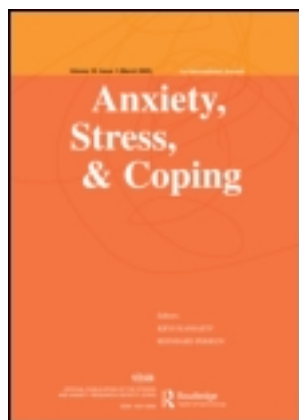


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## Anxiety, Stress & Coping: An International Journal

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/gasc20>

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Available online: 12 Jun 2011

To cite this article: Mina Westman, Arnold B. Bakker, Ilan Roziner & Sabine Sonnentag (2011): Crossover of job demands and emotional exhaustion within teams: a longitudinal multilevel study, *Anxiety, Stress & Coping: An International Journal*, 24:5, 561-577

To link to this article: <http://dx.doi.org/10.1080/10615806.2011.558191>

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## Crossover of job demands and emotional exhaustion within teams: a longitudinal multilevel study

Mina Westman<sup>a\*</sup>, Arnold B. Bakker<sup>b</sup>, Ilan Roziner<sup>a</sup> and Sabine Sonnentag<sup>c</sup>

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(Received 18 February 2010; final version received 24 January 2011)

This study investigated the crossover of job demands and emotional exhaustion among team members and the moderating effect of cohesiveness and social support on this process. Participants were 310 employees of an employment agency in the Netherlands, working in one of 100 teams. Multilevel analysis using a longitudinal design did not reveal a main effect of crossover. However, consistent with the study's hypotheses, the results showed a moderating effect of team cohesiveness and social support. We detected crossover of job demands and emotional exhaustion across time from the group to individual team members only in teams characterized by high levels of cohesiveness and social support. Teams characterized by low levels of cohesiveness and social support showed no crossover of job demands and exhaustion. The findings demonstrate that team-level moderators play an important role in crossover processes. Moreover, social support and cohesiveness may not always be positive.

**Keywords:** cohesiveness; crossover; emotional exhaustion; job demands; social support; teams

The interpersonal process that occurs when job stressors or strain experienced by one person affect the level of stressors or strain of another person in the same social environment is referred to as *crossover* (Westman & Etzion, 1995). Crossover is an inter-individual transmission of stress or strain. A similar process is *emotional contagion* defined as the tendency to automatically mimic and synchronize expressions, feelings, and attitudes with those of another person and, consequently, to converge emotionally (Hatfield, Cacioppo, & Rapson, 1994).

Most previous studies have focused on various facets of crossover between life partners (Bakker, Westman, & Van Emmerik, 2009; Westman, 2001). Some have focused on the crossover of job stress from the individual to the spouse (e.g., Burke, Weir, & DuWors, 1980; Long & Voges, 1987), some have examined the process whereby job stress affects the strain of the spouse (Shimazu, Bakker, & Demerouti, 2009), and others have studied how psychological strain of one partner affects the strain of the other (Westman & Vinokur, 1998). In the current study, we focus on the crossover of perceived job demands and emotional exhaustion (the core characteristic

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of burnout (Halbesleben & Bowler, 2007)), from the team to perceived job demands and exhaustion of the individual at a later point in time.

Edelwich and Brodsky (1980, p. 25) related to the possibility of burnout crossover at work: "Burnout in Human Services Agencies . . . gets around. It spreads from clients to staff, from one staff member to another, and from staff back to clients." Recently, researchers have begun to investigate affective linkages between team members. Barsade (2002) demonstrated that people are continuously influencing the moods of others. Totterdell, Wall, Holman, Diamond and Epitropaki (2004) claimed that over time the emotional state of individuals and teams converges to create a "team emotion." Similarly, Bakker, Van Emmerik and Euwema (2006) found evidence for a relationship between team burnout and individual burnout.

Thus, the central aim of the present study was to investigate the crossover of team-level job demands and emotional exhaustion to individual-level job demands and emotional exhaustion and examine team-level moderators of the crossover processes. Since most previous crossover studies have been cross-sectional and did not account for the embedding of individuals within an ongoing joint work setting, we use a longitudinal, multilevel design.

### **The main crossover moderators**

According to a literature review by Bakker et al. (2009), empathy, frequency of exposure to the views of other team members, and similarity between a stimulus person and a team and between team members themselves, moderate the crossover process. Westman and Vinokur (1998) argued that empathy can moderate the crossover process, indicating that stress and strain are transmitted from one partner to another directly as a result of empathetic reactions. Thus, a person imagines how he or she would feel in the position of another and, as a consequence, experiences the same feelings. In the same vein Bakker and Schaufeli (2000) found that among teachers the frequency of exposure to colleagues who talked about work-related problems increased the probability of burnout contagion. In trying to understand their colleagues' problems, they had to tune in to the negative emotions expressed. As to similarity with the source, Festinger (1954) argued that when objective sources of information for self-evaluation are lacking, people turn to others in their environment. Indeed, Groenestijn, Buunk and Schaufeli (1992) found that nurses who perceived burnout complaints among their colleagues and who felt a strong need for social comparison were more susceptible to burnout than those who had a low need for social comparison. Bakker, Westman and Schaufeli (2007), examining how similarity contributes to crossover of burnout among soldiers, confirmed the crossover of burnout from a soldier to the group. Soldiers were particularly susceptible to the burnout of those who were similar in rank.

