

**Social interactions, stressful events and
negative affect at work:
a micro-analytic approach**

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Abstract

In the present study a daily event-recording method, the DIRO (Daily Interaction Record in Organizations), was employed for assessing social interactions, stressful events and negative affect at work. Forty-one secretaries filled out the records during the course of a week. This made it possible to consider both between- and within-subject effects of social interactions. The results showed that the social interactions of secretaries were characterized by three dimensions: intimate support, instrumental support and rewarding companionship. These three dimensions appeared to have different relationships with occupational stress. Instrumental support seemed to play the most important role in the work of secretaries, whereas rewarding companionship played no role at all in alleviating occupational stress. In the discussion some explanations are offered for this unexpected result.

INTRODUCTION

Until a few years ago, the effects of social support at work were studied without paying much attention to the development of adequate methods to examine the underlying social psychological processes (Buunk, 1990). Most studies on social
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support in relation to occupational stress have used *self-report* measures to examine global perceptions of social support. However, self-report measures may suffer from at least three potential sources of cognitive biases (Reis and Wheeler, 1991): (1) *selection of representative interactions*: because certain social interactions are likely to be more cognitively available than others, it is unlikely that the interactions are selected randomly, (2) *recall of the content of those interactions*: biases in recall can arise due to random forgetting or even motivated distortions, such as selective perception or dissonance reduction and, (3) *aggregation of multiple events*: the way people combine social information from multiple interactions in order to create one single impression can also be responsible for biased reports.

Various authors (*cf.* Bolger and Eckenrode, 1991; Cutrona, 1986; Eckenrode, 1984; Reis and Wheeler, 1991; Wheeler and Nezlek, 1977) have argued that *daily event-recording* methods can avoid some of the artefacts inherent in global self-reports. According to Frese and Zapf (1988), daily event-recording methods require less cognitive and emotional processing and are therefore more 'objective' than global self-report measures. Hence, in the present study a daily event-recording method, the DIRO (Daily Interaction Record in Organizations), was employed. This method was developed by Buunk and Verhoeven (1991) on the basis of the Rochester Interaction Record (RIR) (Reis and Wheeler, 1991) and the work of Cutrona (1986). It assesses during the course of a week: (1) the characteristics of significant *support-related social interactions* at work, (2) the number and nature of *stressful events*; and (3) the *negative affect* experienced at the end of the workday as an indicator of strain.

In the present study, this method is applied in a sample of female secretaries. Haynes and Feinleib (1980) have shown that clerical work can be very stressful. For instance, they found that Coronary Heart Disease (CHD) rates were almost twice as high among women holding clerical jobs as among housewives. The most significant predictors of CHD among clerical workers were: suppressed hostility, having a nonsupportive boss and decreased job mobility. Moreover, a study by Spector (1987) of 136 female clerical employees of an university showed that of all stressors included in the study, interpersonal conflict had the greatest correlation with stress-related health symptoms, such as stomach disorders, sleep disturbance and headache. Apparently, interpersonal relationships play an important role in the work of secretaries, which underlines the relevance of the present study.

Nature and effects of social interactions

A first goal of the present study was to explore dimensions that may characterize support-related social interactions at work¹. A number of studies have shown that different types of social interactions can have different effects upon stressors and strains (*cf.* Buunk and Verhoeven, 1991; Hill, 1987; Lehman and Hemphill, 1990). In line with the well-known distinction of House (1981), the DIRO assesses for each contact *emotional support* (e.g. empathy, caring, concern), *appraisal support* (e.g. feedback or social comparison relevant to a person's self-evaluation), *informational support* (e.g. advice, suggestions, directions), and *instrumental support* (e.g. giving money, assistance). Furthermore, the DIRO contains questions on *rewarding companionship* (Rook, 1987, 1990), a type of interaction that, though not primarily

¹ In the present study we only focus upon support-related social interactions. Conflicting interactions are recorded as stressful experiences.

help-oriented, may buffer the negative effects of stress. The first question in this study is whether these theoretically expected dimensions of support-related social interactions can be demonstrated empirically. In an earlier study with the DIRO, which was conducted among police officers, a factor analysis showed only three dimensions: intimate support (containing also items on informational and appraisal support), instrumental support, and rewarding companionship (Buunk and Verhoeven, 1991).

