

Does Distraction Facilitate Problem-focused Coping with Job Stress? A 1 year Longitudinal Study

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Abstract This study examined the sole and combined effects of problem-focused coping and distraction on employee well-being (i.e., stress responses and job performance) using two-wave panel survey data with a 1-year time lag. Participants were 488 male employees, who worked for a construction machinery company in western Japan. Hierarchical multiple regression analyses were conducted to examine whether distraction moderates the relationship of problem-focused coping with well-being. More use of problem-focused coping was negatively related to subsequent stress responses among those high in distraction. The combination of high problem-focused coping and high distraction was positively related to subsequent job performance, although it was limited only to the high job stress situation. Results suggest that the combination of high problem-focused coping and high distraction may lead to lower stress responses and better performance (but only in high job stress situations for performance) than the combination of high problem-focused coping and low distraction, at least for male blue-collar workers.

Keywords Problem-focused coping · Distraction · Stress responses · Performance · Longitudinal study

Introduction

Job Stress, Coping, and Coping Effectiveness

There is accumulating evidence that poor psychosocial job characteristics have adverse effects on employee well-being (e.g., increased stress responses, impaired performance; Cooper et al. 2001; Karasek and Theorell 1990). The same effects seem to also apply to person-related variables that also might influence well-being, such as coping strategies (Elfering et al. 2005; Eriksen et al. 2000; Latack and Havlovic 1992). According to the stress and coping model of Lazarus and Folkman (1984), coping is defined as ongoing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person (Lazarus 1993, 1999).

Despite a wide range of strategies and different categorizations, two main categorizations are mentioned almost universally: problem-focused and emotion-focused coping (Elfering et al. 2005; Penley et al. 2002). Problem-focused coping refers to efforts to change a stressful situation (e.g., seeking information, planning, taking action), while emotion-focused coping refers to efforts to regulate the emotional distress associated with the situation (e.g., distraction, positive reappraisal, seeking emotional support).

According to Penley et al. (2002), that performed meta-analyses to examine the association between each form of coping and health-related outcomes among non-clinical adults in 34 studies, problem-focused coping was related to lower stress responses, whereas most types of emotion-focused coping (i.e., distancing, self-control, accepting responsibility, avoidance, and wishful thinking) were related to higher stress responses. However, their results also showed that many of those associations were moderated by

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the type (i.e., health-related, job-related, relationship-related, and self-selected), controllability (i.e., controllable and uncontrollable), and duration (i.e., acute and chronic) of the stressor. This suggests that coping strategies have situation-specific effects—that is, a given strategy may have one effect in a particular situation and a different effect in another situation (e.g., Elfering et al. 2005; Lee-Bagley et al. 2005).

In addition to this possibility for the relationship between coping strategy and situation, there are also some possible explanations for the highly intricate relationship between coping strategies and well-being, a relationship that has yet to be fully examined. One possible explanation is the combined effects of problem-focused and emotion-focused coping (Gaudreau and Blondin 2004). Until now, only bivariate associations of coping strategies with outcome variables have mainly been investigated, but in reality people use both problem-focused and emotion-focused coping in stressful situations (Folkman and Lazarus 1980, 1985; Gaudreau and Blondin 2004; Lazarus 1993; Shimazu and Kosugi 2003). In addition, it is shown that the effect of a particular form of coping on well-being depends on whether the individual uses this coping mode exclusively or in combination with other forms of coping (Gaudreau and Blondin 2004; Shimazu and Kosugi 2003). For instance, distraction-oriented coping (a form of emotion-focused coping) does *not* correlate with either better performance or affective state, whereas a combination of distraction-oriented coping with task-oriented (i.e., problem-focused) coping leads to more positive outcomes (Gaudreau and Blondin 2004).

Another possible explanation may be related to the point in time that well-being is assessed. It has been suggested that the effectiveness of each form of coping depends on whether it is observed in the short-term or the long-term (Aldwin 1994; Cooper et al. 2001; Ingledew et al. 1997; Suls and Fletcher 1985). For instance, Suls and Fletcher (1985) reported in their meta-analysis that avoidance (i.e., emotion-focused) coping might be superior in the short-term, whereas non-avoidance (i.e., problem-focused) coping might be superior in the long-term. It is important to examine both short-term and (especially) long-term coping effectiveness because strategies that are adaptive in the short run might turn out to be maladaptive in the long run.

This study, therefore, aimed to examine the sole and combined effects of problem-focused and emotion-focused coping on employee well-being (i.e., stress responses and performance) using longitudinal data.

Problem-focused Coping and Well-being

Problem-focused coping refers to efforts to change a stressful situation (Cooper et al. 2001; Penley et al. 2002).

Since this form of coping aims at solving the problem and improving the situation directly, it is likely to lead to better well-being (i.e., lower stress responses and better performance; Brown et al. 2005; Cohen et al. 1986; Gaudreau and Blondin 2004; Hockey 1997).

