Journal of Occupational and Organizational Psychology (2005), 78, 171–193

The British Psychological Society

www.bpsjournals.co.uk

Special section

Experience sampling mood and its correlates at work

Andrew G. Miner[1], Theresa M. Glomb[1]* and Charles Hulin[2]

[1]University of Minnesota, USA

[2]University of Illinois at Urbana-Champaign, USA

The experience sampling method is used to measure variance over time in events, moods, and behaviours in the work setting via palmtop computers in a sample of 41 employees. Theoretical propositions about event–mood–behaviour relations are derived from Affective Events Theory (Weiss & Cropanzano, 1996) and tested using within- and between-persons variance. The experiment found 56% of the variance in hedonic tone of mood was within- rather than between-persons. Hedonic tone was significantly related to both positive and negative work events in expected directions. The relationship between negative events and mood was approximately five times stronger than that between positive events and mood, even though positive events were reported three to five times more frequently than negative events. Hedonic tone was positively related to engaging in work withdrawal and negatively related to engaging in work tasks. Implications of these findings as well as the use of experience sampling for the study of dynamic workplace variables are discussed.

Theory suggests that affect or mood on the job[1] is an important component of job attitudes and an important predictor of some job behaviours (Brief & Weiss, 2002; George, 1989; George & Brief, 1992; Weiss, 2002; Weiss & Cropanzano, 1996). Information about empirical relations among these variables at work has come primarily from studies using traditional between-persons correlational approaches. However, given the temporal fluctuations in mood on the job, such between-persons approaches may miss much of the variability in moods and job behaviours and obscure relations between them. Studies testing theoretical hypotheses about job affect – behaviour relationships using day-to-day and hour-to-hour fluctuations in mood and behaviours are a needed supplement to between-persons findings.

* *Correspondence should be addressed to Thersea M. Glomb, Dept of Human Resources and Industrial Relations 3-300 Carlson School of Management, 321 19th Ave. S., Minneapolis, MN 55455, USA (e-mail: tglomb@csom.umn.edu).*

[1] *Affect encompasses both specific emotions and more diffuse moods. We acknowledge that moods and emotions are multidimensional constructs. We use the term affect to generally describe the positive and negative quality of emotions and moods.*

DOI:10.1348/096317905X40105

This study examines relationships among job events, mood, and job behaviours over time using the experience sampling method (ESM; Larson & Csikszentmihalyi, 1983). Employees responded to questions presented on palmtop computers at four random times throughout the workday. Questions concerned (1) work, supervisor, and co-worker related events that occurred in the previous hours, (2) the employee's current mood, and (3) the discretionary behaviours in which the employee was currently engaged. We report the frequency estimates of occurrence of events, moods, and behaviours on the job, sampled in their natural setting, estimates that have unique meaning in an ESM context. We also provide estimates of the relative amounts of within-person to between-persons variance in mood to determine the contribution of capturing within-persons variance with ESM approaches. We then go on to test several of the theoretical propositions derived from affective events theory (AET; Weiss & Cropanzano, 1996), an organizing framework to study 'the structure, causes and consequences of affective experiences at work' (Weiss & Cropanzano, 1996, p. 11).

Given that our research questions require an experience sampling approach to capture dynamic within-person variance in events, mood, and behaviours, our paper also provides an illustration of the advantages of using ESM and the challenges associated with it in an organizational context. We begin with a discussion of the applicability of ESM to the study of dynamic data on the job.

Appropriateness of experience sampling methodology

As stated by McGrath (1981), 'multiple methods is not just a desirable approach but rather is the *sine qua non* for the knowledge accrual process' (p. 129). In the area of affect at work, the use of multiple methods is imperative for building a knowledge base. ESM allows researchers to study quantitatively, in-depth, everyday events, moods, and behaviours in their natural context (Hormuth, 1986). Data are gathered using measures administered at random or pre-set times during the activity of interest. Sampling experiences *in situ* achieves a richness not found in traditional designs, making ESM an attractive method.

In the case of mood at work, ESM provides needed correspondence between our theoretical propositions and research methods. The definition and operation of mood implies variance both among individuals and across time within individuals (e.g. Fisher, 2000, 2002; Ilies & Judge, 2002; see Watson, 2000 for a review; Weiss, Nicholas, & Daus, 1999). For example, one's mood at 10 a.m. on Tuesday is probably not the same as one's mood at 5 p.m. on Friday (within-person variation) and the mean of all mood observations across days of the week is different for different people (between-person variation). Conclusions about the operation of mood using only between-persons variance are circumscribed; they can only be drawn about mean levels of mood, not about how individuals behave differently when they feel pleasant or unpleasant.

Further, relationships between variables may operate differently if based on within-persons, rather than between-persons, variance. Consider, for example, the relationship between exercise and blood pressure (Schwartz & Stone, 1998). A study using a between-persons design would find a negative relationship between these two variables; individuals who exercise more have lower blood pressure. However, an ESM study would conclude the opposite; blood pressure and exercise are positively related because when individuals are exercising, their blood pressure is elevated. This example illustrates the necessity of considering the appropriate level of analysis and appropriate generalization to answer research questions. Neither conclusion is wrong if generalizations are limited to the appropriate level. Neither, however, is generally correct.

ESM has additional advantages. Because sampling of experiences and behaviours occurs in natural contexts, the mean frequency of a variable becomes an estimator of its true frequency *in situ*. ESM frees the participant from having to recall experiences by making assessments as the items of interest occur and frees researchers from reliance on participants' (possibly biased) recall (Alliger & Williams, 1993). In the current study, palmtop computers signal participants, record and store data about events, moods, and behaviours in real time to test theoretical propositions derived from AET (Weiss & Cropanzano, 1996).

Attitude-affect behaviour links and affective events theory

Although the research based on mood and affect in general is voluminous, these constructs have received limited, but increasing, attention in the prediction of organizational phenomena (Brief & Weiss, 2002; Weiss & Cropanzano, 1996). Weiss and Cropanzano's AET is one possible organizing framework for incorporating affect into the study of work behaviour. Drawing on popular social psychological attitude models, Weiss and Cropanzano's AET distinguishes between cognitive evaluations of features of work and affective reactions at work. AET suggests that many popular measures of job satisfaction may load more heavily on the cognitive, as opposed to the affective, component of job attitudes; evidence exists to support this proposition (e.g. Fisher, 2000). AET implies that it is important not only to measure cognitive evaluations of the job as traditional job satisfaction models do (e.g. Smith, Kendall, & Hulin, 1969), but also to study 'the structure, causes and consequences of affective experiences at work' (Weiss & Cropanzano, 1996, p. 11).

