with missing ES-PCAPS responses were deleted listwise from this analysis. To illustrate the two types of events, Table 15 displays examples provided by participants.

Table 15

Illustration of uncontrollable and controllable events.

Uncontrollable event example	Controllable event example
"I am currently interning in a junior high math class one day a week. One day, during sixth period, on a Friday the 13th, a girl in class got upset with the teacher and started yelling at her. So the teacher asked me to take over the lesson while she went to deal with this young girl. I was not expecting to have to teach a lesson that day, seeing as how it was only my second time of ever being in the class."	"I got so busy and caught up in the stress of the holidays, buying gifts, dealing with my boyfriend's crazy family etc., that I forgot my father's birthday. Two days later, while I was on the phone with my mom, she asked me if I had wished my dad a happy birthday. I felt horrible, as this is something I never forget. It made me so upset to think about how I had let something so important get away from me."

With regard to PCA, the results were as expected. There was a statistically significant difference between controllable (N = 171, M = 4.67, SD = 1.07) and uncontrollable (N = 320, M = 1.77, SD, .99) events [F (1, 489) = 892.85, $p < .001$]. Cohen's effect size ($d = 2.81$) suggested a very large practical significance. Unexpectedly, there was also a statistically significant difference in levels of AMC between controllable (N = 172, M = 4.95, SD = .84) and uncontrollable events (N = 325, M = 3.89, SD = 1.23) events [F (1, 495) = 94.76, $p < .001$]. This effect was smaller than that of PCA, but still had large practical significance ($d = .98$).

Predictive Validity of ES-PCAPS

To examine the motivational implications of PCAP at the event-level compared to the general-level, the predictive validity of the ES-PCAPS was assessed. As in Study 2b, the ES-PCA and ES-AMC variables were centered before they were entered into the regression models. The same coefficients (β and ΔR^2) were examined to compare the results of the PCAPS predictive validity analysis. Given that, in in the previous analysis, the controllability of the event significantly influenced levels of ES-PCA and ES-AMC, participants' subjective controllability of the event was included as a control variable in these regression models. Additionally, age, gender, and ethnicity were included as control variables. The results for these demographic variables mirrored the PCAPS predictive validity analysis, as the same dependent variables were used.

Table 14

Indicators of Predictive Validity, ES-PCAP

Measure	ES-PCA		ES-AMC		ES-PCAxES-AMC	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Autonomy	-.131*	.007*	.249**	.046**	.163**	.021**
Well-being	.044	.001	.004	<.001	.047	.002
COPE (cognitive reappraisal)	-.068	.002	.137**	.014**	.125**	.013**
ASQ (adaptive attribution style)	-.100	.004	.184**	.025**	.209**	.035**

Note. PCA = Perceived control of attributions; AMC = Awareness of the motivational consequences of attributions; ASQ = Attribution Style Questionnaire. *$p < .05$; **$p < .01$.

The results were informative regarding the unique predictive properties of both levels of PCAP. ES-PCA was negatively predictive of autonomy, whereas ES-AMC was predictive of autonomy, cognitive reappraisal, and an adaptive attribution style (Table 14). The ES-PCAxES-AMC interaction was predictive of the same outcomes as ES-AMC. The only outcome that was not predicted by the ES-PCAP variables was well-being. The PCAP interaction at the event-level was a more robust predictor of outcomes than at the general-level.

Discussion

RQ6: Is there evidence for the validity and reliability of the ES-PCAPS? A CFA with the ES-PCAPS and PCAPS items was conducted. A four-factor solution (ES-PCA, ES-AMC, PCA, and AMC) best fit the model, which provides evidence for the structural validity of the ES-PCAPS. The PCA factors correlated strongly, as did the AMC factors; whereas the cross-correlations were only moderate in strength. This suggests that the ES-PCAPS measures a PCA and AMC construct that are closely related to the general expressions of those constructs. This convergence provides evidence for the construct validity of the scales.

