Psychological flexibility as a mechanism of change in Acceptance and Commitment Therapy

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Ciarrochi, J. Bilich, L., & Godsel, C. (2010). Psychological flexibility as a mechanism of change in Acceptance and Commitment Therapy. In Ruth Baer's (Ed), *Assessing Mindfulness and Acceptance: Illuminating the Processes of Change*.(pp. 51-76). New Harbinger Publications, Inc.: Oakland, CA.

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The last several decades of clinical research have focused on evaluating the efficacy of entire intervention packages. A wide range of therapies have been rated as at least "probably efficacious," including various forms of cognitive behavior therapy (CBT) for a range of disorders, stress inoculation training, interpersonal therapy, parent training, behavioral marital therapy, eye movement desensitization and reprocessing, brief dynamic therapy, self-control therapy, social problem solving therapy, dialectic behavior therapy, and many others (Chambless & Ollendick, 2001). Whilst the "package approach" has been useful in getting clinical interventions recognized as empirically validated, it does have its limitations (Rosen & Davison, 2003). Essentially, this approach does not help identify what components of the package are effective, and what components are inert or harmful. It does not help identify how packages are similar, or differ. Finally, it does not prevent people from creating an endless number of therapy packages, which are really *re*-packages of currently existing therapies.

One way forward is to focus on processes of change, rather than entire therapy packages (Rosen & Davison, 2003). That is, research can identify the active ingredients of therapy that might cut across therapy packages. The present chapter focuses on processes of change in Acceptance and Commitment Therapy (ACT). The goal is to examine the mediational evidence concerning why ACT works. The central mechanism of change in the ACT model is psychological flexibility, which includes several components that are described later. In this chapter we examine whether ACT works in the theoretically expected way, i.e., by increasing psychological flexibility. We also examine whether the processes elicited in ACT are distinctive from other therapies.

What is ACT?

Before we discuss mediators of change, it is important to consider the philosophical underpinnings of ACT and how ACT theorists use terms like "mediator." ACT is somewhat different from other forms of CBT in that it comes from the radical behaviourist wing of psychology (Ciarrochi & Bailey, 2008; Hayes, Hayes, & Reese, 1988). Researchers within ACT do not view internal constructs as causes of behavior (Hayes, 1995). Rather, the causes are located in the external environment and, in principle, can be directly manipulated. For example, individual differences in psychological acceptance are conceptualized as patterns of behaving rather than "things in the head". Low acceptance would not be seen as a cause of psychological distress. Rather, the cause would be located in the environmental factors that promote low acceptance behavior. Low acceptance is part of a behavioural chain that temporally proceeds symptoms, but does not cause these symptoms. The main goal of the ACT researcher is to understand how to predict and influence acceptance, rather than to understand how, say, acceptance is represented in the mind and how it interacts with other internal constructs such as emotions, beliefs, and personality.

ACT theorists utilize terms like "acceptance" only in so much as they are functional. Specifically, ACT theorists talk about processes of change because it helps them to understand what aspects of their intervention are working and why, and guides them towards what might be missing in the intervention. For example, one may discover that an ACT intervention increases commitment to valued activity but does not increase mindfulness. This may guide the intervener to develop better mindfulness components in the intervention.

ACT is based on Relational Frame Theory (RFT), a modern behavioural account of language (Hayes, Barnes-Holmes, & Roche, 2001). RFT treats language as a kind of behavior that is under operant control. It seeks to identify the contexts that give rise to

language and its ability to dominate people's lives. For example, it seeks to identify the contexts that lead people to experience disturbance about past events (even if they never occurred) or future events (even if they will never occur). RFT seeks to help understand how people become so controlled by their own internal dialogues that they become insensitive to environmental contingencies. In sum, RFT seeks to identify the contexts in which language dominates and promotes suffering, and also contexts that undermine the dominance of language.

Based on RFT, ACT emphasises the normalcy of language-based suffering for humans (Hayes, Strosahl, & Wilson, 1999). What makes 'suffering' prolonged are the psychological processes of experiential avoidance (EA) and cognitive fusion (Hayes, Strosahl, Bunting, Twohig, & Wilson, 2005; Hayes et al., 1999). EA is a process whereby an individual deliberately attempts to change the form or frequency of private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioural predispositions), and the contexts in which they occur, regardless of the social, emotional, cognitive and behavioural consequences that may result (Blackledge & Hayes, 2001; Hayes, 2004; Hayes et al., 1999; Wilson & Murrell, 2003). Cognitive fusion, which supports experiential avoidance, occurs when an individual's verbal processes (i.e., thoughts) markedly regulate overt behaviour in ineffective ways due to the inability or failure to notice the process of thinking (context) over the products of thinking (content) (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Pierson, Gifford, Smith, Bunting, & Hayes, 2004). When these processes dominate an individual's experience, this can result in psychological inflexibility.

Psychological inflexibility can be thought of as being excessively entangled in EA and cognitive fusion, and having difficulties connecting with the context of a situation and choosing behaviour in line with identified values and goals (Hayes et al., 1999). In order to

control or remove unpleasant experiences, individuals may engage in behaviour that is damaging to their physical, emotional and psychological well-being, (e.g., drinking excessively, avoiding situations). Making matters worse, the attempt to control private experiences can lead to a paradoxical increase in the intensity and frequency of those experiences, and may even result in psychopathology (Hayes, 2004; Hayes et al., 2005; Hayes et al., 1999; Wegner, Erber, & Zanakos, 1993; Wenzlaff & Wegner, 2000).

One of the main goals of ACT is to increase psychological flexibility, which refers to an individual's ability to connect with the present moment fully, as a conscious human being, and to change or persist in behavior that is in line with identified values (Hayes et al., 1999). Increasing psychological flexibility involves helping clients to disentangle themselves from the cycle of EA and cognitive fusion, not by challenging or changing their thoughts and emotions for example, but by learning to react more mindfully to such experiences, so that they no longer seem to be barriers (Ciarrochi & Blackledge, 2006). Clients are encouraged to shift their energies away from experiential control and towards valued activity, and to consistently choose to act effectively, even in the presence of difficult private events. For a detailed and comprehensive account of ACT readers are referred to Hayes et al. (Hayes et al., 1999).

What processes does ACT target?

