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Worksite Stress Management Training: Moderated Effects and Clinical Significance

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Manuscript accepted for publication in *Journal of Occupational Health Psychology*

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Abstract

Psychologically healthy participants may dilute the observed effects of worksite stress management training (SMT) programs, therefore hiding the true effectiveness of these interventions for more distressed workers. To examine this issue, 311 local government employees were randomly assigned to SMT based on acceptance and commitment therapy (SMT, n = 177) or to a waitlist control group (n = 134). The SMT program consisted of three half-day training sessions, and imparted a mixture of mindfulness and values-based action skills. Across a six month assessment period, SMT resulted in a significant reduction in employee distress. As predicted, the impact of SMT was significantly moderated by baseline distress, such that meaningful effects were found only among a subgroup of initially distressed workers. Furthermore, a majority (69%) of these initially distressed SMT participants improved to a clinically significant degree. The study highlights the importance of accounting for sample heterogeneity when evaluating and classifying worksite SMT programs.

Keywords: Psychological distress, stress management training, acceptance and commitment therapy (ACT), cognitive-behavior therapy (CBT)

Worksite Stress Management Training: Moderated Effects and Clinical Significance

The levels of psychological distress found amongst working populations remain alarmingly high. For example, in the United Kingdom, one in four workers in various occupational sectors experience distress at a level that equates to a minor psychiatric disorder (e.g., anxiety and/or depression) (Stride, Wall, & Catley, 2007). In some occupational groups, such as public administration and social work, this figure reaches 40% (Hardy, Shapiro, Haynes, & Rick, 1999; Stride et al., 2007). Similarly, research from the United States suggests an average 30-day workplace prevalence of 18% for any DSM psychiatric disorder, with some variation across occupational groups (range 11% to 30%) (Kessler & Frank, 1997). Moreover, higher levels of employee distress have been associated with an elevation in both sickness absence and work cutback days (when distressed employees are present at work but unable to perform effectively) (Hardy, Woods, & Wall, 2003; Kessler & Frank, 1997; Kessler, Marikangas, & Wang, 2008). Despite the well-documented prevalence of workplace distress, only a small percentage of distressed employees actually receive intervention from mental health professionals (Hilton et al., 2008; White, 2000). Such findings highlight a continuing need to implement and evaluate worksite interventions that have the potential to promote mental health.

Worksite stress management training (SMT) is the most widely implemented, and empirically validated, intervention for improving employees' psychological health (van der Klink et al., 2001). The most common SMT programs are based on cognitive-behavioral therapy (CBT) principles and procedures, and seek to impart generalized coping skills (e.g., cognitive restructuring, relaxation, problem-solving, or mindfulness) to working populations. There have been several large-scale reviews of the worksite SMT literature, all of which

provide support for the efficacy of CBT-based interventions (e.g., Murphy, 1996; Richardson & Rothstein, 2008; Saunders, Driskell, Johnston, & Salas, 1996; van der Klink et al., 2001). However, despite some encouraging outcome findings, the SMT literature has been plagued by a lack of conceptual and methodological sophistication (Bunce, 1997; Bunce & Stephenson, 2000; Reynolds & Shapiro, 1991). Some of these shortcomings may stem from the simplistic frameworks used to classify stress interventions (e.g., labeling individual SMT programs as either primary, secondary, or tertiary prevention), as well as from the sample heterogeneity that is a common feature of worksite SMT research. The net result is that we still lack a clear understanding of why SMT is effective, for whom SMT is effective, and whether SMT can provide clinically meaningful benefits to distressed workers.

Levels of Prevention and SMT

Ever since the emergence of the CBT movement, researchers and practitioners have highlighted the utility of delivering cognitive-behavioral coping skills on a "preventive" basis to general populations (e.g., Goldfried, 1980; Meichenbaum, 1985). CBTs are typically highly structured, time limited, and skills based, and these intervention characteristics naturally lend themselves to group training programs outside of the traditional clinical context. Hence, it is perhaps not surprising that CBT, above any other therapeutic approach, has had such a prominent influence on worksite SMT. The link between stress prevention and CBT was further enhanced by the development of the influential *transactional* theory of stress which emphasized the importance of cognitive appraisal processes and distinguished problem-focused and emotion-focused coping (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) described CBT as "highly compatible" (p.374) with their theory of stress and coping, which continues to underpin contemporary SMT research and practice (Bond & Bunce, 2000; de Vente, Kamphius, Emmelkamp and Blonk, 2008; Searle, 2008).

Both the principles of CBT, and the transactional theory of stress, have been incorporated into a three-tier prevention framework that is widely used to classify stress management interventions (Quick, Quick, Nelson, & Hurrell, 1997; Reynolds, 1997). When considering individual-focused interventions (such as SMT), *primary* prevention refers to helping individuals control the frequency and intensity of stressors (e.g., through time management training). *Secondary* prevention aims to modify the stress response at a stage before distress takes hold and becomes chronic (e.g., through muscular relaxation training). Finally, *tertiary* prevention refers to therapeutic interventions designed to help those already experiencing disabling symptoms of distress (e.g., through individual counseling or group therapy). This prevention framework has undoubtedly been useful in identifying the stages through which chronic distress symptoms may develop, and helps to organize the wide range of methods that can be employed in worksite stress management (Quick et al., 1997). However, there appears to be some inconsistency in the way this framework has been used. For example, while SMT is often described as secondary prevention (Richardson & Rothstein, 2008; van der Klink et al., 2001), it has also been classified as a primary level intervention (e.g., Reynolds & Briner, 1994; Reynolds & Shapiro, 1991). Moreover, reviews of worksite SMT research classify interventions simply as "preventive" or "curative" according to whether employees were screened for entry (curative) or whether the SMT program was offered to all employees (preventive) (Murphy, 1996). Unfortunately, labeling any single SMT program as preventive or curative (or indeed as primary, secondary, or tertiary) may obscure the high degree of sample heterogeneity occurring in evaluations of these worksite interventions (Bunce, 1997). We examine this issue in the current study by assessing whether the same SMT program functions at both a preventive and curative level, dependent upon participants' initial level of distress.