Taken together, the reviewed literature supports the existence of a crossover process at the workplace. Thus far only empathy, frequency of exposure, and similarity have been detected as moderators of the crossover process. Additional moderators which may affect the crossover process need to be investigated. Bearing in mind that cross-level studies predict that higher level organizational properties may influence lower level organizational properties (Hitt, Beamish, Jackson, & Mathieu, 2007) and following the finding that empathy and frequency of interaction moderate the contagion process (e.g., Bakker & Schaufeli, 2000), we chose two team

properties as moderators of the crossover process from the team to the individual: cohesiveness and support.

### **The present study**

Roberson and Colquitt (2005) defined cohesiveness as the extent to which people interact frequently and intensely, and are therefore influenced by those with whom they interact directly. They indicated that convergence in perceptions in a group may occur through cohesiveness resulting from the intensity of the interactions. Cartwright (1968) states that where cohesiveness is present, there is more interpersonal communication between members of a group. According to Cartwright and Zander (1968), close and frequent interactions with group members result in greater attraction to membership in the group and greater cohesion. Similarly, Cohen and Bailey (1997) describe team processes as consisting of interactions that characterize the team and its level of cohesiveness. They claim that individuals in a cohesive workgroup are likely to interact more frequently and share information.

There are three main and not always compatible dimensions to interactions: frequency, intensity, and quality. Frequent and intense interactions may be positive or negative, contingent on the situation and the parties. Thus, frequent and intense interactions may be detrimental if the tone is set by an exhausted sender of the message, though, as Labianca and Brass (2006) have shown, such relationships, while extremely influential, comprise only 1–8% of all work relationships in organizations. Research rather demonstrates that interactions tend to be positive and that interpersonal attraction and group pride are important conceptual features of cohesiveness (Beal, Cohen, Burke, & McLendon, 2003; Mullen & Copper, 1994). However, when groups are characterized by high levels of cohesiveness and members frequently interact, they are likely to discuss problems and talk to each other about job-related stressors and strain. These discussions may evoke a reaction among team members such that they think about comparable problems and consequently experience the same job-related stress and feelings of exhaustion (Bakker et al., 2007).

Griffith (2002) maintained that cohesiveness affects group processes such as sharing information and cooperative interactions. Applied to the crossover of emotional exhaustion, this means that emotionally exhausted team members who interact frequently may communicate about their perceptions concerning work and thus convey their perceptions of job demands and a state of emotional exhaustion to the other team members. These frequent interactions and the tendency of cohesive work team members to be more sensitive to others led us to choose cohesiveness as a possible moderator of the crossover process.

An additional possible moderator investigated in the current study is colleague social support, that is, the function and positive quality of social relationships, such as perceived availability of help, or support actually received (Schwarzer & Knoll, 2007). Research on the individual level has provided some – although not unequivocal – evidence that social support buffers the negative effects of job stressors on strain (Dormann & Zapf, 1999). However, several researchers have found contrary evidence, and demonstrated that receiving support is associated with negative outcomes (e.g., Bolger, Zuckerman, & Kessler, 2000; Deelstra et al., 2003; Dunbar, Ford, & Hunt, 1998). Social support theory suggests that individuals are

motivated to seek emotional support and will most likely seek it from colleagues they perceive are sharing a common stressor (Cohen, Underwood, & Gottlieb, 2000). In a team, employees are likely to find an empathetic ear in those who themselves have the same stress or strain. These team members are more able to relate to the feelings of others.

Empirical research has often studied social support as an individual-level variable (Halbesleben, 2006; Ng & Sorensen, 2008). However, as researchers have argued, social support can also be seen as a property of the team and be conceptualized at the team level (Bliese & Castro, 2000; Drach-Zahavy, 2004a). At the team level, social support refers to the degree of sharing ideas and information, mutual caring and acceptance, as well as the tangible assistance that is available within the team (Drach-Zahavy, 2004b). Based on these arguments, we suggest that the moderating effect of social support might be different for team stressors and strain. Thus, stressors and strain shared by the whole team might not be buffered by cohesiveness or support, but augmented, because during frequent and intense interactions team members get a sense of their co-workers' stressors and strain. Specifically, social support might exacerbate crossover of team-level stressors and strains on individual-level stressors and strains. When social support is high, team members corroborate their teammates' stress appraisals – agreeing that the situation is stressful for all concerned, which increases subsequent individual job stress and exhaustion. Furthermore, when colleagues provide support to stressed or exhausted team members, the process creates a contagion effect. Listening to others' job problems may remind them that they experience similar problems, thereby intensifying the crossover of stressors and strains between team members.