The second question in this study concerns the influence of daily support-related social interactions and stressful events at work upon negative affect at the end of the day. Support-related social interactions can have direct as well as buffer effects (Cohen and Wills, 1985). *Direct* effects occur when individuals who are involved in supportive and satisfying relationships have a relatively high degree of physical or mental health. *Buffer* effects refer to those instances where a strong relationship between stress and health is particularly found among individuals with low levels of social support. The evidence for these effects in work settings is not very convincing (for an extensive review, see Buunk, 1990). Using a daily event-recording method to examine the exact role of social interactions at work in alleviating stress seems a particularly timely issue as most research using daily event-recording methods has been conducted outside the work environment (for an exception see Repetti, 1993).

By employing a daily event-recording method, the present research allows not only the examination of between-subjects associations, but also of within-subjects associations between variables (Michela, 1990). In between-subject designs the purpose is to arrive at general relations that can be applied to all individuals within the sample. Within-subject research has the purpose to provide information on relations within one single individual and to elucidate psychological processes (Epstein, 1983). Since the two types of designs address different questions and may therefore produce different results, many authors recommend combining the two procedures in a single study (*cf.* Epstein, 1983; DeLongis, Folkman and Lazarus, 1988; Watson, 1988).

To summarize, the following questions will be addressed in the present study: (1) What dimensions of support-related social interactions at work can be distinguished? (2) What is, both between- and within-subjects, the relationship between daily support-related social interactions, stressful events and negative affect at the end of the workday?

METHOD

Subjects

Subjects in the present study were 41 female secretaries employed at an University in the Netherlands. Their mean age was 37.6 years ($SD = 8.7$), ranging from 21 to 55 years. They had been employed as secretaries for an average of 9.8 years ($SD = 8.3$), with a range from 2 months to 29 years. Somewhat more than half of the secretaries worked full-time (53.7 per cent). Nobody worked less than 20 hours a week. Their work included word processing, dealing with problems of students, organizing exams, answering the telephone and making a variety of arrangements for the head of the department. The number of social interactions was not

related to job experience or age, indicating that it is unlikely that these variables will confound the analyses

Procedure

The first author introduced the study and asked the secretaries if they were willing to participate in this study. The anonymity and confidentiality of the data were emphasized. In exchange for their cooperation they were promised a small gift. In order to explain how to fill out the questionnaires, a second appointment with each secretary was made individually. All participants were first asked to complete a general questionnaire, comprising scales from the Dutch Organizational Stress Questionnaire (DOSQ) (Van Dijkhuizen, 1984). Next, they were given the DIRO and were asked to complete the forms during five consecutive workdays. It was emphasized that it was important to fill out the records at the end of the day. Subjects were urged to be very accurate in their record-keeping and to skip a day rather than to record data retrospectively on the next day. To enhance the accuracy each secretary was given a little notebook in which they could immediately record briefly the content and time of a social interaction and stressful event. To encourage daily event-recording, the first author daily picked up the forms the subjects had already filled out and checked if there were any problems with completing the DIRO.

Analogously to Reis, Senchak and Solomons (1985) an evaluative questionnaire was developed to determine how difficult the secretaries found the procedure and how accurate they felt their record-keeping had been. On a seven-point scale the mean-rating for accuracy was 2.94 (1 = very accurate, 7 = very inaccurate). In the study of Reis *et al.* (1985) this score was 2.47. Subjects' mean estimate of the percentage of interactions not recorded was 11.78 per cent compared to 5.57 per cent in Reis' study. The percentage stressful events that were not recorded was 5.42 per cent. The mean score on the question how difficult it was to determine whether something was actually a social contact, was 4.62 (1 = very difficult, 7 = not at all difficult). The mean score on a similar question about stressful events was 5.56.

Instruments

One scale from the DOSQ was employed for the present paper, an 11-item scale which measures the frequency of such negative and positive (recoded) affects as irritation, anger and cheerfulness (1 = not, 5 = to a very large extent). Cronbach's alpha is 0.74. We will refer to this scale as *basic level of negative affect*.

The DIRO includes three forms in the following order. First, the *Daily Negative Affect Record* consists of a scale assessing the degree to which one experiences a number of negative and positive (recoded) feelings at the end of each workday ($\alpha = 0.81$). The scale contains the same items as the scale for the basic level of negative affect. Second, on the *Daily Stressful Event Record*, individuals were asked to record any stressful event that happened during the day. Both major events and less serious hassles were of interest, so the secretaries were told to record any event that had left them feeling upset for two hours or more (*cf.* Cutrona, 1986). The third form is the so-called *Social Interaction Record*. As in the study of Cutrona (1986) and in all other studies conducted with the RIR (see for example Nezelek, Wheeler and Reis, 1983), participants were asked to record each social interaction that lasted

