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The impact of mindfulness practice on cognition and affective change in psychosis:

A multiple baseline design

By

Alexandra Lievesley

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Thesis Abstract

This thesis addresses understanding the underlying change that occurs in mindfulness practice.

The first paper reviews the literature regarding the processes of change implicated in mindfulness. The paper reviews the literature regarding definition and conceptualisation of mindfulness and the literature regarding therapeutic interventions and applications of mindfulness. The paper then considers in detail literature regarding the proposed processes operating in mindfulness, looking in particular at: cognitive change, exposure, acceptance, attentional control and non-attachment. The review concludes by drawing together the research and discussing the difficulties faced by this developing literature base.

The second paper reports the findings of a study looking at the impact of mindfulness practice on cognitive and affective change for individuals with distressing psychosis. A multiple-baseline design assessing changes to twice weekly ratings of: distress, believability, metacognitive belief, personal control, voices control, acceptance of self, and acceptance of voices during baseline and completion of a mindfulness intervention. Visual analyses indicated no clear discernable changes across participants but individual benefits and patterns of cognitive and affective change indicated for each participant are reported. The mediating effect of practice is also highlighted and consideration is given to limitations, future research, and implications for clinical practice.

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Alexandra Lievesley

Department of Psychology

University of Southampton

Address for correspondence: Alexandra Lievesley, Doctoral Programme in Clinical

Psychology, 34 Bassett Crescent East, Southampton, Hampshire, SO16 7PB, UK.

Telephone: (44)2380 595575.

Email: ajl106@soton.ac.uk.

Abstract

The use of mindfulness as a therapeutic technique within psychological practice has shown increasing popularity. Literature has focused on the application and associated outcome of mindfulness as an intervention and development of theoretical and conceptual explanations has followed indicated treatment success. The purpose of this paper was to provide a contextual overview of the definition, application and use of mindfulness and focus on the emerging literature addressing the conceptualisation and processes theorised to be producing its beneficial effects. The potential role of cognitive change, exposure, acceptance, attentional control, and non-attachment as processes of change are discussed and inter-relatedness highlighted. Finally consideration is given to limitations within the literature, contradictions, implications and directions for future development.

Key words: mindfulness, meditation, process, mechanism, review

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1.   Introduction:

Mindfulness originates in Eastern Buddhist traditions but its ideas are common to Greek philosophy, phenomenology, existentialism, American transcendentalism and humanism, and Western European naturalism (Linehan 1993a, 1993b, cited in Brown, Ryan, & Creswell, 2007b). It has been increasingly applied in Western psychological practice. Interest in and research into mindfulness has grown tremendously in the last two decades. Its growing popularity as an intervention has been reflected in the increasing therapeutic and training opportunities available to patients and practitioners. Essentially mindfulness describes a quality of consciousness. Distinct from the typical focus of therapeutic interest, content of consciousness (e.g. emotions, thoughts, etc), mindfulness instead focuses upon the context of those experiences, consciousness itself (Brown, et al., 2007b). Mindfulness is a mode of 'being' that directly relates to the qualities of consciousness, awareness and attention.

The growing integration and development of mindfulness practice within Western psychological practice has developed from the therapeutic application of mindfulness through the techniques Mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990) and Mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002). Empirically mindfulness studies have successfully demonstrated the efficacy and utility of mindfulness practice, however, empirical research establishing the causal basis and mechanisms underpinning mindfulness have been equivocal. Early studies of the application of mindfulness lacked outcome measures that could begin to unpick and understand the concept and process of mindfulness (Baer, 2007). Continued demonstrations of the clinical efficacy of mindfulness sparked interest in establishing

understanding and conceptualisation of: what mindfulness is, how mindfulness relates to other concepts, and the active processes operating in mindfulness.

This review proposes to establish a picture of current understanding of mindfulness including definition and application and to review the literature regarding the proposed processes thought to be operating in mindfulness. Firstly the concept and practice of mindfulness is described and presented with consideration of the extensive debate regarding the definition and conceptualisation of mindfulness. Secondly the review places mindfulness in context by briefly outlining the therapeutic interventions and applications associated with mindfulness. Efficacy of mindfulness is established and well reported so it is beyond the scope of this limited review to consider the extensive outcome literature. The reader will be directed to relevant reviews within the literature and awareness will be drawn to the major limitations of this research. Finally this review presents the literature surrounding the proposed active processes or mechanisms thought to underlie the positive effects of mindfulness practice. The review will consider in detail the following five categories of process: cognitive change, exposure, acceptance, attentional control and non-attachment. Brief consideration will be given to other remaining potential mechanisms that have received limited empirical study.

The aim of this review is to describe and evaluate the literature regarding the change mechanisms or processes indicated to account for the clinical effectiveness of mindfulness.

2.   Definition and Conceptualisation:

2.1.   Mindfulness in practice:

Descriptions of consciousness stress the importance of the quality of consciousness itself in wellbeing (Kostanski & Hassed, 2008). Such descriptions highlight *awareness* and *attention* as two of the fundamental facets implicated in conscious activity. Definitions of mindfulness, although divided in regards to a consensus description, are in agreement with the implication that *attention* and *awareness* are its core and the development and enhancement of these facets as the aim of mindfulness training (Brown & Ryan, 2003).

Awareness refers to the immediate cognitive, perceptual and sensory conscious recognition of an event, object, or experience. *Attention* is employed when awareness is sufficiently strong and conscious focus becomes directed at the particular phenomena to the exclusion of potential others. This process is sometimes described as "turning towards" (Brown, et al., 2007b). The quality of conscious experience and potential reaction is dictated by these two features (Brown & Ryan, 2004).

Usually an experience or event is held in attention for a very brief period before a cognitive or emotional reaction and associated processing occurs to make sense of it. Cognitive reactions to experience generally involve; a judgment being made e.g. good, bad, etc (often in relation to the self), conditioning by association to memories of past experience of a similar nature, and adaptation to fit into existing cognitive schema (Brown, et al., 2007b). As a result judgements, labels, and conceptualisations are attached rapidly to all experiences, influenced by currently held beliefs and opinions (Bargh & Chartrand, 1999). This conceptual mode of processing enables understanding and ordering of events, especially in regards to the self, and goal directed focus and

accomplishment. However it also limits perception of experiences to a state biased by prior conditioning and self focus (Brown, et al., 2007b).

The primary aim of mindfulness practice is to develop a state of 'non-doing', as opposed to a state of 'doing'(Segal, et al., 2002). Rather than a 'conceptual' state of mind mindfulness cultivates a 'receptive' state of mind where attention observes experience in the present moment without habitual reaction or processing, thus showing phenomena as they truly are (Brown, et al., 2007b). Formalised therapies are aimed at 'fixing' disorders and similarly concentrative forms of meditation use gentle focus on a particular stimulus to enable blocking, distracting, or repressing of thoughts (Kostanski & Hassed, 2008). Mindfulness instead aims to develop insights into the nature of the mind by cultivating awareness of all and any experiences that may arise in the present moment. This develops mindful awareness of our tendency towards habitual patterns of responding while remaining grounded in the present moment through mindful awareness of bodily sensations (Chambers, Chen Yee Lo, & Allen, 2008). All internal and external experiences are observed as passing phenomena rather than facts of reality, including observing cognitive and emotional reactions to a focus of attention as merely continuations of conscious experience (Brown, et al., 2007b).

A sense of autonomy and letting go of reaction develops from the recognition and experience of *not having to be controlled by* thoughts, emotions or sensations; as opposed to the habitual stance of *a need to control* these experiences (Chambers, et al., 2008; Kostanski & Hassed, 2008). This state of simply 'being' allows clarity and purity of observation of conscious phenomena without the imposition of habitual or conceptual processing, enabling greater flexibility and choice of response. Through practice the intention is to be able to bring mindfulness to all aspects of one's life by becoming fully

aware of what is happening in the moment consciously, non-judgementally, and unconditionally (Kostanski & Hassed, 2008; Segal, et al., 2002). Paradoxically, as Kostanski and Hassed (2008) identified, in order to be mindful one learns to let go of attachment to experience, a state that cannot be achieved if one is trying to do it.

2.2.   Definition and conceptualisation:

There have been a number of proposed conceptualisations and definitions of mindfulness and there continues to be little definite agreement on a consensus in this area (Baer, 2003; Bishop, 2002; Bishop, et al., 2004; Brown & Ryan, 2003; Hayes & Wilson, 2003; Kabat-Zinn, 2003). Different definitions position greatest emphasise on different aspects of the mindfulness practice outlined above and vary in use and interpretation of key terminology (Hayes & Plumb, 2007; Hayes & Shenk, 2004). For example mindfulness has been described and argued to be both a "metacognitive skill" (pp. 233 Bishop, et al., 2004) and a self-regulatory skill (Brown & Ryan, 2003, 2004). However, two characteristics are common to most definitions; cultivating attention and awareness of the present moment experience (internal or external) and a stance of equanimity and non-judgement to that experience (Bishop, et al., 2004; Brown, et al., 2007b).

Much of the disagreement regarding the conceptualisation of mindfulness centres on whether it can be considered a distinct construct or a quality that is inherent in and made up of a number of facets of conscious processing (Baer, 2007; Chambers, et al., 2008; Kostanski & Hassed, 2008). It would seem logical that consideration of the assessment literature could provide insight into proposed conceptualisations of mindfulness and underlying mechanisms of effect. However, the difficulties of definition are reflected throughout the assessment literature with self-report measures reporting one

factor (Brown & Ryan, 2003; Chadwick, et al., 2008; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006), two factor (Kohls, Sauer, & Walach, 2009; Lau, et al., 2006), three factor (Baer, et al., 2008), and five factor (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) solutions. The self-report measure the Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003) taps a distinct construct and the authors propose that in cultivating mindfulness individuals develop a self awareness and psychological wellbeing unique from other traits. However others propose that further exploration is required to better understand the dynamic between mindfulness and cognitive processes before construct validity can be assumed (Bishop, 2002).

There is a need for a consensus definition of mindfulness to be reached both to enable effective and comparable empirical study of mindfulness and for ease of communication and explanation (Brown, et al., 2007b). Furthermore consensus would benefit development of interventions to ensure positive outcome and increase general understanding (Teasdale, Segal, & Williams, 2003). There are multiple and subtle aspects to mindfulness each with potential for varied interpretation and emphasis. Furthermore, mindfulness has not only been proposed as an intervention in its own right but also as a component part of therapeutic techniques (see discussion above). As a result some definitions and measures emphasise the facets of mindfulness relevant to the focus of the particular clinical application and associated therapeutic approach rather than a general concept (Brown, et al., 2007b).

Difficulties of definition are confounded further by the orientation and methodology from which the definition originates. Clinically orientated definitions may confound conceptualisation through not only the bias of their particular perspective but also through consideration of the concept through the methods employed to practice

mindfulness. For example, historically mindfulness practice is cultivated through meditation, but if mindfulness is defined as a functional process then any technique that results in this process must be considered to be mindfulness (Hayes & Shenk, 2004). This is seen in the variation of methods, including non-meditative techniques such as guided attention and yoga, used by the different clinical approaches to develop mindfulness (Hayes & Shenk, 2004). Refining the attributes that are relevant to definition and letting go of unnecessary attachment to a specific technique may ease conceptualisation. Buddhist traditions have distinguished between the wealth of methods for potentially cultivating mindfulness and the meaning of mindfulness as a concept (Brown, et al., 2007b). Consideration of and consultation with the extensive and historical scholarly literature regarding definition may be a pertinent next step in defining the meaning of mindfulness.

The literature regarding the definition of mindfulness is extensive and inclusive consideration is beyond the scope of this review (See reviews by Bishop, et al., 2004; Brown & Ryan, 2003, 2004; Brown, et al., 2007b; Hayes & Shenk, 2004). For the continued purposes of the current review we will adopt the definition of mindfulness proposed by Kabat-Zinn (2003); "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgementally to the unfolding of experience moment by moment" (pp 145).

3.   Mindfulness in Context:

Therapeutic gain in mindfulness is based on the principle that distress and difficulty results from an individual's reactive relationship to their experience and are not

an inherently given part of that experience (Abba, Chadwick, & Stevenson, 2007). Thus the aim is to enable individuals to relate differently to experiences rather than changing the content of the experience. Mindfulness has been adapted as an intervention for a variety of disorders and conditions each focusing on changing an individual's relationship to distressing internal experiences.

3.1.   Therapies and application:

Therapies that integrate an element of mindfulness are typically attempting to incorporate a quality of mindful awareness or attention in combination with aspects of cognitive or behavioural therapeutic techniques (Chambers, et al., 2008).

Mindfulness Based Stress Reduction (MBSR; Kabat-Zinn, 1990) combines mindful awareness with relaxation techniques and body awareness to develop an intervention used with disorders such as; anxiety and stress, chronic pain, and AIDS. In the development of MBSR, Kabat-Zinn (1990) identified that his patients, irrespective of background and physical symptomatology, shared a common psychosocial issue – that is, a sense that their disorder controlled their life (Kostanski & Hassed, 2008). The 8week program of MBSR uses mindfulness meditation and increased awareness of the mind and body to teach participants to observe thoughts and emotions non-judgementally and ultimately to see that these sensations are transient and fluctuate (Baer, 2003; Kostanski & Hassed, 2008). A thought or emotion is just a thought or emotion and nothing more.

Mindfulness Based Cognitive Therapy (MBCT; Segal, et al., 2002) integrates the 8 week approach of MBSR in developing mindful awareness with features of Cognitive Behaviour Therapy (CBT) such as a here and now focus and a decentred perspective. MBCT was developed as a treatment for previously depressed patients at risk of relapse

(Teasdale, Segal, Williams, Soulsby, & Lau, 2000) and targets ruminative thinking patterns. Individuals are encouraged to relate differently to their thoughts, feelings and bodily sensations by emphasizing acceptance of them rather than actively trying to change them (Kostanski & Hassed, 2008; Segal, et al., 2002). Viewing cognitions and emotions non-judgementally and simply as mental events rather than true reflections of reality (Baer, 2003).

More recently mindfulness has been integrated with other therapeutic components to develop Person-Based Cognitive Therapy (PBCT) specifically for use with distress associated with psychosis (Chadwick, 2006). In PBCT individuals are encouraged to develop mindful awareness and acceptance of psychotic experiences thereby experiencing them as transient and not necessarily accurate reflections of reality or self defining (Chadwick, Newman-Taylor, & Abba, 2005).

Other therapies have incorporated mindfulness to a lesser extent. Dialectical Behavioural Therapy (DBT; Linehan, 1993), used in the treatment of borderline personality disorder, teaches mindfulness as a component part of a therapy to encourage participants to link up their thoughts and emotions and adopt a stance of acceptance in their lives in an aim to change behaviours (Kostanski & Hassed, 2008). The dialectic between acceptance and change is emphasized with focus on *acceptance* of self, history and current situation and *change* of behaviours and environment (Baer, 2003). Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), like DBT, teaches mindfulness strategies as a component part of a larger therapeutic process although it does not give them a label of mindfulness (Baer, 2003). Participants are encouraged to learn to notice thoughts and emotions with non-judgemental acceptance and without struggle, placing focus on behaviours producing positive outcomes (Hayes,

Luoma, Bond, Masuda, & Lillis, 2006). Phenomena are encouraged to be observed as separate from the person and not self-defining (Baer, 2003).

Much of the literature suggests that to be a practitioner of mindfulness and guide others' learning in mindfulness principles it is necessary first to have adopted ongoing personal practice to enable; recognition of the qualities and characteristics of mindfulness and embodiment of a mindful stance (Kabat-Zinn, 2003; Segal, et al., 2002). However there is very little literature to support this position beyond the anecdotal evidence that those using mindfulness generally do adopt personal practice.

With regard to therapeutic applicability, mindfulness is not considered a therapeutic intervention applied to the individual, rather it is a process or quality that the individual is guided in developing and remains in their repertoire to use at will (Kostanski & Hassed, 2008). This may explain to some extent the initially difficulty faced in establishing a consensus conceptualisation and definition, and is reflected in heavily conceptual nature of the literature regarding processes implicated in mindfulness.