The predictive validity analysis demonstrated that the motivational implications of the event-specific PCAP resemble that of general PCAP. However, there were differences in their predictive properties. ES-PCA only predicted autonomy, and that relationship was negative. ES-AMC had the strongest impact on the dependent variables, predicting all but well-being. Interestingly, ES-PCAxES-AMC was a strong predictor of autonomy, cognitive reappraisal, and an adaptive attribution style. This suggests that

when assessing PCAP at the event-level, it is important to consider the interaction of the PCAP variables; and, that it is more beneficial to possess both PCAP beliefs in regard to a single event, than it is on a general level. None of the ES-PCAP variables predicted well-being which could have several implications, but notably, it suggests that the general PCAPS is a more suitable tool when examining the motivational implications of PCAP.

In terms of reliability, the ES-PCA and ES-AMC subscales had acceptable reliability. These subscales also had strong reliability in Study 1. Thus, the ES-PCAPS was reliable in two different samples which provided further evidence for its internal consistency.

RQ7: Does the controllability of the event for which attributions are made significantly influence one's PCA or AMC? The results indicated participants' subjective controllability of their described event did significantly influence levels of PCA and AMC. The controllability of the event was expected to influence PCA, but its influence on AMC was unexpected and runs counter to the results of Study 1. The results suggest that participants' perceived capability to determine what caused the event was strongly tied to whether they felt capable to control the situation in the first place. Unexpectedly, their subjective controllability of the event was also linked to their awareness of the motivational consequences of such determinations. Notably, the difference between controllable and uncontrollable events was more than twice as large for PCA as it was for AMC. Nevertheless, this indicates that when an event is out of individuals' control, they may also consider the causal reasoning of the event as uncontrollable; this includes thinking about how the cause of the event could affect them.

RQ8: When considering the controllability of the event, does PCAP predict adaptive outcomes? Given the strong influence of context on the PCAP variables, the controllability of the event was controlled for in the predictive validity analysis. The results revealed that the ES-PCAxES-AMC interaction significantly and positively predicted autonomy, cognitive reappraisal, and an adaptive attribution style. This suggests that even though the context of the event strongly influenced PCAP, it did not affect the adaptive properties produced by the construct, with the exception of well-being.

CHAPTER 6

GENERAL DISCUSSION

Peoples' overall experience depends largely on how they deal with stressful events. The attribution process is perhaps the most fundamental and automatic way of dealing with such events. Thus, it was theorized that one's perceived control of the attribution process plays an important role in facilitating and promoting adaptive outcomes. The present study took an empirical approach to examine these claims.

The aim of this study was to develop a psychometrically sound instrument that measures one's perceived control of the attribution process. The results of two studies provided strong evidence for the validity and reliability of the scale, and demonstrated the motivational implications of the PCAP construct. Study 1 assessed the most suitable measurement format and explored the contextual dependency of the constructs. This study demonstrated that measuring a general PCA and AMC is a more appropriate and holistic approach. Study 2 gathered evidence for the validity and reliability of the PCA and AMC subscales. This study also yielded results that support the conceptual PCAP model, in which PCAP facilitated a tendency for cognitive actions that promoted autonomy and subjective well-being.

Implications

Research has shown that individuals have an innate tendency to perceive control over their environment, and when that control is threatened, they engage in internal actions to regain a sense of control. In fact, Whitson and Galinsky (2008) found that when perceived control is lost, people will go as far as to imagine patterns, develop

conspiracies, and create superstitions just to regain a sense of structure and meaning. The present research contributes to the literature that features this synergistic strive for control. While the present conceptualization of perceived control stems from existing theories, it differs from past conceptualizations, in that, it represents a perceived control of an internal phenomenon. This metacognitive component adds an important dimension to the study of personal control beliefs, especially given the inconsistent interpretations of constructs such as secondary control.

In each phase of this study, those who adopted both the PCA and AMC perspective experienced more favorable outcomes than those who did not. This indicates that there are individual differences in metacognitive beliefs of causality and that these differences have a measureable impact on one's motivation. The results indicated that a perceived control to influence attributions was distinct from an awareness of the motivational consequences of attributions. When evaluating these constructs separately, AMC was a stronger predictor of autonomy, whereas PCA was a stronger predictor of well-being. This indicates that those who believe it is "up to them" to determine why events happen are more likely to feel positive about their lives; and those who understand the motivational impact of attributions are more likely to feel autonomous in their lives.