10 minutes or more. If the participants were involved in more than five interactions on a single day, they were instructed to complete the forms for the five most important ones. In accordance with Cutrona (1986) the limit of five was imposed to reduce the record-keeping burden placed upon participants and to limit the volume of data collected. The subjects were asked to describe for each interaction the duration of the contact and whether the other was a colleague, superior, student or somebody else. Furthermore, for each interaction two items were included for each of the elements of social support as distinguished by House (1981), i.e. *emotional support* ('paid attention to my feelings' and 'showed that he/she liked me'), *instrumental support* ('helped me with a given task' and 'took work from me'), *informational support* ('gave me advice on how to handle things' and 'gave his/her opinion about a problem concerning my work') and *appraisal support* ('showed that he/she appreciated the way I do my work' and 'spoke highly about the way I accomplish my tasks'). Also two items asked whether or not the contact was seen as *rewarding companionship* (Rook, 1987) ('we had a casual chat' and 'we made jokes and had fun'), and one item was about the *confidentiality* of the contact ('the contact was confidential').

RESULTS

The results are presented in two sections corresponding to the research questions.

Dimensions of support-related social interactions

The first major issue concerned the exploration of dimensions of support-related social interactions. The secretaries reported in total 362 support-related social interactions in five days. This is a mean number of 8.8 such contacts in five days. In an earlier study with the DIRO among policemen (Buunk and Verhoeven, 1991) a mean number of 9.2 contacts in five days was reported. On the average a contact lasted nearly one hour and 10 minutes. The contacts with faculty members constituted the largest category (35 per cent). A principal component analysis was carried out to explore different dimensions of support-related social interactions. All items on social support, as well as the items on rewarding companionship and the item on the confidentiality of the contact, were included in the analysis. As in the study of Buunk and Verhoeven (1991) the unit of analysis was a social contact ($N = 347$)^{2,3}. After varimax rotation three components emerged with eigenvalue greater than 1, that together explained 66.6 per cent of the variance. The factor-loading matrix showed a clear, simple structure. All items loaded higher than 0.50 on one particular component and lower than 0.40 on both remaining components. The first component (eigenvalue = 4.3) contained all emotional- and appraisal support items, as well as the item about the confidentiality of the contact. We labelled this factor

² Because two subjects reported an extremely large number of social interactions, we randomly chose nine (the average number of interactions over five days) interactions from their data.

³ In order to control for non-independence between contacts, we randomly sampled a single record from each subject and factor analysed the 11 items. We repeated this procedure three times. Each time three factors were extracted with eigenvalue greater than 1 that explained 61.9 to 70 per cent of the total variance. The patterns of the factor-loadings appeared comparable to the pattern we found in the analysis over all the contacts, indicating that the non-independence between the contacts did not distort the results.

intimate support. The second component (eigenvalue = 1.9) contained the instrumental support and informational support items. This component is designated as *instrumental support*. The third component comprised the two items of rewarding companionship, and can therefore simply be referred to as *rewarding companionship* (eigenvalue = 1.2). Accordingly, three scales were constructed to describe the contacts: (1) intimate support ($\alpha = 0.77$) (2) instrumental support ($\alpha = 0.80$) and (3) rewarding companionship ($r = 0.76; p < 0.001$).

Relationship between daily social interactions, stressful events and negative affect

The secretaries reported on the average only one stressful event in five days. This is rather few compared to the policemen who reported one stressful event each day, and the students from the study of Cutrona (1986), who reported one event every two days. The events could easily be categorized in four categories. (1) interpersonal frustration (e.g. 'Colleague holds an extreme long telephone conversation in a quasi low tone, because it deals with so-called confidential issues') (2) work overload (e.g. 'I had to finish several things before 17.00 hours. Because of this terrible time pressure, everything went wrong') (3) hectic work environment (e.g. 'At the same time, two colleagues are talking loudly with each other, a student enters the room and joins the club, suddenly there is a terrible noise coming from another department, and in my office the telephone rings') and (4) problems with the organization. This category includes mainly problems that are the result of the bureaucracy of the university, or problems which imply a lack of control (e.g. 'They refused to let me follow a course on Word Perfect'). Four independent raters were asked to assign all the reported events into one of these *a priori* categories. The mean inter-rater reliability (Cohen's kappa) was 0.63 (range 0.54 to 0.74) indicating that the four raters sufficiently agreed with each other.

As a first step in the analysis of the influence of social interactions and stressful events upon negative affect, both between- and within-subject correlations were computed. In order to compute the within-subject correlations, the data were structured in such a way that a person-day was the unit of analysis ($N = 205$). After that, the file was split by respondent number and correlations were computed between the mean scores on the social interaction variables on a particular day, the number of stressful events on that day and negative affect on that day. The number of cases was equal to the number of days respondents had valid scores. The correlations were then transformed to Fisher's Zs, and these Zs were then averaged. Finally, these average Zs were converted back to correlations (Emmons, 1991). The results are presented in Table 1.

