

## The role of attributions in the cognitive appraisal of work-related stressful events: an event-recording approach

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*Keywords* Cognitive appraisal, Stressful events, Correctional officers, Daily event-recording

This paper describes a micro-analysis of the cognitive appraisal of daily stressful events in a sample of correctional officers (COs). More specifically, the authors examined whether three attribution dimensions mediated the relationship between the occurrence of stressful events and the 'significance' of these events, and whether the latter functioned as a mediator between the attribution dimensions on the one hand and negative affect (outcome variable) on the other. Convincing indications were found for the mediating role of the 'significance' of a stressful event, while weak indications were found for the mediating role of the attribution dimensions. Finally, the strengths and weaknesses of daily event-recording methods are discussed at length.

### 1. Introduction

Theory and research on stress are plagued by a lack of agreement on its definition. In essence, three different approaches to defining stress can be distinguished: the stimulus approach, the response approach and the interactional or appraisal approach (Paterson and Neufeld 1989). The stimulus approach considers stress as a characteristic of the individual's environment, the response approach regards stress as a non-specific response to an aversive or noxious environmental stimulus, while, according to the cognitive approach, stress is neither an external situation nor an internal state but an interaction between the perception of environmental demands and the perceived ability to meet or alter them (Lazarus 1966, Lazarus and Folkman 1984). As in most recent psychological research on stress, the authors consider the interactional approach as the conceptual framework for this study. A micro-analysis of the cognitive processes through which individuals give meaning to stressful events was carried out for a sample of correctional officers (COs).

A distinction is usually made between primary and secondary appraisal (Lazarus and Folkman 1984). Primary appraisal evaluates whether there is anything at stake for the individual. Secondary appraisal occurs when individuals consider whether anything can be done to cope with the stressful event. Primary and secondary appraisal converge to shape the meaning of an event for the individual's well-being. Holroyd and Lazarus (1982, p. 23) point out that in many contexts, primary and secondary appraisal are not separable. The

interdependency of the two processes is also illustrated in a paper by Dewe (1992a). This describes a study that showed that evaluating the availability of different coping resources which is usually associated with the secondary appraisal process made the situation more demanding for some people and can therefore also be considered to be part of primary appraisal. Also, Folkman (1984) acknowledged the role of control as being part of both processes. In this study the authors submit to this line of reasoning, indicating that they also do not explicitly distinguish between primary and secondary appraisal.

#### 1.1 Types of stressful event and their cognitive appraisal

Study of the cognitive appraisal of stressful events requires knowledge about the types of stressful event that are characteristic for—in this case—the work of COs. Therefore, the first issue of the study concerns the nature of stressful events that COs report. More specifically, COs will themselves report those types of stressful event that are characteristic to their job.

A second issue concerns the appraisal of the different types of stressful event. More specifically, the authors wanted to examine the role of attributions in appraising stressful events. Dewe (1992b) argues that 'perhaps when research on appraisal and work stress is set within the context of attribution theory, unravelling why events are important will provide further insights into the appraisal process and the etiology of stress' (p. 107). Research outside the workplace has shown that attributions for negative life events highly influence the incidence of depression (for a review see Sweeney *et al.* 1986). Here, it is assumed that attributions for the stressful events at work will also influence the outcomes of those events. According to Weiner's attribution theory (1985), three causal attributional dimensions are examined. The first dimension, *locus-of-cause*, reflects the extent to which events are attributed to either internal or external causes by the person. The second dimension, *stability*, reflects the extent to which events are attributed to stable, unalterable or unstable, alterable causes. Finally, the third dimension, *controllability*, reflects the extent to which events are attributed to controllable or uncontrollable causes. In addition to these attributional dimensions, the authors wanted to examine the degree to which individuals feel *invariant* about how to handle or cope with an event. It is assumed that if people feel certain about their way of coping, they will be less inclined to appraise a stressful event as being significant (Lazarus and Folkman 1984). In this paper the authors will examine how the different types of stressful events is described by the COs are appraised in terms of the four factors mentioned earlier. In addition, the relationship of these factors to the 'significance' of an event and what type of stressful event is perceived to be most 'significant' will be investigated.