Inferences from the PCAP Model

Those who felt it was "up to them" to determine why events happen and were aware of the motivational consequences of those determinations, were significantly more likely to report using cognitive actions, and more likely to experience autonomy and well-being. Both of the PCAP constructs had unique psychological benefits, and those

who endorsed both beliefs had a significant motivational advantage over their counterparts who adopted only one or none of the beliefs. In the model, neither PCA nor AMC significantly led to an adaptive attribution style; however, both were significant predictors of cognitive reappraisal, which led to adaptive attributions. Thus, in line with the conceptual model, the function of PCAP to influence attribution style is due to the cognitive actions facilitated by the construct. In other words, attribution style is not likely influenced unless a tendency to cognitively intervene in the attribution process is present. Both a tendency for cognitive reappraisal (positive reinterpretation) and an adaptive attribution style were essential components, as they effectively mediated the first and second tiers of the model, respectively.

As demonstrated in past studies (e.g., Dweck et al., 2004; Koole & Jostman, 2004), these results indicate that personal beliefs initiate cognitive processes that lead to distinct motivational outcomes. The actions facilitated by a perceived control of the attribution process may allow individuals to disengage from the attribution process so that they are able to circumvent the negative motivational consequences produced by maladaptive attributions. Even in the absence of cognitive reappraisal, the PCA and AMC beliefs promoted a general sense of autonomy and well-being. Therefore, these metacognitive perspectives are beneficial for one's overall experience and motivation.

PCAP at the Event-Level

Evaluating PCAP at the event-level allowed for examination of the context-specificity of PCA and AMC. Results were consistent with regard to PCA, suggesting that one's perceived control of attributions depends on whether the event is controllable.

With regard to AMC, results were mixed; thus, it is unclear whether one's awareness of the motivational consequences of attributions is influenced by the controllability of the event. The results suggest that when an event is controllable, individuals are considerably more likely to feel capable of determining why it happened. In other words, participants were more likely to perceive control over their causal reasoning of an event if the event itself was under their control (e.g., failing a test); whereas when an event was uncontrollable (e.g., death of a loved one) participants reported significantly lower perceptions of control over determining why the event happened. It is possible that AMC also varies from event to event, but further examination is needed.

These results support past findings that suggest attributions are intrinsically connected to the events for which they are made (Bernsten & Rubin, 2006). Individuals may be inclined to associate all aspects of an event and see them as a single entity, which could hinder their ability to disassociate the event from the process of making casual attributions for the event. One may believe that if the event was uncontrollable, determining why it happened is also uncontrollable; whereas if the event was controllable, making causal attributions for the event is equally as controllable. It may be that controllable events, such as gaining weight, have more obvious causes (e.g., stopped exercising), in which case, determining why it happened may feel well within one's control.

Because PCA, and possibly AMC, were significantly influenced by context, assessing one's PCAP beliefs based on a single event can misrepresent their general PCAP beliefs, or those beliefs on average. Attributions occur in all aspects of life and are

situated in unique contexts each time the process is initiated. Thus, although the controllability of the event had significant impact on PCAP, it is merely one aspect, from one event, from one time in the participants' lives. Additionally, they were asked to report an unexpected event which represents only a fraction of events that could elicit the attribution process. This suggests that a general approach to measuring these metacognitive beliefs provides a broader and more holistic representation of individuals' perceived control of the attribution process. PCAP is conceptualized as a general construct because, like the attribution process, it pervades all domains. Accordingly, PCAPS uses an all-encompassing, multidimensional approach to measure these metacognitive beliefs. ES-PCAPS is useful when assessing the contextual dependency of the PCAP constructs; however, adapting the PCAPS items to refer to a single event may also achieve this goal.