The ACT treatment model consists of six sub-processes that are organized into a 'hexaflex' (see Figure 1). The hexaflex can be divided into two main components. The first includes acceptance and mindfulness processes (acceptance, defusion, the present moment, and a transcendent sense of self), and the second reflects commitment and behavioural change processes (values, committed action, the present moment and a transcendent sense of self). The present moment and transcendent sense of self are considered elements of both

groups of processes. The ACT practitioner targets these six processes in order to build psychological flexibility.

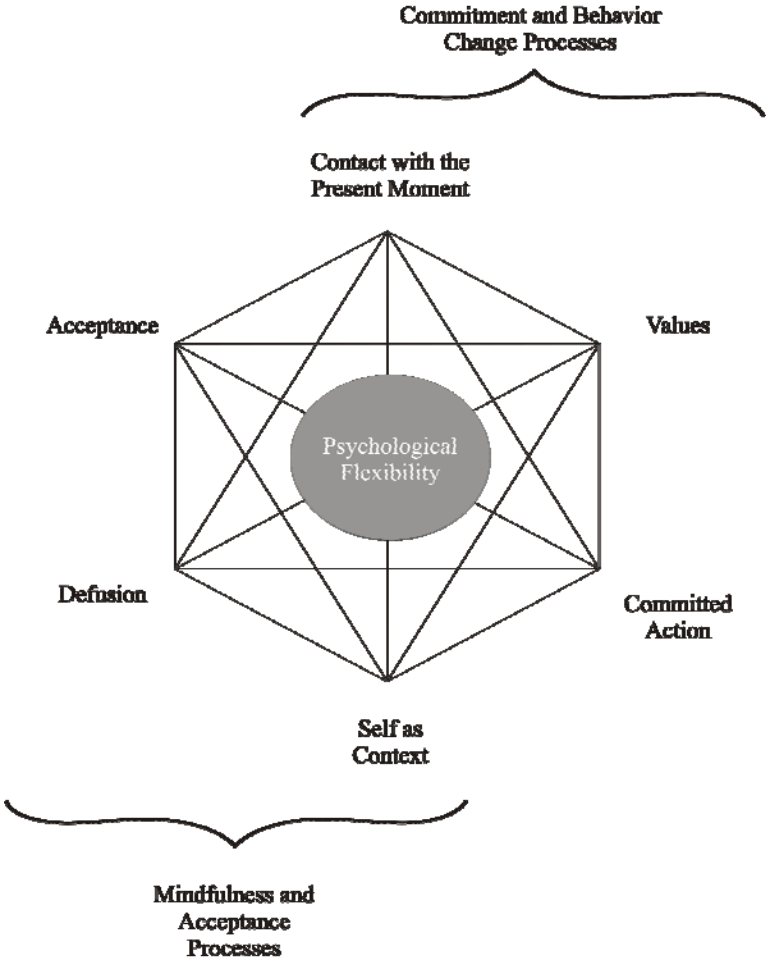

Figure 1: The six core processes targeted by ACT are expected to build psychological flexibility

The hexaflex illustrates that these processes are all connected and support each other. There is no correct order for focusing on the processes and not all individuals need to concentrate extensively on each of the processes (Hayes et al., 2005; Strosahl, Hayes, Wilson, & Gifford, 2004). The ultimate goal is to help people to persist in or change their behavior, depending on what the situation affords, in order to move towards what they value.

ACT clinicians use a number of exercises for each process to enhance adoption and understanding of relevant skills (for more detail see Hayes et al., 1999; Strosahl et al., 2004). These include metaphor, paradox and experiential exercises that aim to undermine the power of EA and cognitive fusion. A brief description of each process will now be provided.

Acceptance. The focus of this ACT process is to develop and enhance clients' willingness to have and accept their private experiences. Treatment involves exploring the futility of emotional control and avoidance, which can often paradoxically increase individuals' levels of distress and deter them from engaging in purposeful and vital, value driven behaviour. Instead, individuals are encouraged to accept their private experiences, when doing so helps them engage in valued behavior.

Defusion is a process that involves weakening the language processes that promote fusion (Hayes et al., 1999; Strosahl et al., 2004). People learn to see thoughts for what they are and not what they say they are (Hayes et al., 1999), for example, symbols of one's experience and not actual descriptive 'realities'. Defusion exercises help people to notice their language processes as they unfold and to watch the thoughts come and go, from the perspective of a neutral observer. Defusion thus involves a radical shift in context, where thoughts are observed events, rather than literal truths that must dictate behavior.

Getting in contact with the present moment. This ACT process is often equated to mindfulness. Clients are taught to build their awareness of their private experiences and be fully open to what is happening in the present moment. In the mindful state, thoughts are expected to be experienced as what they are, events that come and go, rather than what they often seem to be, truths that bind or actual barriers. For example, a self-critical thought such as "I am useless" can be viewed as a passing event rather than something that must control behavior. Mindfulness also connects to the values and commitment component of ACT, in

that it allows the regulation of action that is informed by needs, feelings, values, and their fit with the current situation (Brown, Ryan, & Creswell, 2007). According to Strosahl et al. (2004) and Hayes et al. (1999), the qualities that reflect this process are vitality, spontaneity, connection, and creativity.

Self-as-context. Clients are taught to build their awareness of their 'observing self', or self-as-context, and work on letting go of their attachment to a conceptualised self (i.e. I am boring; I am useless). The self-as-context is independent of content: It is the place where content is observed. No matter how many self-statements we generate about who we are ("I am a father:" "I am an athlete;" I am not good enough"), there is an "I" that can observe these self-statements. This 'I' is experienced as constant and stable, whilst the self-evaluations come and go (Hayes et al., 1999). From the perspective of self-as-context, people come to realize that they can let go of unhelpful self-evaluations and retain a sense of self (Pierson et al., 2004).

Values. Values are the directions in life that individuals choose which guide their behaviour. Thus, values are never really achieved or obtained, yet they are always present every time an individual chooses to act in accordance with them (Hayes et al., 1999; Pierson et al., 2004). Individuals who are entangled in fusion and EA are more likely to engage in behaviours that are inconsistent with their values. For example, even though an individual may value a relationship, he may engage in destructive social behavior, because he is afraid of intimacy. People in ACT learn to choose willingness to experience difficult thoughts and feelings, in order to engage in valued behaviour (Strosahl et al., 2004).