With respect to the outcomes of stressful events, Dewe (1989) suggests that the meaning individuals assign to events acts as an intervening variable between the stressor itself and subsequent strains, such as—in this case—negative affect. Inspired by Parker and DeGroot (1983), he argues that more consistent results may emerge from investigating the relationship between individual evaluations of stressful events on the one hand and strains on the other than from the current practice of simply relating the events themselves to strains, thereby ignoring a whole mediating process. Therefore, in this study an investigation will be made of whether the attribution dimensions mediate the relationship between the occurrence of different types of stressful event and the 'significance' of stressful events, and if the 'significance' of an event functions as a mediator between the appraisal factors on the one hand and negative affect (outcome variable) on the other hand. Figure 1 presents all the hypothesized relationships.

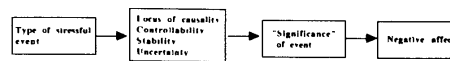


Figure 1. Model of the cognitive appraisal of daily stressful events.

#### 1.2 The event-recording approach

In order to examine the cognitive appraisal of stressful events, this study uses a *daily event-recording method*. This method is referred to as the DIRO (Daily Interaction Record in Organizations) (Hummik and Peters 1994). The DIRO is based upon the Rochester Interaction Record (RIR) (Reis and Wheeler 1991) and upon the work of Citroni (1986). With the DIRO it is possible to assess during the course of a week: (1) the daily social interactions at work (in this study social interactions are excluded (for more information see Peters 1994)); (2) the nature and appraisal of work-related stressful events; and (3) the negative affect experienced at the end of the working day as an indicator of strain. With respect to the one-week limit, Reis and Wheeler (1991) have found that one or two weeks is the optimal record-keeping duration. Shorter periods may be prejudiced by recall bias, while longer periods probably burden subjects too heavily, diminishing the quality of the data. Since the respondents have to record the events they perceive as stressful during five consecutive working days, it is possible to examine how workers themselves describe their own work situations instead of taking for granted the a priori labelling of events as stressors by researchers (Bruck and Atchell 1987).

Employing daily event-recording methods has several methodological advantages compared to other research methods, including self-report questionnaires and behavioural observation. Self-report questionnaires are useful to describe people's global perceptions of their social activity, but because the rating procedure requires them to filter and aggregate events, these events may not be viewed as actual activities. Instead, they are best seen as personalized impressions of social activities that have been refracted through various perceptual, cognitive, and motivational processes. Here, in this stage through which subjects must proceed to arrive at global impressions of the kind most self-report questionnaires require, all of which are liable to substantial distortion (Reis and Wheeler 1991). The first type of distortion is called *selection of representative events*. Selection poses potential problems for several reasons. In the first place, the instructions rarely include the criteria that are to be followed for defining the domain of events that are under study. In the second place, a more important reason why selection biases in effect responses to global questionnaires lies to do with the difficulty of storing and retrieving detailed information about repetitive and often mundane events in long-term memory. Undoubtedly, certain events are likely to be more cognitively available (e.g. a confederated conversation) or extremely important (meeting a potential confrontation) than others. Therefore, it is unlikely that the events being described are selected randomly. A second type of distortion is called *recall of the content of events*. Biases in recalling the content of a past event or incident due to systematic memory processes (random forgetting or memory used distortions such as selective perception, dissonance reduction or defence mechanisms). A third set of distortions inherent to global questionnaires concerns the *aggregation of multiple events*. The way in which people combine data from multiple events to create one single impression can also be responsible for biased reports. In the present study it is assumed that the DIRO is less susceptible to these distortions because the time between the recording of an event and the happening of an event is relatively short in the DIRO.

Most occupational stress research uses a between-subject design with scores that are aggregated over measurement occasions or single scores that are assumed to represent a stable characteristic of the subject's appraisal and stress process. However, the DIRO method, in which individuals fill out detailed reports of their stressful events and appraisal process for five consecutive days, allows analyses on an event-by-event basis. Consequently, it enables the examination of within-subjects effects (Michéa 1990). These kinds of effect allow us to compare the same person with himself or herself across several stressful events.

To summarize, six exploratory questions are addressed: (1) What types of work-related stressful events are reported by COs? (2) How are the different types of stressful event appraised? (3) What type of stressful events is perceived as most significant? (4) What is the relationship between the appraisal dimensions and the significance of a stressful event? (5) Do the appraisal dimensions mediate the relationship between the occurrence of stressful events and the 'significance' of those stressful events? (6) Does the 'significance' of a stressful event act as a mediator between the appraisal dimensions and negative affect?