Thus, in the current study, we depart from the tradition of seeking a positive effect of cohesiveness and social support. Instead we examine these situational variables in a team context where the beneficial effects of cohesiveness and support may be reversed. That is, although a high level of cohesiveness and social support is known to buffer the negative impact of individual-level job demands on individual-level strains, it may act as a double-edged sword in the team context and exacerbate the crossover process within the team.

This idea is strengthened by extrapolating from the literature on dyadic closeness indicating that partners in a close relationship tend to communicate their emotions and are empathetic to one another's stress and strain. Thus, Lavee and Ben-Ari (2007) found crossover of stress only among couples in a high-quality close relationship. High cohesiveness and social support in a team is a phenomenon similar to a high-quality relationship between spouses. Thus, we focus on cohesiveness and social support as moderators of the crossover process and claim that teams characterized by high cohesiveness and social support may be more susceptible to the harmful effects of stressor and strain crossover because team members are more attuned to each other's stressors and strain.

In the present study we used two levels of analysis: individuals (Level 1) working within teams (Level 2). Rousseau (1985) advocated the use of composition theories which specify the functional similarities of constructs at different levels. There are several reasons to expect that team members share perceptions and attitudes concerning their environment. Individual team members comprise the team as a collective entity which may serve as a social context that influences individual members (Hackman, 1992). Multilevel principles suggest that top-down effects, from

teams to individuals are generally more powerful than bottom-up effects, from individuals to teams. As argued by Kozlowski and Klein (2000), it is more difficult for an individual to impact the group than for the group (i.e., the “many”) to impact the individual. We thus expected that the team would affect individuals such that team demands and exhaustion at T1 would affect the individuals’ demands and exhaustion at T2. On the basis of this overview, we formulated the following hypotheses:

*Hypothesis 1a:* A team’s job demands at T1 cross over to individual employees within the team and influence their individual experience of job demands across time (at T2), after controlling for their previous levels of individual demands (at T1). The higher the level of team job demands, the higher the level of job demands of individual team members (main effect).

*Hypothesis 1b:* A team’s exhaustion at T1 crosses over to individual employees within the team and influences their individual experience of exhaustion across time (at T2), after controlling for their previous levels of individual exhaustion (at T1). The higher the level of team exhaustion, the higher the level of exhaustion of the individual team members (main effect).

*Hypothesis 2a:* Team cohesiveness moderates the crossover of job demands and exhaustion from the team to the individual. Crossover of job demands and exhaustion is most likely in teams high (vs. low) on cohesiveness (cross-level interaction effect).

*Hypothesis 2b:* Colleague social support moderates the crossover of job demands and exhaustion from the team to the individual. Crossover of job demands and exhaustion is most likely in teams with high (vs. low) levels of colleague support (cross-level interaction effect).

## Method

### *Participants and procedure*

The study was part of a larger research project conducted on all employees of an employment agency in the Netherlands. The main activities of the employees in this organization were to provide staffing resources, quality assessment, testing and training for different types of jobs, on-site management of the contingent workforce, flexible staffing, employee training, outplacement, and reintegration programs.

Participants worked in small teams of about five persons in separate branches of the organization located at different sites. Their work tasks were interdependent, in that the office manager was responsible for new leads and contacts with customers. The common goal of the team was to reach targets set by the main office. Once the targets were achieved, the team was rewarded. The offices were generally small, implying a high level of social interaction. In terms of Katzenbach and Smith’s (1993) typology, the teams can be characterized as teams that run things – groups that oversee some significant functional activity.

Scores on all variables were collected on two occasions (T1, T2), six weeks apart. The six-week period was chosen as it was believed to be long enough to produce variance in the model variables, given the rapid changes taking place in the focal organization due to fluctuations in the numbers of absent employees and vacant job positions. It should be noted that – in the Netherlands – employment agencies show high turnover, personnel often leaving the organization within two years. These small

interdependent teams of employees with their intense interactions provide a good setting to study social support and cohesiveness as moderating variables.

The employees received a letter that explained the purpose of the study and assured confidentiality of the responses. One week later, the first questionnaire was sent to all 831 agency employees. They were allowed to fill it in at work and return it in the stamped addressed envelope provided. The office manager at each of the employment agencies reminded the employees about the importance of the study one week after they had received the first questionnaire. In total, 576 employees (69.3%) returned the questionnaire at T1. Six weeks after the first wave, 733 out of the original 831 employees received the second questionnaire. Company records showed that the remaining 98 employees had undergone job change, promotion, or job transfer. At T2, the managers were again asked to remind their employees to fill out the questionnaires. This time, 425 employees (58%) returned questionnaires.