Although several studies have found links between job experiences, job behaviours, and mood or affect at work (e.g. Basch & Fisher, 1998; Donovan, 1999; Fisher, 2002; George, 1989, 1991; Kelley & Hoffman, 1997; Munson, 2000; Weiss *et al.*, 1999), and others have examined correlates of mood within-persons over time in a work setting (e.g. Fisher & Noble, 2000; Ilies & Judge, 2002; Teuchmann, Totterdell, & Parker, 1999; Totterdell, 1999, 2000; Totterdell & Holman, 2003; Zohar, 1999), the current study expands these findings by randomly sampling experiences, studying typical organizational work settings, using broader measures of mood, and including self-report discretionary work behaviours.

Hypotheses derived from AET

Events and mood

AET suggests that researchers' focus has been on the evaluation of specific features of one's job. Little attention is paid to what happens on the job and how employees feel about these happenings — how they feel about job events. The focus on job events is unique in AET; it focuses attention on quotidian happenings on the job rather than on overall evaluations of features of the job. AET specifies that these 'affective events' can range from minor events (e.g. 'receiving praise from a co-worker'), to more extreme (e.g. 'being passed over for a promotion'). When events are minor, the affective response is likely to be akin to a diffuse positive or negative mood (Morris, 1989). When events are more meaningful, discrete emotions are likely to ensue; over time the experience of the discrete emotion dissipates, leaving a residual mood state (Morris, 1989).

Research has supported the effect of events on affect; the experience of hassles or negative events predicted affect among paratroopers in a diary study (Zohar, 1999) and negative mood among a broader sample of individuals (Bolger, DeLongis, Kessler, &

Schilling, 1989). We expect similar relations between positive and negative events and feelings of pleasantness and unpleasantness (hedonic tone) on the job. Predictions are made for the occurrences of three types of job events: work, co-worker, and supervisor related events. Mood can be conceptualized as having multiple dimensions; the pleasant/unpleasant dimension, also known as hedonic tone, is the one we refer to here.

Hypothesis 1. Job events will be related to hedonic tone;

(a) positive events (work, co-workers, and supervisor) will be positively related to hedonic tone,

(b) negative events (work, co-worker, and supervisor) will be negatively related to hedonic tone.

Asymmetry of positive and negative events

Researchers have consistently found that negative events have a larger impact on mood than do positive events (see for review, Taylor, 1991). In Taylor's review, a mobilization-minimization process is used to explain why individuals are more responsive to events that have negative connotations as opposed to those that have positive ones. Specifically, 'negative events appear to mobilize physiological, affective, cognitive, and certain types of social resources to a greater degree than do positive or neutral events' (p. 72). Following this short-term mobilization, a long-term minimization occurs during which opposing processes occur to 'damp down, minimize, and even erase the impact of that event' (p. 67). Taylor posits a number of theoretical accounts for this asymmetric mobilization-minimization process occurring for negative events including: opponent process theory in which efforts to maintain hedonic neutrality are engaged after a negative event; range-frequency explanations which suggest that 'the psychological neutral point of a distribution is slightly positive' (p. 77) so negative events require more resources because of their novel or surprising nature; evolutionary arguments suggesting the survival advantages of mobilizing and responding to negative events quickly and with full resources; and work on positive illusions or biases, namely, 'an overly positive conception of the self, an exaggerated perception of personal control, and an unrealistic optimism about the future,' (p. 78) which operate to minimize the effects of negative events. Given the theoretical rationales and past empirical research (Taylor, 1991), we hypothesize that negative events will have a larger effect on short-term hedonic tone than will positive events. This leads to two assertions. First, the effect size for negative events on short-term mood will be larger than that for positive events. Second, when positive and negative events are both reported, the effect of the negative events will overwhelm the effect of the positive events.

Hypothesis 2. Negative events will have stronger effects than positive events;

(a) negative events will have a stronger effect on hedonic tone than positive events,

(b) if a positive and a negative event co-occur within the same temporal interval, hedonic tone will be lower than if no event had occurred.

Mood and work behaviours

Standard ways of relating job satisfaction with on the job behaviours have generated mixed outcomes, predicting some classes of behaviours, such as organizational withdrawal over long periods of time, but less able to predict others (Hanisch & Hulin, 1991; Hom, Katerburg, & Hulin, 1979; Hulin, 1991). Early research suggested that job satisfaction is not as strongly related to the family of work behaviours comprising task performance as

would be predicted by the happy-productive worker hypothesis (Iaffaldano & Muchinsky, 1985; Petty, McGee, & Cavender, 1984; Staw, 1986), although more recent analyses employing different methodologies suggest a moderate relationship (Judge, Thoresen, Bono, & Patton, 2001). However, components of performance such as on the job contextual or prosocial work behaviours have been consistently shown to relate to job satisfaction (Bateman & Organ, 1983; Motowidlo, 1984; Motowidlo, Packard, & Manning, 1988; Puffer, 1987; Scholl, Cooper, & McKenna, 1987; Smith, Organ, & Near, 1983).

AET provides insight into these job satisfaction-job behaviour linkages, suggesting that job behaviours might be effectively categorized as either affect or judgment-driven (Fisher, 2002; Weiss & Cropanzano, 1996). Specifically, AET contends that experiencing positive and negative work events leads to affective reactions that in turn lead to affect-driven, relatively spontaneous job behaviours, as well as job attitudes. Job attitudes influence judgment-driven behaviours, which are more calculated (e.g. turnover). Thus, affect-driven behaviours are direct responses to affective experiences, while judgment-driven behaviours are mediated by work attitudes. Mood at work, assessed moment-to-moment, rather than attitudes towards work, assessed as relatively more stable cognitive evaluations of job features, are the proper antecedents of on the job behaviours (Weiss, 2002; Weiss & Cropanzano, 1996). Accordingly, behaviours at work should be examined in relation to mood. We discuss two classes of discretionary work behaviours: organizational citizenship behaviour (OCB) and work withdrawal.

Organizational citizenship and helping

OCB and the related construct of contextual performance have been studied for more than two decades (Borman & Motowidlo, 1993; Organ & Ryan, 1995; Podsakoff *et al.*, 2000), yet the debate continues regarding whether OCB is driven by the affective or cognitive component of job attitudes. Some argue for the primacy of cognitive evaluations in predicting OCB (Organ 1988, 1990; Organ & Moorman, 1993) while others argue that OCB should be related to mood on the job (George, 1991; George & Brief, 1992).

Among studies that have observed positive relations between OCB and mood (George, 1991; Lee & Allen, 2002; Miner & Hulin, 2000), none has measured mood as a true state variable. For example, George's (1991) state mood measure was measured retrospectively 'during the past week' and prosocial behaviours were assessed as 'characteristic' levels of behaviours (p. 302). Lee and Allen found relations between job affect, measured as how one generally feels at work, and OCB. Organ and Ryan (1995) highlight the importance of how affect and OCB are assessed, noting that the prediction of OCB from affective states '. . .will somehow have to reckon with the problem of detecting discrete episodes of OCB (rather than subjective reactions that presumably reflect aggregations or trends of OCB over time) and the psychological states antecedent to or concurrent with those episodes' (p. 781). This statement underscores the need for methods that match mood and behaviour in terms of timeframe as we do with ESM.