## 2. Method

### 2.1. Participants

Participants were 38 Dutch correctional officers (COs) (29 men and 9 women). The mean age of the COs was 37 years ( $SD = 8.63$  years) and ranged from 25 to 54 years. The COs had been employed as officers for an average of 7 years ( $SD = 6.44$  years), ranging from 0.5 to 22 years. All respondents worked 38 h/week, excluding overtime. On the average, the COs spent 78% of their time working with prisoners ( $SD = 24.87$ ).

### 2.2. Procedure

The DIRO was used as a method for data collection. First, the COs received a letter in which the study was introduced. Next, the first author attended some team meetings as a visitor, at which she explained the purpose and procedure of the study. The anonymity and confidentiality of the data were emphasized. In accordance with the procedures used by Citroni (1986) and Bunnik and Verhoeven (1991), a total sample of approximately 40 COs was assumed to be satisfactory. It was emphasized that it is important to fill out the DIRO at the end of a day. The COs were urged to be very accurate in their record keeping and to miss a day rather than record data retrospectively. In order to improve the memory at the end of the day, they were encouraged to make some notes during the day.

### 2.3. Instruments

Two forms of the DIRO were used in this study. First, the *Daily Negative Affect Record* which consists of a 12-item scale assessing the degree to which one experiences negative or positive (recoded) feelings at the end of each workday, such as nervousness, depression, gloominess, cheerfulness, etc. This scale was especially developed by Warr (1990) for measuring job-related negative affect. Cronbach's  $\alpha$  was .81. Second, on the *Daily Stressful Event Record*, individuals were asked to describe in a few sentences any stressful event that happened during the day, and that had left them feeling upset for 2 h or more, with a maximum of five events (Citroni 1986). Next, the COs were requested to answer several questions about this event, all relating to the factors that are supposed to constitute the cognitive appraisal of a stressful event.

(a) *Significance*: How significant was this event for you? On a five-point rating scale, the answers varied from (1) not at all significant to (5) very significant ( $M = 3.2$ ,  $SD = .95$ ).

The next questions refer to the three attributional dimensions and to the degree of uncertainty about how to cope with the event.

(b) *Uncertainty*: Did you feel uncertain about the way you had to handle this stressful event? The answers ranged from (1) not at all to (5) very strongly ( $M = 2.2$ ,  $SD = 1.0$ ).

(c) *Locus of causality*: The cause of this stressful situation lies (1) completely inside myself to (4) completely outside myself ( $M = 3.4$ ,  $SD = .81$ ).

(d) *Controllability*: Did you have the feeling that you could do something about the cause of this stressful situation? The answers varied from (1) I could do very much about it to (5) I could do nothing about it ( $M = 3.4$ ,  $SD = 1.2$ ).

(e) *Stability*: Do you think something at all can be changed about the cause of the stressful situation? The answers ranged from (1) certainly to (4) certainly not ( $M = 2.2$ ,  $SD = 1.0$ ).

## 3. Results

### 3.1. Types of stressful events

The correctional officers reported 176 stressful events in total. This is an average of nearly five stressful events per officer over 5 days. On the basis of content analysis, the authors created seven categories that are, as much as possible, mutually exclusive and theoretically justified (Weber 1990). The categories were:

- (1) *Aggressive acts from prisoners* (19.3%). This included both verbal and non-verbal aggression.
- (2) *Prisoners' disobedience and transgression of the rules* (25.6%). For instance, disobeying orders, lack of co-operation, wanting something that is not allowed, etc.
- (3) *Quantitative overload* (9.7%). Too much work is result of, for instance, absenteeism or too few personnel.
- (4) *Conflicts between colleagues* (10.2%). Colleagues did not keep their promises, bad communication, irritation, lack of co-operation.
- (5) *Lack of understanding and support from authorities* (9.7%). This also included the neglect of wishes regarding the work schedule.
- (6) *Poor organization of work* (15.9%). Unexpected risks, poor regulation of risks.
- (7) *Qualitative overload* (9.7%). The work was hard to take, feelings of uncertainty about one's opinions.