3.2.   Outcome literature:

Research has indicated the clinical efficacy of mindfulness, both as an intervention in it's own right and as a component part of the psychological therapeutic techniques outlined above; MBSR (Bishop, 2002; Carlson, Speca, Patel, & Goodey, 2003; Chang, et al., 2004; Grossman, Niemann, Schmidt, & Walach, 2004; Roth & Stanley, 2002; Tacon, Caldera, & Ronaghan, 2004; Tacon, McComb, Caldera, & Randolph, 2003), MBCT (Segal, et al., 2002; Teasdale, et al., 2000), ACT (Bach & Hayes, 2002), and DBT (Chambers, et al., 2008). Positive effects through practice of

mindfulness have been seen in respect of symptoms of distress, physical health, psychopathology, and improved interpersonal relations (Baer, 2007; Teasdale, et al., 2003). Comprehensive consideration of the clinical efficacy research regarding mindfulness is beyond the scope of this review and subject to thorough consideration in a number of recent reviews in the literature (See reviews by Allen, et al., 2006; Baer, 2003, 2006; Bishop, 2002; Brown, et al., 2007b; Hayes, et al., 2006; Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004).

Although promising, there are a number of limitations that need to be addressed within the mindfulness efficacy literature. Generalisability of findings is limited as research is typically confined to heavily controlled interventions aimed at specific client populations and with consideration of application to only a limited range of disorders (Baer, 2003; Bishop, 2002; Kostanski & Hassed, 2008). Furthermore, studies have focused on short term implications of mindfulness interventions with little consideration of follow-up or longer term effectiveness. Therefore research is required applying rigorous or RCT methodology to varying populations in both cross-sectional and longitudinal studies to provide greater weight to the argument of mindfulness clinical efficacy (Kostanski & Hassed, 2008). Greater consideration is needed of the potential effect of participant adherence to practice to ensure comparability of research findings. For example, in a study looking at the effects of MBSR on sleep disturbance in women with breast cancer, adherence to practice was associated with improved stress reduction and outcome (Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003). Finally there is a lack of research addressing the potential impact of other confounding and real world variables such as; motivation, readiness to change, suitability, format in which

mindfulness is practiced e.g. meditation, and therapist quality (Kostanski & Hassed, 2008).

Despite these limitations it is reasonable to concur with the efficacy of mindfulness as a treatment both as a component part of a greater therapeutic technique and in its own right. However, what is currently missing is a clear and concise conceptualisation and definition of mindfulness and its effective underlying process or mechanism. Greater understanding of the specific active mechanisms mediating positive outcome would provide greater understanding of mindfulness, insight into common themes across all applications, and reveal the basis for conceptualisation and effective measurement. In addition better understanding of the concept and associated processes would enable optimal application of mindfulness for particular disorders and understanding of the potential wider applicability of mindfulness across conditions and disorders.

4.   Processes Operating in Mindfulness:

As mentioned previously the efficacy of mindfulness both as part of existing therapeutic techniques and as an intervention in its own right has been recently demonstrated within the literature. Mindfulness has been shown to be effective for a range of disorders and interest within the literature has begun to turn toward establishing the processes or mechanisms underlying this clinical effectiveness. Interestingly, efficacy has been demonstrated for a mixed sample of individuals treated in a group context, thereby receiving the same mindful intervention, irrespective of their varying presenting

diagnoses (Baer, 2003, 2007). This suggests either that mindfulness may be operating on processes common to a range of conditions or concurrently acting on different processes in different conditions (Baer, 2007; Teasdale, et al., 2003).

At present there are a number of different processes or mechanisms hypothesised to account for the underlying clinical effectiveness of mindfulness. Suggested processes have included; cognitive flexibility including metacognitive insight, rumination, processes of thinking, and deficits in autobiographical memory; exposure and experiential avoidance; acceptance and non-attachment; and changes in attentional control (See reviews by Baer, 2003, 2007; Brown, et al., 2007b; Chambers, et al., 2008). Integration of functioning (Brown, et al., 2007b) also requires consideration given the overlap between processes and potential for them to be operating together. Relaxation is a frequently reported feature of mindfulness. However it is not generally considered an essential mechanism but rather a positive 'side effect' (Baer, 2003). It is unlikely to be an effective process of mindfulness given that mindful practice cultivates non-judgemental observation of any present moment experience including states of stress and tension (Baer, 2003).

One of the complexities in considering the process literature is that a number of different terms have been used to describe the same or similar processes. Thus it can be problematic establishing which process is being described in different cases. Conversely within the mindfulness literature similar terms have been used in the description of differing processes, e.g. metacognitive insight versus metacognitive awareness. As such it is important for clarity that descriptions and definitions of applied terminology are made explicitly and consistently.

The terms 'process' and 'mechanism' are used interchangeably in this section of the review. Both descriptive terms are used to refer to the mechanism of change or active ingredient thought to account for the positive effects of mindfulness. The term 'process', when used in the context of therapy, can refer to the interpersonal process occurring between individual (or group) and therapist rather than the internal psychological mechanism of the individual. This review is interested in the latter 'intrapsychic' processes that have been implicated in individuals learning to be mindful.

A further difficulty associated with teasing apart the process literature is the linked and overlapping nature of many of the concepts and processes indicated. For the purposes of this review and to ease clarity each process will be considered independently of the others, however overlap and concurrent functioning will be highlighted.

4.1.   Cognitive change:

Given that mindfulness practice encourages individuals to relate differently to internal and external experiences it seems fair to consider that this cognitive change itself may account for the processes operating.

4.1.1. Thinking processes ('modes of processing') and rumination:

Mindfulness-based cognitive therapy (MBCT) was developed primarily as a therapy to address the risk of relapse in patients who have experienced previous episodes of depression (Segal, et al., 2002). Through consideration of the development of MBCT, insight can be gained into the mechanisms proposed to be operating. Segal et al. (2002; Teasdale, Segal, & Williams, 1995) viewed the relapse in previously depressed patients to be the result of rumination. Mental strategies, that may previously have been helpful to

problem solving, lock individuals into old routines of thinking, bringing on and perpetuating depressive styles of thinking (Teasdale, et al., 1995). For individuals having previously experienced depression the main risk factor of relapse is reactivation of a combination of integrated thoughts, feelings and physical sensations which the individual associates with the onset of depression. More than simply a negative thinking style, this represents a 'model of depressive experience' closely linked with a negative self view (Segal, et al., 2002). The authors proposed that changes to this model cannot be made through conceptual understanding but instead require 'new experiences for the mind and body, over and over again, that will accumulate to create an alternative view' (pp 67) (Segal, et al., 2002). Thus attempts to 'think' one's way out of problems represents an old mental habit which actually self-perpetuates the current state of mind thereby maintaining the very problems individuals are trying to overcome. Furthermore, perpetuating this ruminative thinking style is what is described as an internal 'discrepancy monitor'. This is an evaluation of the current state of the self compared to a standard of what is expected, desired, or feared (Segal, et al., 2002). The discrepancies identified between the current and desired state motivate further rumination in an attempt to reduce this discrepancy and in so doing maintain the negative mood.

As outlined earlier in the review, mindfulness is proposed to cultivate a 'non-doing' or receptive state of mind rather than a 'doing' or conceptual state of mind. This allows an observer stance to be taken toward all internal and external experiences and insights to be gained into the nature of the mind (metacognitive insight). In the development of MBCT the authors developed the thinking behind these opposing mental

states and distinguish between two modes of mind; the 'doing mode' and the 'being mode'.

The 'doing mode' is proposed as the habitual mental state entered when the mind identifies discrepancies between the current state and desired state in an attempt to problem solve and reduce this discrepancy (Segal, et al., 2002). This is a common mental state associated with action and drive and is a useful and appropriate skill when applied by individuals in an intentional and knowing way to solve discrepancy-based problems (Segal, et al., 2002). However when no solution is available to reduce the discrepancy gap or this mode is entered and maintained automatically, continual processing, rehearsal and rumination of mismatches serves to maintain a sense of unsatisfactoriness and general negative feeling (Segal, et al., 2002). In cases where no action is possible the continued manipulation of ideas, monitoring and evaluation is carried out in an attempt to reduce the discrepancy gap. This action state reduces the individuals awareness of the present moment with focus instead aimed at analyzing the past or future or the success/failure of current goals (Segal, et al., 2002). With regard to depression a parallel can be drawn between manifestations of the "doing" mode of mind and relapse-related processing or negative thought patterns triggered at times of potential relapse. Hence it is this mode of mental processing itself putting the individual at risk of relapse.

In MBCT mindfulness practice is proposed to cultivate an alternative cognitive mode, the "being" mode. The "being" mode is characterized as "accepting and allowing what is without any immediate pressure to change it" (pp. 73; Segal, et al., 2002). In contrast to the "doing" mode there is no motivation to achieve particular goals, thereby removing the need for goal-related monitoring and evaluation. Furthermore the focus on accepting and allowing removes the need for discrepancy based processing. The authors

suggest this allows a widening of the narrow discrepancy focus of the present in the "doing" mode of mind to a potentially rich and full focus on any experience in the present moment. Thoughts and emotions become simply objects in awareness as a "decentred" perspective is gained. Individuals develop the skill of disengaging from the doing mode of mind when maladaptive, and engage in the being mode, therein shifting focus from content to process (Segal, et al., 2002; Teasdale, et al., 1995). That is, individuals disengage from ruminative thinking and focus attention instead on present moment experiences (Baer, 2007).

Moving from theory to evidence, two methodologically strong studies have clearly demonstrated efficacy for MBCT in depression relapse (Ma & Teasdale, 2004; Teasdale, et al., 2000) however neither degree of rumination nor mindfulness was measured and so conclusions cannot be drawn regarding the role of rumination within mindfulness (Baer, 2007). This missing data is indicative of the focus of research in evaluating applications of mindfulness and not in empirically validating conceptualisations and underlying processes of mindfulness. A recent study indicated that reduced rumination was associated with increased mindfulness skills in a sample of meditators compared to non-mediators (Baer, 2007). However the study did not randomly allocate participants or provide the mindfulness practice, instead selectively sampling individuals based on previous 'meditation' experience and so cannot rule out sampling effects or confirm effects are due to mindful and not another form of meditation. Thus future research is required to confirm the role rumination plays in mindfulness and to establish if 'modes of processing' could account for the process of change across conditions and applications.

Currently the role of 'modes of processing' in mindfulness has only been considered conceptually within the literature. Although a widely acknowledged given the efficacy of MBCT the author's face a challenge in empirically demonstrating the shifting cognitive mode in individuals practicing mindfulness.

4.1.2. Metacognitive insight:

The previously outlined idea of 'decentred awareness' is linked directly to the concept of metacognitive insight, although considered separately for the purposes of this review. MBCT and other theoretical descriptions of mindfulness describe the processes of thinking implicated in mindfulness and metacognitive insight as parts of a single process.

The term 'metacognitive insight' refers to the development of greater intuitive understanding and awareness of one's own thinking processes and how they work or insight through thinking about thinking. There are a number of aspects of experiential insight gained through mindfulness practice which may account in part for its effectiveness. Mindfulness encourages an observer stance towards all experience and development of a relationship to perceptual experiences that highlights their insubstantial and transient nature as opposed to accurate accounts or reflections of reality (Baer, 2003; Brown, et al., 2007b; Segal, et al., 2002). That is, thoughts become seen as 'just thoughts' and feelings are experienced as 'just feelings', both simply experiences of the present moment rather than being facts (Kabat-Zinn, 1990). This reflects the "decentred" perspective encouraged in MBCT (Segal, et al., 2002). The metacognitive insight that may result from gaining this new perspective to perceptual experiences has been proposed to be or be part of the potential processes operating in mindfulness.

There are a variety of propositions for how metacognitive insight may have an effect on subsequent psychological states and behaviours. These including bringing about a reduction of automatic and habitual thinking patterns and behaviours may help reduce unhelpful psychological and behavioural reacting (Baer, 2003; Brown, et al., 2007b; Segal, et al., 2002; Teasdale, et al., 1995); development of self-encouragement to realize and accept threatening cognitions and emotions (Brown, et al., 2007b); insight into desires, needs and values may reduce behaviour influenced by internal and external pressures and needs (Brown, et al., 2007b); and increased reality testing (Brown, et al., 2007b). In the case of MBCT metacognitive insight enables a decentred view toward depression to be adopted.

As with the 'modes of processing' literature, the role of metacognitive insight has only received conceptual empirical consideration and lacks the backing of experimental empirical study. Conceptually speaking there has been extensive consideration and development of the concept of metacognitive insight across a number of different proposed conceptualisations and applications of mindfulness. Consistency of description between authors and across reviews is encouraging (Baer, 2003; Brown, et al., 2007b; Segal, et al., 2002; Teasdale, et al., 1995). However, whether it can account for the effective process operating in mindfulness is yet to be demonstrated. As with a number of the potential processes of mindfulness quantifying the conceptualised metacognitive insight in a way that can be studied within Western empirically meaningful criteria is difficult.

The effects of metacognitive insight appear to be occurring alongside many of the other proposed processes operating in mindfulness, including changing patterns of thinking, exposure, and emotion regulation, making it difficult to ascertain the direct

impact of metacognitive insight this also suggests a potential role within a more integrated process. Future research is needed to establish the role of metacognitive insight in mindfulness and tease apart from modes of processing.

4.2.   Exposure:

The concept of 'exposure', desensitisation to threatening or fearful stimuli through repeated exposure to the fearful experience, has been proposed to potentially account for some of the effectiveness associated with mindfulness. Borkovec (2002) postulates that the process of practicing viewing internal and external experiences through mindfulness, without attempts to escape, avoid or conceptualise, represents the same type of desensitisation typical to exposure. This sustained non-judgemental observation of sensation has been hypothesised to lead to reduced emotional reactivity and distress associated with the particular sensations, even when there is not a reduction in the sensations themselves (Baer, 2003; Kabat-Zinn, et al., 1992).

Exposure as a process of mindfulness was first suggested following identification that patients suffering from chronic pain who completed MBSR as a treatment were being exposed to the sensations of pain and discomfort during the long periods of sitting meditation (Kabat-Zinn, 1982). Rather than being instructed to move to be comfortable patients were encouraged to bring non-judgemental awareness to the sensations of pain and associated cognitions and emotions (Baer, 2003). Kabat-Zinn (1982) proposes that desensitisation occurs through prolonged exposure to the sensation of pain in the absence of 'catastrophic consequences' and over time this becomes a generalised pain response.

That is, even without a reduction in pain sensations emotional reactivity (distress and suffering) may be moderated (Baer, 2003). Kabat-Zinn's (1982) findings were consistent across different pain categories (i.e. neck, back etc), however unfortunately the study did not include a control group. In another uncontrolled study a similar mechanism of exposure was proposed to be operating for anxiety patients using MBSR (Kabat-Zinn, et al., 1992). Similarly in the case of DBT for borderline personality disorder (BPD) exposure has been proposed to operate (Baer, 2003). Individuals with borderline personality disorder avoid negative emotional states due to their experience of such states as extreme and intense. This attempted avoidance or escape, often through maladaptive strategies, has led to the description of individuals BPD as 'emotion phobic' (Linehan, 1993a, 1993b cited in Baer, 2003). However, this conceptualisation is based on observation and clinical experience and lacks empirical research backing. Through the practice of mindfulness meditation individuals adopt a sustained observer stance toward experiences of current emotional states and cognitions. Thus desensitisation occurs towards previously feared phenomena enabling extinction of fear responses and perhaps more adaptive behavioural responses as well as potentially increasing individuals' tolerance of negative emotions (Baer, 2003).