Information about expected relationships can be drawn from laboratory studies where mood state has been shown to have broad impact on motivation to engage in activities such as helping (see George & Brief, 1992; Isen, 2000; Isen & Baron, 1991, for reviews). However, the effects of mood have proven to be complex. For example, the relationship between positive mood and helping can be reduced if positive mood

may suffer as a consequence of helping or if the actor dislikes the target organization or person (Isen, 2000). Individuals seek to maintain their positive moods (i.e. mood maintenance) so helping behaviour that reduces positive levels of mood may not be enacted. Other research has examined the capacity of helping to repair negative moods. In these studies, laboratory subjects in negative mood states are more likely to engage in helping behaviours (Carlson & Miller, 1987), however the effect is not consistent and debate remains (Cialdini & Fultz, 1990; Miller & Carlson, 1990). One explanation for this finding is that people repair their negative mood states (i.e. mood repair) by engaging in social behaviours such as helping (Morris, 1989).

Despite the complexity, both explanations lead to the same hypothesis, that state positive moods will be related to helping and OCB, but imply different causal directions. Because our data are co-occurring, we are unable to test the causality, or temporal precedence of the two variables, but still expect to observe a positive relationship between hedonic tone and OCB.

> *Hypothesis 3.* Hedonic tone will be positively related to PCB at the momentary, within-persons, level of analysis.

Work withdrawal

Research on another class of discretionary work behaviours, work withdrawal, defined as employees' attempts to remove themselves from their quotidian work tasks (Hanisch & Hulin, 1990, 1991), is less extensive but suggests a link between affect and withdrawal. Existing between-persons research suggests a negative link between mood and withdrawal (Miner & Hulin, 2000; Munson, 2000; Pelled & Xin, 1999) and mood and absence, one behavioural indicator of work withdrawal (George, 1989). This negative link between affect and withdrawal would also be expected based on the propositions of AET.

However, an alternative relationship may also be possible. In their development of the work withdrawal construct, Hanisch and Hulin (1990, 1991) sought to validate a behavioural construct that would capture individual attempts to obtain relief from work tasks without engaging in extreme behaviours such as turnover. As stated, work withdrawal may serve a mood repair function; individuals may engage in withdrawal behaviours such as taking a break or talking to friends to relieve negative moods resulting from work tasks. Withdrawal behaviour is an escape from the negative mood consequences of work tasks, resulting in more positive moods.

Initially, the empirical between-persons results seem to be inconsistent with the theoretical mechanisms proposed for the behavioural construct. However, these ideas are reconcilable when considering the level of analysis and time frame. At the momentary level of analysis, a person in a negative mood may engage in work withdrawal tasks to repair mood, resulting in more positive moods and evidencing a positive relationship between mood and withdrawal. Over time, individuals who are frequently in negative moods will also report frequent work withdrawal, evidencing a negative relationship between mood and work withdrawal.

Despite the possibility of a positive relationship depending on the timing of the affect-withdrawal link, we propose a negative relationship based on the empirical data and to adhere more closely to AET.

> *Hypothesis 4.* Hedonic tone will be negatively related to work withdrawal at the momentary, within-persons level of analysis.

Structure of mood

Given that the definition and structure of mood is an issue of debate among researchers, we must discuss our decisions regarding the measurement of this construct. The mood circumplex (Russell, 1980) describes a structure underlying co-occurring affective states and provides a guide for researchers to describe the experience of affect using a reduced number of higher level dimensions; these higher level dimensions are commonly called 'moods'. It is possible to rotate the mood circumplex to represent either hedonic tone (e.g. 'happy') and activation (e.g. 'aroused') dimensions (Larsen & Diener, 1992; Russell, 1980) or separate positive activation (PA; e.g. 'elated') and negative activation (NA; e.g. 'distressed') dimensions (Russell, 1980; Watson & Tellegen, 1985). Hedonic tone refers to the pleasantness or unpleasantness of moods — how happy or sad one feels. Activation describes the level of arousal, or excitement, one might feel from 'aroused' to 'still'. Together these two dimensions can explain the covariance structure among affective states. The PA/NA rotation also describes this covariance, but combines hedonic tone and activation to form independent PA and NA dimensions. The PA/NA rotation implies that positive and negative activated moods occur independently.

Researchers have suggested that momentary mood may be better represented by the hedonic tone/activation rotation. When participants are asked to report their current mood, the hedonic tone/activation rotation fits the data better than the PA/NA rotation (Diener & Emmons, 1984; Diener & Iran-Nejad, 1986; Weiss & Cropanzano, 1996); individuals may find it difficult to experience positive and negative emotion concurrently. The utility of the hedonic tone/activation structure has also been acknowledged more recently by Tellegen, Watson, and Clark (1999) who derived a three-level hierarchical structure with, 'a general bipolar Happiness-Versus-Unhappiness dimension, the relatively independent PA and NA dimensions at the level below it, and discrete emotions at the base' (p. 297). This structure, suggesting the predominance of a global pleasantness versus unpleasantness dimension or hedonic tone, as well as the assessment of momentary mood, led us to measure the hedonic tone dimension of mood.

Method

Participants

A group of 68 participants were randomly selected from a pool of 103 employees who completed a researcher administered web-based survey of employee attitudes 4–5 months prior to the ESM phase. Of the 68 employees selected for the information/training sessions, 48 attended and began the ESM phase, and 42 fully completed the ESM phase. Most participants who failed to complete the study lost battery power during the study causing a loss of data. ESM participants were not significantly different from non-participants on variables assessed in the initial survey.

Participants were from a light manufacturing company in a large Mid-west US city. The average age of the final sample was 40.2 years and average job tenure was 4.1 years. The sample included employees from engineering (53.7%), information services (14.6%), and customer service (31.7%). Of the participants, 55% were White, 25% African American/Black, and 20% were of another ethnicity. Fifty-four percent were female and 42% had a minimum of a bachelor's degree.

Overview of experience sampling procedure

Prior to beginning the 2–3 week experience sampling period, participants attended a 1 hour training session. At this session they were given detailed instructions about the

operation of the palmtop unit, the procedures of the study, the meaning of the items, and were paid $30 US for their participation in the study.

Two different experience sampling questionnaires, morning and workday, were programmed into palmtop computers and administered each workday during the study period. The morning survey asked how the participant was feeling at the start of the workday and provided a 'baseline' mood measure. The participants completed morning surveys after being reminded by a signal that was set by each to occur when they usually arrived at work. Completion of the morning survey triggered four signals for workday surveys that occurred at stratified random times within 7.5 hours of the morning survey (temporally stratified so that none appeared within 30 minutes of the previous one).[2] At the signals, a workday survey was presented on the palmtop computer. Participants could postpone the workday surveys for up to 20 minutes, but they could not complete surveys after this 20-minute window.