Table 1 shows that, both between and within subjects, the number of stressful events has the highest correlation with negative affect. None of the types of social interactions shows within-subjects a significant relationship with negative affect. Intimate support correlates — both between- and within-subjects — highly with particularly instrumental support but also with rewarding companionship. Because in the regression analyses these high intercorrelations may cause problems of multicollinearity, for each type of interaction a separate regression analysis was performed. In order to control for chance capitalization due to multiple analyses, the Bonferroni correction was employed. Dividing the conventional alpha level (0.05) by the number of analyses (3) yielded an adjusted alpha level of 0.017.

Table 1. Within- and between-subject correlations between social interactions, number of stressful events and negative affect.

	2	3	4	5
1. Negative affect	0.58** 0.55***	0.03	0.38* -0.20	0.03 -0.03
2. Number of stressful events		0.16	0.18 -0.09	- 0.03 0.17
3. Instrumental support			0.00	- 0.05 0.72**
4. Rewarding companionship				0.36* 0.23
5. Intimate support				

The bold-printed correlations are the between-subject correlations

Due to pairwise deletion of missing values, the N of the between-subject correlations differs from 21 to 41. For computing the statistical significance of the within-subject correlations Table V A of Fisher and Yates (1963) was used $Df=N-2$, where N refers to the number of subjects who had valid scores on more than one day.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

To assess in regression analyses the within-subject effects of daily social interactions and stressful events upon negative affect, again a person-day was employed as unit of analysis ($N = 205$). As suggested by various authors (e.g. Michela, 1990; Repetti, 1993) between-subject variance was controlled for by a set of dummy variables, equal to the number of subjects minus one. In addition, it was decided to determine how much of the total variance in negative affect due to persons (captured by the $N-1$ dummy variables) was attributable to each person's average or basic level of negative affect (Michela, 1990). Therefore, in each analysis in the first step the basic level of negative affect was entered, in the second step the dummy variables, in the third step the number of stressful events and the degree of support, and in the final step the interaction between these last two variables.

Table 2. Three regression analyses predicting daily fluctuations in negative affect from number of stressful events and rewarding companionship, intimate support and instrumental support

Predictor variables	Daily negative affect		
	β	R^2 -change	
Step 1	Number of stressful events	0.49***	
	Rewarding companionship	-0.08	0.06***
Step 2	Rewarding companionship \times number of stress	0.13	0.01
Step 1	Number of stressful events	0.46***	
	Intimate support	-0.02	0.06***
Step 2	Intimate support \times number of stress	-0.06	0.01
Step 1	Number of stressful events	0.52***	
	Instrumental support	-0.02	0.06***
Step 2	Instrument support \times number of stress	-0.16**	0.02**

The total R -square is respectively 0.72, 0.72 and 0.73. This includes 65 per cent for all between-subject variance in negative affect. The basic level of negative affect explains 20 per cent and the dummy variables add 45 per cent to the total explained variance.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As Table 2 indicates, individual differences in daily negative affect explain 65 per cent of the variance in daily negative affect. Twenty per cent of this percentage can be attributed to individual differences in the basic level of negative affect. Further-

more, the number of stressful experiences appeared to have the most substantial impact: on a day that a secretary reported many stressful experiences, her score on negative affect tended to be higher. This factor added 6 per cent to the total explained variance. None of the main effects of the features of support-related social interactions appeared to be significant. However, the significant interaction between instrumental support and the number of stressful experiences points to the operation of a buffer effect. Thus, on days that a secretary experiences many stressful events, instrumental support in particular seems to reduce the occurrence of negative affect at the end of that day. Also, after using the more restrictive level of significance ($p < 0.017$), effects remain significant.

We also executed three between-subject regression analyses for each type of support, with negative affect as dependent variable, and the degree of support and the interaction between support and number of stressful events as independent variables. In each analysis the main effect of the number of stressful experiences was highly significant (β ranged from 0.55 to 0.89; $p < 0.001$) and explained about 30 per cent of the total variance in negative affect. The analysis with rewarding companionship as independent variable showed no main effect of this variable, and no significant interaction with number of stressful experiences. The analysis with instrumental support as independent variable indicated no significant main effect of this variable either, but showed a significant interaction effect with number of stressful events ($\beta = -0.43$, R^2 -change = 0.14; $p < 0.01$) (even significant after Bonferonni correction). In a similar vein, in the third regression no main effect of intimate support was found, but there was a significant interaction between intimate support and the number of stressful events ($\beta = -0.53$, R^2 -change = 0.16, $p < 0.01$) (even significant after Bonferonni correction). Thus, those subjects who experienced in their daily interactions intimate and instrumental support, were less likely to feel negative affect when they experienced a high number of stressful events.