Baseline Distress as a Moderator of SMT

It has been suggested that employees with low baseline distress dilute (or moderate) the observed impact of SMT on mental health (Bunce & Stephenson, 2000). While there is a lack of research testing this moderation hypothesis, there is some evidence that greater mental health benefits are obtained by employees who enter SMT with higher distress. For example, in their meta-analytic review of worksite stress management research, van der Klink et al. (2001) compared overall effect sizes from the few studies that were "remedial" in orientation (i.e., specifically targeted workers with above average levels of distress) with the more common "preventive" programs. They found a larger overall effect for remedial programs (d = .59) than preventive programs (d = .32). Similarly, Gardner, Rose, Mason, Tyler, & Cushway (2005) observed statistically significant SMT effects only among those employees showing signs of distress at baseline.

An exception to this assumption was recently reported by de Vente et al. (2008). They compared the effects of a CBT-based SMT program delivered individually, group SMT, and a care as usual control condition. Unlike most worksite SMT research, participants had been prescreened for clinical levels of work-related distress. Distress and sickness absence decreased significantly in all three conditions, but there were few between-group differences. In contrast to the hypothesis that larger SMT effects will be observed amongst high strain participants, de Vente et al. found that individual SMT was more effective for employees with lower levels of depression. In view of this finding, the researchers suggested that SMT programs may lack effectiveness for employees experiencing clinical levels of work-related distress (particularly those with elevated depressive symptoms). However, there did not appear to be a similar moderating effect for anxiety, and the screened sample generally had poorer functioning than those usually included in SMT studies.

As far as we are aware, no other research has directly tested the extent to which baseline distress moderates worksite SMT outcomes. We believe that a rigorous examination of this hypothesis is necessary if we are to assess the validity of the frameworks that are used to classify SMT programs, and enhance our understanding of the types of employees who benefit from these interventions.

Assessing Clinically Significant Change in SMT

Worksite SMT studies frequently report statistically significant improvements in mental health, but clinical significance is rarely examined. Clinically significant change is inferred when an individual moves from the dysfunctional to the functional population on a particular outcome variable (Jacobson, Follette, & Revenstorf, 1984; Jacobson & Revenstorf, 1988; Jacobson & Truax, 1991). This change indicator is operationalized through two statistical criteria. The first is a cut-off point between the unhealthy and healthy distributions of an outcome measure - essentially the point that people have to cross postintervention in order to be classified as improved to a clinically meaningful degree (Jacobson & Truax, 1991). The second criterion, known as the *reliable change index* (RCI), assesses the reliability of any pre to postintervention improvements (Jacobson & Truax, 1991). This establishes the degree to which any change is "real" and not merely an artifact of measurement error. Clinical significance is established when both criteria are met.

Bunce and Stephenson (2000) reviewed the SMT literature to estimate the proportion of studies that met the criteria for clinical significance. They found that while a majority of studies (67%) showed evidence of clinically meaningful improvement, only a small percentage (12%) of studies demonstrated reliable change. Bunce and Stephenson (2000) attributed this limited support for clinical significance in SMT to the dilution effect created by the inclusion of psychologically healthy participants. Indeed, only three of the reviewed studies specifically

examined more distressed working populations, all of which demonstrated both clinically meaningful and statistically reliable change. This is perhaps not surprising, in that to demonstrate clinical significance preintervention scores would need, by definition, to be in the unhealthy range on the outcome measure being used (Jacobson & Truax, 1991). This highlights a limitation of assessing clinical significance in reviews of heterogonous SMT studies. Bunce and Stephenson therefore recommended that clinical significance be assessed in individual SMT studies that evaluate change among more distressed workers.

When based on established CBT principles and techniques, there are good reasons to believe that SMT would be sufficiently powerful to produce clinically significant improvement in distressed workers. Contemporary CBT theories suggest that the same core processes (such as cognitive fusion and experiential avoidance) underpin many forms of psychological distress, and that these processes can be targeted by interventions delivered in both clinical and non-clinical contexts (Biglan, Hayes, & Pistorello, 2008; Eifert & Forsyth, 2005; Flaxman & Bond, 2006; Gardner & Moore, 2007). Moreover, the clinical literature contains numerous evaluations of group-based CBT interventions that are not dissimilar to worksite SMT programs. Across a selection of these CBT studies, we found that, on average, 66% (range 47% to 100%) of participants were classified as clinically improved according to Jacobson et al.'s criteria (Free, Oei, & Sanders, 1991; Kellett, Clarke, & Matthews, 2007; Scott & Stradling, 1990; White, 1998; White, Brooks, & Keenan, 1995). In view of the similarities between SMT and group CBT for common mental health disorders, it seems reasonable also to expect clinically significant change among distressed SMT participants. The validity of comparing SMT and CBT research is enhanced further by the finding that a significant proportion of worksite SMT participants meet the criteria for minor psychiatric disorder (Bond & Bunce, 2000; Gardner et al., 2005; Searle, 2008). Based on this rationale, the present study assesses both the statistical

and clinical significance of mental health improvements found amongst a subgroup of more distressed SMT participants.

In sum, the present study was designed to address some of the conceptual and methodological issues that exist within the worksite SMT literature. First, we predict that an SMT program, based on contemporary CBT principles and techniques, will lead to significant improvements in general mental health for an unscreened sample of workers (Hypothesis 1). Second, we examine the utility of classifying single programs as preventive or curative (or as primary, secondary, or tertiary prevention) regardless of sample heterogeneity. Specifically, we predict that the effects of SMT will be significantly moderated by participants' level of distress, such that much larger effects will be found among initially distressed participants (Hypothesis 2). Finally, based on findings in the wider CBT literature, we hypothesize that initially distressed SMT participants will experience clinically significant improvements in mental health (Hypothesis 3).