Morning survey: Mood

The morning survey presented respondents with a series of eight discrete affect items from the hedonic tone dimension (8 items, average $\alpha = .84$) of the affective circumplex derived by Russell (1980), Watson and Tellegen (1985), and Larsen and Diener (1992). The items are listed in Table 1. Respondents indicated their response to 'right before the beep, did you feel. . .' for each item by tapping 0 = *not at all*, 1 = *a little*, 2 = *moderately*, or 3 = *extremely*. We inserted a space between the 0 = *not at all* option and the other options to distinguish not feeling a specific mood from feeling it to differing degrees (Russell & Carroll, 1999). Items from the unpleasant ends of the hedonic tone dimension were reverse scored and summed with the positive items. Mood scores were then standardized to have a mean of 0 and a standard deviation of 1 across all participants and all signals.

Workday survey: Events

Three items measuring work, co-worker, and supervisor events were constructed with the joint goals of measuring a broad array of job events while being short enough that they could be asked four times each day without being overly intrusive. Respondents were provided examples of the different types of events during training so that they could self-classify the multitude of events that could potentially occur. The items asked respondents to indicate whether an event had occurred 'since the last beep' from the event categories of work, co-worker, and supervisor (e.g. 'since the last beep, did an event occur relating to your work?') using the response options, 'yes, a positive event occurred', 'yes, a negative event occurred', and 'no event occurred'. Respondents were provided training on how to classify events and were encouraged to classify each event as a member of one, and only one, category.

Workday survey: Mood

Hedonic tone was assessed for each workday survey by sampling items from the mood items in the morning survey. Three items were repeated at every time period (contented, satisfied, unhappy), and each of the remaining items appeared at least once per day (in addition to the morning survey). Sampling of items permitted assessment of

[2] *Time between signals approached a normal distribution with a mean of 109 minutes and a variance of 51 minutes.*

Table 1. Descriptive statistics for workday surveys

Item category	Item text	Percent endorsement
Event[a]	Positive co-worker	29.3
	Negative co-worker	11.7
	Positive supervisor	16.0
	Negative supervisor	4.2
	Positive work	37.5
	Negative work	8.4
Behaviour[a]	Doing something to avoid my work tasks (e.g. taking a break, talking to friends)	6.5
	Doing personal tasks (e.g. talking on the phone, using the computer)	8.4
	Doing something not required by my job that will benefit the organization (e.g. volunteering to help out, covering for absent co-workers)	15.3
	Helping a co-worker	22.8
	Doing a work task required by my job	76.1
Hedonic Tone[b, c]	Blue	11.1
	Contented	85.9
	Happy	84.3
	Lonely	11.0
	Pleased	86.6
	Sad	7.8
	Satisfied	87.6
	Unhappy	14.7

Note. [a]$N = 1,226$ signals.
[b] *N* varies from 295 to 1,226 depending on item.
[c] Items have been dichotomized; responses '1 = *a little*', '2 = *moderately*', and '3 = *very much*' have been collapsed into one endorsement category.

a broader range of affective states than would be possible if the survey items were fixed. Sampling also avoided priming participants to attend to specific affective states during the period of the study; participants were less likely to attend to specific affect states because it was difficult to predict which items would be asked at each signal.

The presentation of items, the response format, and scoring were identical to the morning survey. The order in which the four surveys appeared during the day was randomly determined.

Workday survey: Behaviours

Five items asked respondents what they were doing at the signal for the workday survey (i.e. 'when the beep went off were you. . .'). To keep this section short, participants responded to questions describing the broad categories of behaviours. Information was provided about what types of behaviours fit into the categories of work withdrawal, work tasks, and OCBs during the training session.

Two items asked about work withdrawal behaviours: '. . . doing something to avoid my work tasks (e.g. taking a break, talking to friends)', and '. . . doing personal tasks (e.g. talking on the phone, using the computer)'. Two items asked about OCB, '. . .doing something not required by my job that will benefit the organization (e.g. volunteering to

help out, covering for absent co-workers)', and '. . . helping a co-worker'. One item asked whether participants were engaged in work tasks ('doing a work task required by my job'). Respondents indicated what they were doing by tapping either yes or no to each item. Composite indicators were formed by summing across the two work withdrawal and two OCB items so that scores could range from 0, *no behaviours being enacted*, to 2, *both behaviours enacted at the signal*.

Overview of analyses

The advantages of theory testing using the multi-level, temporal data provided by ESM are accompanied by challenges for data analyses. The first challenge is to handle the multiple levels on which data exist (e.g. signal level and person level). In this study, the signal level of analysis is nested within the person level, that is, each person responded to multiple signals. To analyse these data, we used hierarchical linear modelling (HLM; Bryk & Raudenbush, 1992), an analytic procedure that explicitly models multiple levels of data (for a more detailed review see Bryk & Raudenbush, 1992; Hoffmann, Griffin, & Gavin, 2000; Schwartz & Stone, 1998). HLM models each person's signal level relationships independently. All models were estimated using HLM for Windows, version 5.02 (Raudenbush, Bryk, & Congdon, 2000).

The second challenge associated with analysis of ESM data is their time-series nature. To account for the lack of independence in residuals in time-series data (West & Hepworth, 1991), one may enter the value of the dependent variable lagged one time period into regression equations to (partially) remove the effects of non-independent residuals. This is usually sufficient to account for serial dependence in the data (Alliger & Williams, 1993). Alternatively, one may remove serial dependence of residuals by entering a baseline measure of mood, that is, mood measured in the morning of each day. In the current study, there were two reasons for using assessments of morning moods rather than lagging one time period. First, the longer morning assessment of mood was more reliable than the daily assessments. Second, when mood is lagged one time period, a missed signal can cause missing data later that same day even though the later signals are responded to. The missing observation from an earlier signal causes the information from the later signal to be discarded. Using the morning surveys did not cause any missing observations because only by responding to a morning survey were daily signals triggered. Partial correlations computed among signals after removing morning mood were approximately half the zero-order correlations.

Results

Preparation of data

All data were examined to detect outliers who could exert abnormal leverage on the regression analyses to be performed. One person was significantly below average in mood, exhibited an abnormal pattern of reactions to events, and provided unusual responses to job behaviours. This person may have been inattentive to the content of the questions or the response format and thus was removed from the analyses reported here.[3]

[3] *Analyses were also conducted with this outlier included. The results were marginally different. We report the results without this person because this person exerted abnormal leverage on the models, although the direction and significance of the findings was unaffected.*

Respondents completed 1,807 total surveys (451 morning surveys and 1,356 workday surveys). The 41 participants began 451 days of surveys, or an average of 11 days per person. The fewest number of days completed was 6 and the most was 15. Of the 1,356 workday surveys, 1,247 were scheduled surveys completed at the signal, and 109 were made up within 20 minutes. Once a workday survey was initiated by taking the morning survey, 75.2% of the signals were answered within 20 minutes, producing an average of 30 completed workday surveys per person.