Committed Action. Engaging in value-directed behaviour can often produce difficult experiences such as distress, failure, and fusion. ACT helps people to see that choosing a valued direction is not a permanent thing. The choice must be made again and again, for

example, after failure. ACT helps prepare people for the difficult feelings and thoughts that will show up due to their valued striving and to be more willing to "carry" those feelings and thoughts in order to do what it takes to move in a valued direction.

Measuring Psychological Flexibility

Psychological flexibility is a construct that captures the overarching ACT model in its most current rendition (Bond et al., 2009; Hayes et al., 2006; Hayes, Strosahl et al., 2004; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Accordingly, the assessment of individual differences in psychological flexibility has been a central focus of ACT research. A generic self-report measure of psychological flexibility, the Acceptance and Action Questionnaire (AAQ) has been developed for this purpose (Bond et al., 2009; Hayes, Strosahl et al., 2004). The current form of this instrument is the AAQ-II (Bond et al., 2009), which is designed to evaluate the extent to which an individual exhibits psychological flexibility, that is, the ability to fully contact the present moment and the thoughts and feelings it contains without needless defense, and, depending upon what the situation affords, persisting in or changing behavior in the pursuit of goals and values (Hayes et al, 2006). Both positive and negative manifestations of psychological flexibility are reflected in the various AAQ-II items. As such this measure is deemed suitable for application in a range of divergent contexts, for example, in both organizational and clinical psychology settings which differentially emphasize positive and negative aspects of psychological flexibility (Bond et al., 2009)

The AAQ-II is derived from an earlier version of the AAQ (Hayes, Strosahl et al., 2004), hereafter referred to as the AAQ-I. This original instrument was developed particularly for use in adult population-based studies and is said to be a general measure of several ACT processes that are "markers" of psychological flexibility (Hayes et al., 2006).

Several versions of the AAQ-I exist, two of which have demonstrated adequate criterion-related, predictive and convergent validity (Bond & Bunce, 2003; Hayes, Bissett et al, 2004). First, a two-dimensional 16-item version of the AAQ-I measures acceptance and mindfulness as well as values-based action. These dimensions have been shown to load onto a second-order factor, which has been labelled psychological flexibility (Bond & Bunce, 2003; Hayes, Strosahl et al., 2004). Second, a 9-item version of the AAQ-I has been shown to be unidimensional (Hayes et al., 2006). The 9- and 16-item versions of the AAQ-I have been found to significantly correlate at .89 (Hayes, Strosahl et al., 2004). Norms have been obtained for these instruments using both clinical and non-clinical populations and a number of versions of the AAQ-I have been developed in languages other than English.

The AAQ-I has demonstrated moderate to high correlations in the expected direction with general markers of emotional wellbeing such as stress and negative affect, as well as perceived physical health, work-related wellbeing and quality of life (Hayes, Strosahl et al., 2004). It correlates with many forms of psychopathology beyond related measures and social desirability and self-presentation (Hayes, Strosahl et al., 2004). These include anxiety, depression, trauma and specific phobias (Feldner, Zvolensky, Eifert, & Spira, 2003; Hayes, Wilson et al., 2004). Additionally, it has shown modest correlations with measures of specific aspects of experiential avoidance including thought suppression, dissociation, self-deceptive positivity and avoidant coping, indicating that it is related to these constructs yet taps into something unique, most likely the overarching facet of experiential avoidance (Hayes, Strosahl et al., 2004).

Longitudinal research suggests that the AAQ-I predicts future mental health (Bond & Bunce, 2003) and objectively measured work performance (Bond & Flaxman, 2006). The AAQ-I has also been shown to be positively influenced by ACT and to mediate the link

between ACT and improvements in well-being and value-consistent behaviour (Bond & Bunce, 2000; Dalrymple & Herbert, 2007; Forman, 2007; Kocovski, Fleming, & Rector, In press; Roemer, Orsillo, & Salters-Pedneault, 2008; Varra, Hayes, Roget, & Fisher, 2008; Woods, Wetterneck, & Flessner, 2006).

The AAQ-I has had some problems with internal consistency levels and item complexity (Bond et al., 2009; Godsell & Ciarrochi, 2009). The AAQ-II seeks to remedy these problems. It is a 10-item instrument that has been described as an internally consistent measure of ACT's model of mental health and behavioral effectiveness (Bond et al., 2009). The AAQ-II consists of both positively worded items such as "My thoughts and feelings do not get in the way of how I want to live my life" and negatively worded items which are reverse-scored, for example, "My painful experiences and memories make it difficult for me to live a life that I would value" and "Emotions cause problems in my life".

Although in its early stages of development, preliminary results from a validation study of the AAQ-II across seven samples involving 3,280 participants are promising (Bond et al., 2009). Specifically, findings indicate that the measure has adequate structure, reliability and validity, and reveal the presence of a single factor, namely "acceptance" or "psychological flexibility" thought to reflect the degree of acceptance of negatively evaluated private experiences (Bond et al., 2009). The AAQ-II has also demonstrated good construct validity as well as internal consistency. Cronbach's alpha's range between .76 and .87 across the samples tested, with an average alpha co-efficient of 0.83 achieved overall. It has also shown good test re-test reliability in a community sample over both a 3-month (α = .80) and 12-month period (α = .78), and significantly correlates with the AAQ-I (α = .82).

The AAQ-II has been found to relate with variables to which it is theoretically tied. For instance, higher levels of psychological flexibility as measured by the AAQ-II have been

associated with lower levels of depression, anxiety, and overall psychological distress. Longitudinally, higher scores on the AAQ-II have been shown to predict self-reported mental health (Bond et al., 2009), and objectively measured success at sales, workplace absenteeism, and ability to learn new workplace skills (Bond et al., 2009). The AAQ-II has also been shown to be unrelated with measures to which it is not theoretically linked such as social desirability (Bond et al., 2009)

In addition to the AAQ-I and AAQ-II, which are designed for general populations, other versions of the AAQ have been designed for populations with specific problems, including the Chronic Pain Acceptance Questionnaire (Vowles, McCracken, & Eccleston, 2008), the Avoidance and Inflexibility Scale for smoking behaviors (Gifford et al., 2004), the Acceptance and Action Diabetes Questionnaire (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007), the Acceptance and Action Questionnaire for Weight (Lillis, Hayes, Bunting, & Masuda, 2009), and the Acceptance and Action Questionnaire for Prejudice (Lillis & Hayes, 2007). In addition to these specific measures based on the AAQ, there are also measures that emphasize the fusion component of the hexaflex (Figure 1). Fusion is said to be present to the extent that a verbal-based event (e.g., a thought) has a controlling role over behavior and dominates other sources of control (e.g., environmental contingencies). Fusion measures typically ask people to indicate the extent they believe certain dysfunctional thoughts (Blackledge & Hayes, 2006; Varra et al., 2008; Zettle, Rains, & Hayes, 2009; Zettle & Hayes, 1986) or hallucinations (Bach & Hayes, 2002; Gaudiano & Herbert, 2006).