Five independent raters were asked to assign all the reported events into one of these categories. The inter-rater reliability (Cohen's  $\kappa$ ) was .65 (range: .55 to .73), indicating that most of the time the five raters agreed with each other. When there was a disagreement between the raters, they tried to reach consensus by means of discussion. If this was not possible, the event was placed in the category in which the majority of the raters would like to place it.

### 3.2. Appraisal of the different types of stressful event

To examine how the reported stressful events were evaluated in terms of the appraisal dimensions, the data was structured in such a way that a stressful event was the unit of analysis. This was necessary because data analysis only makes sense for each stressful event separately. Since the stressful events were normally distributed across days (kurtosis = .71, skewness = 1.37) as well as across subjects (kurtosis = 1.09, skewness = 1.17), no between-subjects correction was applied. A MANOVA was conducted with type of stressful event as independent variable and the stability, controllability, locus of causality and uncertainty

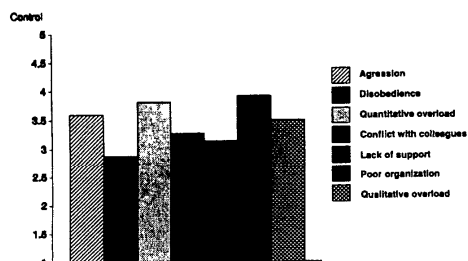


Figure 2. Mean scores of the types of stressful events on controllability. Score 1 = much control, score 5 = little control,  $F(6, 152) = 2.72$ ,  $p < .05$ .

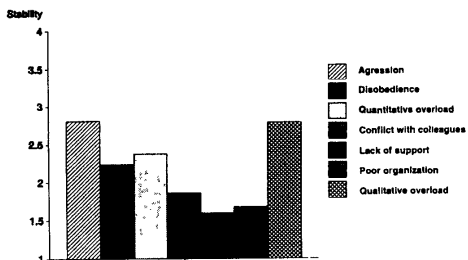


Figure 3. Mean scores of the different types of stressful events on stability. Score 1 = unstable, score 4 = stable,  $F(6, 152) = 4.93$ ,  $p < .05$ .

as dependent variables. (Owing to listwise deletion of missing values  $n = 159$ ). The multivariate effect was significant ( $F(24, 608) = 2.57$ ,  $p < .001$ ). The univariate analyses showed that both controllability and stability produced significant differences between the types of stressful event,  $F(6, 152) = 2.72$ ,  $p < .05$  and  $F(6, 152) = 4.93$ ,  $p < .001$ , respectively. In both cases the test of homogeneity of variances showed that the variances were equal in each group (Bartlett-Box  $F(6, 18123) = 58255$ ,  $p = .744$ ; Bartlett-Box  $F(6, 18123) = 11195$ ,  $p = .995$ ). There was no difference between the stressful events with regard to uncertainty about the way to handle the event and the extent to which events are attributed internally versus externally.

Figures 2 and 3 show the mean scores for all the types of stressful event for controllability and stability.

Figure 2 shows that the COs indicated that they experienced the least control over aggression from prisoners, quantitative overload and poor organization of work. Figure 3 shows that COs experienced the causes of aggression from prisoners and qualitative overload as the most stable causes of stressful events.

### 3.3. The 'significance' of stressful events

To examine what type of stressful event was appraised as most 'significant', a one-way ANOVA (Scheffé-test) was conducted with 'significance' of event as dependent variable and type of stressful event as independent variable. Disobedience from prisoners appeared to be the least significant stressor ( $M = 2.67$  versus 3.06 for aggression of the prisoners, 3.48 for overload, 3.40 for conflict with colleagues, 3.36 for poor organization of work, 3.60 for lack of support from authorities and 3.57 for qualitative overload,  $F(6, 153) = 3.91$ ,  $p < .01$ ). Only disobedience from prisoners and lack of support from authorities appeared to differ significantly from each other.

### 3.4. The cognitive appraisal dimensions and 'significance'

In order to assess the association between the appraisal dimensions and the 'significance' of an event, zero-order correlations were computed. Uncertainty and controllability correlated significantly with 'significance' of stressful events, respectively,  $r = .47$ ,  $p < .001$  and  $r = -.18$ ,  $p < .05$ .