The process of desensitisation through exposure to any perceptual and sensory phenomena may result in: increased tolerance and acceptance of unpleasant experiences and events; more effective regulation of emotion; reduced emotional reactivity; and faster recovery (Brown, et al., 2007b). Indication of these positive mindful effects as a result of exposure is supported by implication of alternative (non-mindful) regulatory strategies, such as experiential avoidance, suppression and rumination, in the maintenance of emotionality of phenomena and increased psychopathology (Broderick, 2005; Campbell-

Sills, Barlow, Brown, & Hofmann, 2006; Sloan, 2004). Further studies have also reported that voluntary exposure to threatening stimuli, as seen in mindfulness practice, can result in more adaptive behavioural responses and decreased emotional and cognitive disturbance with no change reported in incidence of panic symptoms or physiology (Levitt, Brown, Orsillo, & Barlow, 2004). However, none of these studies directly considered mindfulness as part of the research and although indicating 'mindful traits' in adaptive strategies the link with mindfulness itself is only speculative. Both the Levitt, et al. (2004) and Campbell-Sills, et al. (2006) studies compared acceptance and suppression as strategies following exposure to emotion provoking stimuli. They reported acceptance to be associated with reduced emotionality and increased coping. The Campbell-Sills, et al. study (2006) was uncontrolled however the Levitt, et al. study (2004) included a control group for comparison. Nonetheless in drawing conclusions regarding the implications for effective processes in mindfulness acceptance effects and exposure effects need to be teased apart.

Exposure plays a component part in each of the major mindfulness interventions. Whether it also reflects the primary effective process operating in mindfulness itself requires further specific experimental investigation and confirmation. Currently studies have only demonstrated that voluntary exposure occurs as a part of mindfulness practice (Arch & Craske, 2006; Brown, et al., 2007b; Levitt, et al., 2004; Sloan, 2004) and not that it is a causal component of its effectiveness.

4.3.   Acceptance:

Acceptance has been described as a core aspect of mindfulness practice (Kabat-Zinn, 1990) and is very different to the stance of traditional therapies focused on change.

Mindfulness practice in all therapeutic approaches aims to cultivate an acceptance of all phenomena just as they are through non-judgmental observation without attempts to escape, avoid, or change them. Different approaches emphasise the acceptance of different phenomena including: pain, emotions, thoughts, urges and bodily sensations (Baer, 2003). Therefore it has been hypothesised that mindfulness practice may teach acceptance skills and this may account for the positive effects observed when responding mindfully (Baer, 2003).

The concepts of acceptance, and the 'being mode' from MBCT discussed earlier, have a significant overlap in regards to their conceptualisation. The fundamental difference that distinguishes the two is that acceptance by definition is unchanging whereas the 'being mode' of mind is an active state that is cultivated.

What is unclear from the literature is whether acceptance can be or should be considered a process. This uncertainty is reflected in the absence within the literature of any explanation as to how this potential process is operating. In fact 'acceptance' appears to not actually be adding anything in terms of understanding of the processes operating in mindfulness but instead reflects a different way of describing other processes. That is rather than being a process in its own right, acceptance may be a word that points to a whole range of things already described.

4.4.   Attentional control:

It seems reasonable that attention is implicated as a potential process mediating the positive effectiveness of mindfulness given its core role in conceptualisation of mindfulness and in mindfulness practices within MBSR and MBCT. Mindfully cultivated attention has been hypothesised to operate in slightly different ways.

Chambers et al. (2008) demonstrated that mindfulness training helps individuals develop two subsystems of attention; *attentional switching* and *sustained attention*. *Attentional switching* is defined as the ability to deliberately shift ones attentional focus between different stimuli, whereas *sustained attention* refers to the ability to direct one's attention on a particular stimulus in a prolonged manner (Chambers, et al., 2008). The authors hypothesised that through development of these attentional processes psychological wellbeing may be improved due to increased ability to self regulate mental and emotional states. Chambers et al. (2008) acknowledge that other processes may underlie mindfulness training which depend on the initial development of attentional and executive cognitive function abilities. Although this was a well controlled study the findings were minimal and mixed for the mindful group over the control group in regards to attentional switching and reduced rumination respectively. The authors report that caution has to be exercised to avoid over interpreting the findings. Further evidence to confirm the observed effects is needed.

It is important not to confuse the concept of *self-focused attention* with mindful attentional control. *Self-focused attention* is used to refer to the process of bringing awareness to internally generated experiences such as thoughts, emotions and sensations or 'attentiveness of the self' (Baer, 2007). It has been proposed that selective attention to internal experience is prominent in several disorders and that *self-focused attention* may be associated with increased psychopathology in these disorders (Harvey, Watkins, Mansell, & Shafran, 2004). Baer (2007) reported that practice of mindfulness meditation although cultivating a close attention to internal and external stimuli was adaptive in meditators as opposed to non-meditators who exhibited maladaptive or neutral self-

focused attention. Baer (2007) proposed that this paradoxical finding indicated that being mindful must also cultivate other factors allowing 'better psychological adjustment'. However s*elf-focused attention,* although describing an attention to subjective experience, differs from the concept of mindfulness. *Self-focused attention* focuses on aspects of the self from a biased perspective of the self unlike mindful attention which encourages unbiased non-judgemental observation of internal experience (Brown, Ryan, & Creswell, 2007a). The use of similar terminology to describe different concepts and the absence of clear and concise definitions highlight the potential difficulties faced by this relatively young literature and the ease with which confusion can occur.

This confusion in terminology use also highlights that the perspective adopted, e.g. mindful or self focused, has a direct influence on the experience of the phenomena to which attentional control is focused. Thus for attentional control to be an effective process operating in mindfulness it assumes that other processes, such as acceptance and metacognitive insight, are operating alongside it.

4.5.   Non-attachment:

The philosophy of Buddhism, from which mindfulness is derived, associates suffering with a perception of all experiences as unsatisfactory and the desire for things to be different from what they are. 'Craving' is associated with the desire for things that are not currently present in one's life or for positive things not to end and 'aversion' is the desire to remove things that are present but considered unwanted (Brown, et al., 2007b).

Mindfulness develops acceptance and tolerance of whatever is experienced in the present moment, a state sometimes described simply as 'being' (Segal, et al., 2002). This is contrary to more typical stances of goal attainment, control, avoidance or striving to

change circumstances for perceived personal well being (Brown, et al., 2007b). Brown et al. (2007b) suggest that development of this state of 'non-attachment' through the practice of mindfulness may enable individuals to develop a sense of wellbeing and happiness unrelated to circumstance. What is unclear from the authors' description is how the concept of 'non-attachment' differs or adds to the argument of 'differing modes of processing' proposed by Segal and colleagues (2002) as the underlying process of mindfulness. This highlights further the limitations to building a wider understanding of mindfulness through the use of varying and ill-defined terminology. In fact the review of Brown, et al. (2007b) does not consider the extensive and well developed theories of Segal and colleagues (Segal, et al., 2002; Teasdale, et al., 1995) beyond the description of MBCT as an application of mindfulness. Suggestion of 'non-attachment' as a process underpinning mindfulness in the Brown, et al. (2007b) review stems from the parallels indicated between Zen Buddhist thought and social psychology laid out in a commentary by McIntosh (1997). McIntosh's (1997) article nicely outlines the ideas of Zen Buddhist thinking and the role and utility of mindfulness within it. There are many similarities across this commentary and the thinking and theory of Segal and colleagues (Segal, et al., 2002; Teasdale, et al., 1995) whose work links such ideas with Western psychological practices. The absence of comment and consideration of the parallels and linking of these theories and the idea of 'non-attachment' is a fundamental weakness of the Brown, et al. review (2007b).

4.6.   Other processes implicated in the mindfulness literature:

4.6.1. Mind-body Functioning:

The link between mind and body promoted in mindfulness has been associated with health benefits including decreased stress and improved subjective vitality (Brown & Ryan, 2003). Brown et al. (2007b) suggest that development of physical processes such as relaxation, pain tolerance, and enhanced immunological resistance may be beneficial to health in addition to acting as psychological and behavioural mediating factors. The authors hypothesise that direct stress relief, through the practice of mindfulness, may enable remaining psychological and biological resources to remain available to maintain other aspects of wellbeing. However literature to support this proposition is only emerging and needs to account for other potential mediating processes (Brown, et al., 2007b). Although an interesting area of proposed influence in mindfulness the integration of mind and body functioning lacks theory. Furthermore as the review by Brown, et al. (2007b) reflects evidence to support this idea is lacking. The study of wellbeing in cancer patients by Brown and Ryan (2003) formed part of an evaluation of the mindful Attention Awareness Scale (MAAS). In the study mindfulness was defined as a distinct construct reflecting the 'presence or absence of attention to and awareness of what is in the present' and did not include attributes common to other mindful definitions such as acceptance, non-judgement etc. The findings of the study indicated that increased mindfulness was associated with lower mood disturbance and stress levels. The study did not include a control group for comparison nor did it account for the initial increased levels of baseline mindfulness indicated on the MAAS for this particular population. Thus the findings could reflect increasing present moment awareness as a result of experiencing cancer. In addition given that the MAAS only taps one aspect of

mindfulness future research confirming the link with health benefits needs to consider the other potentially salient attributes of mindfulness.

A longitudinal study by Alexander, Langer and Newman (1989) found that mindfulness was associated with increased life expectancy compared with controls in a sample of elderly individuals also indicating a possible mind-body link. However, participants practicing transcendental meditation showed an even greater improvement to life expectancy. Thus it is important that research is tapping into a genuine trait of mindfulness to be able to assess the process of effect and not a beneficial factor of practice common to other meditative techniques.

4.6.2   Self management:

Self management refers to the ability of individuals to identify negative or worrying affective states in themselves and apply techniques and strategies to facilitate coping. Improved attentional control and development of an observer stance towards cognitive and emotional phenomena may allow an individual responding mindfully to evoke a range of coping strategies in response to early warning signs. Increased ability to self manage symptoms or distress through improved self observation has been proposed as part of the effective process operating in mindful responding (Baer, 2003). This response to the early identification of depressive symptomatology is the suggested mechanism in MBCT preventing depression relapse (Segal, et al., 2002; Teasdale, et al., 1995). Similarly studies have asserted that early activation of coping strategies or improved self awareness through mindfulness training can account for positive effects seen in regards to pain management (Kabat-Zinn, 1982), and binge eating (Kristeller, Baer, & Quillian-Wolever, 2006).

In general, greater awareness of cognitive and emotional experiences occurring in the present moment through mindfulness practice may enable earlier identification of potential difficulties or increasing distress. This could allow individuals to self manage through application of coping strategies, more adaptive behaviours and skills at a time of greater impact and efficacy (Baer, 2003). Furthermore, early identification may enable greater consideration of the direct consequences of particular reactions and behaviours enabling individuals to be less impulsive and more adaptive in their choice of response (Linehan 1993, cited in Baer, 2003). However, it is debatable whether improved self management reflects a process in mindfulness or is better described as a behavioural outcome of mindfulness. This raises the question of at what point do we evaluate mindfulness. Should mindfulness be evaluated while people are engaged in mindful meditative practice or can we evaluate mindfulness on the basis of changed behaviours and outcomes in everyday life? If we choose to consider that mindfulness is a functional process then any practice cultivating that process is mindfulness, not simply meditation, and this opens the possibility that any thing could be used to cultivate mindfulness (Hayes & Shenk, 2004).

4.7.   Summary:

The processes hypothesised to be operating in mindfulness primarily reflect the descriptive stages of the practice of mindfulness with differing core emphasis: (1) mindfulness does not strive for change or to occupy a goal-orientated stance, 'doing' mode, instead mindful acceptance embodies a position of just *'being'* (*modes of processing/non-attachment)*; (2) individuals develop self directed *attentional control* through mindfulness practice; (3) individuals experience sustained *exposure* to

experienced phenomena; (4) practice encourages non-judgemental *acceptance* of phenomena; (5) through practice a decentred perspective is gained and learning occurs that phenomena are transient rather than facts or reflections of reality (*metacognitive insight*); (6) mindfulness results in desensitisation towards phenomena, reduced habitual responses such as experiential avoidance and rumination (Baer, 2003); (7) and improved self regulation and management.

The huge overlap and mutual reliance between the different processes of potential influence described above may indicate that an integration of some or all of these processes most likely accounts for the effectiveness of mindfulness. However, what is clear from consideration of the literature is that for the processes considered either a lack empirical support or contrary empirical evidence currently prevents drawing meaningful conclusions from the literature. In fact most proposed processes are still at a stage of hypothesis and conjecture in terms of development and understanding and require robust and rigorous investigation before conclusions can be drawn. Without clearly defined terminology and explicit description of woolly and confused concepts this task becomes increasingly difficult. Furthermore, without conclusive supporting evidence for a particular process we must remain mindful that as yet the mechanism operating in mindfulness is undiscovered.

5.   Discussion:

This review illustrates that there is still some way to go in the understanding and development of mindfulness. Nevertheless, even within its relative infancy the literature

confirms the technique as a valid and useful addition to the therapeutic repertoire. However, and perhaps predictably, the relative recentness of the empirical consideration of mindfulness within Western psychological practice is reflected in; limited descriptive consensus, variable assessment literature methodological flaws within the outcome literature and limited understanding of implicated processes of effect.

5.1.   Definition:

Fundamentally, and highlighted throughout this review, lack of consensus regarding the definition and description of mindfulness limits its effective empirical study and development. Although there are many common elements across descriptions of mindfulness the variation in emphasis of the core features remains. This problem is compounded by inconsistent use and interpretation of key terminology.

The difficulty created by unclear definition impacts equally on both the assessment literature and outcome literature. If a definition of what is being measured isn't agreed it becomes increasingly difficult to include measures within outcome literature that are appropriate and fit logically with the direction of empirical discovery (Baer, 2003). Any potential outcomes can be dismissed by the use of apparent unreliable or inconsistent assessment measures. Hence although perhaps not limiting the continued completion of empirical investigation of mindfulness, lack of a consensus description limits the conclusions and fitting together of any discovery and theory.

Development of the assessment literature could begin to provide a clearer understanding of the potential constructs and factors indicated in defining mindfulness and potentially indicate the associated processes of operation. However, mindfulness has been mapped onto both single and multiple factor solutions and so is of limited benefit to

conceptualization at present. Further study of the assessment factors indicated in mindfulness may enable researchers to identify and better describe areas requiring clarification and those established as facets of mindfulness.

Finally, distinction of clinical and theoretical definitions and proposed processes of effect may help to clarify some aspects of contention. Through the application of mindfulness within Western psychological practice development of clinical application to disorders, theoretical understanding, clinical definitions and descriptions of processes occurred concurrently. Therefore some discrepancies within the literature reflect the differences between theoretically driven definitions and process descriptions versus those derived from the clinical application of mindfulness.

5.2.   Application and outcome:

Mindfulness has been successfully integrated into a number of therapeutic techniques (Mindfulness Based-Cognitive Therapy, Mindfulness Based-Stress Reduction, Acceptance and Commitment Therapy, Dialectical Behaviour Therapy, Person Based-Cognitive Therapy, etc) as well as being developed as a stand alone practice and overall the outcome literature is encouraging. Although techniques and practices are well described consideration of potentially confounding and mediating variables is limited.

Future research is required to address design and methodological flaws including: small sample sizes; varied or missing follow up data; limited generalisability due to heavily sampled populations and inadequate use of control groups (Baer, 2003; Bishop, 2002; Brown, et al., 2007b; Kostanski & Hassed, 2008). In addition potentially confounding variables, e.g. adherence to practice (Shapiro, et al., 2003), need identification, evaluation and consistent control across research studies. The outcome

literature would benefit from randomized controlled and methodologically sound studies confirming effectiveness of mindfulness interventions. Furthermore, although increasingly researched and described treatments including only an element of mindfulness (e.g. ACT, DBT etc) offer little indication as to what extent mindfulness accounts for any observed effect. Establishing whether mindfulness is adding anything to the efficacy of these treatments would be valuable. The absence of clarity regarding the process by which therapies embody 'mindfulness' and the degree to which mindfulness contributes alongside the other components of the therapeutic technique seems indicative of an over all absence of clarity within the literature and terminology.

5.3.   Processes operating in mindfulness:

This review illustrates that beyond definition, outcome and evaluation the difficulty around developing an understanding of mindfulness also reflects the processes proposed to account for its effectiveness. Changes in cognitive processing, metacognitive insight, exposure, acceptance, attentional control, and non-attachment have all been proposed to be operating in mindfulness and although described individually there is significant overlap and mutual reliance between them.