Nevertheless, additional analyses at the event-level revealed that the PCAP variables have adaptive properties, despite this context-dependency. When controlling for the context of the event, the PCAxAMC interaction predicted cognitive reappraisal, an adaptive attribution style, and autonomy. Thus, when evaluating the contextual dependency of PCAP, it is important to consider the interaction term, as it appears to have a more prominent effect at the event-level than at the general-level. Importantly, these results suggest that even when individuals are faced with uncontrollable events, they benefit from the perceived control of the attribution process. This indicates that PCAP allows individuals to exercise control of a cognitive aspect of the event, and reap the benefits of psychological control. This notion resembles Rothbaum et al's (1982) original sentiments regarding secondary control.

Educational and Practical Implications

There are also practical implications to consider. Perceiving oneself as having control over a cognitive process, especially when primary control is threatened, is an advantageous perspective that, as demonstrated here, has the potential to safeguard one's well-being and promote the experience of autonomy. Given that students often encounter stressful events (e.g. failure); PCAP may shed light on why some persist while others are motivationally debilitated by them. The PCAPS allows educators to identify students who would benefit from a change in metacognitive perspective.

Ultimately, the perceived control of the attribution process can be assessed following interventions designed to promote the construct. These interventions would likely be created using elements from counseling psychology and attributional retraining. In combining these elements, the intervention can not only educate individuals about the attribution process, but promote an awareness and perceived control over the process. Those who understand these principles are less likely to operate in their default setting; less likely to answer the "why" question with an automatic response, and less likely to be at the mercy of their learned patterns. Because individuals make attributions in all aspects of life, these interventions can produce important realizations that lead to improved motivational outcomes in one's life.

Future Directions

While this study provided substantial evidence for the validity and reliability of the PCAPS, future studies with more diverse samples are encouraged to assess PCAP across ethnic groups. Existing research suggests that these types of coping strategies

differ between those in Western and Eastern cultures (Morling & Fiske, 1999; Sasaki & Kim, 2011). This research asserts that religious beliefs in Eastern cultures emphasize a reliance on a higher power, or an external-oriented coping style, which may discourage PCAP beliefs as PCAP is an internal-oriented coping source. Thus, future research that examines the role of religion in one's PCAP beliefs, or coping locus, is encouraged. Additionally, an individual's childhood environment can also affect his or her sense of control. Mittal and Griskevicius (2014) demonstrated that those who experienced a poor childhood were more likely to develop an environmental uncertainty that led to a lower sense of control; whereas, those from wealthier childhoods were less impulsive and reported having more control over their environment. This suggests that one's perception of control is shaped by contextual factors as well as personal beliefs.

Given the context-specificity of the perceive control of attributions, further studies are needed to examine the influence of other types of events such as failure and successful events, as well as differences in perspective (e.g., actor vs. observer). Additionally, the present conceptualization of PCAP involves only causal attributions. There are, however, other attributions that individuals could perceive themselves as the ''one who determines'' such as meaning attributions. Meaning attributions have been studied in various contexts such as religious beliefs (Spilka, et al., 1985), and work-family conflict (Cinamon & Rich, 2002). The situations and events that people ascribe meaning to inevitably impact their cognitive processes and behavior (Petty & Cacioppo, 1986). Dole and Sinatra (1998) suggested that an individual is more likely to engage deeply in processing information if the information has meaning to that individual. Following an important event, one is likely to engage in a cognitive process to determine

whether the event is personally meaningful. Those that perceive control over this type of attribution would likely endorse a statement such as, ‘‘Ultimately, I’m the one who determines if it is meaningful.’’ Thus, the present construct could be expanded to include other types of attributions (e.g., good-bad). While the perspective ‘‘I’m the one who determines…’’ is likely beneficial in a multitude of circumstances, PCAP is specific to causal attributions in order to more directly address the perceived control of an internal process.

Concluding Remarks

Currently, the literature seems to lack a clear conceptualization of an internal-oriented perception of control. The present study provided a comprehensive analysis of the literature related to this concept, and developed an instrument that measures a perceived control of the attribution process. Furthermore, the results revealed that these metacognitive beliefs of causality have unique and adaptive qualities regarding one’s motivation. Even in situations of uncontrollability, those who perceived control over their attribution process retained a sense of autonomy, viewing themselves as the ‘‘one who determines why things happen’’. Conceptually, those who adopt these beliefs use them to metacognitively position themselves to help withstand the onslaught of uncertainty and distress that all individuals inevitably encounter. Perceiving oneself as having control over a cognitive process, especially when primary control is threatened, is an advantageous perspective that has the potential to safeguard one’s well-being and promote the experience of mastery.