CONCLUSIONS AND DISCUSSION

The present study suggests a number of interesting though tentative conclusions. First, we identified three dimensions of support-related social interactions of secretaries: (1) intimate support, (2) instrumental support and (3) rewarding companionship. Similar dimensions were found in an earlier study with the DIRO among police officers (Buunk and Verhoeven, 1991). Although it cannot be ruled out that secretaries are involved in more types of social interactions than are captured in this research, it is remarkable that the three dimensions we have identified are similar to the three general needs suggested by Argyle and Henderson (1985): (1) social and emotional support, (2) instrumental reward, and (3) common interest. This seems to suggest that supporting relationships at work can fulfil basic social needs.

The present study provides some evidence for the different role played by different types of support-related social interactions. Although the three types of social interactions are interrelated, the patterns of correlations with other variables appear to differ. Instrumental support seems to play the most important role in the work of secretaries and to buffer, both between- and within-subjects, against the potential detrimental influence of stressful events on negative affect. In addition, intimate support showed a significant buffer effect between-subjects. This indicates that secre-

taries who often obtain such support seem to cope better with stress. The positive between-subject correlation between instrumental support and negative affect suggests that the experience of negative affect (caused by stressful events) triggers a process of actively seeking instrumental support.

Remarkably, rewarding companionship played no role at all in alleviating stress. This is not in line with the results of Rook (1987) and Buunk and Verhoeven, (1991). The latter authors found in a sample of male police officers that companionship buffered job-related stress more effectively than did intimate and instrumental social support. These inconsistent results may be related to gender differences between samples. There is evidence that social interactions of women more often have an intimate character, while companionship seems to be characteristic for friendships and relationships between men (Reis, 1989; Vaux, 1985).

In accordance with several other studies (*cf.* Ormel and Schaufeli, 1991; Repetti, 1993) the present study showed that 65 per cent of the variance in negative affect represents between-subject variance. The basic level of negative affect accounted for 20 per cent and the remaining 45 per cent reflects stable personality variables. Accordingly, 35 per cent of the variance is attributable to the effects of non-observed events that cause negative affect levels to deviate from their basic level. The results of the current study show that the daily stressful events explain 6 per cent of the remaining variance in negative affect. Several other studies that used within-subject analyses, also found that minor stressful events are associated with same-day mood (Eckenrode, 1984; DeLongis *et al.* 1988; Repetti, 1993).

Interpersonal frustration appeared to be a major stressor for the secretaries. This is completely in line with the results of Spector (1987) who also investigated female clerical workers at an university. However, compared to policemen and students, secretaries seem to have a relatively stress-free job. It is of course possible that for women, some major potential stressors lie outside the work situation, for instance problems which refer to the various roles women sometimes have to fulfil, such as the spousal and the maternal role. Indeed, as Meleis and Stevens (1992) have argued it is important to include domestic stress when studying the relationship between women's work and mental health.

Although our findings suggest the usefulness of a daily event-recording method for drawing more fine-grained conclusions with regard to the nature and effects of social support, some problems with the DIRO must be noted. Firstly, the various measures may not be independent from one another. For instance, the definition of an event as a stressor is left to the subject. This may lead to artificially inflated correlations between the incidence of stressors and negative affect at the end of the workday. Secondly, participants filled out records at the end of the workday. Although Hedges, Jansdorf and Stone (1985), for instance, argue that obtaining data at the end of the day offers opportunities for distortion, such retrospections may still be more precise and accurate than more global retrospections. Thirdly, like Cutrona (1986) and Reis and Wheeler (1991) we instructed the respondents to restrict their recording of interactions to those interactions that lasted longer than about 10 minutes. Of course it cannot completely be ruled out that we excluded some relevant interactions by imposing this limit, but we believe (supported by pilot data from Reis and Wheeler (1991)) that for the most part very brief social interactions rarely are to be considered meaningful. Moreover, requiring subjects to describe every encounter would be too burdensome a task for them. Finally, because indivi-

duals do not report an equal number of events, the use of a daily event-recording method implies almost always that one has to deal with missing values. This may indicate that some conclusions may not pertain to *all* subjects. Therefore, we have to be particularly careful with generalizing results obtained with event-recording methods. Despite these limitations, the present study suggests that the micro-analytic approach offers interesting possibilities for fine-grained analyses of daily occurring social interactions and psychological mechanisms involved in social support as related to work stress.

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