Method

Design

Data were collected from three identical SMT projects that were conducted across two local government organizations in London, UK. Each project involved a randomized controlled trial that compared SMT against a waiting list control group. Questionnaires were administered at baseline (Time 1), three months after two initial training sessions (Time 2), and another three months after a final training session (Time 3). Hence, the three time points were equally spread over a six month assessment period (see *Procedure* for further details).

Participants

Participants were employees of the two participating organizations who had volunteered for SMT. A total of 456 employees registered an interest in receiving SMT. Out of these initial

expressions of interest, 311 workers agreed to participate after receiving further information and completed measures at Time 1, with 191 (61%) of these participants also responding at Time 2, and 119 participants (38%) providing data at all three time points (eight participants responded at Time 1 and Time 3, but not Time 2). The final "completer" sample sizes were as follows: SMT = 104, Control = 87 (Time 1 to Time 2); SMT = 63, Control = 64 (Time 1 to Time 3). There were no significant differences in baseline distress or on any of the demographic variables between those who responded only at Time 1, and those who provided data at two or more assessment points. As described in the Results section, we employ a multiple imputation procedure (Schafer, 1999) that allows for the inclusion all 311 participants who provided baseline data.

Participants' ages ranged from 18 to 63, with a mean of 41. Average tenure with current organization was 10 years. Participants worked 37 hours per week on average (range 9-60), with 17% working in excess of 40 hours per week. Forty-percent indicated that a UK (high) school qualification was their highest education level completed, while 30% held a university undergraduate degree, and 17% also had a postgraduate qualification. Forty-five percent classified their job role as clerical or administration, 1% as manual, 21% as middle management/ technical, and 20% as senior management/ professional. Participants were drawn from various departments within the two organizations, including council tax, environmental health, housing and social services (welfare), education, finance, and libraries.

Measures

General Health Questionnaire-12 items (GHQ-12; Goldberg, 1978). The GHQ-12 was used to assess participants' general psychological distress. Respondents were asked to indicate whether they had experienced 12 common symptoms of distress over the last few weeks (e.g., "Have you recently….. felt constantly under strain?"), with four possible response options (e.g.,

Not at all, *No more than usual*, *Rather more than usual*, *Much more than usual*). Higher scores indicate greater levels of distress. The GHQ case classification scoring method was used in the present study. This method assigns values of 0, 0, 1, 1 to the four response options, and is specifically designed to differentiate likely *cases* of minor psychiatric disorder from *noncases*. The validity of the GHQ-12 as a psychiatric case detector has been established by comparing GHQ scores with the Composite International Diagnostic Interview which can generate diagnoses using the International Classification of Disease (ICD-10) and the DSM-IV systems (Goldberg et al., 1997). Additionally, Hardy et al. (1999) validated the GHQ-12 within a UK working population, and found a strong correlation (.70) with an independent standardized clinical interview (the Clinical Interview Schedule-Revised). Goldberg et al. (1997) and Hardy et al. (1999) report a 3/4 threshold as the most accurate for identifying psychiatric cases in the general UK population. That is, people scoring four or more on the GHQ-12 (GHQ scoring method) are identified as likely cases of minor psychiatric disorder while those scoring three or less are classified as noncases. In the present study, 48% of participants (149/ 311) were classified as probable cases of minor psychiatric disorder at Time 1. Cronbach alphas for the GHQ-12 were .87, .89, and .91 at Time 1, Time 2, and Time 3, respectively.

SMT Program

The SMT program adopted the principles and techniques of *acceptance and commitment therapy* (ACT; Hayes, Strosahl, & Wilson, 1999) - a mindfulness-based CBT that has been successfully adapted for use in work settings (e.g., Bond & Bunce, 2000; Bond & Hayes, 2002; Dahl, Wilson, & Nilsson, 2004; Flaxman & Bond, 2006; Hayes et al., 2004). The content of the program closely followed two existing ACT manuals specifically developed for group worksite interventions (Bond, 2004; Bond & Hayes, 2002). Participants practiced a series of eyes-closed mindfulness (meditative) exercises that were 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 designed to help participants untangle from the literal content of thoughts and beliefs that interfere with the pursuit of valued behavioral goals. In addition, participants completed a series of values and goals clarification exercises to identify chosen behavioral directions, and increase commitment to pursing those directions. In accordance with the theory and practice of ACT, the SMT program continually emphasized the intimate link between mindfulness and values-based action skills (see Flaxman & Bond, 2006 for further details on this SMT program).

Procedure

Advertisements for the SMT program were circulated at the two participating organizations. The training had not been previously offered within the organizations, and was being implemented on the initiative of the study authors. Consistent with usual SMT practice, the training was open to all employees, with no exclusion criteria applied. Participants registered their interest in the training by phoning or e-mailing an internal occupational health or human resources contact. Lists of volunteers were forwarded to the research team, who randomly assigned participants to the SMT group or waitlist control group. Participants allocated to the SMT group received a letter informing them of the dates and locations of their training sessions. Participants in the control group were informed that they had been placed on a waiting list and would receive the training in six months time. Control participants were also informed that they would be asked to complete questionnaires in the months prior to their training and when they attended their first session of training. Both groups of participants were aware that the training was being conducted as part of a research project.

The training was delivered to employees during working hours using a "two-plus-one" format, which has been recommended as a cost-effective and efficient way of delivering brief CBT interventions (Barkham, 1989; Barkham & Shapiro, 1990; Bond & Bunce, 2000). Specifically, each participant received three sessions of training, two of which occurred on consecutive weeks, with the final session occurring three months later. Each session lasted for approximately 2.5 to 3 hours. All sessions were facilitated by the first author who had prior experience of implementing CBT-based SMT programs. Participants in the SMT group completed the GHQ-12 at the beginning of session 1 (Time 1) and again at the beginning of session 3 (Time 2). Participants in the control group received the GHQ in the post at the same time intervals. A reminder was sent to those participants who had not responded to postal questionnaires within two weeks. The SMT group then received a final questionnaire in the post, three months after the final session of training (Time 3). Simultaneously, participants in the control group completed the Time 3 GHQ at the beginning of their first training session.