However, problem-focused coping may also have deleterious effects. According to Cohen's costs of coping theory (Cohen et al. 1986), even if the direct effects of a stressor are neutralized by an apparently adaptive (i.e., problem-focused) coping strategy, some negative side-effects may occur, such as cumulative fatigue or pathogenic physiological responses. For instance, it is reported that after coping with a stressor, individuals suffer from performance decrements (Glass and Singer 1972) and show insensitivity toward others as expressed in increased aggression and decreased helping (Cohen and Spacapan 1978). It is also reported that norepinephrine levels in blood and urine remain elevated in subjects engaged in active efforts to cope with stressors (Contrada et al. 1982). These negative effects would particularly be observed in individuals who engage in prolonged stressful situations that deplete their energy, a mental condition known as job burnout (Maslach et al. 2001).

In a similar vein, Hobfoll's (1989) Conservation of Resources (COR) theory asserts that an individual aspires to preserve, protect, and build resources. Resources are characterized as objects, conditions, personal characteristics, or energies that have specific importance for the individual. According to COR theory, stress occurs when individuals are threatened with resource loss, actually lose resources, or fail to gain resources following resource investment. Thus, although problem-focused coping is basically adaptive in the short run, it might be maladaptive in the long run because continuous use of this effortful coping mode provides less opportunity for recovery from resource loss (Hockey 1997; Schaufeli and Bakker 2004).

It follows that in order to improve the effectiveness of problem-focused coping in the long run, it is important to recuperate and replenish one's energy resources that have been depleted by attempts to actually overcome the problem. This can be achieved by combining problem-focused coping with emotion-focused coping (e.g., Cohen et al. 1986; Gaudreau and Blondin 2004; Shimazu and Kosugi 2003).

Cohen et al. (1986) claimed that individuals who combine active (i.e., problem-focused) and non-active (i.e., emotion-focused) coping strategies in dealing with stressors may experience less psychological costs than people who exclusively rely on other, more active strategies. This suggests that, if individuals combine problem-focused and emotion-focused coping, then the deleterious effects of problem-focused coping may be attenuated because emotion-focused coping such as distraction fosters recuperation

and recovery from resource loss (Aldwin 1994; Cohen et al. 1986; Folkman and Moskowitz 2000). As a result employee well-being may be enhanced.

Emotion-focused Coping and Well-being

Emotion-focused coping refers to efforts to regulate the emotional distress associated with a situation. The strategies classified under this category are quite different from one another (e.g., distraction, positive reappraisal, seeking emotional support) and empirical support for their effectiveness is inconclusive (Ingredeew et al. 1997; Penley et al. 2002; Tamres et al. 2002). One possible reason is that emotion-focused coping scales often mix strategies in which emotions are unregulated and expressed freely and those which involve active attempts to regulate emotional reactions (Reid et al. 1998; Stanton et al. 2000). Since the former strategy might be contaminated with psychological distress and psychopathology, the relationship between emotion-focused coping and maladjustment may be inflated. Thus, this study avoids the confounding of emotional expression and active attempts to regulate emotional reactions and focuses on the active attempts, especially distraction.

Distraction refers to active attempts to deal with a stressful situation by engaging in an alternative pleasurable activity (Livneh et al. 2001; Skinner et al. 2003). It has been found to lead to better well-being (i.e., lower stress responses and better performance) by enhancing the effectiveness of problem-focused coping (Gaudreau and Blondin 2004; Nolen-Hoeksema and Morrow 1993; Shimazu and Kosugi 2003) because it may provide individuals with the opportunity for rest and detachment from the stressful situation. As a result, it is likely that the depleted resources are replenished, which, in turn, enhances individual well-being. From the perspective of COR theory, distraction may provide individuals with the opportunity to interrupt loss spirals and to set in motion gain spirals because of the replenishment of resources, such as increased energy or dedication. These resources could then be invested to gain even more resources, and so on (Fritz and Sonnentag 2005; Llorens et al. 2007).

However, since distraction does *not* aim at solving the problem and improving the situation directly, it is *not* likely that the sole use of it leads to better well-being (Brown et al. 2005; Gaudreau and Blondin 2004; Pascual et al. 2003). Instead, when used *in concordance with* problem-focused coping, it is more likely to lead to subsequent positive outcomes.

For instance, Shimazu and Kosugi (2003), in their cross-sectional study of 4,487 male employees, found significant interaction effects between problem-focused coping and distraction (i.e., emotion-focused coping) on psychological

distress. More specifically, they reported that the use of more problem-focused coping was associated with lower psychological distress, but only among those high on distraction. In addition, Gaudreau and Blondin (2004), in their longitudinal study of 144 male golfers, found a similar interaction effect between task-oriented (i.e., problem-focused) coping and distraction-orientated coping on performance and positive affect. They observed that the use of more task-oriented coping was associated with subsequent higher performance and more positive affect, but only among those who used distraction-oriented coping.

Although these results suggest that the advantage of using problem-focused coping increases as the use of distraction increases, the long-term effects of the combination of problem-focused coping and distraction are unknown. Please note that the only available supportive empirical results were observed either in a cross-sectional study (Shimazu and Kosugi 2003) or a longitudinal study with a very short time interval of only a couple of days (Gaudreau and Blondin 2004).