Although the AAQ-I and AAQ-II are purported to measure psychological flexibility, they do so only indirectly, by measuring processes correlated with psychological flexibility. That is, they do not directly assess the ability to “persist or change in behavior (depending on the situation) in the pursuit of goals and values.” Rather, they appear to measure ACT

subcomponents of the hexaflex (see Figure 1), including experiential acceptance ("It is ok if I remember something unpleasant") and beliefs (or fused thoughts) that private experience interferes with valued activity ("Worries get in the way of my success"). Similarly, the measures of thought believability map primarily to the fusion component of the hexaflex. We will use the term "psychological flexibility" to refer to these hexaflex components, and will return to definitional issues at the end of the chapter.

Research on psychological flexibility as a mediator of ACT outcomes

A substantial body of research has developed around what we will term ACT's core mediational hypotheses.

1) Psychological inflexibility is expected to be a precursor to suffering across a wide variety of diagnoses and populations (e.g., clinical and nonclinical).

2) ACT is expected to improve psychological flexibility

3) Psychological flexibility is expected to lead to well-being, reduced clinical symptoms, and increased value-based activity.

A considerable number of cross-sectional studies have evaluated the first part of the core meditational hypothesis, namely that low psychological flexibility is important in understanding a wide variety of problems and symptoms. Almost without fail, these studies find significant mediational effects. These studies suggest that low psychological flexibility may be a significant component in the development of a wide range of symptoms, including distress, anxiety, depression, hair pulling, PTSD, self-harm, and psychological well-being. For example, Marx and Sloan (2002) found that the AAQ mediated the relationship between a history of child sexual abuse and current psychological distress in young adults. Similar findings were reported by Reddy et al. (2006) and Rosenthal et al. (2005). These findings are

important because they suggest that childhood abuse alone does not entirely account for later psychological distress; rather, experiential avoidance following such experiences plays an important role in exacerbating the distress. Many other studies with a wide range of populations have shown a similar pattern of findings (Kashdan & Breen, 2007; Kashdan, Morina, & Priebe, 2007; Masuda, 2009; Orcutt, Pickett, & Pope, 2005).

All of these studies have used cross-sectional designs, in which all variables were measured at a single time point. Cross-sectional designs have advantages, in that they are usually less expensive to conduct than other designs, and allow one to test whether the mediational model is feasible. If the mediational model fails to fit the cross-sectional data, then more expensive designs may be unnecessary. However, cross-sectional designs also suffer from confounds. The direction of causality is impossible to determine. Although these studies suggest that psychological inflexibility contributes to the development of symptoms, the opposite relationship is also possible (that symptoms contribute to the development of inflexibility). This problem can be addressed, at least in part, by studying ACT interventions and measuring the relevant variables before and after treatment, and perhaps also at a follow-up point.

Studies of nonclinical and behavioral medicine interventions. ACT intervention studies fall into two broad categories: those studying nonclinical and behavioural medicine populations and those studying mental health and substance abuse problems. Studies of nonclinical and behavioural medicine interventions have encompassed substantial breadth in the target populations, which included people who have a child with autism, work in organizational settings, work as counsellors, have chronic pain and other health problems, have cancer, or have a history of smoking (Bilich & Ciarrochi, 2009; Blackledge & Hayes, 2006; Bond & Bunce, 2000; Branstetter, Wislon, Hildebrandt, & Mutch, 2004; Flaxman,

2006; Gifford et al., 2004; Gregg et al., 2007; Hayes, Bissett et al., 2004; Hesser,Westin, Hayes, & Andersson, 2009; Lillis et al., 2009; Lundgren, Dahl, & Hayes, 2008; Varra et al., 2008; Vowles & McCracken, 2008). ACT has been shown to improve mental health and well-being and promote a broad range of value-consistent behaviors, such as increased innovativeness, reduced taking of sick days and utilization of medical resources, reduced cigarette smoking, improved diabetes self-care, non-prejudiced actions, better weight maintenance, behavioural activity despite pain, and willingness by professional counsellors to use empirically supported treatments .

The issue of mediation, or of how these interventions work, has been studied with the general AAQ as a measure of psychological flexibility, or with the adaptations of the AAQ for specific populations. In addition, measures of believability of thoughts have occasionally been used. Of studies that used the general AAQ, three showed evidence that increases in psychological flexibility were at least partially responsible for the positive outcomes observed. For example, Bond & Bunce (2000) showed that changes in the AAQ mediated improvements in general mental health in employees of a media organization who completed an ACT intervention. Flaxman (2006) reported similar findings in government employees. Varra et al. (2008) found that changes in the AAQ and in believability of particular thoughts mediated the impact of ACT on professional counsellors' willingness to use empirically supported interventions. On the other hand, two studies using the AAQ did not find evidence of mediation. Bilich & Ciarrochi (2009) reported that ACT led to significant improvements in mental health and in values-based living in members of the police force, but AAQ scores did not change during the intervention. Blackledge & Hayes (2006) found that ACT led to improved mental health in parents of children with autism. Although AAQ scores were only marginally changed by the intervention, believability of dysfunctional thoughts changed more

substantially and mediated the effects of the intervention. Overall, this group of studies provides mixed evidence that increased psychological flexibility is responsible for the positive outcomes of ACT interventions.