Results

Multiple Imputation

To reduce the impact of participant attrition, we used a multiple imputation (MI) procedure to replace missing data. MI is considered superior to other approaches for analyzing incomplete datasets as it takes into account the uncertainty due to missing information (Schafer, 1999; Schafer & Graham, 2002; Sinharay, Stern, & Russell, 2001). We employed Schafer's (1999) NORM software to generate five imputed datasets, and performed the same outcome and moderation analyses on each of these datasets; parameter estimates and standard errors were then pooled to obtain final estimates. Where appropriate, we compare the MI results with those obtained from the reduced (completer) sample. By employing MI, we were able to compute

Time 2 and Time 3 scores for all 311 participants who completed the GHQ at Time 1 (SMT n = 177; control n = 134).

Impact of SMT on Psychological Distress

Table 1 displays group descriptive statistics for the GHQ-12 across the three time points. To assess the impact of SMT for the sample as a whole, we used the NORM software to generate pooled between-group *t*-tests at both Time 2 and Time 3, after controlling for T1 scores. Based on the MI procedure, the SMT group had a significantly lower level of distress than the control group at Time 2 ($t(18) = 2.55$, $p < .05$, Cohen's $d = .34$). Across each of the five imputed data sets, effect sizes (d) were .29, .37, .51, .51, and .31. At time 3, the difference between the two groups was marginally outside of statistical significance ($t(5) = 2.27$, $p < .07$, $d = .32$), reflecting a degree of uncertainty due to the higher level of missing data at follow-up. Between-group effect sizes at Time 3 were .67, .32, .91, .58, and .69 for each imputation. A similar pattern of results was found in the reduced completer sample, with significantly lower levels of distress observed in the SMT condition at both Time 2 ($d = .45$) and Time 3 ($d = .50$). Taken together, these results suggest that the SMT program had a small to moderate impact on the mental health of a heterogeneous sample of employees.

Moderation Analyses

We computed two moderated regression models in order to establish whether baseline level of distress (i.e., Time 1 GHQ) influenced the impact of SMT at Time 2 and Time 3 (see Table 2). As indicated in Table 2, baseline distress significantly moderated the impact of SMT between Time 1 and Time 2 and between Time 1 and 3. To examine this effect in more detail, we split the sample into *cases* and *noncases* according to GHQ score at Time 1 (see Figure 1). In support of Hypothesis 2, SMT resulted in minimal change in mental health for the noncases, while producing a substantial reduction in distress among the cases. For the imputed data, only

the GHQ cases subgroup showed a significantly lower level of distress than the corresponding control group at Time 2 ($t(118) = 4.31$, $p <. 001$, $d = .66$) and at Time 3 ($t(8) = 2.88$, $p < .05$, $d = .57$). A similar pattern of results was found in the completer sample at both Time 2 ($d = .86$) and Time 3 ($d = .65$).

Clinical Significance

We employed Jacobson & Truax's (1991) (see also Jacobson & Revenstorf, 1988; Jacobson et al., 1984) two statistical criteria to calculate the proportion of participants identified as cases at Time 1 who improved to a clinically significant degree. As noted earlier, the first criterion requires that participants move from the dysfunctional to the functional population on the variable of interest (in this case the GHQ-12) following an intervention. To calculate a meaningful cutoff point, we utilized existing norms obtained from over 5000 employees working in organizations similar to those participating in the present study (i.e., UK city council/ local authorities) (Stride et al., 2007). A GHQ-12 normative mean of 2.85 (sd 3.32) was entered into Jacobson et al.'s formula, along with the preintervention mean and sd for the distressed workers in the present sample, resulting in a cutoff value of 5.43. Hence, those initially distressed participants whose Time 2 and Time 3 GHQ scores decreased from above 5.4 to less than 5.4 were considered improved to a clinically meaningful degree. In support of Hypothesis 3, the distressed SMT participants clearly showed clinically meaningful change, in that this subgroup's GHQ-12 mean decreased from 7.17 at Time 1 to 2.67 at Time 2, and 2.28 at Time 3 (see Figure 1). We then computed a reliable change (RC) index based on the GHQ-12 test-retest reliability of $r = .73$ (Goldberg & Williams, 1988; Hardy et al., 1999). This generated a standard error of 1.76. An RC value was therefore computed for each participant by dividing Time 1 to Time 2 and Time 1 to Time 3 difference scores by 1.76. An RC value greater than 1.96 was considered statistically significant at $p < .05$. On the basis of these computations, 69%

of distressed SMT participants experienced clinically significant improvement in mental health at both Time 2 and Time 3. In the initially distressed control group, 38% (at Time 2) and 31% (at Time 3) of participants also improved to a clinically significant degree.

Discussion

The aims of this worksite SMT study were threefold. First, the study sought to examine the efficacy of a three session SMT program for improving the mental health of a heterogonous sample of workers. A second aim was to test whether SMT impact was moderated by baseline level of distress. The final aim was to assess the extent to which distressed SMT participants would improve to a clinically significant degree. Support was found for all three study hypotheses. Specifically, SMT resulted in significant improvements in mental health for the sample as a whole across a six month assessment period (Hypothesis 1). In support of Hypothesis 2, the beneficial impact of SMT was significantly moderated by initial level of distress, with significant change found only amongst a subgroup of more distressed participants. Finally, results indicated that SMT was able to elicit clinically significant change in a majority (69%) of initially distressed participants (Hypothesis 3).