The Current Study

The current study examines the sole and combined effects of problem-focused coping and distraction on subsequent employee well-being using 1-year longitudinal data. We extend previous studies (Gaudreau and Blondin 2004; Shimazu and Kosugi 2003) in the following two ways. First, our study examines the long-term effects of the combination of problem-focused coping and distraction rather than focusing on relatively short-term effects. Second, this study captures somewhat different experiences from previous studies (Gaudreau and Blondin 2004; Shimazu and Kosugi 2003), possibly in relation to chronic job stressors. Specifically, rather than directing participants to focus on a particular event (i.e., golf tournament match; Gaudreau and Blondin 2004) or the most stressful problem experienced in the workplace during the previous 3 months (Shimazu and Kosugi 2003), we ask employees how they *usually* deal with chronic stressors at work. In line with the conceptual discussion above, we expect a significant interaction effect between problem-focused coping and distraction on the outcome variables. More specifically, we hypothesize that the effectiveness of problem-focused coping on subsequent stress responses and performance will be facilitated by distraction.

Since our aim is to examine the long-term effects of coping with chronic job stressors on stress responses and performance, we measure job stressors and coping at a more general level, that is, we ask employees how they *usually* deal with stressors at work. According to Aldwin (1994, p. 114), the key criteria in determining whether to use a coping process (i.e., incident-specific coping) or

coping style measure must be the research question at hand. More specifically, process measures may be better for predicting immediate outcomes, while style measures may be better for predicting long-term outcomes. Since our goal is to predict the overall responses of employees across stressors in the workplace (*not* their specific responses to a specific work situation), we use a measure of coping *style* that asks employees how they *usually* cope with chronic job stressors to predict long-term outcomes.

We adopt 1-year as the interval period based on the following rationale. According to Hockey (1997), a longitudinal study of work and health will require at least 1 year between first and second survey to allow time for stress responses to develop. In addition, a 1-year interval largely eliminates possible seasonal fluctuations (De Jonge et al. 2001). Furthermore, we assumed from a theoretical point of view that the advantage of using distraction in combination with problem-focused coping is more obvious in the long run because the deleterious effects of problem-focused coping are more likely to occur when individuals continue to invest their energy in dealing with a prolonged problem (Cohen et al. 1986; Hobfoll 1989; Kristenson et al. 2004; Maslach et al. 2001; Schaufeli and Bakker 2004; Ursin 1980).

We use self-reported job performance as well as stress responses as indicators of employee well-being because: (1) it is a specific positive outcome that is indicative of employee overall well-being (Schaufeli and Bakker 2004), and (2) empirical studies have shown that individual coping plays an important role not only in explaining stress responses but also performance (Brown et al. 2005; Gaudreau and Blondin 2004; Hockey 1997). Therefore this study considers stress responses to be an affective (and psychosomatic) aspect and job performance to be a behavioral aspect of well-being. Correlations between stress responses and job performance were found to be $r = -.13$ (T1) and $r = -.16$ (T2), respectively, suggesting that they are weakly correlated and do not overlap with each other. We therefore formulate the same predictions for different aspects of well-being as follows.

Hypothesis 1: The favorable effect of problem-focused coping on subsequent stress responses (i.e., lower stress responses) will be enhanced as the use of distraction increases (Hypothesis 1a). Likewise, the favorable effect of problem-focused coping on subsequent job performance will be enhanced (i.e., better job performance) as the use of distraction increases (Hypothesis 1b).

Distraction might not, however, be equally important in all situations. For instance, when facing a highly stressful work situation,¹ one might require an active coping effort to

deal with it (Hockey 1997; Muraven and Baumeister 2000). Since active coping efforts consume more energy resources, a subsequent opportunity for rest and detachment from the stressful situation might be needed in order to recover and restore the lost energy resources (Hockey 1997; Muraven and Baumeister 2000). As a consequence, distraction might be particularly necessary in a highly stressful work situation. In line with the discussion above, we expect that the extent of job stressors will moderate the relationship between the two coping strategies (i.e., problem-focused coping and distraction) and the study outcomes (i.e., stress responses and job performance). More specifically, we formulate the second hypothesis as follows:

Hypothesis 2: When employees face a stressful situation, the favorable effect of problem-focused coping on subsequent stress responses will be enhanced (i.e., lower stress response) as the use of distraction increases (Hypothesis 2a). Likewise, in such a situation, the favorable effect of problem-focused coping on subsequent job performance will be enhanced (i.e., better job performance) as the use of distraction increases (Hypothesis 2b).

Methods

Participants

All employees, comprised of production assembly line workers of a construction machinery company in western Japan, were invited by the industrial health staff of the company to participate in the study. Before participating, all employees were informed about the objectives of the study by pamphlet as well as by their supervisors. The study was approved by the ethics review board of Hiroshima University.