We inspected the data for signals at which both positive and negative events were reported. Because questions asked about events separately, it was possible to report, for example, a positive co-worker event and a negative work event. This occurred on 10% or 130 of the total 1,356 workday surveys. To avoid ambiguity, these 130 observations were omitted from analysis, except in testing Hypothesis 2b, where we make a specific hypothesis about mood following the occurrence of more than one job event.

Decomposition of variance

As a first step in the analyses, we assess the proportion of within- and between-persons variance in mood. The intra-class correlation coefficient (ICC) describes the ratio of between-person variance to the total variance. The ICC for mood was .44, suggesting 44% of the variance in mood resides between-persons, leaving 56% residing within-persons.

Signal level descriptive statistics

Event, mood and behaviour frequencies

Table 1 contains item means for the event, behaviour, and mood items collapsed across times and participants. Inspection of the event data reveals the base-rate of positive events was much higher than that of negative events across all three types of events: co-workers, supervisor, and work events. For example, employees reported a positive co-worker event happening since the last signal at 30% of the signals, but a negative co-worker event was reported at only 12% of the signals. The data also indicate the percentage of time employees reported engaging in various behaviours. Participants spent most of their time doing work tasks (76.1%). Employees reported engaging in helping and OCB about twice as frequently as work withdrawal (helping 23% of the time, OCB 15%, work withdrawal 7%, and personal tasks 8%).

Mood across time

Although we are primarily interested in fluctuations in mood over time, a consistent predictor of mood at any given time is previous mood (Alliger & Williams, 1993; Totterdell, 1999, 2000). The average correlation between each of the hedonic tone observations across all persons, within each day was .56 (range .50–.69). Relationships between assessments of hedonic tone were weaker as time between assessments was greater conforming to the super-diagonal pattern of regular temporal decay (Hulin, Henry, & Noon, 1990).

Relational results

Hypothesis 1

Three separate hierarchical models tested Hypothesis 1 using within-person variance in mood to examine the impact of each type of positive and negative event (i.e. co-worker,

supervisor, and work) on mood. All models included morning mood as a predictor to account for correlated error variance. Table 2 shows that Hypotheses 1a and 1b were generally supported. As indicated by the significant slope coefficients, mood was related to reports of positive and negative events of all types, except for positive supervisor events. For example, after reporting a negative co-worker event, mood was 0.69 SD lower than if no negative co-worker event was reported. After reporting a positive co-worker event, mood was 0.19 SD higher than if no positive co-worker event was reported. These figures can be interpreted directly as effect sizes because events were dummy-coded and the coefficients represent mean differences. The R^2 values for the work, supervisor, and co-worker models were .18, .14, and .15, respectively. Reactions are generally in line with valence of the event, however individuals react differently as indicated by statistically significant variation in slopes for negative co-worker events ($\hat{U}_2 = .19$, $\chi^2_{30} = 70.4$, $p < .01$), positive ($\hat{U}_1 = .02$, $\chi^2_{24} = 37.5$, $p < .05$) and negative ($\hat{U}_2 = .50$, $\chi^2_{24} = 62.9$, $p < .01$) supervisor events, and negative work events ($\hat{U}_2 = .19$, $\chi^2_{31} = 60.2$, $p < .01$).

Hypothesis 2

The hypothesis that negative events will have a stronger effect on hedonic tone than positive events, was also supported. Although they were two to five times less likely to be reported, negative events had approximately five times the effect on hedonic tone than did positive events (Hypothesis 2a). The average coefficient relating positive events to hedonic tone was 0.20 SD, while the average coefficient for negative events was −0.96 SD. Examination of Fig. 1 also suggests the stronger effects of negative as opposed to positive events.

Hypothesis 2b concerned the co-occurrence of positive and negative events in one time period. In support of the hypothesis, hedonic tone was significantly more unpleasant when a positive and negative event co-occurred ($\hat{\mu} = -.46$, N = 130) than when there was no event ($\hat{\mu} = .13$, N = 468, $t_{596} = 6.04$, $p < .01$), or at least one positive event ($\hat{\mu} = .24$, N = 555, $t_{683} = 8.31$, $p < .01$). Hedonic tone when a positive and negative event co-occurred was not significantly different from hedonic tone when one or more negative events occurred ($\hat{\mu} = -.65$, $N = 203$, $t_{331} = -1.59$, $p > .10$). The effects of co-occurring events can be seen in Fig. 2. Notice that positive events result in slight changes to hedonic tone, yet the presence of one or more negative events creates appreciable changes in hedonic tone. The departure from linearity for the point describing zero positive and three negative events is probably due to the small number of observations (N = 22; 1.6% of signals) that generate this point.

Hypothesis 3 and 4

Two separate models were run to test within-person relations between hedonic tone and OCB (H3) and work withdrawal (H4). As shown in Table 2, Hypothesis 3 was not supported; hedonic tone at the signal did not relate to OCB being enacted at the signal ($\hat{\gamma}_{10} = -.04$, $t_{40} = -.923$, $p > .10$).

The test of Hypothesis 4 was significant; however, it was in the direction opposite of that hypothesized. Hedonic tone was positively related to work withdrawal behaviours at the signal ($\hat{\gamma}_{10} = .15$, $t_{40} = 2.85$, $p < .01$). Participants were in more pleasant moods when also engaging in work withdrawal. Consistent with this result, an exploratory analysis suggests that participants were in less pleasant moods when engaged in work

Table 2. HLM Signal level models relating hedonic tone to events (H1, H2) and behaviours (H3, H4)