Moderated Effects

The initial outcome results were encouraging, and suggest that this study can be added to the body of literature demonstrating the efficacy of both traditional and more recent CBT interventions delivered in the workplace (Bond & Bunce, 2000; Dahl et al., 2004; Richardson & Rothstein, 2008; van der Klink et al., 2001). However, the present study was more specifically concerned with investigating the moderating effect of participants' initial level of distress. As predicted, much larger decreases in distress were experienced by employees who were classified as probable cases of minor psychiatric disorder at baseline. The subgroup of SMT participants identified as cases at Time 1 reached a similar level of functioning as the noncases

at both Time 2 and Time 3 (see Figure 1). This finding has important implications for worksite SMT research. As others have noted, observed effects of worksite SMT programs may be diluted by subgroups of psychologically healthy workers (Bunce, 1997; Bunce & Stephenson, 2000). Similarly, stress management outcomes that fail to reach statistical significance may be concealing significant (and perhaps clinically relevant) effects for subgroups of more distressed employees (Gardner et al., 2005). The results of our study lend credence to this view. This implies that, at least for moderately or highly distressed employees, SMT programs may be more effective than many published reports suggest.

This finding raises wider questions regarding the way SMT programs tend to be labeled and classified. In particular, because the SMT program evaluated in this study was open to all employees, it would typically be described as primary or secondary prevention, or more simply as preventive (as opposed to curative or remedial). However, moderation analyses revealed that the observed SMT effects were primarily curative (or tertiary) for a subgroup of distressed workers. Thus, the practice of classifying single interventions without reference to sample heterogeneity can be misleading (Reynolds & Shapiro, 1991). A more useful approach might be to classify SMT programs according to impact on different types of employees. It is noteworthy that more recent SMT studies have adopted this potentially more accurate classification approach (de Vente et al., 2008). In this way, the same SMT program could conceivably be described as preventive for less distressed employees and curative for more distressed employees. While the present study supports the efficacy of SMT as a curative intervention, further research is needed to assess the protective effects of SMT for workers with lower levels of distress. Empirical examination of this issue would require extended follow-up periods (e.g., one year or more).

The moderation effects found in this study are consistent with the results of van der Klink et al.'s (2001) quantitative review of the SMT literature. They found a larger effect size for the few studies that targeted distressed workers, when compared to the more common preventive (i.e., open to all) approach. A similar result was reported by Bunce and Stephenson (2000). Nonetheless, other SMT studies appear to contradict this trend. For instance, de Vente et al. (2008) reported greater effectiveness for SMT in the treatment of workers with lower levels of work-related depression. Similarly, a review of SMT (stress inoculation training) by Saunders et al. (1996) found evidence that, for some outcomes, SMT can be equally (if not more) effective for less distressed individuals. Hence, it is likely that the worksite SMT literature would benefit from further research assessing moderators of outcome change. A promising avenue would be to assess whether SMT effects are influenced by certain forms of psychological distress (e.g., depression) more than others (e.g., anxiety). Such research would help inform the optimal content and duration of SMT programs for particular subgroups of distressed workers. We hope that the findings of the present study will serve as a driver for this future empirical work.

When considering the implications of the moderation findings, we would not necessarily advocate restricting SMT to employees who are showing elevated psychological distress. Such an approach could have the effect of stigmatizing workers who are selected to participate. However, where training resources are limited, occupational health practitioners might consider screening volunteers so that priority is given to distressed workers interested in receiving SMT. For ease of administration, the GHQ-12 has a number of advantages as a simple screening instrument, particularly if there are limited resources available for more in-depth assessments (e.g., clinical interviews).

Clinical Significance

A clear majority (69%) of the initially distressed workers in this study improved to a clinically significant degree. This result is encouraging given the stringent criteria required for establishing clinical significance, and given that this was a relatively brief worksite intervention. It can be argued that such criteria provide a more meaningful change index than relying solely on statistical significance and standardized effect sizes. The rates of clinically significant improvement compare very favorably to those reported in a number of group CBT studies (e.g., Kellett et al., 2007; Scott & Stradling, 1990; White, 1998), and support those who advocate the use of SMT for imparting cognitive-behavioral principles and skills in non-clinical contexts (Biglan et al., 2008; Brown, Cochrane, & Hancox, 2000; Schiraldi & Brown, 2001; White, 2000).

The tests of clinical significance also highlighted an unexpected degree of "spontaneous" improvement amongst distressed control group participants, 38% (at Time 2) and 31% (at Time 2) of whom met the criteria for clinically significant change. It is certainly not uncommon to see spontaneous remission in stress management research (e.g., Agras, Taylor, Kraemer, Southam, & Schneider, 1987; Barkham & Shapiro, 1990; Gardner et al., 2005; McLeroy, Green, Mullen, & Foshee, 1984). A number of possible explanations have been proposed for this phenomenon, including regression to the mean, seasonal effects, heightened expectation of benefit, and the effects of responding to stress and coping measures (Agras et al., 1987). It is unlikely that treatment diffusion (i.e., SMT participants discussing and sharing techniques with coworkers in the control group) caused control group change in the present study (Beehr & O'Hara, 1987). This conclusion is based on the fact that participants were asked to resist discussing training content with coworkers until everyone had received the intervention, and informal feedback suggested that this request was adhered to. Interestingly, Barkham and Shapiro (1990) note that small therapeutic effects might be expected from the

point at which a distressed employee takes action toward dealing with the problem (e.g., enrolling for SMT). Future SMT research may wish to investigate this issue further, perhaps by interviewing control group participants to identify perceived reasons for improved mental health.