Questionnaires were distributed twice among the participants with an interval of 1 year. For the first-wave (T1), questionnaires were sent to all employees ($n = 607$), with 589 employees returning completed questionnaires (97.0% response rate). For the second-wave (T2), questionnaires were once again sent to all employees ($n = 707$), with 694 employees returning completed questionnaires (98.2% response rate). An industrial health staff member sent a reminder to participants if their completed questionnaire had not been received within 2 weeks. In total, 518 employees returned both questionnaires (87.9% of the initial respondents). Almost 99% of those who returned both completed questionnaires were men. In light of this fact, the data from the eight female respondents were excluded so that a longitudinal sample of 510 male employees remained.

A comparison of completers who answered both surveys ($n = 510$) with drop-outs who responded only at the T1 ($n = 63$) did *not* reveal serious selection bias. Although the

¹ In this study, we consider stressful work situation as follows: the more amount of job stressor a respondent reported, the more stressful the situation would be (Hurrell et al. 1998).

completers had significantly higher scores on job performance than drop-outs ($p < .01$), no significant differences were found on any of the other variables, such as demographic characteristics (age and job status), job stressors, coping, and stress responses ($p > .05$).

Measures

Job Stressors

Job stressors were assessed using the corresponding subscales of the Brief Job Stress Questionnaire (BJSQ; Shimomitsu et al. 1998). The questionnaire was developed with support from the Japanese Ministry of Labor and is used in Japan on a regular basis. Job stressors were measured by 17 items, reflecting quantitative, qualitative, physical job demands, and interpersonal conflict. Examples include “My job requires working hard,” “My job requires much concentration,” and “There are conflicting opinions at the worksite.” The BJSQ items were scored on a 4-point Likert scale, ranging from “1 = agree” to “4 = disagree.” Each item was scored so that high scores indicated a high level of job stressors. As we intended to use an aggregate level of perceived job stressors as the independent variable, the summation of the scores of all 17 items was used as the score of the index for total stressors. The alpha coefficients were .74 for T1 and .76 for T2, and the test–retest reliability between T1 and T2 was .60.

Coping

Coping was assessed using the corresponding subscale of the Brief Scales for Coping Profile (BSCP; Kageyama et al. 2004). The current study used the “Active Solution” scale (three items: I try to analyze the causes and solve the problem; I look at the problem in the light of past problems; I think calmly about what I should be doing now) for problem-focused coping and the “Changing Mood” scale (three items: I seek distraction through my hobbies and entertainment; I try to do something that calms me down; I try to refresh myself by engaging with activities such as going out or traveling) for distraction. Respondents were asked to indicate the extent to which they often used the strategy described by the particular item, ranging from “1 = almost never” to “4 = very often.” The α coefficients were .79 and .82 for problem-focused coping (T1 and T2, respectively) and .75 and .76 for distraction (T1 and T2, respectively), and the test–retest reliabilities between T1 and T2 were .52 and .50 for problem-focused coping and distraction, respectively.

Stress Responses

Stress responses were assessed using the corresponding subscale of BJSQ (Shimomitsu et al. 1998) that includes 29 items, reflecting lack of vigor (“I feel vigorous”), fatigue (“I am completely tired”), anger (“I feel anger”), anxiety (“I feel ill at ease”), depression (“I feel depressed”), and somatic complaints (“I have a pain in the back”). Each item was scored on a 4-point Likert scale ranging from “1 = strongly disagree” to “4 = strongly agree.” It is believed that it is difficult to discriminate between different types of psychological distress in the workplace (Gotlib and Cane 1989; Tsutsumi et al. 2005). Therefore we conducted a principal component analysis of the six measures, and only one component with an eigenvalue over one emerged, accounting for 55.3 and 54.8% of the variance for T1 and T2, respectively. Furthermore, the α coefficients were .93 for T1 and .93 for T2, suggesting high internal consistency. Therefore the six measures were combined into one composite index of stress responses. The test–retest reliability between T1 and T2 was .62.

Job Performance

Job performance was assessed using a single item from the World Health Organization Health and Work Performance Questionnaire (HPQ; Kessler et al. 2003). Respondents were asked to rate their overall work performance during the past 4 weeks on a 0–10 self-anchoring scale, in which 0 is defined as the “worst possible work performance a person could have on this job” and 10 is defined as “top work performance” on the job.

We used the single-item self-report global scale because (1) it has been argued that a global index of overall job performance (single item measure) is an inclusive and valid measure of job performance (Kessler et al. 2003), (2) data on the objective performance of employees is difficult to obtain, and (3) alternative self-report measures of job performance focus on single occupations and include questions tailored to the unique demands of those occupations. The test–retest reliability between T1 and T2 was .50.

Analysis

Hierarchical multiple regression analyses (Cohen et al. 2003) were carried out on the two outcome variables at T2 (stress responses and performance). In order to test Hypothesis 1 and Hypothesis 2, the two-way interaction (problem-focused coping \times distraction) and the three-way interaction (job stressors \times problem-focused coping \times distraction) needed to be computed. In order to achieve this, we included main effects and two two-way interactions (job stressors \times problem-focused coping, and job

stressors \times distraction) in the regression. Accordingly, the independent variables at T1 were entered into the equation in the following order. At Step 1, the respective outcome variable at T1 was entered to control for the initial level of well-being. At Step 2, job stressors, problem-focused coping, and distraction were entered simultaneously. At Step 3, three two-way interaction terms (job stressors \times problem-focused coping, job stressors \times distraction, and problem-focused coping \times distraction) were entered simultaneously. Finally, at Step 4, a three-way interaction term (job stressors \times problem-focused coping \times distraction) was entered.