In contrast to studies that used the general AAQ, all eight studies that focused on population specific measures of psychological flexibility found significant evidence of mediation. ACT improved acceptance and flexibility related to smoking cessation (Gifford et al., 2004), self-care in diabetes (Gregg et al., 2007), prejudice (Lillis & Hayes, 2007), weight-related issues (Lillis et al., 2009), seizures and quality of life in epilepsy (Lundgren et al., 2008), adaptive functioning in chronic pain patients (McCracken, Vowles, & Eccleston, 2005; Vowles & McCracken, 2008; Wicksell, Ahlqvist, Bring, Melin, & Olsson, 2008), In addition, there was evidence that ACT influenced population-specific measures of the believability of negative thoughts (Hayes, Bissett et al., 2004; Varra et al., 2008).

The majority of studies involving nonclinical and behavioural medicine samples assessed psychological flexibility and outcomes at two time points: pre- and post-treatment. That is, the studies predominantly found changes in psychological flexibility occurring at the same time as changes in the outcome variables (both at post-treatment). Thus, there is no way to know if improved psychological flexibility caused the observed positive outcomes or vice versa. There were three notable exceptions. Gifford and her colleagues (2004) and Zettle and Hayes (1986) found that psychological flexibility changed before outcome variables changed. Hesser, et al. (2009) reliably coded in-session behaviors reflecting either acceptance or cognitive defusion. They found that the peak level and frequency of cognitive defusion behaviors and peak level of acceptance rated in session 2 predicted symptom reduction six months following treatment. They showed that these relationships could not be accounted for by improvements that had occurred prior to the measurement of defusion and acceptance.

These findings suggest that psychological flexibility is likely to be influencing the outcome variables (rather than exclusively vice versa).

Studies of mental health and substance abuse problems. We turn our review now to a consideration of ACT interventions for mental health and substance abuse. ACT has shown some efficacy in treating a wide variety of disorders, including psychosis, social anxiety, anxiety and depression, borderline personality disorder, obsessive compulsive disorder, and substance abuse. Many studies have examined whether increased psychological flexibility, as measured by the AAQ, is responsible for these outcomes. Only two failed to find evidence of mediation (Block, 2002; Hayes et al., 2006; Hayes, Wilson et al., 2004), whereas 10 studies reported that increased flexibility mediated the observed improvements (Dalrymple & Herbert, 2007; Forman, 2007; Gratz & Gunderson, 2006; Kocovski et al., In press; Lappalainen et al., 2007; Luoma, Kohlenberg, Hayes, Bunting, & Rye, 2008; Roemer et al., 2008; Twohig, 2009; Woods et al., 2006; Zettle, 2003). ACT has also been shown to reduce believability of hallucinations (Bach & Hayes, 2002; Guadiano & Herbert, 2006) and dysfunctional thoughts (Zettle et al., 2009; Zettle & Hayes, 1986).

Although many of these studies showed changes in psychological flexibility occurring at the same time as changes in the outcome (both at post-treatment), three studies provided evidence that changes in flexibility preceded changes in outcomes. Dalrymple & Herbert (2007) and Kocovski et al. (in press) showed that earlier changes in the AAQ predicted later changes in symptom severity, even after controlling for earlier changes in symptoms.In another study, Twohig et al. (2009) collected session data on believability of obsessions and willingness to have obsessions without reacting to them. Time lag correlations suggested that the ACT processes were more likely to predict obsessive symptoms than vice versa. This

study, along with the other three, suggests that acceptance and defusion are likely to be precursors of outcomes, rather than merely concomitants or consequences.

Several of the available studies allow us to examine whether ACT works by different mechanisms than other interventions. There are two general classes of studies relevant to this issue; those studies that compare ACT to a variety of educational or supportive interventions, and those studies that compare ACT to a form of cognitive therapy. Four studies have shown that ACT works differently than educational lectures for reducing prejudice (Hayes, Bissett et al., 2004; Lillis & Hayes, 2007), increasing willingness among counsellors to use empirically supported treatments (Varra et al., 2008), and self-care in diabetes (Gregg et al., 2007). Two other studies suggest that ACT works by different processes than supportive therapy (Lundgren et al., 2008) and different processes than an intervention that teaches people to modify workplace stressors (Bond & Bunce, 2000). These studies generally show that while ACT increases psychological flexibility, educational lectures and supportive interventions do not.

Seven studies have compared ACT to a form of cognitive therapy (CT). ACT was better than CT at decreasing avoidant coping amongst cancer patients (Branstetter et al., 2004). ACT has been shown to be better than CT at improving psychological flexibility (AAQ) amongst government employees (Flaxman, 2006), university students with anxiety or depression (Forman, 2007), people recruited from the general public with mood and interpersonal problems (Lappalainen et al., 2007), and people with clinical depression (Zettle et al., 2009; Zettle & Hayes, 1986).

One possible explanation for the general pattern of differences between ACT and CT is that ACT is simply better at influencing any process measure, regardless of whether it is ACT consistent or inconsistent. However, three studies appear to be inconsistent with this

hypothesis. Dalrymple and Herbert (2007) showed that ACT improved psychological flexibility but did not improve skill at controlling private experience, an ACT incongruent process. Forman (2007) showed that CBT, but not ACT, improved observing and describing components of mindfulness. Lappalainen et al. (2007) showed that ACT improved psychological flexibility, whereas CBT improved self-confidence.

The results of Flaxman (2006) are somewhat more complicated but generally support the notion that ACT and CT work by distinct processes. Both the ACT group and the stress inoculation group (SIT, a form of cognitive therapy) produced improvements in ACT consistent measures (psychological flexibility) and CT consistent measures (dysfunctional attitudes). Flaxman (2006) conducted mediational analyses that looked at the unique influence of psychological flexibility and dysfunctional attitudes and found that psychological flexibility was the primary mediator in the ACT condition. In contrast, psychological flexibility did not mediate the SIT outcomes, and there was some evidence that dysfunctional cognitions mediated the effect of SIT between times 1 and 3 (but not between times 1 and 2).

Conclusions and future directions

Although more research is needed to compare the influence of ACT on general versus specific forms of the AAQ, this review suggests that increased psychological flexibility is likely to be an important mechanism through which ACT leads to beneficial outcomes for a wide variety of populations and clinical symptoms. The majority of intervention studies show that participating in ACT leads to changes in flexibility and changes in outcomes at the same time (post-treatment), and that these changes were correlated. This is consistent with the core

ACT meditational hypothesis, but does not rule out an alternative hypothesis that reductions in symptoms lead to improvement in psychological flexibility, rather than vice versa. For example, reduced anxiety symptoms may lead people to become more accepting of anxiety.