Study Limitations

One limitation of the present study stems from the focus on a single mental health outcome variable (GHQ-12). Future SMT moderation studies might benefit from assessing change on more specific measures of distress (e.g., anxiety, depression, job-related strain) and perhaps also physical health outcomes. In addition, to enhance the credibility of SMT programs among organizational decision-makers, it will be important to establish the efficacy of SMT for improving job performance and reducing absenteeism. To date, relatively few SMT studies have employed organization-level criteria, and mixed results have been found amongst those studies that have done so (for reviews see Richardson & Rothstein, 2008; van der Klink et al., 2001). Nonetheless, as the principal aims of this study were to assess the moderated impact of SMT on mental health and clinical significance, the GHQ seems an appropriate measure. The assessment of clinical significance was particularly enhanced by the availability of population-specific GHQ-12 norms (Stride et al., 2007).

A second limitation of this study was the high level of participant attrition. Out of the 311 participants who completed Time 1 measures, only 119 (38%) went on to provide data at all three time points. It is conceivable that employees who felt they were not benefiting from SMT were less inclined to complete questionnaires or attend all three training sessions. However, there was no evidence of this in the present study. There were no significant baseline differences on the GHQ between those who responded only at Time 1, and those who responded on more than one occasion. Moreover, the impact of participant attrition was greatly

reduced by the multiple imputation (MI) procedure, which is now widely employed in the clinical literature (Sinharay et al., 2001). The pattern of results was similar in the MI datasets and in the reduced completer sample, further increasing confidence in the reliability of the findings. Participant attrition is not uncommon in longitudinal evaluations of worksite SMT, and a number of factors can influence attendance and questionnaire response rates (e.g., work scheduling, workload, vacations, sickness absence, and turnover). Barriers to SMT participation have not been widely examined and may warrant further investigation.

It is also worth considering the feasibility of performing moderation analyses in SMT research. This study was unusual in that it was able to utilize a large sample of workers who had volunteered for SMT across two organizations. Usually, SMT samples are more modest, and this can restrict the range of analyses performed. However, even with smaller samples, it is possible to analyze change among subgroups of employees to assess whether effects are being diluted or obscured by psychologically healthy participants. This approach was recently adopted by Gardner et al. (2005) who found that significant SMT effects were isolated to those employees showing signs of distress at baseline. Sample heterogeneity has often been neglected in SMT research and an increased awareness of this issue may help to advance the field (Bunce, 1997).

A final issue concerns establishing a role for worksite SMT alongside organization-focused stress management interventions. In particular, it has frequently been argued that employing SMT in isolation may create an unethical situation in which employees are taught strategies and skills for coping with stressors only to be sent back into a "toxic" psychosocial work environment (Giga, Cooper, & Faragher, 2003; Murphy, 1984). One possible outcome from such a one-sided approach is that participants will be less motivated to engage in the SMT program being delivered. Hence, it is preferable that SMT is one component of a more

comprehensive intervention approach that also includes efforts to tackle problematic work-related stressors. Delivering a combination of SMT and work redesign, for example, is supported by research indicating that workers with more adaptive coping skills and styles (e.g., psychological flexibility, active coping) obtain most benefit from favorable work designs (e.g., Bond & Bunce, 2003; Bond, Flaxman, & Bunce, 2008; Jex, Bliese, Buzzell, & Primeau, 2001). At the very least, it is important that stress management trainers fully acknowledge participants' concerns about work-related stressors, and find a way to feedback these concerns to relevant stakeholders within the organization (e.g., human resources, health and safety, senior management). Adopting a more comprehensive stress management approach opens up the enticing possibility of using information discussed in SMT groups to inform the design of concurrent, or subsequent, organization-focused interventions (Munz, Kohler, & Greenberg, 2001).

Conclusion

This study aimed to provide a rigorous and detailed evaluation of the impact of a worksite SMT program. Results indicate that the effects of SMT were significantly moderated by initial level of distress, and that SMT can deliver clinically meaningful mental health benefits to distressed workers. The findings support Bunce's (1997) contention that sample heterogeneity serves to dilute empirical evaluations of these popular worksite interventions. It is highly conceivable that this same issue will impact evaluations of work reorganization interventions that employ mental health outcomes. We therefore encourage further intervention research examining moderators of change. This should help reveal the circumstances in which, and indeed for whom, occupational health psychology interventions are most effective.

References

Agras, W. S., Taylor, C. B., Kraemer, H. C., Southam, M. A., & Schneider, J. A. (1987). Relaxation training for essential hypertension at the worksite: II. The poorly controlled hypertensive. *Psychosomatic Medicine, 49*, 264-272.

Barkham, M. (1989). Brief prescriptive therapy in two-plus-one sessions: Initial cases from the clinic. *Behavioural Psychotherapy, 17*, 161-175.

Barkham, M., & Shapiro, D. A. (1990). Brief psychotherapeutic interventions for job-related distress: a pilot study of prescriptive and exploratory therapy. *Counselling Psychology Quarterly, 3*, 133-147.

Beehr, T. A., & O'Hara. (1987). Methodological designs for the evaluation of occupational stress interventions. In S. V. Kasl & C. L. Cooper (Eds.), *Research methods in stress and health psychology*. Chichester: Wiley.

Biglan, A., Hayes, S. C., & Pistorello, J. (2008). Acceptance and commitment: Implications for prevention science. *Prevention Science, 9*, 139-152.

Bond, F. W. (2004). ACT for stress. In S. C. Hayes & K. D. Strosahl (Eds.), *A practical guide to acceptance and commitment therapy*. New York: Springer.

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

Bond, F. W., & Bunce, D. (2003). The role of acceptance and job control in mental health, job satisfaction, and work performance. *Journal of Applied Psychology, 88*, 1057-1067.

Bond, F. W., & Hayes, S. C. (2002). ACT at work. In F. W. Bond & W. Dryden (Eds.), *Handbook of brief cognitive behaviour therapy*. Chichester, UK: John Wiley & Sons.

Bond, F. W., Flaxman, P. E., & Bunce, D. (2008). The influence of psychological flexibility on work redesign: Mediated moderation of a work reorganization intervention. *Journal of Applied Psychology, 93,* 645-654.