In order to reduce potential problems of multicollinearity, independent variables were centered by subtracting the respective means from each of the independent variables before the formation of cross-product terms. Hypothesis 1 would therefore be supported if the two-way interaction (problem-focused coping \times distraction) at Step 3 were significant, whereas Hypothesis 2 would be supported if the three-way interaction (job stressors \times problem-focused coping \times distraction) at Step 4 were significant.

Results

Descriptive Statistics

Table 1 presents the ranges, means, standard deviations, and zero-order correlations of all study variables. As for the independent variables, job stressors were significantly and positively correlated with stress responses (T1, T2). Problem-focused coping was significantly and positively correlated with distraction and job performance (T1, T2). However, problem-focused coping was not significantly correlated with stress responses (T1, T2), and distraction was not significantly correlated with any of the outcome variables. As for the outcome variables, stress responses and job performance were weakly but significantly negatively correlated with each other.

Predicting Levels of Stress Responses

Table 2 shows the results of the longitudinal hierarchical multiple regression analyses on stress responses at T2. The increases in R^2 from Step 1 to Step 2 and from Step 2 to Step 3 are significant. Although the main effects of both problem-focused coping and distraction were not significant ($p > .05$), two interaction terms (i.e., stressors \times distraction and problem-focused coping \times distraction) reached significance at Step 3.

To examine the nature of the interaction between problem-focused coping and distraction (*H1a*), we calculated the regression equation of problem-focused coping on T2 stress responses separately for low (mean $-1SD$) and high (mean $+1SD$) levels of distraction (cf. Aiken and West 1991). A negative relationship between problem-focused coping and stress responses, although marginally significant, was found for the group high in distraction (mean $+1SD$; $\beta = -.09$, $p < .10$), whereas *no* relationship was found for those low in distraction (mean $-1SD$; $\beta = .06$, $p > .10$) (Fig. 1). In other words, problem-focused coping was associated with subsequent fewer stress responses, *but only in combination with high levels of distraction*. This means that *H1a* was confirmed.

Predicting Levels of Job Performance

Table 3 shows the results of the longitudinal hierarchical multiple regression analyses on job performance at T2. The increases in R^2 from Step 1 to Step 2 and from Step 3 to Step 4 reached significance (please note that the increase from Step 1 to Step 2 was marginally significant). At Step 4, the main effect of distraction was negatively associated with job performance ($p < .05$). In addition, the three-way interaction between job stressors, problem-focused coping, and distraction reached significance ($p < .01$).

When few job stressors were perceived (Fig. 2a), *no* relationship between problem-focused coping and job performance was found for those high in distraction ($\beta = -.13$, $p > .10$), whereas a *positive* relationship, although marginally significant, was found for those low in distraction ($\beta = .14$, $p < .10$). Put differently, problem-focused coping was associated with subsequent better job performance in combination with low distraction—*but only when few job stressors were perceived*. Contrarily, in a high job stress situation (Fig. 2b), a *positive* relationship between problem-focused coping and job performance was found for those high in distraction ($\beta = .19$, $p < .05$), whereas *no* relationship was found for those low in distraction (mean $-1SD$; $\beta = .09$, $p > .10$). That is, problem-focused coping was associated with subsequent better job performance in combination with high distraction—*but only when more job stressors were perceived*. This means that *H2b* was confirmed.

Discussion

The aim of this study was to examine whether or not the interplay between problem-focused coping and distraction predicts future employee well-being (i.e., stress responses and job performance) levels 1 year later. In contrast to

Table 1 Descriptive statistics for the key study variables ($N = 461\text{--}488$)^a

Variable	Measurement range	Mean	SD	2	3	4	5	6	7	8	9	10
1. Job stressors (T1)	17–68	44.06	6.40	.00	-.03	.58***	-.02	.59***	-.03	-.08 [†]	.43***	-.05
2. Problem-focused coping (T1)	3–12	8.78	2.21		.20***	-.05	.18***	-.03	.52***	.17***	-.03	.12**
3. Distraction (T1)	3–12	7.97	2.62			-.02	.00	-.02	.12**	.49***	-.04	-.07
4. Stress responses (T1)	29–116	59.90	15.49				-.13**	.41***	.01	-.04	.62***	-.13**
5. Job performance (T1)	0–10	7.33	1.89					-.08 [†]	.09 [†]	.00	-.13**	.50***
6. Job stressors (T2)	17–68	44.08	6.42						-.04	-.03	.61***	-.11*
7. Problem-focused coping (T2)	3–12	8.73	2.28							.22***	-.06	.12**
8. Distraction (T2)	3–12	7.85	2.54								-.03	-.10*
9. Stress responses (T2)	29–116	61.97	15.21									-.16***
10. Job performance (T2)	0–10	7.53	1.78									

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

^a The numbers did not add up to the total number of the participants because of occasional missing data