It appears the primary difference between the processes proposed is the stage at which it is suggested the process has effect. Each of the described processes requires adoption of a decentered perspective, or observer stance, embodying nonjudgmental acceptance towards all phenomena. MBCT emphasizes this change in mental processing and associated reduction in previous thinking habits (rumination and discrepancy monitoring) to be the process of effect. Attentional control theories see development of these attentional skills and associated improved self monitoring to be the process of

effect. Metacognitive insight proposes that beyond establishing this perspective towards phenomena it is the learning that occurs through this perspective that is the process of effect. Finally, exposure also proposes that beyond establishing this perspective the process of effect is exposure and desensitization of phenomena. All of the processes result in apparent reduction of previous unhelpful habits of responding, reduced emotional reactivity and increased emotion regulation. In fact, these processes appear to merely extend the description of mindfulness practice already established with different emphasis placed on the aspect considered to be core to the process.

The processes reviewed may more accurately be considered as parts of a unified process with differing effects. Mindfulness has been shown to be transdiagnositically effective (Baer, 2007). Such impact suggests either that the underlying effectiveness of mindfulness is acting on a process common to most disorders or that a combination of processes present in different disorders are operated upon through mindfulness practice. Teasdale et al. (2003) propose that given the overlap of many processes the latter seems more likely with the process operating with most salience varying dependent on the disorder of presentation. With regard to anxiety disorders experiential avoidance is most salient whereas in depressive disorders processes affecting rumination would be of greater importance (Baer, 2007). This raises the questions: is it most appropriate to think of the described processes independently, should mindfulness be re-defined dependant on the disorder of presentation, or can a unified description of underlying processes be established? In addition the difficulties observed in operationalizing mindfulness may also be associated with the attempt to provide a single definition across applications. Future research investigating the scope of potential application of mindfulness is

pertinent (Brown, et al., 2007b) both given its therapeutic benefit and to begin to understand the underlying processes.

Empirically the processes discussed in this review lack rigor and validation. Future studies are required to be able to unpick their relatedness and individual effects on developing mindfulness. Greater understanding of the process of effect would, clinically, enable more effective focus on the practice of mindfulness. Continued lack of consensus regarding definition and salient processes opens the possibility of emphasis being placed on particular aspects of the practice considered to be important, at the expense of others. Like the definition literature, transparency and clarity of terminology would help avoid duplication, confusion and misinterpretation within the process literature. Future research should also consider other potential processes operating. For example, concurrent processes operating together may develop integrated functioning. Enhanced cognitive functioning such as attentional control, improved processing of stress and equanimity, greater 'choicefulness', acceptance, and increased emotion regulation all indicate an integration of functioning (Brown, et al., 2007b). Reduction of self-focus enables a bypassing of typical cognitive functioning invested in providing self focused accounts '*about*' life and develops direct experience *of* life (Brown, et al., 2007b).

5.4.   Conclusion:

In conclusion consideration and evaluation of the potential change mechanisms accountable for the clinical effectiveness of mindfulness offers little clarity of which mechanism reviewed is most likely operating. 'Modes of processing' and metacognitive

insight are the most conceptually considered and developed processes. However, exposure and attentional control offer the most empirically tested and testable theories. It seems that the most difficult task faced by the authors is finding meaningful ways to measure and describe the proposed mechanisms of effect to enable valid empirical investigation. The continued debate and lack of literature regarding both definition and processes effecting clinical change relative to the outcome literature may reflect something beyond the stages of development of application and conceptualization. Application of Western methods of empirical investigation can be applied to some extent effectively to the application of mindfulness-based interventions through consideration of symptom reduction and rate of relapse. However, such methods do not capture other salient aspects of mindfulness; acceptance, cultivation of awareness, insight etc (Baer, 2003). It is these aspects that are fundamental to the operationalizing of definition and process of effect. Absence of literature and consensus opinion may reflect current absence of tools and methodology that can capture the essence of mindfulness in a Western, empirically meaningful way.

It is pertinent to note that development of any psychological concept, technique, or phenomenon requires a process of consideration, hypothesis, development, empirical investigation, and rethinking. This dynamic process is replicated over and over to ensure clarity of understanding and continued development. Mindfulness is, empirically speaking, in its infancy in terms of development and has a long way to go before complete certainty of understanding can be assumed. What is clear is from the literature is that this continues to be a positive and exciting time in its development.

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Empirical Paper

The impact of mindfulness practice on cognitive and affective change in psychosis:

A multiple baseline design

Alexandra Lievesley

Department of Psychology

University of Southampton

Prepared for submission to:

Behavioural and Cognitive Psychotherapy (Appendix A)

Address for correspondence: Alexandra Lievesley, Doctoral Programme in Clinical

Psychology, 34 Bassett Crescent East, Southampton, Hampshire, SO16 7PB, UK.

Telephone: (44)2380 595575.

Email: ajl106@soton.ac.uk.

Abstract

Background. The efficacy of the use of mindfulness for distress associated with

psychosis has been recently indicated in the literature and grounded theory analysis has

begun to identify the variables and processes associated.

Aims. To investigate cognitive and affective change occurring for individuals practicing

mindfulness for distressing auditory hallucinations. To establish any key variables

indicated and consider any relationships between them.

Method. A multiple-baseline case series approach was used with four participants.

Varied baseline periods and eight weeks mindfulness intervention were completed. Twice

weekly measures of distress, believability, metacognitive belief, personal control, voices

control, acceptance of self and acceptance of voices were completed throughout.

Measures of clinical functioning, mindfulness in relation to both voices and to thoughts

and images, and experience of voices and paranoia were completed at the start of baseline

and end of intervention.

Results. No discernable common cognitive or affective changes were indicated across participants however varied minimal benefits were indicated and individual patterns of change across variables are described. The role of practice in ensuring ability to generalise gains was indicated.

Conclusions. Findings are discussed in terms of the role of each variable and the pattern of affective and cognitive change indicated for each participant. Consideration is given to limitations, future research, and implications for clinical practice.

Key words: mindfulness, meditation, psychosis, multiple-baseline.

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1.   Introduction:

1.1.   What is mindfulness?

Mindfulness has been operationally defined as "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgementally to the unfolding of experiences moment to moment" (Kabat-Zinn, 2003). It has been applied throughout Western psychological practice in recent years but has its origin in Eastern Buddhist traditions. Mindfulness practice is based on the principle that distress results from an individuals' reactive relationship to their experience and is not an inherently given part of that experience (Abba, et al., 2007; Chadwick, 2006). It aims to change an individual's relationship to their experience, rather than changing experience content (as is the aim of cognitive therapy). This is achieved through encouraging individuals to increase awareness of the present moment (body and mind experience) and promoting acceptance of what is present without reaction or judgement.

1.2.   Applications and uses of mindfulness:

Mindfulness has been successfully incorporated into a number of therapeutic techniques each focusing on changing an individual's experience with distressing internal experiences. The main applications that incorporate mindfulness are Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1990) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, et al., 2002). Although mindfulness has also been incorporated as a smaller component part in other interventions including Acceptance and Commitment Therapy (ACT; Hayes, et al., 1999) and Dialectical Behavioural Therapy (DBT; Linehan, 1993). MBSR and MBCT have been demonstrated to be clinically efficacious and studies

have reported favourable effects for anxiety, stress, chronic pain, AIDS, depression

relapse, chronic fatigue syndrome, and eating disorders (Baer, 2003; Kostanski & Hassed,

2008). However the outcome literature, perhaps unsurprisingly given its recency, is

limited by methodological flaws including lack of control and consistency between

studies of potential confounding or mediating variables such as adherence to practice

(Kostanski & Hassed, 2008).

1.3.   Development of use of mindfulness with psychosis:

Application of mindfulness to psychosis had to initially overcome the general

perception that meditation practice was harmful to individuals with psychosis (Chadwick,

Hughes, Russell, Russell, & Dagnan, Under review). This view is linked to a small

number of methodologically weak studies indicating individuals with active psychotic

symptoms who used meditation experienced negative effects (Deatherage & Lethbridge,

1975; Yorston, 2001).

The relationship an individual has with psychosis has often been described in the

literature as "distressing" and "tyrannical" (Birchwood, Meaden, Trower, Gilbert, &

Plaistow, 2000; Chadwick & Birchwood, 1994). As mindfulness focuses on changing

how individuals relate to experiences the potential relevance of the use of mindfulness

with psychosis was indicated by research showing distress was associated with how

individuals relate to psychotic experience. Studies indicated; increased intensity of

psychotic experience (e.g. intensity of voices) when individuals reacted confrontationally

(Romme, Honig, Noorthoorn, & Escher, 1992), increased distress associated with

perceived uncontrollability of thoughts and delusions (Baker & Morrison, 1998; Freeman

& Garety, 1999), increased distress associated with perceived power and malevolence of

voices (Birchwood & Chadwick, 1997), and increased dysfunctional metacognitive beliefs associated with the experience of voices (Morrison & Wells, 2003).

Promising results for the potential effective use of mindfulness for psychosis were first indicated in a study by Bach and Hayes (2002; and replicated by Gaudiano & Herbert, 2006) applying mindfulness principles as part of ACT to reduce re-hospitalisation rates in individuals with psychosis. Mindfulness specifically adapted for use with distressing psychosis was developed as part of Person-Based Cognitive Therapy (PBCT; Chadwick, 2006). Mindfulness practice in PBCT encourages calmness and empowerment through present moment awareness and acceptance of psychotic symptoms and letting go of reacting (i.e. struggle, avoidance, self judgement, rumination). Individuals develop greater understanding, through reflective learning, of the nature of experience (challenging beliefs such as "I am what I experience" or "if I don't fight voices they will become more powerful and overwhelm me") and the link between distress and their reaction to symptoms of psychosis.

1.4.   Efficacy of use of mindfulness with psychosis:

The efficacy of mindfulness, as a stand alone intervention, for psychosis has been demonstrated in a number of studies. In an uncontrolled study, significant pre-post improvement to clinical functioning was demonstrated following a mindfulness group intervention (Chadwick, et al., 2005). In an RCT feasibility study clinical functioning and mindfulness of thoughts and images indicated improvement following group-based mindfulness practice (Chadwick, et al., Under review). In two single cases, reduced believability and distress associated with voices was observed following introduction of mindfulness intervention and pre-post increased mindfulness was reported (Newman-

Taylor, Harper, & Chadwick, Under review). A recent grounded theory analysis (Abba, et al., 2007) established psychological processes and variables implicated with responding mindfully to distressing psychosis following completion of a group mindfulness programme. The study described three-stages; "centering in awareness of voices, thoughts, images in the moment; allowing voices, thoughts, images to come and go without reacting/struggle; and reclaiming power through acceptance of psychosis and self" (p.1; Abba, et al., 2007). These stages were captured by a central core process of learning to relate differently to distressing psychosis. The subcategories and processes identified in the study are typical of other therapeutic applications of mindfulness indicating a similar learning of mindfulness occurs, irrespective of presenting condition, and validity of the grounded theory (Abba, et al., 2007). Unfortunately clinical efficacy of the mindfulness group in this study is not captured by the methodology.

1.5.   Context of current research:

In formulating the current research it was important to consider what is missing from the literature regarding mindfulness for psychosis. Recent research has indicated the efficacy of mindfulness for responding to distressing psychotic experiences and has begun to establish the processes and variables indicated to be operating and significance of relating differently to psychotic experiences. Therefore the current study aimed to continue to develop the understanding of changes to affective and cognitive variables indicated for individuals responding mindfully to distressing psychosis.

Further consideration of the variables implicated and understanding of associated changes or relationship between variables may facilitate better understanding of mindfulness for psychosis. It would enable development of optimal mindfulness practice

including structuring of practice related learning and discussion of mindfulness practice. Moreover it would develop the research literature both specifically in regards to psychosis and in developing an understanding of the commonalities and differences in responding mindfully for different conditions.

1.6.   Research aims:

The primary aim of the present study was to investigate the impact of practicing mindfulness on cognitive and affective changes in individuals experiencing distressing auditory hallucinations. Changes in distress and meaning of voices, acceptance and control were considered. The secondary aim was to extend current research through establishing the potential key variables indicated in responding mindfully to voices and any relationships between these variables.

2.   **Method:**

2.1.   Design:

To explore cognitive and affective change occurring for individuals responding mindfully to distressing auditory hallucinations across multiple participants a multiple-baseline case series design was applied. Following a minimum of 2 weeks (4 data points)

baseline, the mindfulness intervention was introduced at weekly intervals. This methodology provides a clear indication of changes occurring after the introduction of treatment while other specific variables remain constant or unchanged. Staggering baseline periods for different participants provides control conditions to evaluate the change that would have occurred had the intervention not been introduced e.g. due to effects such as passage of time (Kazdin, 1982)

2.2.   Ethical considerations:

Ethical approval to carry out the study was applied for and received from: the University of Southampton School of Psychology Ethics Committee and Research Governance Office (Appendix B); the Berkshire NHS Research Ethics Committee (Appendix C); and the Hampshire Partnership NHS trust Research and Development Department (Appendix D).

To ensure participant confidentiality was maintained throughout the study participant names were replaced with a numerical code, any identifying participant details were left out of the write up, all data collected was anonymised on collection and stored in a locked cabinet, and any anonymised data stored electronically for data analysis was stored in a password protected file. Data protection act compliance approval was received from Hampshire Partnership NHS Trust prior to the start of the study (Appendix E). Informed written consent was required from all participants.

Two periods of potential discomfort for participants were identified to the ethical committees. Firstly, during the baseline period potential frustration through delayed start of the intervention and continued likely distress from current psychotic symptomatology. This was addressed by empathic discussion in session and continuation of other

treatments being received outside of the study. Secondly, potential anxiety and discomfort were predicted at the end of the mindfulness intervention due to 'treatment ending'. This was addressed through planning, discussion, and appropriate further support was available if necessary.

Finally to address potential concern that participants may feel coerced into taking part in the research through the recruitment procedure the referring clinician fulfilled only a signposting role with no involvement in the research. Furthermore, a statement outlining the voluntary nature of participation and the individual's right to withdraw from the study at any time without giving a reason and without effect to medical or legal rights was included in the participant information sheet (Appendix F) and the consent form (Appendix G). Given the vulnerability of the participant group formal weekly supervision was provided to the primary researcher.

2.3.   Measures:

The study used two types of measures profiling measures and outcome measures. Profiling measures provided descriptive self-report information regarding an individual's perception of voices including severity, intensity, frequency, power, way of relating to voices, and content of voices. Outcome measures provided indication of potential changes to quality of life and changes in functioning. Both measures were used in this study to gauge changes across variables due to practice of mindfulness.

Participants completed all measures at assessment including profiling measures, to establish a picture of participants' experience of psychoses, and all outcome measures. In acceptance-based therapies presence or absence of (psychotic) symptomatology is not the focus of change, but instead the primary outcome measure is clinical functioning

(Bach & Hayes, 2002). Outcome measures administered assessed clinical functioning, degree of mindfulness, and twice weekly visual analogue ratings of subjective changes in relationship to voices.

2.3.1   Profiling measures:

The **Psychotic Symptom Rating Scale** (PSYRATS; Haddock, McCarron, Tarrier, & Faragher, 1999) was used to profile participants' experiences of auditory hallucinations and paranoia. It measures severity and intensity of auditory hallucinations, 11 items, and delusional symptoms, six items, as indicated on a five point Likert scale. Scores range from 0-44 for hallucinations and 0-24 for delusions. The PSYRATS has been shown to be a reliable and valid measure (Drake, Haddock, Tarrier, Bentall, & Lewis, 2007).

The **Beliefs about Voices Questionnaire-revised** (BAVQ-r; Chadwick, Lee, & Birchwood, 2000) was used to assess individuals' beliefs about auditory hallucinations, and their behavioural and emotional responses to them. It is a 35 item measure comprising five subscales relating to beliefs about voices (malevolence, benevolence & omnipotence, each assessed by six items), and ways of relating to voices (resistance, assessed by nine items, & engagement, assessed by eight items) and has been shown to be a reliable measure (Chadwick, et al., 2000).

2.3.2.   Un-standardised outcome measures:

The **Living with voices** questionnaire (Appendix H) was completed twice weekly, during session and midway between sessions. It comprised seven visual analogue scales to assess subjective ratings of: distress from voices, believability of voices, control of self

over life, control of voices over life, acceptance of voices, acceptance of self, and an individualised metacognitive belief e.g. 'if I don't control my voices they will control me'. Each item was rated on an 11 point scale grounded at either end as 0 (not at all) to 10 (extremely/totally). Although not formally standardised the Living with voices questionnaire has been used successfully in a similar study (Newman-Taylor, et al., Under review).