Brown, J. S. L., Cochrane, R., & Hancox, T. (2000). Large-scale health promotion stress workshops for the general public: A controlled evaluation. *Behavioural and Cognitive Psychotherapy, 28,* 139-151.

Bunce, D. (1997). What factors are associated with the outcome of individual-focused worksite stress management interventions? *Journal of Occupational and Organizational Psychology, 70,* 1-17.

Bunce, D., & Stephenson, K. (2000). Statistical considerations in the interpretation of research on occupational stress management interventions. *Work & Stress, 14,* 197-212.

Dahl, J., Wilson, K. G., & Nilsson, A. (2004). Acceptance and commitment therapy and the treatment of persons at risk for long-term disability resulting from stress and pain symptoms: A preliminary randomized trial. *Behavior Therapy, 35,* 785-801.

de Vente, W., Kamphuis, J. H., Emmelkamp, P. M. G., & Blonk, R. W. B. (2008). Individual and group cognitive-behavioral treatment for work-related stress complaints and sickness absence: A randomized controlled trial. *Journal of Occupational Health Psychology, 13,* 214-231.

Eifert, G. H., & Forsyth, J. P. (2005). *Acceptance and commitment therapy for anxiety disorders.* Oakland, CA: New Harbinger.

Flaxman, P. E., & Bond, F. W. (2006). Acceptance and commitment therapy in the workplace. In R. A. Baer (Ed.), *Mindfulness-based treatment approaches*. San Diego, CA: Elsevier.

Free, M. L., Oei, T. P. S., & Sanders, M. R. (1991). Treatment outcome of a group cognitive therapy for depression. *International Journal of Group Psychotherapy, 41,* 533-547.

Gardner, B., Rose, J., Mason, O., Tyler, P., & Cushway, D. (2005). Cognitive therapy and behavioural coping in the management of work-related stress: An intervention study. *Work & Stress, 19,* 137-152.

Gardner, F. L., & Moore, Z. E. (2007). *The psychology of enhancing human performance: The Mindfulness-Acceptance-Commitment (MAC) approach*. New York: Springer Publishing Company.

Giga, S. I., Cooper, C. L., & Faragher, B. (2003). The development of a framework for a comprehensive approach to stress management interventions at work. *International Journal of Stress Management, 10,* 280-296.

Goldberg, D. P. (1978). *Manual of the General Health Questionnaire.* Windsor: NFER-NELSON.

Goldberg, D. P., Gater, R., Sartorius, N., Ustun, T. B., Piccinelli, M., Gureje, O., & Rutter, C. (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine, 27,* 191-197.

Goldberg, D. P., & Williams, P. (1988) *A user's guide to the General Health Questionnaire.* Windsor: NFER-NELSON.

Goldfried, M. R. (1980). Psychotherapy as coping skills training. In M. J. Mahoney (Ed.), *Psychotherapy process: Current issues and future directions*. New York: Plenum.

Hardy, G. E., Shapiro, D. A., Haynes, C. E., & Rick, J. E. (1999). Validation of the General Health Questionnire-12 using a sample of employees from the healthcare services. *Psychological Assessment, 11,* 159-165.

Hardy, G. E., Woods, D., & Wall, T. D. (2003). The impact of psychological distress on absence from work. *Journal of Applied Psychology, 88,* 306-314.

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

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

Hilton, M. F., Whiteford, H. A., Sheridan, J. S., Cleary, C. M., Chant, D. C., Wang, P. S., & Kessler, R. C. (2008). The prevalence of psychological distress in employees and associated occupational risk factors. *Journal of Occupational & Environmental Medicine, 50,* 746-757.

Jacobson, N. S., Follette, W. C., & Revenstorf, D. (1984). Psychotherapy outcome research: Methods for reporting variability and valuating clinical significance. *Behavior Therapy, 15,* 336-352.

Jacobson, N. S., & Revenstorf, D. (1988). Statistics for assessing the clinical significance of psychotherapy techniques: Issues, problems, and new developments. *Behavioral Assessment, 10,* 133-145.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59,* 12-19.

Jex, S. M., Bliese, P. D., Buzzell, S., & Primeau, J. (2001). The impact of self-efficacy on stressor-strain relations: Coping style as an explanatory mechanism. *Journal of Applied Psychology, 86,* 401-409.

Kellett, S., Clarke, S., & Matthews, L. (2007). Delivering group psychoeducational CBT in Primary Care: Comparing outcomes with individual CBT and individual

psychodynamic-interpersonal psychotherapy. *British Journal of Clinical Psychology, 46,* 211-222.

Kessler, R. C., & Frank, R. G. (1997). The impact of psychiatric disorders on work loss days. *Psychological Medicine, 27,* 861-873.

Kessler, R. C., Merikangas, K. R., & Wang, P. S. (2008). The prevalence and correlates of workplace depression in the National Comorbidity Survey Replication. *Journal of Occupational & Environmental Medicine, 50,* 381-390.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer Publishing Company.

McLeroy, K. R., Green, L. W., Mullen, K. D., & Foshee, V. (1984). Assessing the effects of health promotion in worksites. *Health Education Quarterly, 11,* 379-401.

Meichenbaum, D. (1985). *Stress inoculation training*. New York: Pergamon.

Munz, D. C., Kohler, J. M., & Greenberg, C. I. (2001). Effectiveness of a comprehensive worksite stress management program: Combining organizational and individual interventions. *International Journal of Stress Management, 8,* 49-61.

Murphy, L. R. (1984). Occupational stress management: A review and appraisal. *Journal of Occupational Psychology, 57,* 1-15.

Murphy, L. R. (1996). Stress management in work settings: A critical review. *American Journal of Health Promotion, 11,* 112-135.

Quick, J. C., Quick, J. D, Nelson, D. L., & Hurrell, J. J. (1997). *Preventive stress management in organizations.* Washington DC: American Psychological Association.

Reynolds, S. (1997). Psychological well-being at work: Is prevention better than cure? *Journal of Psychosomatic Research, 43,* 93-102.

