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A Randomised Worksite Comparison of Acceptance and Commitment Therapy and Stress

Inoculation Training

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Abstract

In this comparative intervention study, 107 working individuals with above average levels of distress were randomly assigned to one of three conditions: acceptance and commitment therapy (ACT; $n = 37$); stress inoculation training (SIT; $n = 37$); or a waitlist control group ($n = 33$). The interventions were delivered to small groups in the workplace via two half-day training sessions. ACT and SIT were found to be equally effective in reducing psychological distress across a three month assessment period. Mediation analysis indicated that the beneficial impact of ACT on mental health resulted from an increase in psychological flexibility rather than from a change in dysfunctional cognitive content. Contrary to hypothesis, a reduction in dysfunctional cognitions did not mediate change in the SIT condition. Results suggest that the worksite may offer a useful, yet underutilised, arena for testing cognitive-behavioural theories of change.

Keywords: stress management; stress inoculation training; acceptance and commitment therapy; mediators of change

Introduction

The estimated costs of workplace distress to employees, organisations, and societies are substantial. For example, recent surveys in the United Kingdom indicate that between 25% and 40% of workers in various occupational groups could be diagnosed with a minor psychiatric disorder (Hardy, Woods, & Wall, 2003; Stride, Wall, & Catley, 2007). Similarly, studies of the United States workforce suggest an average 30-day workplace prevalence of 18% for any DSM psychiatric disorder (Kessler & Frank, 1997). Moreover, greater levels of employee distress are associated with a significant elevation in sickness absence and work cutback days (when distressed employees are present at work but unable to perform effectively) (Hardy et al., 2003; Kessler & Frank, 1997; Kessler, Merikangas, & Wang, 2008).

Stress management training (SMT) remains the most widely implemented and empirically evaluated intervention for improving mental health in the workplace (van der Klink, Blonk, Schene, van Dijk, 2001). Worksite SMT programmes have traditionally been based on variants of Meichenbaum's (1985) stress inoculation training (SIT) protocol, providing a combination of cognitive restructuring, muscular relaxation, and/or behavioural skills (e.g., problem solving) (Murphy, 1996). Reviews of SMT research indicate that these interventions are at least moderately effective in improving employees' psychological health (e.g., Murphy, 1996; Richardson & Rothstein, 2008; Saunders, Driskell, Johnston, & Salas, 1996; van der Klink et al., 2001).

While SMT programmes have successfully adopted CBT technologies, there is a distinct lack of research examining the mediators of change in these interventions (Bunce, 1997). This is unfortunate, as a lack of understanding of how SMT works makes it

difficult to know how one might enhance the efficiency and impact of these programmes (Kazdin, 2007; Kraemer, Wilson, Fairburn, & Agras, 2002). Moreover, in an evolving field such as CBT, it can be informative to examine multiple mediators simultaneously in order to assess the validity of apparently competing theories of therapeutic change (Preacher & Hayes, 2008).

In addition to focusing on mediators of change, there is a need to compare traditional SMT interventions (such as SIT) with the mindfulness-based approaches that have emerged within the CBT movement. In particular, there is increasing interest in the theory and practice of acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999), not only as a treatment for a range of psychological and behavioural problems, but also for promoting workplace mental health (Biglan, Hayes, & Pistorello, 2008; Bond & Bunce, 2000; Hayes, Bissett et al., 2004). ACT's model of change promotes six interrelated therapeutic processes: acceptance, defusion, contact with the present moment, self-as-context, values, and committed action. These six processes serve to enhance *psychological flexibility*, which is defined as the ability to contact the present moment, and based upon what the situation affords, to change or persist in behaviour in accordance with one's values (Hayes, Strosahl, Bunting, Twohig, & Wilson, 2004).

Despite some recent debate about possible similarities between ACT and other treatment approaches (see Arch & Craske, 2008; Hayes, 2008; Hoffman, 2008), there appear to be both theoretical and technical differences between ACT and traditional CBT. For example, traditional CBT targets the modification of negatively biased cognitions, while ACT encourages people to view such thoughts from a more mindful, defused (i.e., non-literal), and non-judgemental perspective. More broadly, traditional CBT seeks to reduce or change cognitive and affective symptoms of distress, whereas ACT aims to

increase people's willingness to experience such symptoms (i.e., to reduce experiential avoidance) in order to facilitate the pursuit of valued behavioural goals (Hayes et al., 1999; Hayes, Strosahl et al., 2004).