However, several lines of research suggest that changes in psychological flexibility occur prior to changes in symptoms, and therefore are not mere correlates or consequences of reduced symptoms. First, a number of ACT intervention studies have shown that changes in psychological flexibility occurred prior to changes in symptoms (Dalrymple & Herbert, 2007; Gifford et al., 2004; Hesser et al., 2009; Kocovski et al., In press; Twohig, 2009; Zettle & Hayes, 1986). Second, experimental studies show that individuals high in experiential avoidance (or low in psychological flexibility) as measured by the AAQ demonstrate greater distress and lower pain endurance during laboratory-induced physical stress (Feldner et al., 2006; Feldner et al., 2003) . Thus, high scores on avoidance occur prior to physical stress and moderate people's reactions to that stress (rather than merely being the consequence of stress). Third, longitudinal research suggests that psychological flexibility predicts future levels of mental health and positive workplace behaviors, even when controlling for baseline measures of these variables (Bond & Bunce, 2003; Bond & Flaxman, 2006; Supavadeeprasit & Ciarrochi, 2009).

There is perhaps no form of psychotherapy that has as inspired as much mediational research as ACT. We identified over 50 studies, many of which have been completed in the last 5 years. The evidence suggests that ACT improves three markers of psychological flexibility: it reduces believability of dysfunctional thoughts, increases acceptance of private experience, and reduces believability that private experience acts as a barrier to action. More research needs to be done to evaluate the other components of the hexaflex. Does ACT improve the extent to which people contact self-as-context? Does ACT increase commitment

to valued activity? To what extent are the dimensions within the hexaflex distinctive? That is, can interventions improve some aspects of the hexaflex, but not others? Do some clients struggle with some dimensions (e.g., fusion and avoidance), but not others (mindfulness, self-as-context)? Answers to these questions could have practical value. If, for example, the dimensions are distinctive, then this would allow one to identify the particular dimensions that a client was struggling with and customize the intervention accordingly.

There is a somewhat broader issue with the current ACT conceptualization of psychological flexibility. None of the current measures assess it. They could be said to assess "markers" or correlates of psychological flexibility, but none of the current measures assess people's tendency to persist in or change behaviour, depending on what the situation affords (a core part of psychological flexibility). Future research needs to develop more direct measures of psychological flexibility. It will be especially important to evaluate the extent that each of the six ACT processes is correlated with flexible behavior.

There is some evidence that dimensions of the hexaflex correlate, and therefore might be influenced by a single common factor. At present, research suggests that experiential avoidance correlates with both mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Baer, Smith, & Allen, 2004) and fusion with dysfunctional thoughts (Godsell & Ciarrochi, 2009). However, this does not indicate that the common factor—psychological flexibility-- is what is primarily measured by all six process variables or targeted by ACT interventions. For example, there might be substantial variance in mindfulness that does not relate directly to psychological flexibility but that does relate to mental health (Baer et al., 2004). It is clear that further psychometric research is needed.

The ACT researcher works within a functional framework, which means the ultimate test of a measure is its utility. Does a measure help guide an intervention and make it more

effective? The current state of evidence suggests that ACT produces a number of beneficial outcomes across a wide variety of populations, and does so by improving several indices of psychological flexibility. The practitioner can feel reasonably confident that ACT will improve a client's level of experiential acceptance and help a client defuse from difficult thoughts. More research is needed to examine other processes that might be active in ACT.

References

Bach, P., & Hayes, S. C. (2002). The use of Acceptance and Commitment Therapy to prevent the rehospitalization of psychotic patients: A randomized controlled trial. *Journal of Consulting & Clinical Psychology, 70*, 1129-1139.

Baer, R. A., Smith, G. S., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Asessment, 13*, 27-45.

Baer, R. A., Smith, G. T., & Allen, K. B. (2004, Sep). Assessment of Mindfulness by Self-Report: The Kentucky Inventory of Mindfulness Skills. *Assessment, 11*(3), 191-206.

Bilich, L., & Ciarrochi, J. (2009). *Evaluating Acceptance and Commitment Therapy in the Police Force*. Unpublished manuscript, Wollongong, NSW, Australia.

Blackledge, J. T., & Hayes, S. C. (2001). Emotion regulation in acceptance and commitment therapy. *Journal of Clinical Psychology, 57*(2), 243-255.

Blackledge, J. T., & Hayes, S. C. (2006). Using Acceptance and Commitment Training in the Support of Parents of Children Diagnosed with Autism. *Child & Family Behavior Therapy*, *28*(1), 1-18.

Block, J. (2002). *Acceptance and change of private experiences: A comparative analysis in college students with public speaking anxiety.* University of Albany, State University of New York, Albany.

Bond, F. W., & Bunce, D. (2000). Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *Journal of Occupational Health Psychology*, *5*(1), 156-163.

Bond, F. W., & Bunce, D. (2003, Dec). The Role of Acceptance and Job Control in Mental Health, Job Satisfaction, and Work Performance. *Journal of Applied Psychology, 88*(6), 1057-1067.

Bond, F. W., & Flaxman, P. E. (2006). The ability of psychological flexibility and job control to predict learning, job performance, and mental health. *Journal of Organizational Behavior Management, 26*, 113-130.

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Orcutt, H. K., Waltz, T., et al. (2009). *Preliminary psychometric properties of the Acceptance and Action Questionnaire – II: A revised measure of psychological flexibility and acceptance.* Unpublished manuscript.

Branstetter, A. D., Wislon, K. G., Hildebrandt, M., & Mutch, D. (2004). Improving psychological adjustment among cancer patients: ACT and CBT. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, New Orleands.

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry, 18*, 211-237.

Chambless, D. L., & Ollendick, T. H. (2001). Empircally supported psychological interventions: Controversies and evidence. *Annual Review of Psychology, 52*, 685-716.

Ciarrochi, J., & Bailey, A. (2008). *A CBT-Practicioner's Guide to ACT: How to Bridge the Gap Between Cognitive Behavioral Therapy and Acceptance and Commitment Therapy*. Oakland, CA: New Harbinger Publications, Inc.