Reynolds, S., & Briner, R. B. (1994). Stress management at work: With whom, for whom and to what ends? *British Journal of Guidance and Counselling, 22,* 75-87.

Reynolds, S. & Shapiro, D. A. (1991). Stress reduction in transition: Conceptual problems in the design, implementation, and evaluation of worksite stress management interventions. *Human Relations, 7,* 717-733.

Richardson, K. M., & Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: A meta-analysis. *Journal of Occupational Health Psychology, 13,* 69-93.

Saunders, T., Driskell, J. E., Johnston, J. H., & Salas, E. (1996). The effect of stress inoculation training on anxiety and performance. *Journal of Occupational Health Psychology, 1,* 170-186.

Schafer, J. L. (1999). NORM: Multiple imputation of incomplete multivariate data under a normal model. Available from http://www.stat.psu.edu/~jls/misoftwa.html

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art, *Psychological Methods, 7,* 147-177.

Schiraldi, G. R., & Brown, S. L. (2001). Primary prevention for mental health: Results of an exploratory cognitive-behavioral college course. *The Journal of Primary Prevention, 22,* 55-67.

Scott, M. J., & Stradling, S. G. (1990). Group cognitive therapy for depression produces clinically significant reliable change in community-based settings. *Behavioural Psychotherapy, 18,* 1-19.

Searle, B. J. (2008). Does personal initiative training work as a stress management intervention? *Journal of Occupational Health Psychology, 13,* 259-270.

Sinharay, S., Stern, H. S., & Russell, D. (2001). The use of multiple imputation for the analysis of missing data. *Psychological Methods, 6,* 317-329.

Stride, C., Wall, T. D., & Catley, N. (2007). *Measures of job satisfaction, organisational commitment, mental health and job-related well-being: A benchmarking manual.* Chichester: Wiley.

van der Klink, J. J. L., Blonk, R. W. B., Schene, A. H., & van Dijk, F. J. H. (2001). The benefits of interventions for work-related stress. *American Journal of Public Health, 91***,** 270-276.

White, J. (1998). "Stress control" large group therapy for generalized anxiety disorder: Two year follow-up. *Behavioural and Cognitive Psychotherapy, 26,* 237-245.

White, J. (2000). *Treating anxiety and stress: A group psycho-educational approach using brief CBT*. Chichester: John Wiley & Sons.

White, J., Brooks, N., & Keenan, M. (1995). Stress control: A controlled comparative investigation of large group therapy for generalized anxiety disorder: Process of change. *Clinical Psychology and Psychotherapy, 2,* 86-97.

Table 1

GHQ-12 Means, Standard Deviations, and Between-Group Effects

	SMT (n = 177)		**Control** (n = 134)		Between-group effect
	M	*SD*	*M*	*SD*	*t (df)*
Time 1	4.04	5.59	4.00	4.41	
Time 2	2.44	3.86	3.69	4.98	2.55 (18)**
Time 3	1.80	6.27	3.87	6.60	2.27 (5)*

Note. Results were pooled from five imputed data sets (N = 311);

SMT = stress management training; GHQ = general health questionnaire

**p < .05. *p < .10.

Table 2

Moderated Regression Analyses for Determining Whether Baseline

Distress Moderates the Impact of SMT

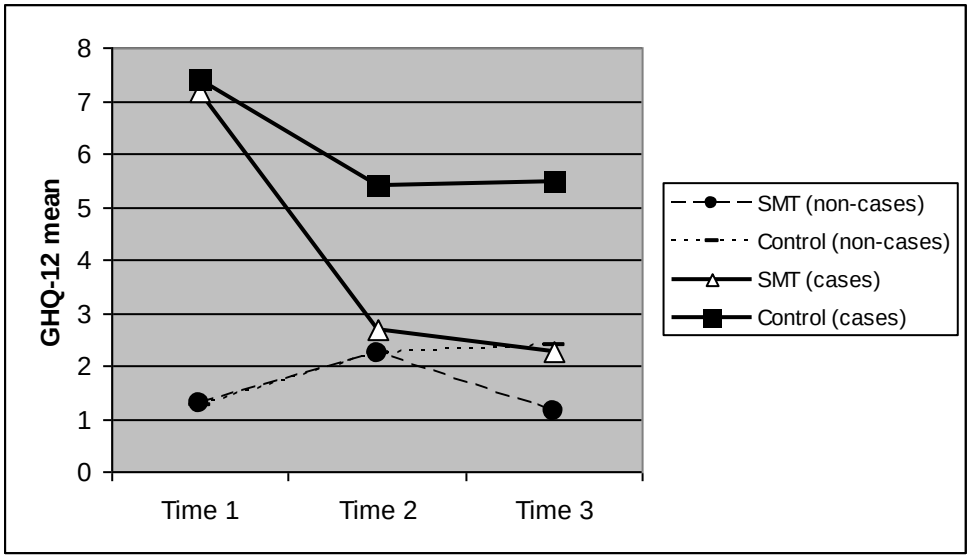
Outcome Variable	**Predictor**	**B**	**SE**	**R^2**
GHQ Time 2				
	GHQ Time 1	.51**	.09	
	Group [SMT vs. control]	.30	.77	
	Group X GHQ Time 1	-.38*	.12	
	Model Summary			.17**
GHQ Time 3				
	GHQ Time 1	.23	.90	
	Group [SMT vs. control]	-.53	1.22	
	Group X GHQ Time 1	-.29*	.11	
	Model Summary			.24**

Note. GHQ = general health questionnaire; B values are unstandardized coefficients

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

Figure Caption

Figure 1. Change on GHQ-12 in case and non-case subgroups


GHQ-12 mean
8
7
6
5
4
3
2
1
0
Time 1
Time 2
Time 3
SMT (non-cases)
Control (non-cases)
SMT (cases)
Control (cases)