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APPENDIX A

RESULTS FOR DEMOGRAPHIC VARIABLES IN REGRESSION AND PATH ANALYSES

A.1 Predictive Validity Regression Results: Demographic Control Variable, PCAP

Predictor Variable	Dependent Variable	*B*	*SE*	β	*t*
	Well-being				
Age		.02	.11	.07	1.77
Gender		-.45	.19	-.09	-2.39*
American Indian		.42	.65	.03	.65
Asian		-1.16	.38	-.16	-3.03**
African American		-1.49	.47	-.14	-3.12**
Hispanic		-.29	.34	-.05	-.86
Hawaiian		1.32	1.30	.04	1.02
Caucasian		-.01	.29	.00	-.04
	Attribution style				
Age		.01	.00	.09	2.27*
Gender		.00	.06	.02	.06
American Indian		.14	.20	.03	.68
Asian		-.07	.12	-.03	-.60
African American		.33	.14	.11	2.30*
Hispanic		-.11	.10	-.06	-1.01
Hawaiian		-.42	.40	-.40	-1.04
Caucasian		-.02	.09	-.02	-.25
	Autonomy				
Age		.02	.00	.15	4.28**
Gender		-.01	.06	-.01	-.18
American Indian		.34	.21	.06	1.64
Asian		-.25	.12	-1.0	-2.02*
African American		-.09	.15	-.03	-.62
Hispanic		-.18	.11	-.09	-1.62
Hawaiian		-.03	4.2	.00	-.06
Caucasian		-.10	.10	-.07	-1.07

Cognitive reappraisal				
Age	.01	.00	.09	2.50*
Gender	-.06	.05	-.04	-1.12
American Indian	.24	.18	.05	1.34
Asian	-.08	.11	-.04	-.77
African American	-.12	.13	-.04	-.95
Hispanic	-.13	.09	-.08	-1.35
Hawaiian	.23	.35	.03	.66
Caucasian	.01	.08	.01	.17

Note. *$p < .05$; **$p < .01$.

A.2 Standardized Parameter Estimates for Final PCAP Path Model

Predictor Variable	Dependent Variable	Estimate	S.E.
	Cognitive reappraisal		
PCA		.08*	.04
AMC		.14**	.04
Age		.10**	.03
Gender		.03	.04
Ethnicity		.07	.04
	Attribution style		
Cognitive reappraisal		.17**	.04
PCA		.08	.04
AMC		.04	.04
Age		.08*	.03
Gender		-.02	.04
Ethnicity		-.03	.04
	Autonomy		
Cognitive reappraisal		.41**	.03
Attribution style		.18**	.03
PCA		-	-
AMC		.28**	.03
Age		.10**	.03
Gender		-.03	.03
Ethnicity		.01	.03
	Well-being		
Cognitive reappraisal		.37**	.03
Attribution style		.10**	.03
PCA		..08*	.04
AMC		-	-
Age		.01	.03

Gender	.08*	.03
Ethnicity	.14**	.03

N = 800. S.E. = Standard error; PCA = Perceived control of attributions. AMC = Awareness of the motivational consequences of attributions. *$p < .05$; **$p < .01$.

APPENDIX B

MAP TEST, PARRALEL ANALYSIS RESULTS AND CORRELATIONS AMONG STUDY VARIABLES

B.1 Parallel Analysis Results

```
Run MATRIX procedure:

PARALLEL ANALYSIS:

Principal Components & Random Normal Data Generation

Specifications for this Run:
Ncases     272
Nvars       11
Ndatsets  1000
Percent     95

Raw Data Eigenvalues, & Mean & Percentile Random Data Eigenvalues
         Root     Raw Data        Means     Prcntyle
     1.000000     4.261380     1.353058     1.445625
     2.000000     1.870927     1.249507     1.318449
     3.000000      .992997     1.172681     1.222900
     4.000000      .796736     1.107014     1.155353
     5.000000      .627642     1.047249     1.090608
     6.000000      .563994      .989782     1.031415
     7.000000      .524739      .934852      .977975
     8.000000      .459356      .878147      .922307
     9.000000      .344422      .820719      .866751
    10.000000      .293276      .759201      .810447
    11.000000      .264530      .687790      .749325
```