Model[a]	−2*LL	*df*	Effect		Coefficient	SE	*df*	*t*-ratio
Null	2,876.6	2	Average intercept	$\hat{\gamma}_{00}$	.00	.08	40	.05
			Fixed slope for morning hedonic tone	$\hat{\gamma}_{10}$	.23	.04	1,224	5.93**
Co-worker events	2,725.8	7	Average intercept	$\hat{\gamma}_{00}$	.03	.08	40	.32
			Average slope for positive event	$\hat{\gamma}_{10}$	.19	.05	40	3.80**
			Average slope for negative event	$\hat{\gamma}_{20}$	−.69	.10	40	−6.89**
			Fixed slope for morning hedonic tone	$\hat{\gamma}_{30}$	.21	.03	1,222	6.24**
Supervisor events	2,725.9	7	Average intercept	$\hat{\gamma}_{00}$	.05	.08	40	.61
			Average slope for positive event	$\hat{\gamma}_{10}$	.12	.07	40	1.82
			Average slope for negative event	$\hat{\gamma}_{20}$	−1.26	.17	40	−7.33**
			Fixed slope for morning hedonic tone	$\hat{\gamma}_{30}$	.22	.04	1,222	6.19**
Work events	2,661.3	7	Average intercept	$\hat{\gamma}_{00}$	−.02	.09	40	−.20
			Average slope for positive event	$\hat{\gamma}_{10}$	.28	.05	40	5.67**
			Average slope for negative event	$\hat{\gamma}_{20}$	−.94	.11	40	−8.66**
			Fixed slope for morning hedonic tone	$\hat{\gamma}_{30}$	.24	.03	1,223	7.15**
OCB	2,875.0	4	Average intercept	$\hat{\gamma}_{00}$	.02	.08	40	.81
			Average slope for OCB + helping	$\hat{\gamma}_{10}$	−.04	.04	40	−.92
			Fixed slope for morning hedonic tone	$\hat{\gamma}_{20}$	.23	.04	1,223	5.90**
Work withdrawal (WW)	2,870.1	4	Average intercept	$\hat{\gamma}_{00}$	−.02	.08	40	−.26
			Average slope for WW + person tasks	$\hat{\gamma}_{10}$	.15	.05	40	2.85**
			Fixed slope for morning hedonic tone	$\hat{\gamma}_{20}$	.24	.04	1,223	6.02**

[a] The dependent variable is hedonic tone at the signal.
[b] *$p < .05$, **$p < .01$.

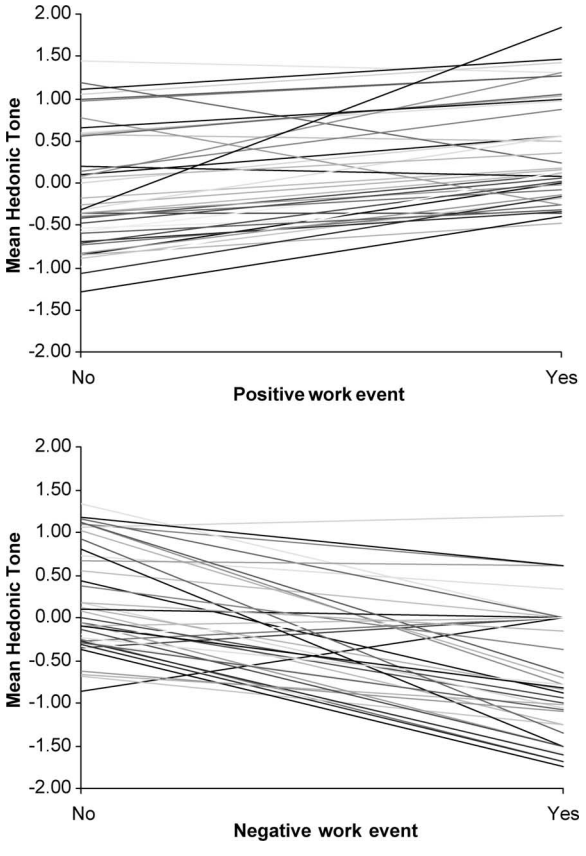

Figure 1. Relationship between work events and hedonic tone. Each line represents one participant.

tasks ($\hat{\gamma}_{10} = -.17$, $t_{40} = -2.86$, $p < .01$). R^2 values for both the OCB and withdrawal models were .01. Individual differences in slopes relating mood to behaviours were not statistically significant.

Supplemental analyses

We ran additional exploratory analyses to determine whether we could predict variance in reactivity to events using a proxy for trait hedonic tone.[4] This proxy was derived by computing the average score for morning mood for each person. As shown in Table 3, positive work and supervisor events were moderated by individual average morning hedonic tone (work, $\hat{\gamma}_{11} = .20$, $t_{39} = 3.08$, $p < .01$; supervisor, $\hat{\gamma}_{11} = .23$, $t_{39} = 2.73$, $p < .05$). Individuals who generally arrived at work in more positive moods during the study experienced stronger jumps in mood following positive events. Figure 3 illustrates this result for work events. Negative co-worker events were also moderated by aggregate morning hedonic tone ($\hat{\gamma}_{21} = .31$, $t_{39} = 2.16$, $p < .05$). Individuals who arrived at work in more positive moods reacted less negatively to negative coworker events.

[4] *We thank the editors and reviewers for their suggestions regarding this analysis.*

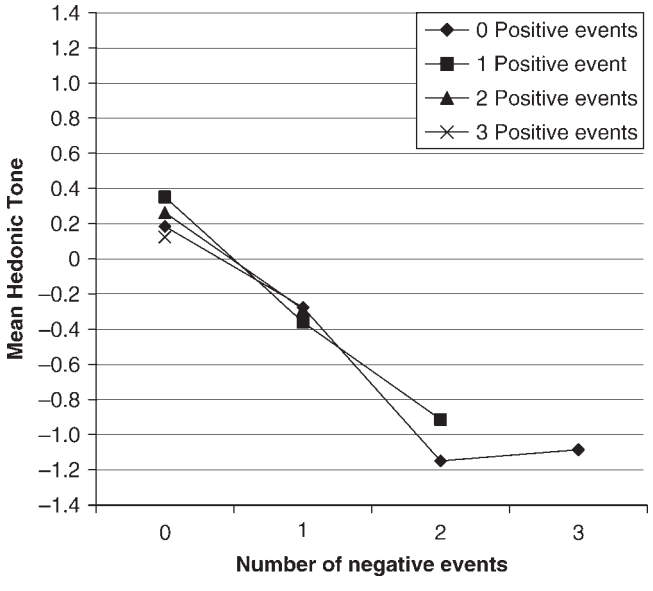

Figure 2. Hedonic tone at the signal when experiencing co-occurring positive and negative job events.

Discussion

Frequencies of events, moods and behaviours at work

The raw frequencies of the different categories of events, moods, and behaviours reported by respondents at work are an important contribution of this study as there is limited knowledge on these frequencies sampled in real time within the natural work context.

Participants in the sample reported doing their work tasks most frequently of all behaviours; 76% of the sampling period was spent on work tasks. OCB accounted for approximately 15% of the signals reported by the employees in the sample, and helping 23%. This represents a large amount of time spent on tasks that are presumably outside the job description, but reinforces the importance of these activities in modern organizations.

The raw frequencies of affective states illustrate that employees experienced pleasant mood far more frequently than negative mood, replicating many studies reviewed by Watson (2000). Nonetheless, negative affect states, such as unhappy and sad, were experienced with nonzero frequency, 14.7% and 7.8%, respectively. Collectively, these data provide insight into the affective states, behaviours, and experiences of employees while at work.

Within- to between-person variance in mood over time

In this study, over half of the variance in mood on the job was within-persons. Fisher and Noble (2000) observed similar results using different measures and different samples. Such findings suggest between-persons research on mood at work may be limited; between-subjects designs would have analysed only half of the total variance in mood. Research capitalizing on within-persons variance may be needed to address hypotheses about mood in work settings.