There is some empirical evidence to support these distinctions. Lappalainen et al. (2007) assessed change among clients of trainee therapists who had received instruction in both traditional CBT and ACT. Results indicated that clients receiving ACT improved to a greater extent than those exposed to traditional CBT. ACT increased clients' psychological flexibility, whereas CBT improved clients' self-confidence. In another effectiveness trial, Forman, Herbert, Moitra, Yeomans and Geller (2007) compared ACT and cognitive therapy (CT). Improvements in the CT condition were mediated by changes in observing and describing one's experiences, while improvements in the ACT condition were mediated by reduced experiential avoidance and increased acting with awareness and acceptance. In a previous worksite study, Bond and Bunce (2000) compared ACT with an innovation promotion training programme designed to teach workers how to reduce work-related sources of stress. Improvements in the ACT condition were mediated by increased psychological flexibility, and not by a reduction in dysfunctional cognitions, again supporting the view that ACT and traditional CBT may operate through different processes of change (see also Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

Despite a growing number of comparative studies, no research has directly compared ACT and SIT in the workplace. Such a comparison seems worthwhile for the following reasons. First, SIT (i.e., traditional CBT) has remained the dominant model for worksite SMT for more than two decades, and the efficacy of ACT can therefore be assessed against this well-validated approach. Second, there have been calls for further research examining whether ACT and other forms of CBT operate via the same, or

distinct, processes of therapeutic change (Arch & Craske, 2008; Hayes, 2008; Hoffman & Admundson, 2008).

The present study randomly assigned distressed employees to receive ACT or SIT in the workplace, or to a waitlist control group. It was predicted that both ACT and SIT would improve the mental health of distressed employees. On the basis of the ACT model of change, we hypothesised that ACT would improve mental health by increasing psychological flexibility. In contrast, based on Beck's cognitive model of change (which has strongly influenced SIT; Meichenbaum, 1985), we predicted that the beneficial impact of SIT would be mediated by a change in dysfunctional cognitions.

Method

Participants

Participants were employees of two large local government organisations in the United Kingdom who had volunteered for SMT. A total of 107 participants (72% female) completed pre-intervention measures. Of these participants, 37 had been randomly assigned to the ACT group, 37 to the SIT group, and 33 to the waitlist control group. Participants' mean age was 39 (SD 8.12, range 19-55), and they had worked for their current organisation for an average of 10 years. Participants worked an average 37 hour per week, with 17% of the sample working in excess of 40 hours per week. Sixty-one percent indicated that a UK secondary (high) school qualification was their highest education level completed, while 22% held a university undergraduate degree, and 12% a postgraduate degree. Based on the "caseness" threshold (3/4) of the General Health Questionnaire (GHQ-12), all participants included in the present study were likely to have been diagnosed with a minor psychiatric disorder at baseline (Goldberg & Williams, 1988; Hardy et al., 2003).

Measures

Outcome variable

General Health Questionnaire (GHQ-12; Goldberg & Williams, 1988). The GHQ-12 was used to measure general psychological distress. This 12-item scale has been widely used as an outcome in occupational health research and has good psychometric properties (Banks et al., 1980; Goldberg & Williams, 1988; Hardy et al., 2003).

Respondents were asked to indicate whether they had recently experienced a range of common symptoms of distress (e.g., “Have you recently....lost much sleep over worry?”), which were rated on a 4-point response scale (e.g., *not at all* to *much more than usual*). Higher scores on the GHQ reflect greater levels of psychological distress. In this study, the Likert scoring method was used for all principal analyses, with values of 0, 1, 2, or 3 assigned to each of the four response options. Cronbach alphas for the GHQ were .90 and .93 at pre- and post-intervention, respectively.