To rule out selection biases due to attrition, we examined whether there were differences between employees in the panel group and the dropouts. Results of *t*-tests indicated that the panel group was comparable in age and tenure to the dropouts, but that the panel group included slightly more male employees than the dropout group ( $\chi^2(1) = 8.38, p < .01$ ). There were no significant differences between the panel group and the dropouts in the mean values of variables measured at T1, suggesting that the dropouts were comparable to the panel group and that there was no serious selection problem due to attrition.

As this study was concerned with the influence of a group-level variable, we excluded from our analyses the data of teams with only one respondent in any of the two waves. The final sample consisted of 310 respondents employed in 100 teams, all of whom answered the research questionnaires on both occasions. It consisted of 233 women (75%) and 77 men (25%), working in teams ranging in size from 2 to 15 members ( $M = 5.15, SD = 2.89$ ). The employees' mean age was 33 years ( $SD = 5.78$ ), and mean organizational tenure was 4 years ( $SD = 3.78$ ). Most of the respondents had a steady contract (81%) and worked full-time (83%), and 27% of them held a supervisory position. In terms of status, most of the teams comprised one or two supervisors and several subordinates.

## **Measures**

### *Job demands*

Demands were measured with a scale developed by Bakker, Demerouti, Taris, Schaufeli and Schreurs (2003). The scale includes three items that refer to demanding aspects of the job: "My work requires working very hard," "I have a lot of work to do," and "I have to work extra hard to finish something." Items are scored on a 5-point scale (1 = never, 5 = always). Cronbach's alpha was .82 at both T1 and T2.

### *Emotional exhaustion*

Exhaustion was assessed with five items of the subscale of the Maslach Burnout Inventory (MBI – GS; Schaufeli, Leiter, Maslach, & Jackson, 1996). A sample item is: "I feel emotionally drained from my work." Items are scored on a 7-point rating scale (0 = never, 6 = every day). Cronbach's alpha was .86 at T1 and .89 at T2.



### *Team cohesiveness*

Cohesiveness was assessed with three items based on the work of Chang and Bordia (2001), to measure the degree to which workgroups were close-knit and cohesive: “In my team, there is a good work atmosphere,” “In my team, it is impossible to collaborate effectively because there are always some persons who obstruct” (reverse), and “In my team, the discipline and work norms suffer from a lack of team spirit” (reverse). Items are scored on a 5-point scale (1 = totally disagree, 5 = totally agree). High scores are indicative of high team cohesiveness. Cronbach’s alpha was .83 at T1.

### *Colleague social support*

Support was measured using the three-item scale developed by Bakker, Demerouti and Verbeke (2004). A sample item is: “If necessary, can you ask your colleagues for help?” (1 = sometimes, 5 = always). High scores are indicative of high colleague support. Cronbach’s alpha was .83 at T1.

To ensure construct validity of our measures, we carried out confirmatory factor analyses of the items comprising these four variables, separately for T1 and T2, using the EQS program Version 6.1 (Bentler, 2002). The data fitted the model well for both T1, with scaled  $\chi^2$  (142,  $N=310$ ) = 215.44,  $p < .001$ , NNFI = .966, CFI = .972, and RMSEA = .041; and for T2, with scaled  $\chi^2$  (142,  $N=310$ ) = 263.85,  $p < .001$ , NNFI = .952, CFI = .960, and RMSEA = .053. Thus, we concluded that our measures tapped distinct theoretical constructs.

## **Results**

### ***Data treatment***

According to our hypotheses, T1 team-level measures of job demands and exhaustion predict T2 individual-level job demands and exhaustion, and T1 team-level measures of cohesiveness and colleague support moderate the T1–T2 job demands and exhaustion relationship. In the first step of hypotheses testing, we estimated whether our T1 variables constituted team-level phenomena. We regard the phenomena of job demands, exhaustion, cohesiveness and social support measured at the individual level as being manifested or emergent at the team level (in the sense of Kozlowski & Klein, 2000). To support this view, we calculated the intra-class correlation ICC(1), and the measure of the group mean reliability, ICC(2) (Bartko, 1976) for each variable. We tested the statistical significance of the ICC(1) coefficients by conducting an analysis of variance on each variable with the team as an independent variable. The results showed that each of our four model variables could be considered as emerging at the team level to a moderate, but statistically significant extent. For job demands, ICC(1) was equal to .12,  $F(99, 210) = 1.42$ ,  $p < .05$ ; for exhaustion it was .12,  $F(99, 210) = 1.42$ ,  $p < .05$ ; for cohesiveness .37,  $F(99, 210) = 2.74$ ,  $p < .001$ ; and for colleague support .19,  $F(99, 210) = 1.76$ ,  $p < .001$ . The values of ICC(2) were .30, .30, .65 and .42, respectively. The mean within-group agreement coefficient  $r_{wg}$  (James, Demaree, & Wolf, 1984) for demands was .85; for exhaustion .74; for cohesiveness .87; and for social support measure .76. These results justified constructing the variables at the team level. Descriptive statistics of individual- and team-level data are presented in Table 1.