Ciarrochi, J., & Blackledge, J. T. (2006). Mindfulness-Based Emotional Intelligence Training: A new approach to reducing human suffering and promoting effectiveness. In J. Ciarrochi, J. P. Forgas & J. D. Mayer (Eds.), *Emotional Intelligence in everyday life* (2nd ed., pp. 206-228). New York: Psychology Press.

Dalrymple, K. L., & Herbert, J. D. (2007). Acceptance and Commitment Therapy for Generalized Social Anxiety Disorder: A pilot study. *Behavior Modification, 31,* 543-568.

Feldner, M. T., Hekmat, H., Zvolensky, M., Vowles, K. E., Secrist, Z., & Leen-Feldner, E. (2006). The role of experiential avoidance in acute pain tolerance: A laboratory test. *Journal of Behavior Therapy and Experimental Psychiatry, 37*, 146-158.

Feldner, M. T., Zvolensky, M. J., Eifert, G. H., & Spira, A. P. (2003). Emotional avoidance: an experimental test of individual differences and response suppression using biological challenge. *Behaviour Research and Therapy, 41*, 403-411.

Flaxman, P. E. (2006). *Acceptance-based and traditional cognitive-behavioural stress management in the workplace: Investigating the mediators and moderators of change.* Unpublished Doctor of Philosophy thesis, Goldsmiths College, University of London, London.

Forman, E. M., Herbert, J. D., Moitra, E., Yeomans, P. D., & Geller, P. A. . (2007). A randomized controlled effectiveness trial of Acceptance and Commitment Therapy and Cognitive Therapy for anxiety and depression. *Behavior Modification, 31*, 772-799.

Gaudiano, B. A., & Herbert, J. D. (2006). Believability of hallucinations as a potential mediator of their frequency and associated distress in psychotic inpatients. *Behavioural and Cognitive Psychotherapy, 34*(4), 497-502.

Gifford, E. V., Kohlenberg, B. S., Hayes, S. C., Antonuccio, D. O., Piasecki, M. M., Rasmussen-Hall, M. L., et al. (2004). Acceptance theory-based treatment for smoking cessation: An initial trial of Acceptance and Commitment Therapy. *Behavior Therapy, 35*, 689-706.

Godsell, C., & Ciarrochi, J. (2009). *A psychometric evaluation of process measures in Cognitive Behavioral Therapy*. Unpublished manuscript, Wollongong, Australia.

Gratz, K. L., & Gunderson, J. G. (2006). Preliminary data on an acceptance-based emotion regulation group intervention for deliberate self-harm among women with Borderline Personality Disorder. *Behavior Therapy, 37*(1), 25-35.

Gregg, J. A., Callaghan, G. M., Hayes, S. C., & Glenn-Lawson, J. L. (2007). Improving diabetes self-management through acceptance, mindfulness, and values: A randomized controlled trial. *Journal of Consulting and Clinical Psychology 75*(2), 336-343.

Guadiano, B., & Herbert, J. D. (2006). Acute treatment of inpatients with psychotic symptoms using Acceptance and Commitment Therapy: Pilot results. *Behaviour Research & Therapy, 44*(3), 415-437.

Hayes, S. C. (1995). Why cognitions are not causes. *The Behavior Therapist, 18*, 59-64.

Hayes, S. C. (2004). Acceptance and Commitment Therapy, Relational Frame Theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy, 35*, 639-665.

Hayes, S. C., Barnes-Holmes, D., & Roche, B. (Eds.). (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition*. New York: Kluwer Academic/ Plenum Publishers.

Hayes, S. C., Bissett, R., Roget, N., Kohlenberg, B. S., Fisher, G., Masuda, A., et al. (2004). The impact of acceptance and commitment training and multicultural training on the stigmatizing attitudes and professional burnout of substance abuse counselors. *Behavior Therapy, 35*, 821-835.

Hayes, S. C., Hayes, L. J., & Reese, H. W. (1988). Finding the philosophical core: A review of Stephen C. Pepper's World Hypotheses. *Journal of Experimental Analysis of Behavior, 50*, 97-111.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy, 44*(1), 1-25.

Hayes, S. C., Strosahl, K., Bunting, K., Twohig, M., & Wilson, K. G. (2005). What is Acceptance and Commitment Therapy? In S. C. Hayes & K. D. Strosahl (Eds.), *A practical guide to Acceptance and Commitment Therapy* (pp. 3-29). New York: Springer Science + Business Media.

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An experiential approach to behavior change*. New York: The Guilford Press.

Hayes, S. C., Strosahl, K. D., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., et al. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record, 54*, 553-578.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Bissett, R., Piasecki, M., Batten, S. V., et al. (2004). A randomized controlled trial of twelve-step facilitation and Acceptance and Commitment Therapy with polysubstance abusing methadone maintained opiate addicts. *Behavior Therapy, 35*(4), 667-688.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting & Clinical Psychology, 64*(6), 1152-1168.

Hesser, H., Westin, V., Hayes, S. C., & Andersson, G. (2009). Clients' in-session acceptance and cognitive defusion behaviors in acceptance-based treatment of tinnitus distress. *Behaviour Research and Therapy, in press*.

Kashdan, T. B., & Breen, W. E. (2007). Materialism and diminished well-being: Experiential avoidance as a mediating mechanism. *Journal of Social and Clinical Psychology, 26*(5), 521-539.

Kashdan, T. B., Morina, N., & Priebe, S. (2007). Post-traumatic stress disorder, social anxiety disorder, and depression in survivors of the KosovoWar: Experiential avoidance as a contributor to distress and quality of life. *Journal of Anxiety Disorders, in press*.

Kocovski, N. L., Fleming, J. E., & Rector, N. A. (In press). Mindfulness and Acceptance-based group therapy for social anxiety disorder: An open trial. *Cognitive and Behavioral Practice*.

Lappalainen, R., Lehtonen, T., Skarp, E., Taubert, E., Ojanen, M., & Hayes, S. C. (2007). The impact of CBT and ACT models using psychology trainee therapists. *Behavior Modification, 31*(4), 488-511.

Lillis, J., & Hayes, S. C. (2007). Applying acceptance, mindfulness, and values to the reduction of prejudice: A pilot study. *Behavior Modification, 31*, 389-411.