Table 2 Hierarchical multiple regression analyses predicting stress responses scores (Time 2) from stress responses, job stressors, problem-focused coping and distraction at Time 1 ($N = 418$)^a

Predictors	Steps							
	I		II		III		IV	
	B^b	β^c	B	β	B	β	B	β
I Stress responses (T1)	.61	.60***	.53	.52***	.53	.52***	.53	.52***
II Job stressors (T1)			.32	.13**	.31	.13**	.34	.14**
Problem-focused coping (T1)			-.13	-.02	-.11	-.02	-.11	-.02
Distraction (T1)			-.20	-.03	-.24	-.04	-.24	-.04
III Stressors × Problem-focused coping (T1)					-.02	-.02	-.02	-.02
Stressors × Distraction (T1)					.07	.08*	.07	.08*
Problem-focused coping × Distraction (T1)					-.21	-.08*	-.20	-.08*
IV Stressors × Problem-focused coping × Distraction (T1)							-.01	-.04
R^2		.36***		.38***		.39***		.39***
Change in R^2		.36***		.01*		.01*		.00

* $p < .05$, ** $p < .01$, *** $p < .001$

^a The constant values of each step are 25.42, 30.12, 30.59, and 30.54 for step 1–4, respectively

^b Unstandardized regression coefficients

^c Standardized regression coefficients

previous studies (Shimazu and Kosugi 2003; Gaudreau and Blondin 2004), the current study focused on the *long-term* effects of the combination of problem-focused coping and distraction in dealing with *chronic* job stressors. Hierarchical multiple regression analyses (Cohen et al. 2003) were carried out in order to test the two hypotheses, whereby we expected the two-way interaction (problem-focused coping × distraction) for Hypothesis 1ab and the three-way interaction (job stressors × problem-focused coping × distraction) for Hypothesis 2ab. In the equation,

the respective outcome variable at T1 was also entered to control for the initial well-being level because previous longitudinal studies had suggested that initial well-being confounds the job stressor-well-being relationship (e.g., Daniels and Guppy 1994; Parkes 1991). Indeed, initial job stressors (and two forms of coping) explained only 1% of the variances in subsequent well-being after controlling for the initial well-being level.

Consistent with our prediction (Hypothesis 1a), a significant two-way interaction between problem-focused

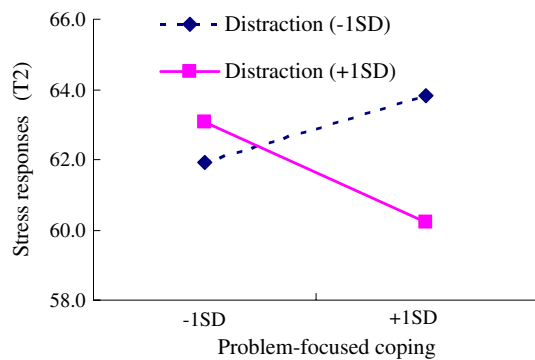


Fig. 1 Interaction between problem-focused coping and distraction on stress responses

copied and distraction was found on subsequent stress responses, whereby problem-focused coping was associated with lower stress responses among those with high distraction. The result was in line with prior cross-sectional (Shimazu and Kosugi 2003) and short-term longitudinal studies (Gaudreau and Blondin 2004), providing stronger evidence for the synergistic effect of problem-focused coping and distraction on stress responses. These results suggest that problem-focused coping may be effective for those who also use distraction as a way of coping with job stress, irrespective of the time frame. Although problem-focused coping is likely to reduce job stressors directly, it might also have deleterious effects on employee well-being due to the depletion of energy, which can be considered a negative cost or side effect (Cohen et al. 1986; Hockey

1997; Schaufeli and Bakker 2004). For problem-focused coping to be effective, recuperation and replenishment of energy resources might be imperative. Distraction, on the other hand, might foster recuperation and the replenishment of energy resources (Gaudreau and Blondin 2004). From the viewpoint of COR theory (Hobfoll 1989), distraction might provide individuals with the opportunity to interrupt resource loss spirals and instead create resource gain spirals (Llorens et al. 2007).

It was observed that problem-focused coping was associated with higher stress responses among those with low distraction. This result suggests that even if employees cope with their problems in an active way, stress responses may not decrease without distraction. Since problem-focused coping requires effort and energy, opportunities for recuperation and replenishment of energy resources are likewise important (Hockey 1997; Schaufeli and Bakker 2004). If such opportunities for recovery are insufficiently provided, then the psychobiological systems of employees will remain activated and not stabilize at baseline levels, thus leading to a state of sustained activation (Demerouti et al. 2005; Kristenson et al. 2004; Sluiter et al. 2000; Ursin 1980). This cumulative process of inadequate recovery drains energy and may ultimately result in a state of exhaustion or burnout (e.g., Demerouti et al. 2005; Meijman and Mulder 1998; Maslach et al. 2001; Ursin 1980). Therefore, it is likely that individuals who exclusively use problem-focused coping suffer from fewer opportunities for recovery of energy. As a result, their level of stress responses will not decrease but increase.