Metacognitive Learning: Following each mindfulness session participants completed three set questions as part of the post practice discussion to facilitate metacognitive learning and prompt link making. The questions were: What has stood out for you from today's practice? What have you learned during mindfulness practice about your voices? What have you learned during mindfulness practice about yourself?

2.3.3.   Standardised outcome measures:

The **Clinical Outcomes in Routine Evaluation** (CORE; CORE system group, 1988) was administered at assessment and post intervention to assess subjective well-being, problems and symptoms, life functioning, and risk. The CORE contains 34 items developed to provide a routine outcome score in clinical practice to indicate therapeutic change, and has been demonstrated to be reliable and valid (Evans, et al., 2002). Each item is scored on a five point Likert scale and the mean score of all 34 items is used.

The **Southampton Mindfulness Questionnaire for Voices** (SMVQ; Chadwick, Barnbrook, & Newman-Taylor, 2007) was administered at assessment and post intervention to assess the extent to which people respond mindfully to distressing voices.

The SMVQ is a 16 item self report questionnaire and has been shown to be reliable (Cronbach's alpha = 0.9) and to measure actual mindfulness (Chadwick, et al., 2007; Hember, 2003). Items asses; "letting come", "mindful observation", non-judgement" and "letting go", and are rated on a seven point Likert scale yielding a range of 0-96.

The **Southampton Mindfulness Questionnaire** (SMQ; Chadwick, et al., 2008) **for thoughts and images** was also administered at assessment and post intervention to assess the extent to which an individual responds mindfully to distressing thoughts and images. The SMQ is a parallel version of the SMVQ with scores rated on a seven point Likert scale again generating a range of 0-96. The SMQ has been shown to be reliable (Baer, et al., 2006) and valid measure (Chadwick, et al., 2008).

The **PSYRATS** and **BAVQ-r** were also re-administered post intervention to assess subjective changes in perception of auditory hallucinations and delusional symptoms.

2.4.   Participants:

2.4.1. Recruitment & referral:

In the recruitment stage of the study a total of 26 participants were identified by clinicians and key workers to potentially take part in the study. Inclusion criteria were: distressing psychosis including current auditory hallucinations of at least six months duration; little or no previous experience of mindfulness; and no known illicit or repetitive drug use. Of the 26 identified nine did not meet inclusion criteria for the study; four had extensive previous experience of mindfulness; and five were not currently hearing voices. The remaining 17 were all approached and provided with information about the study by the referring clinician or key worker. Of those initially approached six

declined to take part in the study, one was un-contactable on the details provided, and ten met with the primary researcher. From the ten who met with the primary researcher three declined to take part in the study and one did not attend any further sessions after the initial meeting leaving a final sample of six participants.

2.4.2. Participant characteristics:

Six people entered the study, (Mean age 39.2, SD 12.9). Mean duration of illness was 14 years (SD 13.6). All participants met criteria for a diagnosis of schizophrenia according to Diagnostic and Statistical Manual of Mental Disorders (DSM IV; APA, 1999). All participants were taking antipsychotic medication and receiving standard care from mental health services in the UK including monthly review appointments with a psychiatrist. Those living in supported accommodation received 24 hour nursing support and those living independently received fortnightly visits from a community psychiatric nurse (CPN). Two participants chose to withdraw from the study without giving reason, during the initial baseline period (week 3) and at session one respectively, their data was removed.

The BAVQ-r and PSTRATS were used to establish a profile of participants' auditory hallucinations (see Appendix I for PSYRATS breakdown table for each participant).

Participant **(P) 01** was a 39 year old woman who had a diagnosis of severe depression with psychotic features dating back seven years. Since this time she had experienced frequent (hourly), persistent and distressing persecutory and command voices. The voices elicited suicidal ideation, anxiety, low mood, and paranoia. P01

perceived the voices as malevolent (BAVQ-r malevolence 6/18) and powerful (BAVQ-r omnipotence 10/18). She resisted (BAVQ-r resistance 23/27) them and typically responded by trying to block them out (e.g. with cushions), distraction strategies (e.g. music), shouting/arguing back and at times deliberately self harming. P01 also experienced less frequent, persuasive and occasionally distressing paranoid beliefs. She lived independently with her husband and two children and worked two days a week for a charity organisation. She had no previous experience of mindfulness. P01 identified the metacognitive belief *'if I don't try to control my voices they will control me'*.

P02 was a 56 year old woman with a 33 year psychiatric history and diagnosis of chronic psychotic depression. She experienced some persuasive and distressing paranoid beliefs, and persecutory visual, tactile and auditory hallucinations which elicited anxiety and low mood. P02 described the voices as very frequent almost continuous, loud and distressing. P02 attributed the voices to family members and perceived them as malevolent (BAVQ-r malevolence 17/18) and powerful (BAVQ-r omnipotence 15/18). P02 resisted the voices (BAVQ-r resistance 21/27) and typically responded by using distraction (e.g. television, music), arguing back and self harming. She lived independently with one of her three children. She had experience of one session of mindfulness in a group context at a day centre. P02 identified the metacognitive belief *'if I don't try to control my voices they will control me'*.

P03 was a 49 year old man with a diagnosis of paranoid schizophrenia and a 14 year psychiatric history. He experienced critical and persecutory auditory hallucinations, delusional ideation and distressing paranoid beliefs. P03 attributed the voices to family

members and passing members of the public and described them as continuously occurring but fleeting in duration, loud, and negative. The voices were perceived as malevolent (BAVQ-r malevolence 9/18), with some power (BAVQ-r omnipotence 7/18), and resisted (BAVQ-r resistance 16/27). He responded with distraction strategies (e.g. swimming, radio, shopping) and cognitive strategies such as rationalising and reality testing. P03 lived independently and had attended two group mindfulness sessions in the past. P03 identified the metacognitive belief *'if I don't try to control my voices they will control me and I will believe what they say'*.

P04 was a 22 year old woman who had become unwell two years ago and received a diagnosis of Schizophrenia. She experienced frequent almost continuous, persistent (lasting for hours), whispering auditory hallucinations. She also experienced negative symptoms and frequent and persistent paranoid beliefs. P04 described her voices to be both benevolent (BAVQ-r benevolence 9/18) and malevolent, however her score on the BAVQ-r malevolence subscale (0/18) indicated no perception of voices as malevolent. Her voices were not attributed to any known person, perceived as not powerful (BAVQ-r omnipotence 2/18), and elicited anxiety and low mood at times but reassurance and comfort at other times. In the past she had experienced suicidal ideation associated with hearing the voices. She both resisted (BAVQ-r resistance 10/27) and engaged (BAVQ-r engagement 11/24) with the voices at times, typically responding by distraction (music), blocking strategies (including alcohol), arguing back, engaging with voices and self harming. P04 was currently living in supported accommodation at a rehabilitation unit following a recent admission as an inpatient. She had the most previous experience of mindfulness having had three individual sessions of mindfulness

18months previously. P04 identified the metacognitive belief *'if I don't limit my voices (i.e. using medication) they will become louder and more powerful'*.

2.5.   Procedure:

The primary researcher met weekly with all participants at their home for all aspects of the research; initial meeting, assessment, baseline and mindfulness sessions.

2.5.1. Initial meeting, assessment, and baseline phase:

The initial meeting between the participant and the primary researcher covered: (1) introduction and discussion of the research study including examination of the information sheet, consent form, confidentiality boundaries and questionnaires; (2) participants' current coping strategies for distressing voices, pros and cons of these strategies, and exploring mindfulness as an middle way strategy (see appendix J for figure 4); (3) participants' understanding of mindfulness, previous experience of mindfulness practice, and questions regarding mindfulness; (4) establishing understanding of mindfulness as a strategy aimed at 'relating differently' and not 'getting rid' of voices; (5) Socratic discussion to identify participant's underlying metacognitive belief regarding their voices. Participants were given a 48 hour cooling off period to consider participation in the research study.

At the assessment session participants were encouraged to identify concerns or expectations regarding the study, ask any questions arising, and sign the consent form. Participants completed two profiling questionnaires (PSYRATS & BAVQ-r), three outcome questionnaires (CORE, SMQ, & SMVQ), and at the end of the session the 'living with voices' rating scales. The ratings from this session provided the first baseline data point for each participant.

The baseline phase developed the therapeutic relationship and established a baseline picture of key variables through completion of twice weekly rating scales, in session and over the telephone. Participants experienced varying baseline periods of 3weeks (6 data points), 4weeks (8 data points), 5weeks (10 data points), and 6weeks (12 data points) to evaluate the change that would have occurred had the intervention not been introduced (Kazdin, 1982).

2.5.2. Mindfulness intervention phase:

The mindfulness intervention was provided by the primary researcher who had completed an introductory MBCT workshop, attended a mindfulness meditation course and maintained a personal mindfulness practice for 18 months, although this was her first experience of communicating mindfulness to a client group. The principal supervisor provided weekly supervision and gave feedback on recorded sessions. The content of the intervention sessions followed Chadwick (2006). Each session comprised two 10 minute, script-guided mindfulness meditation practices followed by a 15-20 minute reflective discussion to facilitate guided discovery of insights (metacognitive learning) including answering the three, set metacognitive learning questions. Each mindfulness meditation practice began by grounding awareness in the body, then extending to include the breath,

and finally opening awareness out to all experiences. Guidance comments identified directly psychotic sensations and associated reactions to bring awareness to and were given frequently to reduce likelihood of individuals getting lost in voices or paranoid thinking.

Three components of mindfulness were emphasised during practice; reacting versus letting go, experiential avoidance versus turning towards the difficult, and judgement versus acceptance of psychosis. During the mindfulness practice session each participant experienced auditory hallucinations to differing degrees. Participants were encouraged to bring awareness to difficult voices (or images, emotions, thoughts) and notice habitual coping strategies (e.g. experiential avoidance, struggling). Participants were encouraged to practice letting go of these habitual responses, instead allowing and observing difficult experiences without reacting to them. Discussion facilitating metacognitive insight focused on identifying that mindful acceptance and observation of psychotic sensations can be calming and empowering whereas reacting, judging, struggling and ruminating creates distress (Chadwick, et al., Under review). Through experimentation participants discover relinquishing habitual responding during periods of mindfulness does not elicit the feared consequences in their identified metacognitive belief.

Each intervention session ended with completion of the rating scales. Participants were contacted by telephone midweek by the primary researcher to complete a second weekly rating scale. The duration of the mindfulness intervention followed the 8 week format applied in MBCT (Segal, et al., 2002) and MBSR (Kabat-Zinn, 1990) treatment approaches. Participants were provided with CDs of the 10 minute guided mindfulness meditation practice. Practice between sessions was encouraged but not required (as this is

not in keeping with the nature of work in psychosis) and a log of personal practice completed was recorded.

3. Results:

3.1. Distress, believability, and metacognitive belief:

Figure 1 shows distress, believability and metacognitive belief ratings plotted over time (two data points: 1 week) for the four participants. High ratings indicate high distress associated with voices, high believability of what voices say, and high conviction in the identified metacognitive belief.

3.1.1 P01 ratings:

For P01 during the baseline period (data points 1-12: weeks 1-6) ratings of distress, believability, and metacognitive belief show wide variability. The three variables change together and in-session ratings are typically higher than between-session ratings. Mindfulness intervention began at week 7 (data point 14). After 4weeks of mindfulness intervention (data point 20) in-session ratings and variation show some reduction but ratings remain variable and within the baseline range. Ratings of believability, distress, and metacognitive belief continue to show an in-session versus between-session difference to ratings. This pattern may reflect the low level of practice between sessions completed by P01 (see table 1 for practice log).

3.1.2. P02 ratings:

At baseline (data points 1-10: weeks 1-5) distress, believability, and meta-cognitive belief are rated at the high end of the rating scale with some variability in ratings. Mindfulness intervention began at week 6 (data point 12). After introduction of the mindfulness intervention ratings continue to vary within the rating range seen at baseline. In-session ratings of distress and metacognitive belief show reduced variation with ratings at the low end of the baseline range. Interestingly distress and metacognitive belief change together.

3.1.3. P03 ratings:

During baseline (data points 1-8: weeks 1-4) distress, believability, and metacognitive belief show wide variability. Believability and metacognitive belief change together, reducing then increasing in the final week. Distress shows an in-session versus between-session difference in ratings with lower ratings in-session. Mindfulness intervention began at week 5 (data point 10). There was no discernable reduction in ratings or variability of ratings following introduction of mindfulness practice.

3.1.4 P04 ratings:

At baseline (data points 1-6: weeks 1-3) believability and metacognitive belief ratings show some variability and change together. Distress ratings appear fairly stable with a spike increase at the end of the baseline period (data point 6). Mindfulness intervention began at week 4 (data point 8). Ratings of believability and metacognitive belief show increased stability but distress ratings continue to vary following introduction of mindfulness.
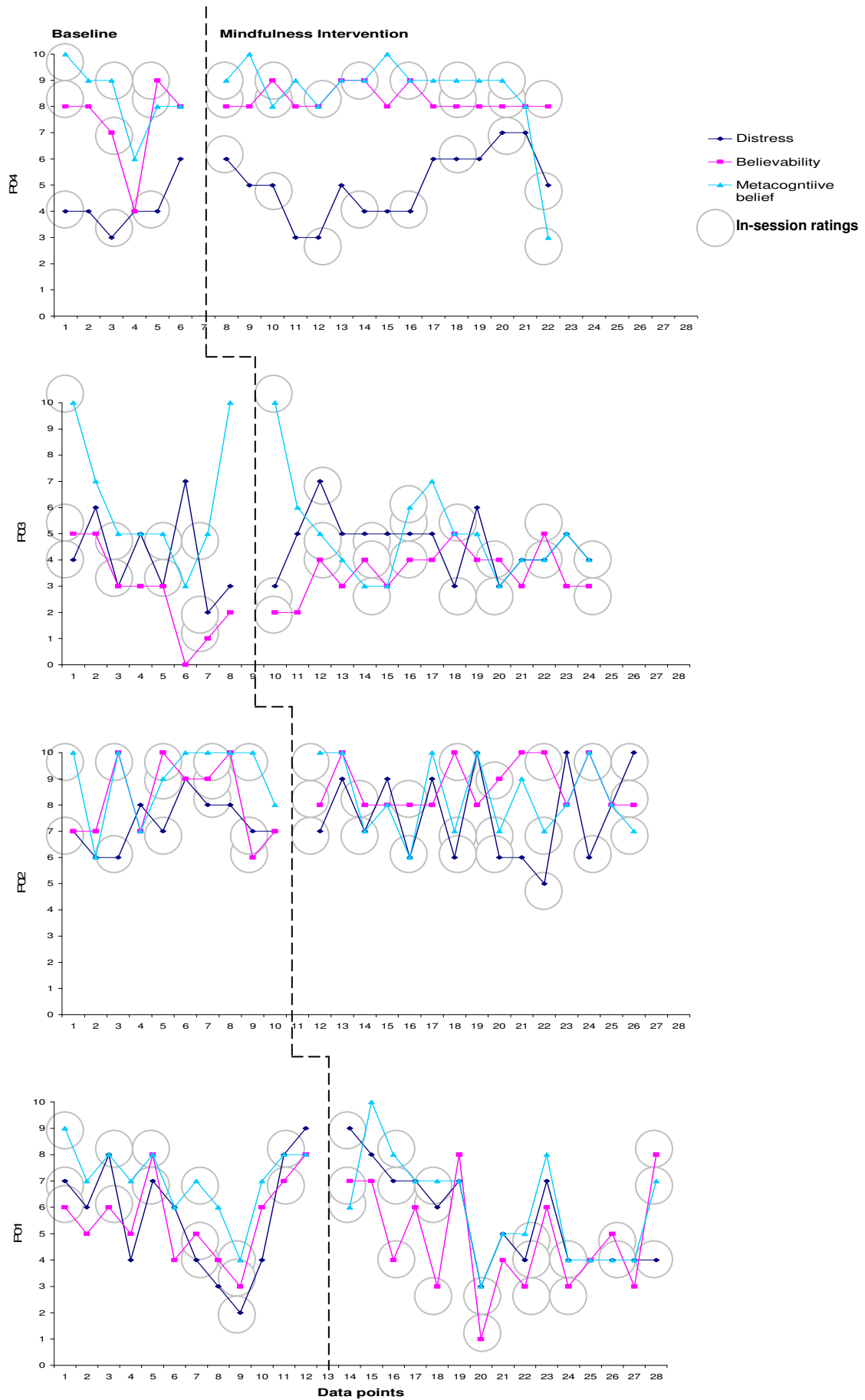
Figure 1. Ratings of distress, believability, and metacognitive belief associated with hearing voices for the four participants during baseline and mindfulness.