Table 1. Means, standard deviations, and intercorrelations of study variables.

Variable	Mean	SD	1	2	3	4	5	6	7
1. T1 TL team cohesiveness	4.13	.62	–						
2. T1 TL colleague support	4.02	.59	.67**	–					
3. T1 TL job demands	3.61	.54	-.37**	-.22*	–				
4. T1 TL exhaustion	2.02	.74	-.34**	-.21*	.41**	–			
5. T1 IL job demands	3.58	.80	-.26**	-.18**	.63**	.31**	–		
6. T1 IL exhaustion	2.00	1.13	-.24**	-.17**	.31**	.63**	.33**	–	
7. T2 IL job demands	3.63	.83	-.23**	-.16**	.41**	.26**	.64**	.36**	–
8. T2 IL exhaustion	1.99	1.13	-.23**	-.15**	.32**	.52**	.32**	.76**	.44**

Note: T1, time one; T2, time two; TL, team-level ( $N = 100$ ); IL, individual-level ( $N = 310$ ).  
\* $p < .05$ ; \*\* $p < .01$ .

### Hypotheses testing

In the next step of the analyses, we tested whether T1 team-level job demands and exhaustion had an effect on T2 individual-level job demands and exhaustion, after controlling for T1 individual-level job demands and exhaustion (*Hypothesis 1*). Since three background variables (gender: female vs. male; contract type: permanent vs. temporary; and position: supervisor vs. non-supervisor) were found to be related to the dependent variables, we dummy-coded and added these variables to the analyses as controls. We performed the analyses using the individual-level sample ( $N = 310$ ) with aggregated team-level job demands and exhaustion data re-assigned to each individual. In order to obtain correct standard errors for cross-level effects, we used random coefficient modeling with SAS PROC MIXED (Singer, 1998).

At the first step of the analyses, the job demands and exhaustion measure for individual  $i$  in group  $j$  at T2 ( $S_{ij2}$ ) was modeled as a function of the same measure at T1 (and the control variables, not shown in the formula):

$$\text{Level 1: } S_{ij2} = \beta_{0j2} + \beta_{1j1} S_{ij1} + r_{ij2} \quad (1)$$

The team intercept  $\beta_{0j2}$  was allowed to vary freely across teams, and it was modeled as a function of the same measure (team average) at T1:

$$\text{Level 2: } \beta_{0j2} = \gamma_{002} + \gamma_{011} S_{j1} + v_{0j2} \quad (2)$$

The effect of individual-level T1 job demands and exhaustion  $\beta_{1j1}$  was constrained to be equal across teams, as we did not have any specific predictions regarding its inter-team variability:

$$\beta_{1j1} = \gamma_{101} \quad (3)$$

Analyses showed that team-level job demands did not predict individual-level job demands and team-level exhaustion was not a significant predictor of individual-level exhaustion (all  $p$ 's  $> .20$ , see Table 2). Thus, *Hypothesis 1* was not supported.

Next, to test *Hypotheses 2a and 2b*, we assessed, in four separate analyses, the moderating effect of T1 team-level cohesiveness and colleague support on the relationship between T1 team-level and T2 individual-level job demands and

exhaustion. Moderation was tested by adding two independent variables to the model, namely, T1 team-level measures of cohesiveness and support, and interaction terms between these variables and T1 team-level job demands or exhaustion. The independent variables were grand mean-centered before computing their products. Estimates of interaction effect sizes (percentage of explained variance added by the interaction term) were computed as the proportional reduction of error in predicting the group mean, as suggested by Snijders and Bosker (1994).

As can be seen in Table 2 the T1 individual measures of job demands and exhaustion were highly predictive of the same measures taken at T2, with regression coefficients of .56 ( $p < .01$ ) for job demands, and .72 ( $p < .01$ ) for exhaustion. After

Table 2. Results of random coefficient modeling of moderating effects of cohesiveness and social support  $\times$  team job demands and exhaustion on individual job demands and exhaustion.

Dependent and independent variables in equations	<i>B</i>	SE	Interaction $\Delta R^2$
DV: T2 individual job demands			
T1 individual gender (1 = Female)	.17*	.07	
T1 individual contract (1 = Permanent)	.20*	.09	
T1 individual position (1 = Supervisor)	.15*	.05	
T1 individual job demands	.56**	.05	
T1 team job demands (A)	-.02	.09	
T1 team cohesiveness (B)	-.11	.07	
A $\times$ B	.18	.12	.009
DV: T2 individual exhaustion			
T1 individual gender (1 = Female)	.15	.10	
T1 individual contract (1 = Permanent)	.14	.12	
T1 individual position (1 = Supervisor)	-.01	.10	
T1 individual exhaustion	.72**	.05	
T1 team exhaustion (A)	.05	.08	
T1 team cohesiveness (B)	-.13	.08	
A $\times$ B	.25*	.12	.005
DV: T2 individual job demands			
T1 individual gender (1 = Female)	.18*	.07	
T1 individual contract (1 = Permanent)	.20*	.09	
T1 individual position (1 = Supervisor)	.13	.07	
T1 individual job demands	.56**	.05	
T1 team job demands (A)	.01	.09	
T1 team colleague social support (B)	-.07	.07	
A $\times$ B	.26*	.11	.038
DV: T2 individual exhaustion			
T1 individual gender (1 = Female)	.17	.10	
T1 individual contract (1 = Permanent)	.15	.12	
T1 individual position (1 = Supervisor)	.15	.12	
T1 individual exhaustion	.72**	.05	
T1 team exhaustion (A)	.06	.08	
T1 team colleague social support (B)	-.07	.08	
A $\times$ B	.28*	.13	.042