Table 3. HLM models relating hedonic tone to events, moderated by average hedonic tone

Model[a]	−2*LL	*df*	Level 1 effect	Level 2 effect		Coef.	SE	*df*	*t*-ratio
Null	2,876.6	2	Average intercept		$\hat{\gamma}_{00}$	.00	.08	40	.05
			Fixed slope for morning HT		$\hat{\gamma}_{10}$	.23	.04	1,224	5.93**
Co-worker events	2,728.2	7	Average intercept		$\hat{\gamma}_{00}$	.03	.09	40	.38
			Average slope for pos. event	Intercept	$\hat{\gamma}_{10}$	.16	.06	39	2.91**
				Individual average HT	$\hat{\gamma}_{11}$	.14	.07	39	1.97
			Average slope for neg. event	Intercept	$\hat{\gamma}_{20}$	−.71	.10	39	−6.98**
				Individual average HT	$\hat{\gamma}_{21}$	.31	.14	39	2.16*
			Fixed slope for morning HT		$\hat{\gamma}_{30}$	.21	.03	1,220	6.42**
Supervisor events	2,727.4	7	Average intercept		$\hat{\gamma}_{00}$	.05	.08	40	.63
			Average slope for pos. event	Intercept	$\hat{\gamma}_{10}$	.12	.07	39	1.67
				Individual average HT	$\hat{\gamma}_{11}$	.23	.08	39	2.73*
			Average slope for neg. event	Intercept	$\hat{\gamma}_{20}$	−1.27	.19	39	−6.59**
				Individual average HT	$\hat{\gamma}_{21}$	−.05	.29	39	−.17
			Fixed slope for morning HT		$\hat{\gamma}_{30}$	.22	.04	1,220	5.98**
Work events	2,662.4	7	Average intercept		$\hat{\gamma}_{00}$	−.01	.09	40	−.14
			Average slope for pos. event	Intercept	$\hat{\gamma}_{10}$	.25	.06	39	4.34**
				Individual average HT	$\hat{\gamma}_{11}$	.20	.07	39	3.08**
			Average slope for neg. event	Intercept	$\hat{\gamma}_{20}$	−.96	.11	39	−8.60**
				Individual average HT	$\hat{\gamma}_{21}$	.05	.17	39	.31
			Fixed slope for morning HT		$\hat{\gamma}_{30}$	.23	.03	1,220	7.24**

[a] The dependent variable is hedonic tone (HT) at the signal.
*$p < .05$, **$p < .01$.

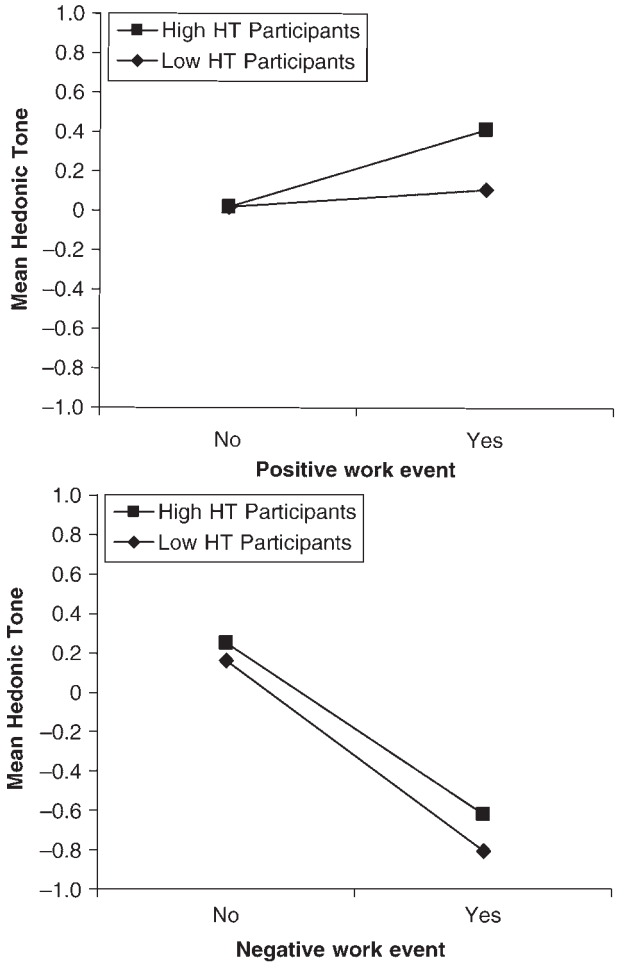

Figure 3. Relationship between work events and hedonic tone, moderated by individual average morning hedonic tone. Hedonic tone is standardized to have a mean of O and SD of I across all participants and all signals.

Event and behavioural correlates of mood

After accounting for mood at the start of the workday, we found that positive and negative events were both related to mood in the expected directions, in support of AET. When participants reported that a positive (negative) event happened since the last signal, they were generally in a more pleasant (unpleasant) mood. Consistent with our hypothesis and with the work summarized by Taylor (1991), the effect size relating negative events to hedonic tone was about five times that of positive events. Supporting this result was the finding that negative events overwhelmed the effects of positive events when both types co-occurred. There was no statistically significant difference in mood between signals where only negative events occurred and where both positive and negative events co-occurred.

This finding has significant practical implications. It extends research on the asymmetry effect to the workplace and suggests that negative events in the workplace have substantial influence over how employees feel on the job. Employees generally

went about their work in mildly positive states, as most people do (Watson, 2000), but when a negative event occurred, it captured attention through large changes in mood. Organizations with the goal of creating pleasant work environments should try to identify the causes of the negative events and concentrate their efforts on reducing the frequency of these events. Focusing on increasing the frequency of positive events is likely to have less impact on employees' mood at work.

Although the average effect size for negative events was about five times the size for positive events, inspection of Fig. 1 reveals compelling individual differences. These differences were predicted by a trait-like measure of hedonic tone. As shown in Fig. 3, individuals who scored higher on average morning hedonic tone (High HT) reported a larger spike in momentary hedonic tone following positive work events. Those lower on hedonic tone during the study showed a much smaller elevation following positive work events. It appears that negative work events were bad regardless of whether one typically started off the day in a positive state, but those who came to work in more positive moods during the study saw their hedonic tone jump after positive work events. High levels of 'trait' hedonic tone did not protect from the effects of negative work events, but rather, sensitized participants to react to positive ones. A similar pattern emerged for supervisor events. Co-worker events were different; positive average hedonic tone buffered the effects of negative events on momentary mood.