3.2.   Personal control and voices control:

Figure 2 shows ratings of perceived personal control over life and voices control over life for each participant plotted over time (2 data points: 1 week) across baseline and mindfulness. Ratings indicate the degree of control participants perceive themselves (personal) and voices to have over their lives, the higher the ratings the higher the level of perceived control.

3.2.1.   P01 ratings:

During baseline (data points 1-12: weeks 1-6) personal control and voice control show wide variation with no indication of systematic change. Mindfulness intervention began at week 7 (data point 14). Both personal control and voices control ratings continued to show variation during the mindfulness intervention.

3.2.2.   P02 ratings:

During baseline (data points 1-10: weeks 1-5) personal control and voices control show some variation with no indication of patterns of change. Mindfulness intervention began at week 6 (data point 12). Both personal control and voices control continue in a similar pattern to baseline with no change associated with the start of the intervention. Consideration of in-session ratings only gives a pattern of more stable ratings at the lower baseline range for voices control.

3.2.3.   P03 ratings:

At baseline (data points 1-8: weeks 1-4) personal control ratings are fairly stable and voices control ratings show some variation. Mindfulness intervention began at week 5 (data point 10). Both personal control and voices control ratings continue to show similar patterns of variation as at baseline.

3.2.4. P04 ratings:

Over the baseline (data points 1-6: weeks 1-3) phase ratings of personal control and voices control decreased and increased respectively. Mindfulness intervention began at week 4 (data point 8). Both ratings of personal control and voices control continue to show similar patterns of variation among ratings as seen at baseline.
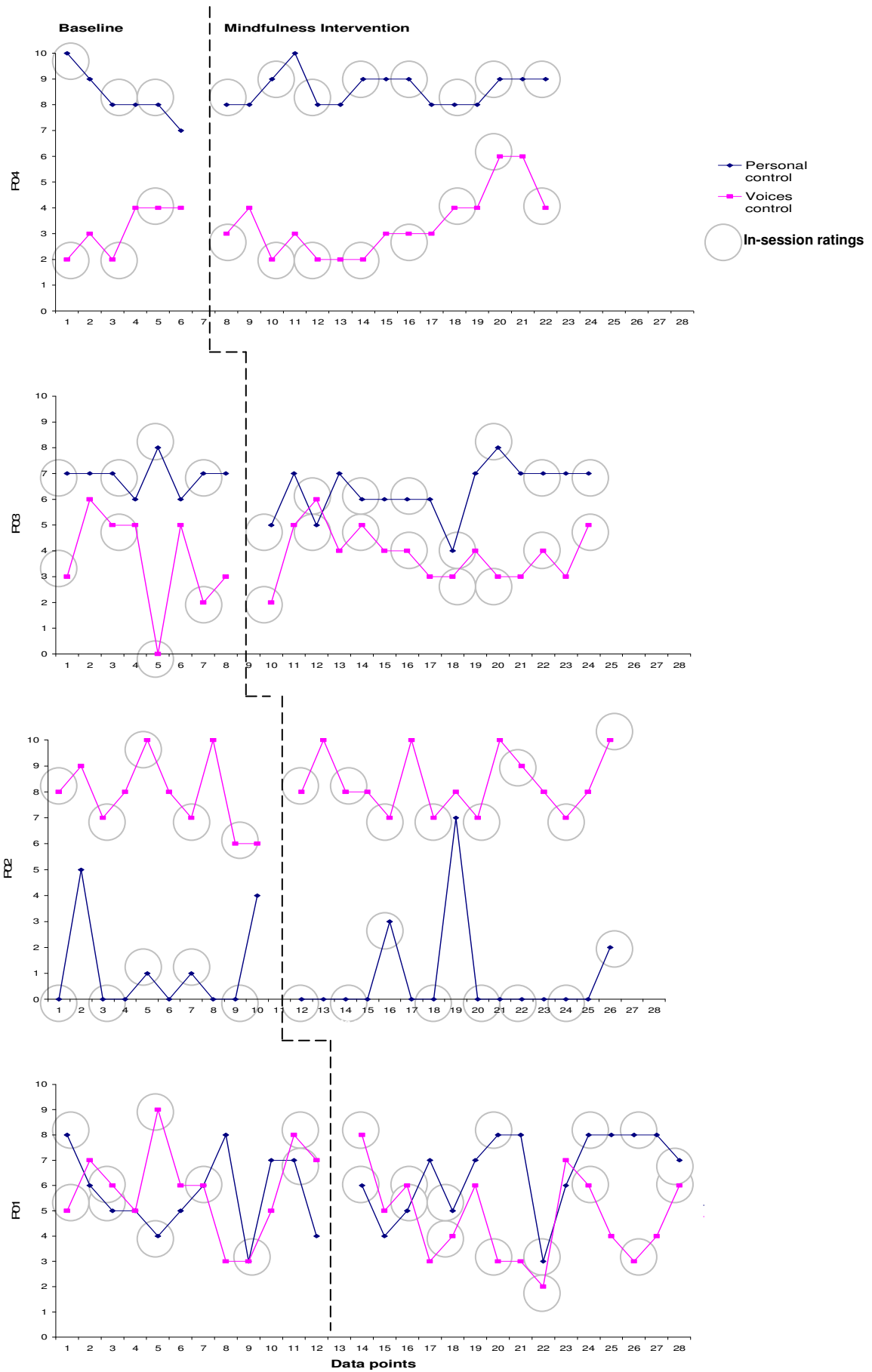
Figure 2. Ratings of perceived personal control over life and voices control over life for the four participants during baseline and mindfulness.

3.3.   Acceptance of voices and acceptance of self:

Figure 3 shows ratings of acceptance of voices and acceptance of self plotted over time (2 data points: 1 week) across baseline and mindfulness. High ratings indicate a high level of acceptance both for voices and of self.

3.3.1. P01 ratings:

During baseline (data points 1-12: weeks 1-6) ratings of acceptance of voices show some variation and ratings of acceptance of self show wide variation. Following start of the mindfulness intervention at week 7 (data point 14) ratings of acceptance of voices stabilise and are consistently at the top of the scale (with the exception of data point 17). Acceptance of self ratings remain within the baseline range and demonstrate an in-session between-session rating effect.

3.3.2. P02 ratings:

At baseline (data points 1-10: weeks 1-5) acceptance of voices ratings show wide variation and no indication of systematic change. Ratings of acceptance of self show consistently low ratings. Mindfulness intervention began at week 6 (data point 12). Both show indication of an in-session versus between-session difference to ratings. In-session ratings are generally higher than between-session ratings for acceptance of voices, whereas for acceptance of self between-session ratings are generally higher than in-session ratings. It does not appear that acceptance of self and acceptance of voices change together.

3.3.3. P03 ratings:

At baseline (data points 1-8: weeks 1-4) ratings of acceptance of voices and acceptance of self both show some variation and appear to change together to some extent. However in the final week of baseline (data point 7 & 8) variation of ratings increased for acceptance of self with a sudden spike and drop. Mindfulness intervention began at week 5 (data point 10). Acceptance of voices ratings show a slight increase following introduction of mindfulness. Acceptance of self ratings remain within the range observed at baseline but show increased stability. The two ratings appear to change together.

3.3.4 P04 ratings:

At baseline (data points 1-6: weeks 1-3) acceptance of voices and acceptance of self show fairly consistent high ratings with some variation. Mindfulness intervention began at week 4 (data point 8). During the first six weeks (data points 8-19) of intervention both acceptance of voices and acceptance of self show continued consistent high baseline ratings. However week 7 and 8 of intervention (data points 20-22) show decreases in ratings of both acceptance of voices and acceptance of self.
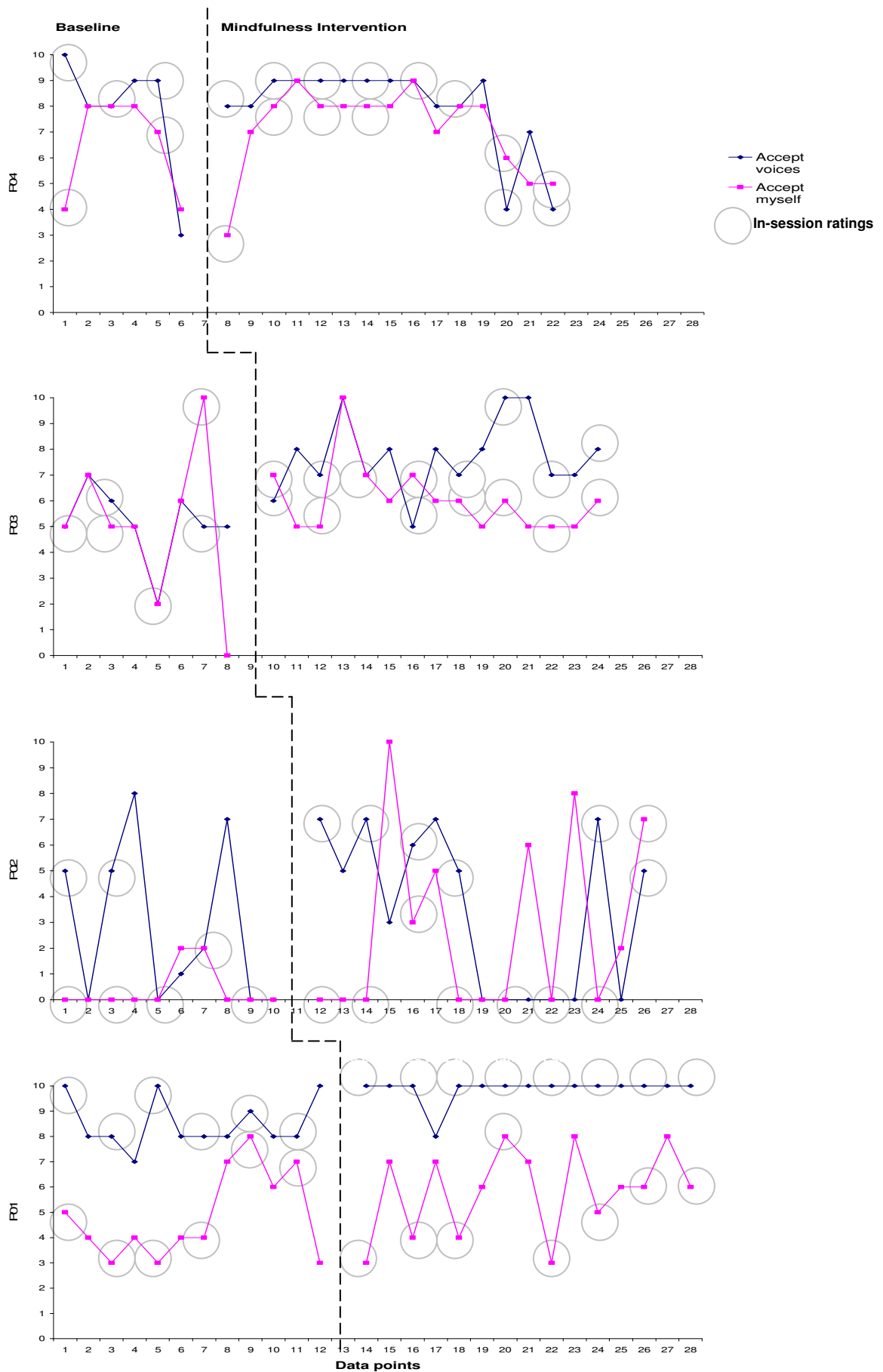
Figure 3. Ratings of acceptance of voices and acceptance of self for the four participants during baseline and mindfulness.

3.4.   Profiling and outcome measures:

The current research was not an outcome study and followed a case study approach with a small sample. As such, calculation of mean scores or completion of statistical analysis of outcome measures is not appropriate in this study. Outcome measure scores provide further evidence of potential changes in the relationship to distressing experiences and the process of change occurring for each individual responding mindfully to psychosis. Comparison of individual scores can be made to mean scores within the literature (see Chadwick, et al., Under review). Table 1 shows comparison scores pre and post mindfulness intervention on profiling and outcome measures.

On the PSYRATS profiling measure comparison with mean pre-intervention scores identified in the Chadwick, Hughes et al. (Under review) study indicated that P01, P02, and P03 all presented with greater severity and intensity of voices and paranoia pre-intervention. Comparison of pre-post intervention scores indicates P02, P03, and P04 show reduced scores on the voices subscale and P01, P02, and P03 show reduced scores on the paranoia subscale. This indicates that severity and intensity of voices and paranoia may be reduced for these participants following mindfulness (Pre and Post PSYRATS breakdown table 2 Appendix I).

On the BAVQ-r profiling measure, P01 and P03 show post-intervention reductions in all scores suggesting that beliefs about voices and relationship to voices may be altered. P02 and P04 both show post-intervention increases in benevolence scores on the BAVQ-r; however this does not indicate increased distress. P02 reported decreased malevolence and no change to omnipotence scores post-intervention. P04 continued to

report zero malevolence both pre and post intervention on the BAVQ-r but indicated increased omnipotence post-intervention.

On the CORE outcome measure, table 1 shows P02 and P03 reported reduction in all subscale scores (except problems which remained unchanged for P03) and total score indicating possible improved clinical functioning. For P01 and P04 total CORE scores increased and remained unchanged post-intervention, respectively. Comparison with mean pre-intervention scores indicates that P01, P03, and P04 reported low clinical functioning scores at the study outset indicating they represent a less disturbed clinical sample.

On both the SMQ and the SMVQ P01 and P02 showed a pre-post intervention increase in mindfulness score. P03 and P04 showed reduced mindfulness scores post-intervention on both the SMQ and SMVQ. However comparison with mean pre-intervention scores(Mean SMQ = 31.4, Mean SMVQ 26.9; Chadwick, et al., Under review) indicate that both P03 and P04 were very mindful at the outset of the study (SMQ = 66, SMVQ = 59, and SMQ = 67, SMVQ = 77 respectively).

Table 1. Comparison scores pre and post mindfulness intervention on profiling and outcome measures.

	(Mean scores*)	P01		P02		P03		P04	
Profiling Measures (min, max possible)		Pre	**Post**	Pre	**Post**	Pre	**Post**	Pre	**Post**
PSYRATS $ Voices (0,44)	(29.6)	32	**33**	35	**34**	32	**27**	25	**21**
Paranoia (0,24)	(13.6)	18	**15**	19	**17**	15	**13**	14	**16**
BAVQ-r $ Malevolence		6	**4**	17	**14**	9	**8**	0	**0**
Benevolence		0	**0**	2	**8**	0	**0**	9	**13**
Omnipotence		10	**9**	15	**15**	7	**5**	2	**7**
Resistance		23	**21**	21	**24**	16	**14**	10	**7**
Engagement		0	**0**	0	**0**	0	**0**	11	**11**
Total (0,105)	(49.9)	39	**34**	55	**61**	32	**27**	32	**38**
Outcome Measures (min, max possible)									
CORE $ Functioning		1.33	**2**	2.75	**2.33**	1.33	**0.42**	0.92	**0.67**
Problems		1.5	**1.33**	2.83	**2.58**	1.25	**1.25**	0.42	**0.92**
Wellbeing		2.75	**2.75**	3	**2.5**	0.75	**0.25**	1.5	**0.75**
Total (0, 4)	(2.07)	1.61	**1.82**	2.82	**2.46**	1.21	**0.75**	0.79	**0.79**
SMQ thought & images ~ (0, 96)	(31.4)	22	**29**	19	**29**	66	**59**	67	**47**
SMVQ voices ~ (0, 96)	(26.9)	25	**29**	15	**29**	59	**57**	77	**60**
Practices completed		-	**4**	-	**0**	-	**2**	-	**0**

$ Decreased scores indicate improvements
~   Increased scores indicate improvements
*   Mean pre-intervention comparison scores taken from Chadwick, Hughes, et al. (Under review)

The practice log tally in table 1 indicates that all participants completed very few or no daily mindfulness practice between sessions provided by the researcher.