\* $p < .05$ ; \*\* $p < .01$ .

these effects had been controlled for, the main effects of T1 team-level job demands and exhaustion turned out to be statistically non-significant, as demonstrated in the previous step of the analysis. The main effects of the T1 cohesiveness and support were negligible as well.

*Hypothesis 2a* was partially supported by the results. The moderating effect of team cohesiveness was not statistically significant for job demands ( $B = .18$ ;  $p = .12$ ). The interaction effect was significant for exhaustion ( $B = .25$ ;  $p < .05$ ). As is common in non-experimental research (cf. Chaplin, 1991), this effect was small in magnitude, adding about 1% of the explained variance. The positive sign of the interaction terms suggested that these moderation effects were of the enhancing type (Cohen, Cohen, West, & Aiken, 2003): the more cohesive the teams were, the stronger was the relationship between T1 team-level and T2 individual-level exhaustion. To illustrate this pattern, in Figure 1 we plotted the predicted values of individual-level T2 exhaustion for employees who are average on their T1 individual-level exhaustion and who find themselves in teams that are either high (one SD above the mean) or low (one SD below the mean) on exhaustion or cohesiveness.

*Hypothesis 2b* was confirmed. As Table 2 shows, the moderating effects of social support on the relation between team-level and individual-level job demands and exhaustion explained about 4% of the variance in job demands and exhaustion, respectively (both  $ps < .05$ ). The pattern of these moderating effects was the same as that illustrated in Figure 1: the higher the team-level social support, the more pronounced the relationship between team-level and individual-level job demands and exhaustion (Figures 2 and 3).

## Discussion

The study had two main goals: to investigate the crossover of perceived job demands and emotional exhaustion within working teams and to investigate the moderating effects of cohesiveness and social support on the crossover process. We used random coefficient modeling of longitudinal data, which is most appropriate for the investigation of crossover processes from teams to individuals. Although the results of the current study did not support the existence of crossover of job demands and

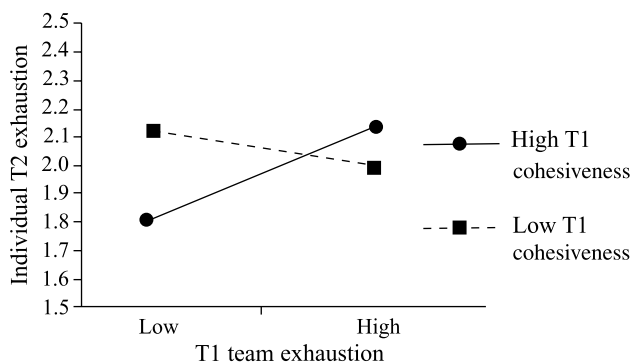


Figure 1. Simple slopes of individual-level T2 exhaustion regressed on team-level T1 exhaustion in teams high or low on team-level T1 colleague cohesiveness.

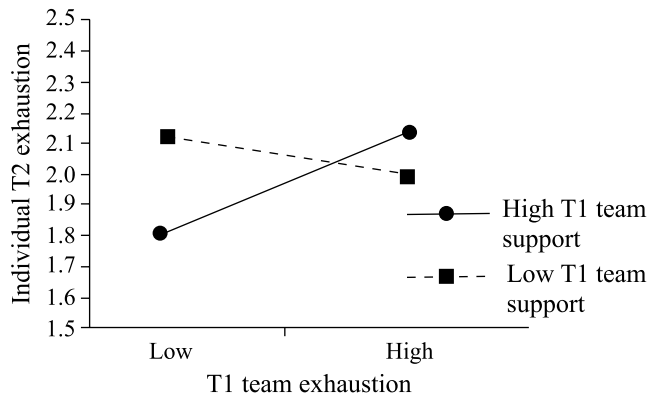


Figure 2. Simple slopes of individual-level T2 exhaustion regressed on team-level T1 exhaustion in teams high or low on team-level T1 social support.

exhaustion in all teams, they did demonstrate a counterintuitive pattern of findings. Crossover of job demands and emotional exhaustion was found in teams high in cohesiveness and social support, in which employees presumably frequently interact with each other. Thus, concerning job demands, we detected a moderating effect of colleague social support. We found that teams high in social support were also high in crossover of job demands. However, with regard to cohesiveness, this effect was not significant. The findings are more consistent for crossover of emotional exhaustion. Teams high in cohesiveness and social support were high in crossover of exhaustion. Thus, the findings are largely replicated across two conceptually similar, yet different variables (cohesiveness and social support), suggesting that the essence of the moderator effect is presumably the favorable social setting.