Mediator variables

Acceptance and Action Questionnaire (AAQ; Hayes, Strosahl, Wilson et al., 2004). A 17-item version of the AAQ was employed to measure psychological flexibility. This scale assesses a person’s willingness to experience undesirable thoughts and feelings (e.g., “I rarely worry about getting my anxieties, worries, and feelings under control”), and a person’s ability to take action in the presence of difficult thoughts and feelings (e.g., “When I feel depressed or anxious, I am unable to take care of my responsibilities”). Respondents indicated their level of agreement with each item on a 7 point response scale ranging from *never true* to *always true*. Greater psychological flexibility has been associated with a range of functional outcomes, such as lower levels of depression, stress,

and anxiety, and better job performance (Hayes et al., 2006). In the present study, the AAQ had acceptable reliability at the two time points (alphas .79 and .80).

Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978). The DAS was employed as a measure of dysfunctional cognition. This instrument has been widely used to evaluate cognitive change in CBT (e.g., DeRubeis et al., 1990; Whisman, 1993), and has also been employed in occupational health research (Guppy & Weatherstone, 1997; Judge & Locke, 1993). The scale consists of 40 conditional propositions that tend to cluster around two themes: perfectionism (e.g., “If a person is not a success, then his life is meaningless”) and need for approval (e.g., “I should be able to please everybody”) (Cane, Olinger, Gotlib, & Kuiper, 1986). Respondents were asked to indicate their level of agreement with each item on a response scale ranging from 1 (*disagree totally*) to 7 (*agree totally*). In the present study, the alpha coefficients for the DAS were .90 (pre-intervention) and .92 (post-intervention).

Interventions

ACT and SIT were delivered via two half-day training sessions, which occurred one week apart. The training was delivered to small groups of employees during working hours. Each training session lasted for approximately three hours. Both interventions were delivered by the first author, who had prior experience of implementing group-based SMT programmes, and a similar level of training in ACT and SIT.

The ACT intervention was based on two manuals developed for group worksite interventions (Bond, 2004; Bond & Hayes, 2002). Participants practiced a series of eyes-closed mindfulness exercises designed to increase present moment awareness, reduce struggle with undesirable thoughts and emotions, and locate a core sense of self that is distinct from difficult psychological content. The training also introduced various

cognitive defusion exercises to help participants untangle from the literal content of thoughts and beliefs that interfere with the pursuit of valued behavioural goals. In addition, participants completed values and goals clarification exercises to identify chosen behavioural directions.

The SIT intervention was based on Meichenbaum's (1985; see also Meichenbaum & Deffenbacher, 1988) protocol. Specifically, the training sessions comprised of two main skill components: relaxation training and cognitive restructuring. The aims of the first session were to: (1) provide participants with a conceptualisation of stress in accordance with a CBT model; (2) introduce and practise abdominal breathing and progressive muscular relaxation exercises; and (3) illustrate the role of cognition in stress reactions (using an A-B-C framework). The aims of the second session were to: (1) practise an abbreviated relaxation exercise; (2) discuss common cognitive distortions and dysfunctional core beliefs; (3) provide instruction on cognitive restructuring techniques; and (4) discuss how relaxation and cognitive coping skills could be incorporated into daily living.

Procedure

In the months prior to the study, general adverts for SMT were circulated at the two participating organisations. A final list of volunteers was forwarded to the research team, who randomly assigned participants to ACT, SIT, or the waitlist control group. Participants allocated to ACT and SIT received a letter informing them of the dates and locations of their training sessions. Participants in the control group received a letter explaining that they had been placed on a waiting list and would receive the training in six months time. All participants completed pre-intervention measures immediately before the initial ACT and SIT sessions, and post-intervention measures three months after the

second training sessions. While the training was open to all interested employees within the two organisations, the present study includes only those participants who were classified as probable cases of minor psychiatric disorder at baseline.

Results

Participant Attrition

Participant attrition resulted from non-attendance at one of the two training sessions, and/or a failure to return post-intervention measures. Dropout from the training was relatively low, with 5 participants in the ACT group and 4 participants in the SIT group failing to return for session two. However, a total of 18 ACT participants, 14 SIT participants, and 9 controls failed to return post-intervention measures. As a result of attrition, final group sample sizes were as follows: ACT $n = 19$; SIT $n = 23$; and, control $n = 24$. There were no significant baseline differences on any of the biographical, outcome, or mediator variables between those participants who responded at post-intervention and those who did not.