4. Discussion:

The current study aimed to establish the affective and cognitive change occurring for individuals responding mindfully to distressing auditory hallucinations. The study also aimed to extend the findings of previous research to identify key variables indicated in responding mindfully to distressing voices and consider any relationships between these variables.

4.1.   Summary of findings:

Change in the present study can reflect either lower ratings than baseline, more consistently low end ratings of baseline range, or just simply more consistency of ratings. However, no clear changes or relationships among variables were indicated across participants, with different factors appearing to change following introduction of mindfulness for different individuals at different times. Therefore it is difficult to draw conclusions about common cognitive or affective variables implicated or to compare participants. Limited discussion of common and relationships is provided, followed by more specific consideration of the individual cognitive and affective change indicated for each participant.

4.1.1. Distress, believability and metacognitive belief:

Following introduction of mindfulness P01 in-session (see below for discussion of practice effects) ratings of distress, metacognitive belief, and believability reduced in variation and showed improvement (although remaining within baseline range). P02 also showed reduced in-session variation and ratings for distress and metacognitive belief. This fits to some extent with the case study findings of Newman-Taylor, Harper, and Chadwick (Under review) that believability and distress both declined following introduction of mindfulness intervention. Furthermore, as with the two reported case studies (Newman-Taylor, et al., Under review) both P01 and P02 reported increased levels of mindfulness post-intervention. P03 and P04 both reported reduced variation among ratings of distress, believability and metacognitive belief and believability and metacognitive belief respectively, although no reduction in ratings was reported.

For P01, the three ratings appeared to move together, both at baseline and following intervention (particularly in between-session scores). This suggests that changes in level of distress may be related to the meaning associated with voices. For P02 ratings of distress and metacognitive belief also appear to show some indication of changing together. This supports the view that distress may be related to the meaning given to psychotic sensations (Chadwick, 2006) and would explain why change in one variable effects change in another as seen in the Newman-Taylor, Harper, and Chadwick study (Under review). However, this potential relationship was not replicated in ratings for P03 or P04.

4.1.2. Personal control and voices control:

Participants each showed no systematic change regarding aspects of control following introduction of mindfulness. P01's ratings of personal control and voice control showed no clear pattern of change compared to baseline, although personal control ratings began to be more consistently rated at the high baseline range. P03 ratings of personal control showed no improvement with slight increased variation. For P04 ratings of personal control were high and ratings of voices control were low throughout baseline and continued into the intervention phase. No change to ratings may be expected given these baseline ratings as there remained minimal room for improvement following intervention. P02 continued to experience personal control as low and voices control as high throughout the baseline and intervention phases with no apparent impact from introduction of mindfulness. Voices control is generally unlikely to be rated very low by participants due to presence of a constant unrelenting voice which may always be

perceived as having some control over life especially if it prevents the individual from doing things.

P02's and P04's ratings reflected to some extent the expected pattern that personal control and voices control reflect opposite ends of the rating scale and increases in personal control would reflect decreases in voices control, and visa versa. However there was no consistent pattern of change across participants or between the two variables.

Differences in patterns across and between participant ratings of personal and voices control may reflect differing interpretations of 'control'. To some degree mindfulness can be understood as encouraging a relinquishing of all attempts at 'control' instead adopting a stance of acceptance. However 'control' could also suggest not allowing one's self 'to be controlled by' experiences, in the present study distressing voices. In this case decreased control of voices would reflect increased personal control with regards to 'choicefulness' of awareness, and letting go of reacting. Therefore improved personal control reflects a greater control over the processes that maintain distress i.e. a change in the relationship with distressing voices (the core aim of mindfulness) and not through a sense of improved control *over* voices. If ratings reflect a sense of not being able to have control over voices, they are likely to remain high for voices control and low for personal control, given the continued experience of distressing voices throughout practice of mindfulness. Interestingly each of these interpretations represents a relatedness between personal control and voices control, with the perceived height of one reflecting a perceived lowness of the other. This relationship was not notable or clearly indicated in the present study.

Changes to perceived aspects of control are also demonstrated in other areas of the current study not based on subjective ratings. Scores on measures of clinical and daily functioning as indicated by the CORE also reflect experience of control, with individuals typically reporting being restricted in activities by voices. However, the impact of control cannot be separated from the influence of other factors such as distress. Both P02 and P04 showed improvement to CORE scores following introduction of mindfulness, suggesting potential change to perceived personal control or voices control. P04 showed no change to very low baseline CORE score suggesting limited impact on daily functioning at study outset and is in keeping with her ratings of control.

4.1.3. Acceptance of voices and acceptance of self:

Following introduction of mindfulness ratings of acceptance of voices showed greater consistency for P01 and initially for P04, higher in-session ratings compared to in-session baseline for P02, and higher ratings for P03. However in all cases the changes seen were minimal. Improvements in acceptance following introduction of mindfulness would support the proposition of acceptance as a component of the processes indicated to be operating in responding mindfully to distressing psychosis (Abba, et al., 2007). No clear change to ratings of acceptance of self was seen for any participant following introduction of mindfulness. P03 reported greater consistency of ratings of acceptance of self although no increase was observed. Both P01 and P02 showed higher rating of acceptance of self between-session than in-session. P02's rated acceptance of self continuously as 'none-at-all' in-session. This pattern suggests that both P01 and P02 experienced less acceptance directly following completion of mindfulness practice. This may reflect a difference in interpretation of terminology. If acceptance is viewed as a

resignation, hopelessness or giving up to the situation, this will elicit very different responses to the accepting stance implied in mindfulness.

P04 continued to consistently highly rate both acceptance of voices and acceptance of self following introduction of mindfulness. However both ratings of acceptance decreased towards the end of the intervention. It is difficult to make sense of this finding, but it reflects a similar pattern of ratings seen at baseline and therefore suggests no change as a result of mindfulness practice.

The two ratings of acceptance showed no clear relationship or association between themselves or across participants. P03 and P04 ratings appeared to indicate that increased acceptance of once variable was mirrored by increased acceptance of the other variable; however P04 ratings indicated a converse effect. The findings of the grounded theory analysis would suggest that acceptance of self and acceptance of psychosis are subcategories of the overall variable acceptance which is indicated as a process in responding mindfully to distress (Abba, et al., 2007). The current study did not provide a clear discernable indication of change in acceptance for the participants following mindfulness. As with potential variable interpretation of control it is possible that differing patterns of acceptance ratings reflect differing interpretation of the term acceptance. It is more likely though that different variables of change are indicated in responding mindfully for different participants. As Abba et al. (2007) identified grounded theory provides a process 'grounded in individuals experience' to understand core processes but all participant's don't show and don't need to show all variables or categories that are identified.

4.1.4. Summary of cognitive and affective change for P01:

All P01's ratings show a negative shift in post-intervention changes at week five. This fits with P01's self-reported increase in experience of difficult and critical voices. The literature suggests that as individuals begin to bring greater awareness to psychotic experiences ('turn towards') and lessen strategies such as active avoidance, increased frequency and perceived worsening of experiences is reported (Chadwick, 2006). This reflects increased *awareness* of psychotic experiences rather than an actual increase in experience.

In general P01 showed some slight improvements to ratings of distress, meaning associated with voices (believability, metacognitive beliefs), and acceptance of voices following mindfulness practice. These changes were supported by outcome measures reflecting increased reported mindfulness and slight improved perception of voices. The cognitive and affective changes for P01, increased mindfulness, some reduction to distress and meaning of voices, echo findings within the literature. However the changes noted for all variables were minimal and be attributable to factors other than mindfulness practice, e.g. sense of support through weekly contact with the researcher.

P01 appeared to revert back to baseline and habitual strategies of responding to distressing voices and was unable to maintain and generalise potential gains being made during in-session practice between sessions. Although P01 reported being able to see the benefit of mindfulness during practice sessions she also identified on going concern that mindfulness would not be able to help at times of extreme distress or difficulty. It seems likely that lack of practice to consolidate the skills cultivated in practice limited their use outside of guided sessions. This effect has been indicated elsewhere in the literature. In a study by Shapiro, Bootzin, Figueredo, Lopez, & Schwartz (2003) adherence to practice

was associated with improved outcome for cancer patients. Also a study by Ramel, Goldin, Carmona, and McQuaid (2004) indicated level of mindfulness practice completed predicted decreases in post-intervention rumination scores and associated affective symptoms in individuals with lifetime mood disorders.

4.1.5. Summary of cognitive and affective change for P02:

P02 showed on a number of variables variation to ratings associated with being completed in-session or between-sessions. However, as with P01 changes on variables were minimal and no systematic change that can be attributed to the introduction of mindfulness was observed. Consideration of only in-session ratings indicated some improvement post-intervention to ratings of distress, metacognitive belief, believability and acceptance of voices. This discrepancy between responses may represent an inability or reluctance to generalise mindfulness skills practiced in-session to between-session distress and a reluctance to give up habitual coping styles. During practice session discussion P02 reported reluctance in bringing awareness to breathing as she did not want to give up on "my busy mind", a strategy used to distract from voices. However P02 also completed no additional practice outside of mindfulness sessions, therefore it is not possible to tease apart if the lack of generalising seen between ratings reflected reluctance to give up on habitual responding, lack of practice (Ramel, et al., 2004; Shapiro, et al., 2003), or continued variation to ratings seen at baseline. Lack of adherence to practice may also account for the absence of any gains (either in- or between-session) following introduction of the mindfulness intervention in regards to acceptance of self and aspects of control.

Consideration of mean comparison pre-intervention scores in the Chadwick, Hughes et al (Under review) study indicate that P02 presented with notably greater impacted clinical functioning and increased perceived intensity and severity of auditory hallucinations and paranoia at the outset of the study. Thus limited benefit from mindfulness practice in regards to ratings of acceptance and control may reflect greater severity of presentation. However it is noteworthy that P02 made the greatest gains across all participants in terms of increased mindfulness scores post-intervention. This may suggest that for P02 learning to respond mindfully to distressing voices may not necessarily involve aspects of control or self acceptance.

4.1.6.   Summary of cognitive and affective change for P03:

P03 showed improvement following mindfulness practice in terms of reduced variation among ratings although this was minimal and no systematic changes associated with introduction of mindfulness were observed in the ratings. However, P03 did show improvement with regard to pre-post intervention clinical functioning (CORE score). Improved clinical functioning through mindfulness practice. This reflects the findings of Chadwick (2005) teaching mindfulness within a group context. Comparison with mean pre-intervention scores show that P03 was notably above the expected mean with regard to level of mindfulness prior to study onset (Chadwick, et al., Under review). For P03 mindfulness practice appeared to influence aspects of daily functioning and not the experience of psychotic symptoms. Again consideration needs to be given to potential limitation to gains made during mindfulness practice sessions due to limited practice between-session.

4.1.7.   Summary of cognitive and affective change for P04:

In general P04 shows no systematic cognitive or affective change following introduction of the mindfulness intervention with indication of slightly worsening of ratings of acceptance, control and distress following intervention. As reported in the literature not all participants benefit from mindfulness-based approaches (Ma & Teasdale, 2004; Teasdale, et al., 2000) and P04 may simply have not benefited from the practice of mindfulness during the current study. In further support of this hypothesis are a number of aspects of P04's baseline assessment that indicate potential limited effectiveness to mindfulness including; high levels of pre-intervention mindfulness, high ratings of personal control, low ratings of voices control and low ratings of distress. These factors are likely to have impacted upon P04's motivation to relate differently to voices although this is contrary to her self-reported motivation. Furthermore, P04 frequently used alcohol as a coping strategy with voices which had a number of practical implications for in-session practices. Quality and engagement in mindfulness may have been moderated by attendance at practice sessions whilst hung-over or sleep deprived. See below for discussion of sample limitations.

4.2.   Considerations, limitations and future research:

The current research suffers from a number of flaws and limitations that may account for the limited consistency of cognitive and affective change indicated across participants and apparent lack of a discernable effect of mindfulness.

It must be considered that the current study may reflect limited or ineffectiveness of mindfulness for distressing auditory hallucinations. Also, research demonstrates that not all individuals respond to mindfulness (Segal, et al., 2002) with some individuals

benefiting from some applications of mindfulness and others not. Therefore it is possible that the current research recruited four participants who do not respond to mindfulness. Continued research into the application of mindfulness to psychosis will indicate whether either of these suppositions was the case, but given the current literature both are very unlikely to have been true. Furthermore, within the current study participants demonstrated some gains following introduction of mindfulness which indicates at least a limited effect.

Equally consideration has to be given to potential limited effect due to the provision of the mindfulness practice. Trainer effects, such as limited previous experience of providing mindfulness cannot be ruled out. However research has indicated that previous experience of providing mindfulness is not necessary for practitioners, only continued personal practice prior to and throughout the intervention, a criterion fulfilled by the trainer (Kostanski & Hassed, 2008). Nevertheless, further research ruling out the impact of lack of previous experience would be beneficial.

The limited effects within the current study may alternatively reflect characteristics particular to the current sample of participants. Differences were apparent across participants with regard to symptom emphasised for consideration in mindfulness (e.g. P01's emphasis on distress and meaning, P03's emphasis on paranoia) and this may have mediated the effects. Future research that matches participant presentation may limit this effect and indicate more consistent processes of change.

However there are a number of other participant characteristics that could have influenced outcome. Participants within the study varied from one another with regard to experience and severity of psychotic symptomatology and other aspects of presenting psychopathology. In comparison to similar research, at the study outset participants in the

current study presented with greater voice severity and intensity but reduced distress in terms of beliefs about and ways of relating to voices (Chadwick, et al., Under review). Furthermore, two of the four participants were already identified to be very mindful prior to the study onset which may have limited the scope for potential further mindfulness development.

Future research could assess whether varying levels of pre-intervention mindfulness mediate its effectiveness as an intervention or act on different processes. In addition further research could establish if the findings of the present research were limited by participants being less disturbed and more accepting at study outset compared with other studies, thus limiting the room for changes to be indicated. In addition limiting sample selection to more specific groupings may indicate clearer similarities in variables of change. However, the wider mindfulness literature frequently assesses application to very selectively sampled groups and it is important that understanding is also gained that reflects real world presentation to ensure not to lose generalisability of mindfulness application.

Beyond participant characteristics, the current research was limited by a number of other aspects of sample selection. Uncontrollable constraints on time, given time needed for intervention completion, and research commitments, limited more rigorous sample selection and prevented re-recruitment following participant dropout. Greater stringency of inclusion criteria may have reduced potential inappropriateness of the sample selected. As mentioned, restrictions to degree of pre-intervention mindfulness in study participants may improve responses to mindfulness practice and, in the current research, this may have reflected inclusion of individuals with minimal previous

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experiences of mindfulness practice. Future research could exclude participants with any previous experience of mindfulness or with particularly high indicated pre-intervention levels of mindfulness.

The current research may have benefited from more robust assessment of participant motivation to change their relationship with current psychotic experiences. Motivation and readiness to change have frequently been cited in research as confounding variables (Erikson, Stevens, McKnight, & Figueredo, 1995; Prochaska & Di Clemente, 1982) and future research potentially needs to consider these factors in a more clearly defined way before recruiting individuals to take part in mindfulness practice.

4.3.   Methodological limitations:

Finally there are a number of methodological issues that should be considered with regard to the findings of the present study. The small study sample and self-report methodology applied limit the generalisability of any findings as demand characteristics cannot be ruled out. Furthermore, the study did not re-administer outcome measures at the end of the baseline period prior to beginning of the intervention. It is therefore not entirely clear if changes noted on pre-post measures indicated changes as a result of mindfulness or if they were present at the end of baseline and reflect the effect of passage of time.