In sum, our findings have shown that under some conditions (i.e., team-level job demands and exhaustion) high levels of cohesiveness and social support can be harmful, insofar as they may exacerbate crossover of demands and exhaustion. The findings suggest that the beneficial effects of cohesiveness and social support within work settings (Beal et al., 2003; Halbesleben, 2006) may become a problem when job demands and exhaustion within a team are high. At first glance, these findings may

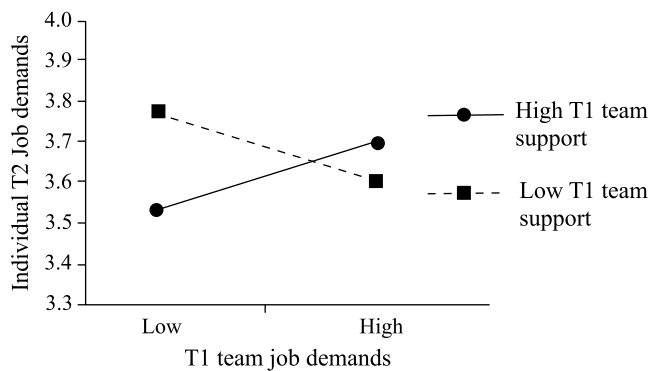


Figure 3. Simple slopes of individual-level T2 job demands regressed on team-level T1 job demands in teams high or low on team-level T1 social support.

seem counterintuitive, as cohesiveness and social support, which reflect frequent and intensive positive contact among team members, are usually perceived as resources that buffer against stress and relate to positive outcomes (Hochwarter, Witt, Treadway, & Ferris, 2006). However, as stated in the introduction, these findings have mainly been demonstrated at the individual level and with respect to the association between job stressors and strains. It is important to note that our findings relate to longitudinal processes that originate at the team level and concern the association between a team-level stressor and an individual-level stressor and between team-level strain and individual-level strain. When teams perceive high levels of job demands and exhaustion, and when cohesiveness and social support within the team are high, implying that problems are discussed among team members, the positive cohesive and supportive team atmosphere exacerbates the contagion of these feelings among team members.

The crossover effect is contingent upon the cohesiveness and social support in the team, team members with high-quality relationships being more attuned to the other's job demands and exhaustion and affected by them to a greater extent. The present findings are consistent with Bakker and Schaufeli's (2000) findings that teachers were particularly susceptible to the burnout of their colleagues when they frequently talked with them about work-related problems. When the atmosphere is positive, the closeness and intensive interactions may act as a double-edged sword, becoming dysfunctional and spreading the exhaustion.

### ***Contributions and limitations***

The current study contributes to the existing literature on crossover in several ways. Its results extend previous crossover research focusing on partners in the family by demonstrating that processes of stressor and strain crossover also operate within ongoing work teams. It also contributes by moving from the emotion literature with its findings regarding contagion of emotions, and applying these ideas to the stress literature. The multilevel analysis used in the current study confirmed the existence of meaningful team-level job demands and exhaustion constructs.

Moreover, whereas past research concentrated on individual-level moderators in the crossover process (Bakker & Demerouti, 2009), we investigated cohesiveness and social support as moderators at the team level. We formulated two cross-level interaction hypotheses that have not been tested in previous research. This advances the field theoretically. Our findings suggest that crossover of stressors and strain is not only enhanced for specific individuals (e.g., those highly susceptible to emotional contagion). It is also more likely under specific team conditions (i.e., teams high on cohesiveness and social support). Thus, our study emphasizes the importance of exploring additional moderators in crossover research, particularly in team settings. This study also adds to the research on social support and cohesiveness by demonstrating that these variables do not uniformly enhance well-being. It demonstrates that there are situations where high levels of social support and cohesiveness are harmful (see also Deelstra et al., 2003).

Finally, emotional exhaustion has traditionally been analyzed at the individual level. The consideration of the team-level paints a richer picture of emotional exhaustion, showing that social processes moderate the impact of team stressors and strain levels on individual stressors and strain over time (see also Moliner,

Martinez-Tur, Peiro, Ramos, & Cropanzano, 2005). Furthermore, following several scholars (Barsade, 2002; Totterdell et al., 2004) who concluded that interpersonal processes evolve over time and should therefore be studied longitudinally, our study is one of the first to use a longitudinal design in crossover research on team members working in a naturalistic setting. The vast majority of crossover studies is cross-sectional, and we wanted to overcome this limitation of previous research. While statements about causality are tenuous at best, the longitudinal design and multilevel analysis add rigor to the findings by controlling for initial levels of individual job demands and exhaustion, and by modeling inter-individual interdependence within teams.