B.2 MAP Test Results

```
Run MATRIX procedure:

MGET created matrix CR.
The matrix has 11 rows and 11 columns.
The matrix was read from the record(s) of row type CORR.

Velicer's Minimum Average Partial (MAP) Test:

Eigenvalues
       4.2614
       1.8709
        .9930
        .7967
        .6276
        .5640
        .5247
        .4594
        .3444
        .2933
        .2645

Average Partial Correlations
                      squared         power4
         .0000         .1250          .0280
        1.0000         .0596          .0073
        2.0000         .0378          .0040
        3.0000         .0474          .0048
        4.0000         .0715          .0228
        5.0000         .1044          .0349
        6.0000         .1454          .0666
        7.0000         .2178          .1201
        8.0000         .3081          .1866
        9.0000         .5739          .4615
       10.0000        1.0000         1.0000

The smallest average squared partial correlation is
        .0378

The smallest average 4rth power partial correlation is
        .0040

The Number of Components According to the Original (1976) MAP Test is
  2

The Number of Components According to the Revised (2000) MAP Test is
  2

------ END MATRIX -----
```

B.3 Correlations among Study Variables

Variable	1	2	3	4	5	6	7	8	9
1. Mastery	-								
2. ASQ - internal	.13**	-							
3. Connectedness	.35**	.14**	-						
4. Causal importance	.06	.02	.16**	-					
5. Social desirability	.23**	.06	.07*	-.08*	-				
6. Interpersonal orientation	-.42**	-.06	-.30**	.04	-.27**	-			
7. Extroversion	.25**	.08*	.19**	.02	.10**	-.43**	-		
8. Agreeableness	.32**	.11**	.37**	.01	.28**	-.34**	.18**	-	
9. COPE	.34**	.14**	.31**	.15**	.25**	-.32**	.26**	.36**	-
10. Autonomy	.31**	.19**	.35**	.28**	.10**	-.28**	.34**	.31**	.50**
11. ASQ	.17**	.74**	.26**	.09*	.09**	-.08*	.15**	.17**	.20**

(continued)

Variable	1	2	3	4	5	6	7	8	9
12. Well-being	.45**	.13**	.19**	.01	.25**	-.40**	.30**	.27**	.41**
13. Positive affect	.34**	.16**	.18**	.09*	.20**	-.30**	.33**	.19**	.43**
14. Negative affect	-.25**	-.04	-.10**	.12**	-.21**	.33**	-.13**	-.17**	-.15**
15. SWLS	.38**	.10**	.14**	.06	.14**	-.23**	.23**	.21**	.15**
16. PCA	.16**	.12**	.04	.38**	.11**	.00	.00	.01	.13**
17. AMC	.14**	.02	.24**	.44**	-.09	-.02	.05	.09*	.18**

18. ES-PCA	.00	-.02	-.07*	.19**	.01	.13**	-.08*	-.07	.03
19. ES-AMC	.10**	.04	.13**	.23**	.00	.00	.08*	.03	.13**

(continued)

Variable	10	11	12	13	14	15	16	17	18
11. ASQ	.30**	-							
12. Well-being	.24**	.18**	-						
13. Positive affect	.31**	.21**	.71**	-					
14. Negative affect	.01	-.04	-.66**	-.14**	-				
15. SWLS	.22**	.15**	.78**	.42**	-.29**	-			
16. PCA	.15**	.11**	.13**	.11**	-.03	.16**	-		
17. AMC	.38**	.11**	.10**	.14**	.06	.16**	.38**	-	
18. ES-PCA	.00	.02	.04	.05	.03	.06	.35**	.17**	-
19. ES-AMC	.22**	.16**	.04	.10**	.09*	.08*	.19**	.40**	.48**

Note. ** $p < .01$, *$p < .05$. N = 800