Multiple-baseline methodology applied in this study is subject to a number of potential limitations. Methodology utilising visual analyses to identify presence of effects is at risk of making increased type I or type II errors (Ferron & Jones, 2006). However given that the present study was not an outcome study and so did not infer treatment effectiveness, effect size or clinical significance from the data this concern is not

maintained. Use of this methodology does however limit the degree of inferences that can be made from the findings and in all cases further research would be required to replicate any changes observed.

Furthermore the current research did not follow a response-guided design (Ferron & Jones, 2006). That is, rather than the length of each participant's baseline phase being determined by their emerging data the present study used predetermined baselines that were established prior to collection of any data. Use of this methodology would be particularly indicated in studies establishing treatment effectiveness however in the present research given the variability of ratings greater clarity of the cognitive and affective change for each participant may have been indicated from a response-guided design.

Perhaps most importantly, given some of the findings in the current research, future research studies need to consider the issue of participant adherence to practice. The current study design did not stipulate that practice had to be completed by participants and participants practiced either none or very little mindfulness between sessions. Practice was encouraged each week but not required as a coercive approach is not in keeping with psychosis work. Given the clear indication on some participant ratings of limited ability to generalise in-session gains to between-session distress it seems likely that some limitation to overall effectiveness of mindfulness reflected the absence of practice.

Future research would benefit from a commitment to practice being gained from participants prior to commencing mindfulness and greater emphasis being placed on reinforcing the role and importance of practice. Practice is a requirement of MBSR and MBCT approaches and if the current results were to be replicated it may be appropriate to

consider the practicalities and implications of making it a requirement with mindfulness for psychosis.

Finally, the role of the author as researcher, study designer, data gatherer, and therapist may have impacted upon aspects of the research process and the interpretation of the study findings. The additional motivation for the researcher to complete the study as part of an educational course requirement may have also been influential to the participants involved in the study. Following the initial meeting with the researcher participants were given the opportunity to withdraw from taking part in the study however participants may have been influenced by a desire to 'help out' the researcher rather than an actual interest or motivation associated with mindfulness. During participation in the study development of a therapeutic relationship between participants and the researcher may also have resulted in participants feeling obliged or keen to remain in the study to facilitate and please the researcher rather than due to experienced benefits or interest in mindfulness. The multifaceted role of the author is also likely to have had other direct implications. Awareness of all aspects of the research, e.g. including those participants not demonstrating effects from mindfulness practice, may have influenced the researcher and continuing process of the research towards achieving desired outcomes and effects, albeit without the researcher's awareness. Furthermore, although not explicitly reported upon within the study write up, the author/researcher was exposed to the qualitative information gathered verbatim during the clinical mindfulness session contacts. This may have provided the author with a context in which to interpret the results and is likely to have influenced the significance the attributed to them in interpretation.

4.4.   Clinical implications:

Although the findings from the research do not provide a consistent picture of the cognitive or affective changes across participants or indicate consistent key variables, there are a number of considerations for clinical practice.

The present study indicates that mindfulness can be actively, and to some extent effectively, engaged in for participants presenting with a variety of psychotic presentations. In addition, the absence of reported negative effects associated with mindfulness further reduces the concern regarding teaching of mindfulness meditation practice to individuals experiencing psychosis. The design of the present study provides support for the specifically adapted format of mindfulness meditation practice indicated by Chadwick (2006), with reduced 10minute mindfulness practice times and reduced periods of silence during the practice.

Worryingly, the study does highlight the general reluctance of individuals to engage in practice outside of session and if benefits will be significantly limited without practice it may not be appropriate to pursue mindfulness with some individuals. This highlights the potential need for greater clinician input and contracted agreement before commencing mindfulness practice. Furthermore the issue of practice may indicate the greater ease of applicability of mindfulness within in-patient and rehabilitation settings where increased support is present.

Finally, the research cannot exclude the possibility that the low level of effectiveness of mindfulness across participants reflected trainer provision and as such clinicians planning to provide mindfulness may require further training in addition to personal practice and completion of workshops. Close supervision, though appropriate for all clinicians providing intervention, may be particularly pertinent for a novice trainer.

4.5.   Conclusions:

In summary the present research indicates that for these four participants the cognitive and affective changes occurring following introduction of mindfulness practice for distressing voices varied considerably. Although some indication of gains in regards to stability or reduction of ratings is evident the study is unable to establish if differences between participants reflected differing participant characteristics, methodological constraints or reduced effectiveness of mindfulness as an intervention.

Apparent gains, although minimal, indicated in the research do support the growing body of literature indicating use of mindfulness with distressing psychosis including the format of provision and applicability of meditation practice with individuals experiencing active psychosis. Further research is needed to confirm the cognitive and affective change occurring when responding mindfully to psychosis and whether varied variables are implicated depending on participant presentation. Finally confirmation of the role of confounding variables, such as practice effects, in mediating the effectiveness of mindfulness would enable the development of optimal application to psychosis.

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Appendices

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Appendix A

Behavioural and Cognitive Psychotherapy guidelines for submitting a paper   A

Appendix B

University of Southampton School of Psychology ethical approval   B

Appendix C

Berkshire Research Ethics Committee (REC) ethical approval   C

Appendix D

Hampshire Partnership NHS Trust Research and Development approval   D

Appendix E

Data Compliance approval   E

Appendix F

On Headed Paper with
Running header: Study Number: 08/H0505/161 Version 4. October 2008

Participant Information Sheet

Title: **Process of Change in Mindfulness for Psychosis**
Researcher: **Alexandra Lievesley**
Study Number: 08/H0505/161

Participant Identification: _ _ _ _ _ _ _ _ _ _

We would like to invite you to take part in a research study into the process of change occurring in individuals responding mindfully to distressing psychosis. Before you decide you need to understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully. Talk to others about the study if you wish.

Part1:
What is the purpose of the study?
The study is to look at the process of change occurring for individuals who respond mindfully to distress caused by hearing voices. The study will also be part of an educational project.
Mindfulness originates in Eastern Buddhist traditions, and has been defined as "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgementally to the unfolding of experiences moment to moment".
The idea in applying mindfulness to distressing psychosis is that distress is not an inherent part of that experience but is rather the result of our reaction to our experience. The aim is to change our reaction to our experience, rather than changing the content of the experience. We do this by increasing our awareness of our experience in the present moment and encourage acceptance of what is present without reaction or judgement.
Mindfulness has been used as an intervention for a variety of conditions (e.g. depression, chronic pain) each focusing on changing an individuals response to a distressing internal experience.
Mindfulness is taught through the practice of guided meditation and discussion of what is noticed and learnt during periods of mindfulness.

Why have I been invited?
You are currently experiencing distressing psychosis and may benefit from using mindfulness in response to those experiences.

Do I have to take part?
It is up to you to decide. We will describe the study and go through this information sheet, which we will then give to you to take away and think about. If you decide to take part in the study we will arrange for the study researcher to contact you. We will then ask you to sign a consent form to show you have agreed to take part. You are free to withdraw at any time, without giving a reason.

What will happen to me if I take part?
You will meet with the researcher for two 60minute assessment sessions to discuss your experience of distress and complete 5 questionnaires.

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Following assessment you will meet with the researcher weekly. Initially to building a picture of current distress over four sessions (maximum 4 weeks). Mindfulness will not be practiced during this period and distress caused by hearing voices will be addressed through continued use of current strategies (i.e. medication, psychological therapies). During completion of the mindfulness intervention, sessions will include a 10minute mindfulness meditation practice followed by discussion of your experience of mindfulness and associated learning. The intervention will last for 6-10 sessions (maximum 10 weeks). You will be given CDs of guided meditation to practice outside of sessions, although this is not required.

Changes will be recorded twice weekly using a 5minute questionnaire once during session with the therapist and once midweek between sessions. Change will also be assessed by the completion of 3 questionnaires once before the mindfulness intervention begins and once after the mindfulness intervention finished.

To ensure the researcher is providing the same treatment to all participants, with your agreement, we would like to audio tape one intervention session.

Expenses and payments?
There will be no payment offered for taking part in the study. The researcher will meet with you at your current base therefore no travel costs will be incurred.

What will I have to do?
You will be expected to attend the assessment and weekly mindfulness sessions and to complete the twice weekly questionnaire.

What are the alternatives for treatment?
Cognitive behavioural therapy, group cognitive therapy, and medication have been indicated as potential effective treatments to help distress caused by hearing voices. Not all individuals respond to these treatments and some individuals experience a changing response. Mindfulness may provide an additional strategy that can be used.

What are the possible disadvantages or risks of taking part?
During the early phase of the study you may experience frustration that the mindfulness intervention has not started. This period will last a maximum of 4 weeks, any frustrations or difficulties will be discussed in session as they arise.

At the end of the mindfulness intervention you may experience some concern that the intervention is ending. Potential issues and difficulties with ending will be raised and addressed before the final sessions to ensure you are prepared and supported.

You can discuss any concerns you have with the researcher at any time.

There are no known side effects associated with mindfulness or responding mindfully to distressing experiences.

What happens when the research study stops?
When the study stops if you wish to continue your mindfulness practice you will be able to use the CDs of guided practice provided during the study. Any treatment being received outside of the study will continue during and on completion of the research.

Part 2.

What happens if I don't want to carry on with the study?
You can leave the study at any time without giving a reason, this will have no effect on any other care or treatment you are receiving.

What if there is a problem?
If you have concern about any aspect of this study, you should speak to the researcher who will do their best to answer your questions (ajl106@soton.ac.uk). If you have any questions about your rights as a participant in this research, feel that you have been placed at risk, or wish to complain formally you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 5578. In the very unlikely event that something goes wrong and you are harmed during the research and this is due to someone's negligence then you may have grounds for a legal action for compensation against the Hampshire NHS trust but you may have to pay your legal costs. The normal National Health Service complaints mechanism will still be available to you.

Will my taking part in this study be kept confidential?
All data collected in the study will be kept strictly confidential with a participant identification number replacing all identifiable information. The data collected will be stored securely in a locked cabinet. Only authorised persons, such as the researcher and principle supervisor, will have access to view the data. The raw data will be kept securely for 5years, after which time it will be destroyed.
Any information discussed during sessions will be confidential, however if you disclose any information indicating risk of harm to yourself or others the researcher will have a duty of care to discuss this with your key workers.

Involvement of General Practitioner (GP):
It will be necessary to inform your GP of your participation in the study and the nature of the intervention in case it influences any other part of your continuing care. If you have any concerns regarding you GP being informed of your involvement in the study you can discuss these with the researcher.

What will happen to the result of the study?
The results of the study will be written up as part of an educational project and may be published in an academic journal. You will not be identified in any report or publication with all data remaining strictly confidential. Anonymous quotations from session discussions may be used in the write up.

Who has reviewed the Study?
This study was given a favourable ethical opinion for conduct by the Berkshire Research Ethics Committee.

Further information and contact details:
If you require any further information regarding this study please contact the researcher Alexandra Lievesley (ajl106@soton.ac.uk). If you require advice or are unhappy about any aspect of the study please contact the principle supervisor, Paul Chadwick (Paul.Chadwick@hantspt.sw.nhs.uk).

Appendix G

<u>Consent Form:</u>

Title: **Process of Change in Mindfulness for Psychosis**

Researcher: **Alexandra Lievesley**   **Participant Identification:** _ _ _ _ _ _ _ _ _ _
Study Number: _ _ _ _ _ _ _ _ _ _

Please initial
Box

1. I confirm that I have read and understood the information sheet
   dated………. (version……….) for the above study. I have had
   the opportunity to consider the information, ask questions and
   have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free
   to withdraw at any time without giving any reason, without my
   medical care or legal rights being affected.

3. I understand that relevant sections of my medical notes and data
   collected during the study, may be looked at by individuals involved
   in the study from the Hampshire NHS Trust, where it is relevant to
   my taking part in this research. I give permission for these individuals
   to have access to my records.

4. I agree to my GP being informed of my participation in the study.

5. I agree to take part in the above study.

Name of participant   Date   Signature

Name of person   Date   Signature
taking consent

When completed:
1 copy for participant; 1 copy for research site file; Original to be kept in medical notes.

Appendix H

Living with voices questionnaire   H

Appendix I

Table 2. Pre and post intervention item ratings on the PSYRATS.

		P01		P02		P03		P04	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Auditory hallucinations									
	Frequency	3	**3**	4	**4**	4	**3**	4	**4**
	Duration	3	**4**	4	**4**	1	**1**	4	**4**
	Location	4	**4**	3	**3**	4	**2**	4	**4**
	Loudness	2	**2**	3	**1**	4	**1**	1	**1**
	Beliefs re-origin of voice	3	**3**	2	**4**	4	**3**	3	**4**
	Amount of negative content	3	**3**	3	**4**	4	**4**	0	**1**
	Degree of negative content	3	**3**	4	**3**	3	**3**	0	**0**
	Amount of distress	3	**3**	3	**3**	2	**1**	1	**1**
	Intensity of distress	3	**3**	3	**3**	2	**3**	1	**1**
	Disruption to life	1	**2**	2	**2**	1	**2**	3	**0**
	Controllability	4	**3**	4	**3**	3	**4**	4	**1**
Paranoid beliefs									
	Amount of preoccupation	1	**2**	2	**2**	4	**2**	4	**4**
	Duration of preoccupation	2	**3**	3	**4**	2	**2**	4	**4**
	Conviction	4	**2**	3	**3**	3	**4**	3	**2**
	Amount of distress	2	**3**	3	**3**	3	**2**	0	**3**
	Intensity of distress	4	**3**	3	**3**	2	**2**	0	**2**
	Disruption to life	2	**2**	3	**2**	1	**1**	3	**1**

Scores indicate severity or intensity ranging from 1= low/none to 4 = extreme/high.

Appendix J

Figure 4. Diagram of mindfulness as a new relationship with distressing experiences.

Two extremes of coping styles

Experiential Avoidance   **Lost in…**

Distraction/Keeping busy   Fighting/struggle
Blocking out   Rumination/worry
Self Harm/   Searching for
Drug & Alcohol misuse   meaning
Close/constrict mind   Judgement
Avoidance of sensations   Neutralising
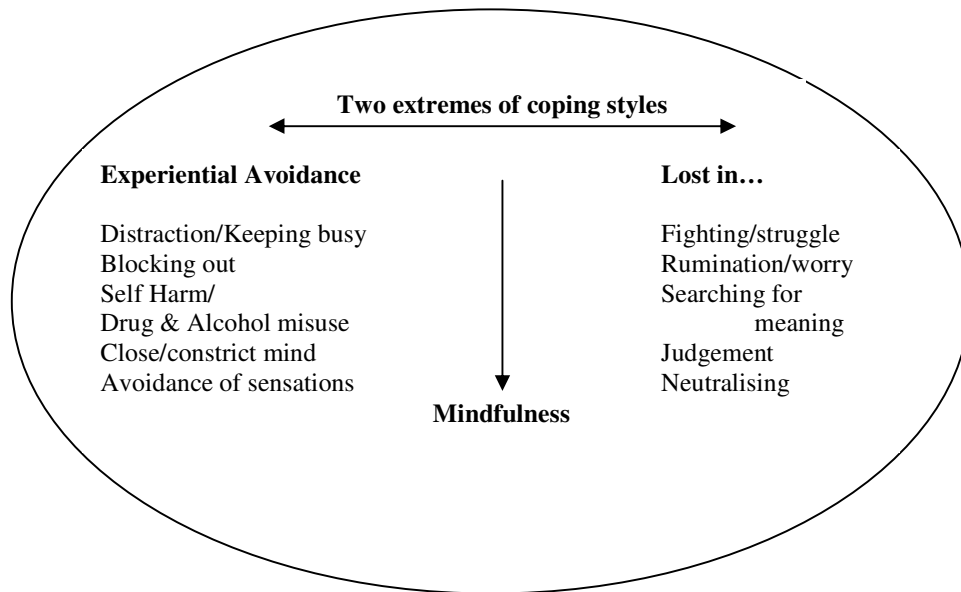
Mindfulness

Reproduced from Chadwick (2006)

Mindfulness represents the middle way between two extremes of styles of coping. Instead of attempts to avoid and getting lost in reacting to voices mindfulness encourages being open to and accepting of voices whilst letting them pass without being caught up in reacting.