Our findings must be interpreted in light of several limitations of the study. The first of these is the use of self-report data. However, it should be noted that the employees in the teams agreed to a considerable extent regarding their job demands and exhaustion, as evidenced by the high values of the  $r_{wg}$  coefficient. The external validity of our findings may also be limited. However, the conclusions drawn from our sample of employees of an employment agency in the Netherlands can be generalized to samples in similar jobs and from similar cultural backgrounds. The sample included supervisors as well as coworkers. Obviously, the relationship employees have with other coworkers is different from their relationship with their supervisor. However, as we statistically controlled for supervisor status this did not influence our findings. Two-member teams accounted for 20% of our teams. We thus repeated our analyses on teams comprising three people and more ( $N = 270$  in 80 teams). In all the four regression equations, the parameter estimates were almost identical to those obtained in the full-sample analyses; however, some were not statistically significant due to the smaller sample size.

Because of the confusion in the cohesiveness literature, partly due to the inconsistency of definitions and measurements of cohesiveness (Chang & Bordia, 2001), we used a newly developed measure of this construct. Although this measure has high face validity, future studies are needed to provide more information on its construct and criterion validity. Though our measure of cohesiveness did not relate specifically to frequency and intensity of interactions, several researchers have implied that frequency and intensity of interactions are the factors that increase cohesion (e.g., Cartwright and Zander, 1968). Furthermore, Wood, Kumar, Treadwell and Leach (1998) who evaluated the relationship between sociometric choice and group cohesiveness found that the frequency and intensity of interactions increased cohesion in students' summer classes.

#### *Practical implications and implications for future research*

The finding that job demands and exhaustion can cross over within working teams characterized by a good pro-social atmosphere has important implications for management. Specifically, interventions aimed at preventing or reducing emotional exhaustion should focus on both the individual level and the team level. Furthermore, planners of interventions should be aware of the negative impact of cohesiveness and social support on the crossover process. Cohesiveness may also represent shared perceptions of negative events and negative emotions in the team and may cause uniformity in viewing the world. One team member becomes similar to another and one individual's feelings become the group's feelings and vice versa. Thus, the findings

of crossover of stressors and strain in specific working teams should be considered when developing action strategies: they may improve effectiveness by increasing the pro-social atmosphere, but they may not always enhance employee well-being.

With respect to specific interventions, our findings suggest that in work settings with high team job demands and high team exhaustion it may be detrimental to aim at an increase of cohesion and social support as cohesiveness and social support facilitate the contagion of demands and exhaustion. Of course, we are reluctant to propose a deliberate reduction of team cohesiveness and social support because lack of cohesiveness and support might be detrimental with respect to other outcomes (Halbesleben, 2006). Instead, our findings should encourage managers within organizations to directly reduce demands and exhaustion by job design efforts (Semmer, 2006), to provide job resources that are unrelated to a team's social processes (e.g., job control; Humphrey, Nahrgang, & Morgeson, 2007), and to enable employees to recover from job demands during their leisure time in order to reduce individual exhaustion (Sonnetag, Binnewies, & Mojza, 2010). When it comes to social resources, organizations should prioritize interventions that provide social support from outside the team over interventions that try to enhance within-team cohesiveness and support. For example, professional coaches and members of other teams might be of great importance to alleviate the negative impact of team job demands and team exhaustion.

Recent trends in structuring work, including an increase in the use of team-based production and greater interdependency will increase the possibility and frequency of crossover, thus creating a "strain climate" when team-level job stressors and exhaustion are high. After establishing that individuals' moods can be influenced by their teammates, the next stage should be to investigate how this phenomenon works by using additional frameworks such as social information processes, social exchange models, and investigating the moderating effect of individual characteristics. As team-level job demands and exhaustion were not buffered but rather exacerbated by cohesiveness and social support, it is particularly important to start organizational initiatives to reduce them, such as work re-scheduling or specific interventions that reduce exhaustion (e.g., Freedy & Hobfoll, 1994).

It might be that crossover of job demands and exhaustion does not occur in all types of teamwork arrangements. Although we did not address this question explicitly in our research, one might speculate that the interaction effect found in this study breaks down under certain circumstances. For example, when employees spend only a small portion of their working time in a specific team (e.g., a quality circle), the "forces" from the cohesive and supportive team may be weaker and job demands and exhaustion may not cross over.

The study focused on negative work experiences. Following the development of the field of positive psychology, the next stage should be to focus on positive experiences. If our findings are replicated with positive experiences such as work engagement and satisfaction, this may counterbalance the negative effects. The questions then become: under which conditions does an atmosphere of engagement affect team members? And if engagement crosses over among team members, what are the moderating variables that may enhance this process?



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