Table 3 Hierarchical multiple regression analyses predicting job performance scores (Time 2) from job performance, job stressors, problem-focused coping and distraction at Time 1 ($N = 445$)^a

Predictors	Steps							
	I		II		III		IV	
	B^b	β^c	B	β	B	β	B	β
I Job performance (T1)	.47	.50***	.46	.49***	.46	.48***	.46	.49***
II Job stressors (T1)			-.01	-.04	-.02	-.05	-.02	-.08*
Problem-focused coping (T1)			.06	.07	.06	.07 [†]	.06	.07 [†]
Distraction (T1)			-.06	-.09*	-.06	-.09*	-.06	-.09*
III Stressors \times Problem-focused coping (T1)					.01	.07	.01	.07
Stressors \times Distraction (T1)					.00	.03	.00	.03
Problem-focused coping \times Distraction (T1)					-.01	-.04	-.01	-.05
IV Stressors \times Problem-focused coping \times Distraction (T1)							.00	.11**
R^2	.25***		.26***		.27***		.28***	
Change in R^2	.25***		.01 [†]		.01		.01**	

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

^a The constant values of each step are 4.05, 4.13, 4.18, and 4.15 for step 1–4 respectively

^b Unstandardized regression coefficients

^c Standardized regression coefficients

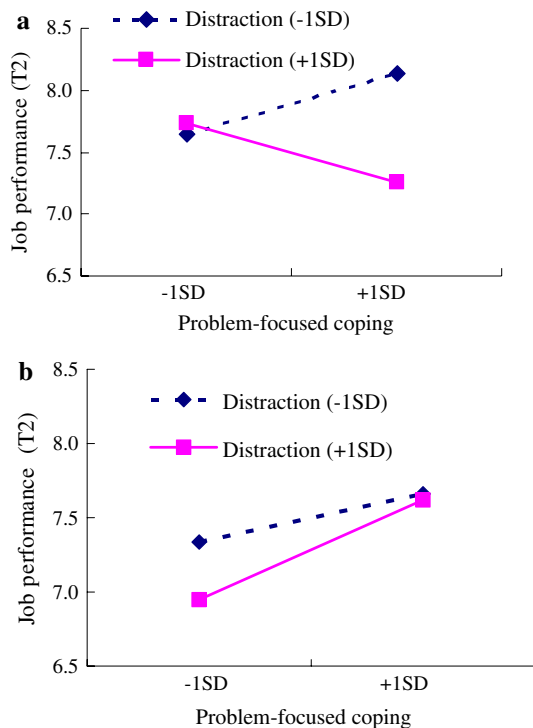


Fig. 2 (a) Interaction between problem-focused coping and distraction on job performance among *low* job stressor group. (b) Interaction between problem-focused coping and distraction on job performance among *high* job stressor group

It is notable that we did not find a significant main effect of problem-focused coping on stress responses in contrast to a previous cross-sectional study (Shimazu and Kosugi 2003) or a longitudinal study with a very short time interval of only a couple of days (Gaudreau and Blondin 2004). One explanation for these contradicting results may be differences in time frame. According to Shimazu et al. (in press), which examined the lagged effects of active (i.e., problem-focused) coping using three-wave panel survey data with intervals of 1 month, a favorable effect of active coping disappeared 2 months after the initial survey. The favorable effect of problem-focused coping, therefore, may become limited over time possibly due to the depletion of energy. Future research should pay more attention to the role of time frame in order to collect more conclusive data regarding this issue. Studies incorporating multi-wave designs (Taris and Kompier 2003) or daily diary measurements (Todd et al. 2004) are possible ways to more fully capture the developmental aspects of the process of interest.

As for job performance, as expected in Hypothesis 2b, a significant three-way interaction among job stressors, problem-focused coping, and distraction was found, whereby the interaction between problem-focused coping and distraction was moderated by job stressors. Specifically, in less stressful situations, no relationship between

problem-focused coping and job performance was found among those high in distraction (Fig. 2a). On the other hand, in more stressful situations, a positive relationship between problem-focused coping and job performance was found among those high in distraction (Fig. 2b). These results suggest that when facing a highly stressful work situation, distraction might be particularly needed in order to recover and restore one’s energy resources. The relative benefit of distraction could be explained by its potentially positive effect on the preservation of physical and mental resources necessary for optimal performance (Gaudreau and Blondin 2004).

It is notable that, consistent with Gaudreau and Blondin (2004), the adverse main effect of distraction was found on subsequent job performance (Table 3). Since distraction does not aim at solving the problem or improving the situation directly (Brown et al. 2005; Gaudreau and Blondin 2004; Pascual et al. 2003), its sole use is *not* likely to lead to better performance due to the problems being left unsolved. Instead, when used *in concordance with* problem-focused coping, distraction is more likely to lead to subsequent better performance. That is, even if employees engage in distraction to cope with their problems, job performance may *not* improve without problem-focused coping.

Together with previous studies (Gaudreau and Blondin 2004; Shimazu and Kosugi 2003), we can summarize our findings as follows: (1) a favorable main effect of problem-focused coping on well-being was *not* found in the long run, although it was found in the short run; (2) a favorable effect of the combination of high problem-focused coping and high distraction was found in the long run (but only in high job stress situations for performance) as well as in the short run; (3) these results suggest that the advantage of using distraction in combination with problem-focused coping is more obvious in the long run.