Outcome Analysis

Table 1 summarises descriptive statistics for the GHQ. ANOVA revealed a significant group by time interaction effect ($F(1,63) = 5.31, p < .01$). At post-intervention, GHQ scores were significantly lower in the ACT group ($F(1,40) = 14.78, p < .001, d = 1.31$) and in the SIT group ($F(1,44) = 12.60, p < .01, d = 1.21$), when compared to the control group (after adjusting for pre-intervention GHQ).

At baseline, all participants were classified as probable cases of minor psychiatric disorder (according to GHQ score). By post-intervention, the proportion of GHQ cases had decreased to 21% in the final ACT group, 26% in the SIT group, and 63% in the control condition.

Mediation Analysis

To examine mediators of change, a bootstrap (resampling) method was used to test the statistical significance of indirect effects (see Preacher & Hayes, 2008). In each mediation model, pre-intervention scores for the outcome and mediators were entered as covariates. Specific indirect effects through the AAQ and DAS were examined simultaneously, and contrasts were generated to compare the magnitude of these effects. In this way, we compared the AAQ and DAS in terms of their unique ability to mediate outcome (GHQ) change in the two interventions.

ACT

Table 2 summarises mediation results for the ACT condition. In support of our hypothesis, an increase in psychological flexibility (AAQ) mediated the beneficial impact of ACT on the GHQ, even after controlling for change on the DAS. There was a statistically significant total indirect effect (reflecting the difference between the total and direct effects) (estimate = -4.09; $p < .01$; bias corrected [BC] 95% CI -.3.77, -.78).

***WHERE DID I GET THOSE P VALUES FROM? CHECK FOLDER** The specific indirect effect of ACT through the AAQ was also significant (estimate = -4.98; $p < .001$; 95% BC CI -9.80, -1.63), whereas the specific indirect effect via the DAS was not (estimate = .89; BC 95% CI -1.75, 4.47). Accordingly, the contrast between the two competing mediators was statistically significant (estimate = 5.88; $p = .05$; BC 95% CI .42, 12.83), indicating that the specific indirect effect of ACT through the AAQ was significantly larger than the effect via the DAS.

SIT

As indicated in Table 3, the mediation tests conducted for the SIT condition failed to support our hypothesis. Specifically, the total indirect effect failed to reach significance

(estimate = $-.98$; BC 95% CI $-.24, .45$) indicating that the inclusion of the AAQ and DAS together did not significantly reduce the observed effect of SIT on the GHQ. To investigate further, we examined the two mediators separately. When entered alone, change on the AAQ functioned as a mediator in SIT (estimate = -2.03 ; BC 95% CI $-5.22, -.12$) while change on the DAS did not.

Discussion

This study assessed the outcomes and processes of change in ACT and SIT interventions delivered in the workplace. Results indicated that the two interventions were equally effective in reducing psychological distress across a three month assessment period. Mediation findings indicated that mental health improvements following ACT resulted from an increase in psychological flexibility and not from a change in cognitive content. Contrary to prediction, the beneficial impact of SIT on employee mental health was not mediated by a reduction in dysfunctional cognitions.

The mediation findings provide strongest support for ACT's underlying model, in that increased psychological flexibility functioned as a mediator of change in even after controlling for change in cognitive content. This finding lends support to the ACT model in two ways. First, the pattern of mediation suggests that ACT was functioning primarily by altering the psychological context within which people experience their thoughts and emotions, rather than by modifying the form or frequency of those private events (Hayes et al., 1999). Second, these results are consistent with the view that the processes designed to promote psychological flexibility will apply across a wide range of psychological and behavioural difficulties (Biglan, Hayes, & Pistorello, 2008; Hayes et al., 2006). The results of the present study at least suggest that ACT operates in a way that is consistent

with its underlying model, and that the model generalises to the promotion of mental health in an occupational setting.

In contrast, our hypothesis that the impact of SIT would be mediated by a change in dysfunctional cognitions (as measured by the DAS) was not supported. It is conceivable that the two-session (6 hour) SIT intervention was simply too brief to modify such cognitive content. This finding contrasts with an earlier study, in which change on the DAS mediated GHQ improvement immediately after a brief SMT programme (Keogh, Bond, & Flaxman, 2006). Future researchers may wish to assess the optimal duration of SIT for activating proposed cognitive change mechanisms. It may also prove fruitful for future studies to include measures of physiological tension, coping style, and/ or other measures of cognitive content, as potential mediators of change in SIT.