### 3.5. The mediating role of the appraisal process

In order to assess the hypothesized mediating role of the appraisal process, regression analyses were executed. Again, stressful event functioning as a unit of analysis. According to Baron and Kenny (1986), a variable functions as a mediator if (a) the relation between the mediator and the dependent variable is significant, (b) the relation between the independent and mediator variable is significant, and (c) when controlled for the mediator, a previously significant relation between the independent and dependent variable is no longer significant.

A few additional remarks have to be made. First, as the independent variable was in this case a categorical variable, it was necessary to transform this variable into dummy variables. Second, since six dummy variables were created,  $R^2$  changes were considered instead of the individual regression coefficients. Third, since only uncertainty and controllability showed significant relationships with the 'significance' of a stressful event, two sets of regression analyses were performed: one to test the mediating role of controllability and one to test the mediating role of uncertainty. The results are presented in figure 4.

Part A of figure 4 shows that (a) the relation between controllability (mediator) and 'significance' (dependent variable) is significant ( $r = .18$ ), (b) the relation between the type of stressful event (independent) and controllability (mediator) is significant ( $R^2 = .31$ ). Most important, however, is the finding that when controlled for controllability, the strength of the relation between the type of stressful event and 'significance' ( $R^2$  change = .13,  $p < .01$ ) decreases slightly ( $R^2$  change = .11,  $p < .01$ ). Thus, according to Cox and Ferguson (1991) who argue that 'a reduction in regression coefficients between the independent and dependent variables would be all that is required to indicate mediation' (p. 13), the results support, although weakly, the mediating role of controllability.

more global retrospections, this may be more so because the study focused on events that kept a CO busy for at least 2 h. It is not likely that such events would be easily forgotten at the end of the day. Fourth, determining whether or not an event should be recorded is stressful probably requires much cognitive processing which could have led to an underestimation of the number of stressful events. Finally, the recording of stressful events may have happened somewhat a-select, indicating that the reported stressful events were not completely representative of a particular job. On the other hand, self-recording of daily stressful events has an important advantage, in that it enables researchers to determine what kind of stressful events are characteristic for a profession according to the workers themselves.

Despite its limitations, the results of the study seem to lend some support, albeit tentative, to the suggestion that occupational stress research may benefit from methodologies that offer alternative approaches that further refine the measurement of stressors, strains and the intervening cognitive appraisal process. Moreover, the DIRO enables us to examine the concepts of stress and appraisal more objectively than does ordinary questionnaire research, in the sense that it requires less emotional and cognitive processing by the subjects (Fress and Zapf 1988).

Besides its advantages, daily event-recording methods also have some disadvantages that must be mentioned (Tommen et al. 1991). First, compared to cross-sectional questionnaire studies, laboratory investigations and even longitudinal enquiries, all self-recording procedures are time-consuming and cumbersome for both subjects and researcher. This raises questions about the generalizations of the conclusions drawn from the data, as it is questionable whether someone who is willing to participate in a very demanding task represents the population to which the investigators hope to generalize their findings. Second, self-recording of daily events may subtly alter subjects' impressions of those events. Self-recording requires introspection of daily life, to which many subjects may be unaccustomed. After a number of days, subjects may begin to observe their behaviour in new ways, which may result in their reporting it differently. To date, this issue has not been adequately addressed and remains a methodological challenge.

A very important issue with regard to practical feasibility, which has often been underestimated, refers to the fit-out of the DIRO. In this research an A4 format was chosen. However, a substantially smaller variant, similar to the RIR, could be designed so that respondents can carry it in their pocket. This would allow them to fill out the record during the day. Another possibility, which was used in the study, among secretaries (Peeters et al. 1995) would be to give the respondents little notebooks. This may seem rather overdone, but it is the authors' conviction that it could help respondents to refresh their memory at the end of the day. Finally, employees were found to be more co-operative if they were allowed to fill out the records during work time. If they had to complete the records in leisure time, the attrition rate would probably be much higher. Therefore, researchers should try to claim some time from the organization for the recording of the DIRO.

A final remark must be made about the theoretical utility of the DIRO. It was possible to gather data with the DIRO that were sufficiently specific to illuminate psychological processes that otherwise would not have come to the surface. The specificity of the results that are acquired with the DIRO makes it possible to advise on practical interventions that are similarly specific.

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Revised version submitted: January 1995.

Accepted: March 1995