This study has some limitations that need to be considered. First, our findings are restricted to male employees working on a production assembly line (i.e., blue-collar workers) at a single construction machinery company in Japan. According to a meta-analysis on sex differences in coping (Tamres et al. 2002), women are more likely to use strategies that involve verbal expressions to others or the self (i.e., seeking emotional support, ruminating about problems, and using positive self-talk) in various situations. In addition, the effectiveness of problem-focused coping may differ between blue-collar and white-collar workers due to their respective job control levels (Karasek and Theorell 1990), as job control enhances the effectiveness of problem-focused coping as a coping resource (Daniels 1999; De Rijk et al. 1998). Thus, further research is needed to determine whether we can generalize these findings to other (e.g., female and white-collar) kinds of employees.

Second, since the present study exclusively relied on subjective and self-reported measures, it cannot be ruled out that the relationship between job stressors, coping, and outcomes was influenced by personality characteristics, and most notably negative affectivity (NA). Research, however, seems to justify the omission of this potential confounder in job stress research using self-reports (e.g., De Jonge et al. 2001; Moyle 1995; Van Vegchel et al. 2005). In addition, after reviewing a range of possible mechanisms by which NA could affect the stressor–stress responses relationship, Spector et al. (2000) argued that partialling NA out is the wrong approach; instead the collection of better quality data is the way forward. To this end, longitudinal examination is one way to collect more conclusive data (Spector et al. 2000).

Third, although we used a measure of coping *style* to ask respondents about their *usual* coping at work, we do not really know whether they were continuously investing their energy into solving problems at work. This is because only the effects of problem-focused coping at T1 were examined. More measurement points might have made it clearer whether sustained use of this coping strategy without distraction is detrimental. In addition, the issue of recall bias should be mentioned when using measures of coping style. According to Todd et al. (2004), a myriad of processes, such as implicit theories (Ross 1989) or the emotional relevance of an experience (e.g., Gilligan and Bower 1985; Mayer and Salovey 1988), may conspire to distort the recollection of personally relevant experiences and behavior, including how accurately one remembers one's coping efforts. Although we statistically controlled for the initial level of well-being to reduce such recall bias, daily reports of coping can be considered for future research (Todd et al. 2004).

Fourth, this study evaluated work conditions in terms of the amount of job stressors (Hurrell et al. 1998). However, it has been claimed that (appraised) controllability of the situation as well as the amount of stressors can affect the extent of energy resources needed to cope with a situation (Hockey 1997; Muraven and Baumeister 2000). It has also been claimed that the appraised controllability can influence the effectiveness of problem-focused (and emotion-focused) coping (e.g., Zakowski et al. 2001; Vitaliano et al. 1990). Thus, the future inclusion of various ways to evaluate work conditions could help us to more fully understand the issue.

Fifth, although distraction has both behavioral and cognitive aspects (Carver et al. 1989; Reid et al. 1998), the measure used in our study includes only the former (e.g., try to do something that calms me down). Therefore, it remains unclear which strategy suffices in order to replenish employee's resources; behavioral distraction, which requires employees to leave the work environment,

or cognitive distraction, which can occur anywhere. Future research needs to clarify how the costs and benefits of behavioral vs. cognitive distraction might be different. Furthermore, since we did not ask for detailed information regarding which activities participants engaged in for distraction, it remains unclear which specific activity contributed to an individual's recovery of energy resources. Although holiday and social activity during the weekend have been found to have positive effects on health and performance, the positive effects of this off-the-job time fade out quickly (Fritz and Sonnentag 2005; Westman and Eden 1997; Westman and Etzion 2001). Therefore, future research should investigate the content of distraction and its relationship with long-term well-being.

Sixth, we used a single-item self-report rating scale to assess job performance because of its feasibility, but this might have some effect on the response accuracy and the scale's sensitivity to worker performance. In addition, this scale has not been standardized and validated in a Japanese setting, and therefore further research is needed to evaluate its reliability and validity in Japanese contexts.

Despite the limitations mentioned above, this study has potential implications for practice at least for male blue-collar workers. Though the exclusive use of problem-focused coping without distraction leads to high job performance in stressful work situations, this is not realistic because it simultaneously leads to high stress responses. Therefore both performance and stress responses must be considered when evaluating coping strategies. In reality, for employees who use more problem-focused coping strategies, suggestions for distraction should be provided as such employees may benefit most from high levels of distraction. On the other hand, for employees who use less problem-focused coping strategies, information about the importance of problem-focused coping and training for the improvement of problem-focused coping skills should be offered. This could then be followed by suggestions for distraction.

In summary, our results emphasize the *combined* effects of problem-focused coping and distraction on long-term employee well-being, whereby problem-focused coping *in concordance with* distraction may lead to lower stress responses and better performance (but only in more stressful situations for performance) than when used alone. Hence, it seems that distraction does indeed facilitate problem-focused coping with job stress.

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