The finding that increased psychological flexibility explained at least some outcome variance in SIT was unexpected, and deserves further investigation. One possible explanation is that SIT includes an element of “distancing” from thought content, which may serve to increase flexibility and hence improve mental health (Orsillo, Roemer, Lerner, & Tull, 2004). Further comparative research of this type may help to identify functional similarities as well as differences between ACT and traditional CBT.

One important limitation of this study was the high level of participant attrition. While the majority of ACT (84%) and SIT (89%) participants attended both sessions of training, the questionnaire response rate at the post-intervention assessment point (three months later) was disappointing (62% across all three groups). It is conceivable that participants who received no benefit from ACT or SIT were less inclined to complete post-intervention measures. However, there were no baseline differences between those who completed both sets of measures and those who failed to respond. Furthermore,

significant pre to post reductions in distress in the ACT and SIT groups were found even under the conservative assumption that non-responders experienced no mental health benefits (i.e., when non-responders' baseline scores were carried forward to post-intervention). These checks notwithstanding, the level of attrition should still be considered when interpreting the present study's findings.

A second limitation stems from the simultaneous measurement of outcome and mediator variables. To provide a more powerful demonstration of mediation, it would be necessary to establish that change in the mediators precedes change on the outcome variable (Kazdin, 2007). For instance, it would have been informative to administer measures at one month post-intervention as well as at the three month assessment point. Nonetheless, it should be noted that the present ACT findings are consistent with previous research. For example, in an earlier worksite ACT study, it was established that the AAQ mediated GHQ change when the mediator was measured prior to the outcome (Bond & Bunce, 2000; see also Hayes et al., 2006), while a separate longitudinal study found no evidence of reverse causation between the GHQ and AAQ (Bond & Bunce, 2003).

Despite these methodological limitations, we believe that the current study makes a worthwhile contribution to the SMT and CBT research literatures. As far as we are aware, this is the first study to compare ACT and SIT in an occupational context, and represents one of only a handful of studies to examine processes of change within worksite SMT programmes. Furthermore, the present study goes some way to addressing recent calls for comparisons of ACT and traditional CBT, aimed at establishing whether these treatment approaches operate via similar or distinct mechanisms of change. The extant empirical evidence tends to support the view that ACT activates different change processes to those traditionally hypothesized for CBT (Forman et al., 2007; Hayes et al.,

2006; Lappalainen et al., 2007). However, the number of comparative studies remains small, and further mediation research is required to test the apparently contrasting theories of change underpinning these approaches.

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Tables

Table 1

Means (and Standard Deviations) for the GHQ

	ACT (<i>n</i> = 19)	SIT (<i>n</i> = 23)	Control (<i>n</i> = 24)
GHQ			
Pre	19.54 (4.36)	18.61 (4.38)	21.46 (4.40)
Post	10.53 (4.80)	10.55 (5.96)	18.71 (7.44)

Note. GHQ = general health questionnaire; ACT = acceptance and commitment therapy; SIT = stress inoculation training;

Table 2

ACT vs. Control Bootstrap Mediation

Effect	Bootstrap Estimate		Bias Corrected 95% Confidence Interval	
	Estimate	SE	Lower	Upper
Psychological flexibility (AAQ)	-4.98	2.05	-9.80	-1.63
Dysfunctional cognitions (DAS)	.89	1.56	-1.75	4.47
Total indirect effect	-4.09	1.91	-7.87	-.42
Contrast (AAQ vs DAS)	5.88	3.09	.42	12.83

Note. AAQ = acceptance and action questionnaire; DAS = dysfunctional attitude scale

Table 3

SIT vs. Control Bootstrap Mediation

Effect	Bootstrap Estimate		Bias Corrected 95% Confidence Interval	
	Estimate	SE	Lower	Upper
Psychological flexibility (AAQ)	-2.45	1.69	-7.17	-.10
Dysfunctional cognitions (DAS)	.42	1.06	-1.43	3.10
Total indirect effect	-2.11	1.40	-5.26	.38
Contrast (AAQ vs DAS)	2.79	2.45	-.55	9.64

Note. AAQ = acceptance and action questionnaire; DAS = dysfunctional attitude scale