Lillis, J., Hayes, S. C., Bunting, K., & Masuda, A. (2009). Teaching acceptance and mindfulness to improve the lives of the obese: A preliminary test of a theoretical model. *Annals of Behavioral Medicine, In press*.

Lundgren, T., Dahl, J. C., & Hayes, S. C. (2008). Evaluation of mediators of change in the treatment of epilepsy with Acceptance and Commitment Therapy. *Journal of Behavior Medicine, 31*(3), 225-235.

Luoma, J. B., Kohlenberg, B. S., Hayes, S. C., Bunting, K., & Rye, A. K. (2008). Reducing self-stigma in substance abuse through acceptance and commitment therapy: Model, manual development, and pilot outcomes. *Addiction Research and Theory, 16*, 149-165.

Masuda, A., Price, M., Anderson, P., Schmertz, S., & Calamaras, M. (2009). The role of psychological flexibility in mental health stigma and psychological distress for the stigmatizer. *Journal of Social and Clinical Psychology, in press*.

McCracken, L. M., Vowles, K. E., & Eccleston, C. (2005). Acceptance-based treatment for persons with complex, long standing chronic pain: a preliminary analysis of treatment outcome in comparison to a waiting phase. *Behavior Research and Therapy, 43*, 1335-1346.

Orcutt, H. K., Pickett, S. M., & Pope, E. B. (2005). Experiential avoidance and forgiveness as mediators in the relation between traumatic interpersonal events and posttraumatic stress disorder symptoms. *Journal of Social and Clinical Psychology, 24*(7), 1003-1029.

Pierson, H., Gifford, E. V., Smith, A. A., Bunting, K., & Hayes, S. C. (2004). *Functional Acceptance and Commitment Therapy Scale*. Unpublished manuscript, Reno, NV.

Roemer, L., Orsillo, S., & Salters-Pedneault, K. (2008). Efficacy of an acceptance-based behavior therapy for generalized anxiety disorders: Evaluation in a randomized controlled trial. *Journal of Consulting and Clinical Psychology, 76*(6), 1083-1089.

Rosen, G. M., & Davison, G. C. (2003, Jul). Psychology should list empirically supported principles of change (ESPs) and not credential trademarked therapies or other treatment packages. *Behavior Modification, 27*(3), 300-312.

Strosahl, K., Hayes, S. C., Wilson, K. G., & Gifford, E. V. (2004). An ACT primer: Core therapy processes, intervention strategies, and therapist competencies. In S. C. Hayes & K. Strosahl (Eds.), *A practical guide to Acceptance and Commitment Therapy* (pp. 31-58). New York: Springer.

Supavadeeprasit, S., & Ciarrochi, J. (2009). *The role of experiential avoidance in predictiong future social and emotional well-being amongst adolescents: A one-year longitudinal study*. Unpublished manuscript, Wollongong, Australia.

Twohig, M. (2009). *A randomized clinical trial of Acceptance and Commitment Therapy vs Progressive Relaxation Training in the treatment of obsessive compulsive disorder.* Unpublished Ph.D., University of Nevada, Reno.

Varra, A. A., Hayes, S. C., Roget, N., & Fisher, G. (2008). A randomized control trial examining the effect of acceptance and commitment training on clinician willingness to use evidence-based pharmacotherapy. *Journal of Consulting and Clinical Psychology, 76*(3), 449-458.

Vowles, K. E., & McCracken, L. M. (2008). Acceptance and values-based action in chronic pain: A study of treatment effectiveness and process. *Journal of Consulting and Clinical Psychology, 76*, 397-407.

Vowles, K. E., McCracken, L. M., & Eccleston, C. (2008). Patient functioning and catastrophizing in chronic pain: The mediating effects of acceptance. *Health Psychology 27*(2(Suppl.)), 136-143.

Wegner, D. M., Erber, R., & Zanakos, S. (1993). Ironic processes in the mental control of mood and mood-related thought. *Journal of Personality & Social Psychology, 65*(6), 1093-1104.

Wenzlaff, R. M., & Wegner, D. M. (2000). Thought suppression. *Annual Review of Psychology, 51*, 59-91.

Wicksell, R. K., Ahlqvist, J., Bring, A., Melin, L., & Olsson, G. (2008). Can exposure and acceptance stategies improve the functioning and life satisfaction in people with chronic pain and whiplash-associated disorders (WAD)? A randomized controlled trial. *Cognitive Behaviour Therapy, 37*, 1-14.

Wilson, K. G., & Murrell, A. R. (2003). Values-centered interventions: Setting a course for behavioral treatment. In S. C. Hayes, V. M. Follette & M. Linehan (Eds.), *The New Behavior Therapies: Expanding the Cognitive Behavioral Tradition*. New York: Guilford Press.

Woods, D. W., Wetterneck, C. T., & Flessner, C. A. (2006). A controlled evaluation of acceptance and commitment therapy plus habit reversal for trichotillomania. *Behavior Research and Therapy*, *44*, 639-656.

Zettle, R., Rains, J., & Hayes, S. C. (2009). *Processes of Change in Acceptance and Commitment Therapy and Cognitive Therapy for Depression: A Mediational Reanalysis of Zettle and Rains (1989)*. Unpublished manuscript, Wichita, KS

Zettle, R. D. (2003, Spr). Acceptance and commitment therapy (ACT) vs. systematic desensitization in treatment of mathematics anxiety. *Psychological Record*, *53*(2), 197-215.

Zettle, R. D., & Hayes, S. (1986). Dysfunctional control by client verbal behavior: The context of reason giving. *The Analysis of Verbal Behavior*, *4*, 30-38.

Appendix: **AAQ-II**

Below you will find a list of statements. Please rate how true each statement is for you by writing the appropriate number in each blank.

never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true
1	2	3	4	5	6	7

_____1. It's OK if I remember something unpleasant.

_____2. My painful experiences and memories make it difficult for me to live a life that I would value.

_____3. I'm afraid of my feelings.

_____4. I worry about not being able to control my worries and feelings.

_____5. My painful memories prevent me from having a fulfilling life.

_____6. I am in control of my life.

_____7. Emotions cause problems in my life.

_____8. It seems like most people are handling their lives better than I am.

_____9. Worries get in the way of my success.

_____10. My thoughts and feelings do not get in the way of how I want to live my life.