Our hypotheses regarding relations between hedonic tone and job behaviours did not receive support. Counter to expectations, hedonic tone was positively related to respondent reports of engaging in work withdrawal. People were in better moods when they reported work withdrawal at the signal. This result was amplified by the finding that people were also in more unpleasant moods when doing work tasks. Although these results are inconsistent with empirical between-subjects research, both the original statement of the theoretical function of work withdrawal, and the mood repair explanation, are consistent with this finding. Engaging in work withdrawal is functional for relieving negative mood states associated with work tasks, placing the participant in a more positive mood state. Collecting data at the momentary, within-persons, level of analysis is a likely explanation for this finding. These data are unable to address causality, so it is also possible that participants engaged in work withdrawal because they were in more pleasant moods, perhaps as an effort to maintain a positive mood state.

Counter to expectations, hedonic tone did not relate to reports of engaging in OCB. Insight into the lack of relationship may be gained from discussions about the extent to which behaviours commonly classified as organizational citizenship actually overlap with task behaviours, as well as discussions around the motivations behind such behaviours (Organ, 1990; Organ & Ryan, 1995). In this study, one item assessing OCB was made distinct from work tasks by using the stem, '. . .doing something not required by my job that will benefit the organization'. However, it is possible that the other item (i.e. '. . .helping a co-worker') was ambiguous because it included no such instruction. Participants may not have distinguished between work tasks and helping co-workers. Given other findings that employees were in worse moods when engaged in work tasks, it is possible that the expected positive relationship between mood and OCB/helping was dampened by inadvertent cross-classification with work tasks.

Another possible reason for the lack of relationship between OCB/helping and mood is that these behaviours may not have been voluntary, but rather were expected or required. In this case, we might expect negative mood to result (e.g. having to help a co-worker who is not competent). The possibility that OCB is multiply determined and hard to classify is not new to this research, but may provide an explanation for the lack

of relationship with hedonic tone; sometimes OCB co-occurs with positive moods, sometimes with negative moods. Without replication, this finding alone cannot be seen as cause for invalidation of theoretical propositions. Future research should attempt to examine the relation between mood and OCB, taking into account the differentiated motivations and their potential implications for mood relations.

Limitations and future directions

In the current study, we did not set out to examine the impact of environmental features (e.g. job evaluations, perceptions of organizational support) or individual difference characteristics (e.g. neuroticism, locus of control) on the relationship between events and hedonic tone, but did so in an exploratory fashion. Results were promising and show that individuals who arrive at work in positive moods react differently to job events. Future studies might assess the effects of individual difference variables such as extraversion, neuroticism, conscientiousness, cognitive ability, and self-esteem, on within-subject relations similar to those studied here.

All data reported here were self-report. We do not believe this to be a major limitation given that two of the major constructs under study are arguably best assessed via self-report (e.g. mood and events) and the ESM approach would require that data from other sources be collected concurrent with the target respondent's data. However, one pointed problem remains: the same individuals rated valence of events and moods. If one rating were coloured by the other, we might observe correlated method bias instead of true effects. The exploratory moderator analyses reported in Table 3 and Fig. 3 argue against this. Correlated method bias does not easily explain why people who tended to come to work in good moods reacted more strongly to positive events, even though they were responding to the same item as those who arrived in bad moods and did not react as positively. Nonetheless, we do feel that alternative sources of data would have been desirable and would add significantly to the internal validity of future work.

Future studies might also examine issues of mood decay over time. The pattern and speed of mood decay may depend on a number of features such as the type of event, intensity of the mood elicited, or the individuals' typical baseline mood. ESM is particularly well suited to investigate questions such as these.

Strengths and challenges associated with the ESM approach

The advantages of a broad range of ESM vehicles for research come hand in hand with challenges for organizational ESM research, many of which we encountered here. First, the method of sampling must be carefully considered to gauge its appropriateness in an organizational context. The choice of event, interval, or signal contingent sampling (Alliger & Williams, 1993) will be determined primarily by the theoretical question of interest; however, the organizational context must be considered as well. Our decision to use signal contingent (i.e. random) sampling throughout the workday necessitated fairly constant access to employees. For some jobs, random interruptions by a beeping palmtop would not be feasible.

Second, the desire to gather comprehensive data must be balanced with the demands on participants. In this study, we surveyed individuals four times per day for between 2 and 3 weeks. Given feedback from participants, this seems to be at about the limits of participants' willingness to cooperate with the research. More frequent surveys over a longer period of time might necessitate greater monetary or other incentives for the participants.

This trade-off also concerns the simplicity and number of items presented at each time period. In this study we were restricted to a small number of items per construct that limit the amount of information on any construct. The length of many of our traditional scales would not be feasible when asked repeatedly throughout a day over an extended period of time. Researchers wishing to gather information on a more comprehensive set of indices would be advised to survey less frequently, perhaps once per day.

Despite these challenges and the significant input of time and effort on the part of the employees, participants saw the value of the method. When we asked them after the study, participants felt that this method captured their true work lives much better than static methods. This, perhaps, is the best argument for the continued use of ESM in work settings.

Acknowledgements

Andrew G. Miner, Department of Human Resources and Industrial Relations; Theresa M. Glomb, Department of Human Resources and Industrial Relations; Charles L. Hulin, Department of Psychology. The research reported here was supported by a grant from the Center for Human Resources Management, University of Illinois. The authors are grateful to the organization and employees that agreed to participate in the research and Moshen Chan for writing the software and providing extensive support.

References

Alliger, G. M., & Williams, K. J. (1993). Using signal-contingent experience sampling methodology to study work in the field: A discussion and illustration examining task perceptions and mood. *Personnel Psychology*, *46*, 525–549.

Basch, J., Fisher, C. D (1998, August). *Affective events-emotions matrix: A classification of work events and associated emotions*. Paper presented at the First Biennial Emotions and Organizational Life Conference, San Diego, CA.

Bateman, T. S., & Organ, D. W. (1983). Job satisfaction and the good soldier: The relationship between affect and employee citizenship. *Academy of Management Journal*, *26*, 587–595.

Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology*, *57*, 808–818.

Borman, W. C., & Motowidlo, S. J. (1993). Expanding the criterion domain to include elements of contextual performance. In N. Schmitt & W. C. Borman (Eds.), *Personality and selection* (pp. 71–98). San Francisco, CA: Jossey-Bass.

Brief, A. P., & Weiss, H. M. (2002). Organizational behavior: Affect in the workplace. *Annual Review of Psychology*, *53*, 279–307.

Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Newbury Park: Sage.

Carlson, M., & Miller, N. (1987). Explanation of the relation between negative mood and helping. *Psychological Bulletin*, *102*, 91–108.

Cialdini, R. B., & Fultz, J. (1990). Interpreting the negative mood-helping literature via mega-analysis: A contrary view. *Psychological Bulletin*, *107*, 210–214.

Diener, E., & Emmons, R. A. (1984). The independence of positive and negative affect. *Journal of Personality and Social Psychology*, *47*, 1105–1117.

Diener, E., & Iran-Nejad, A. (1986). The relationship between different types of affect. *Journal of Personality and Social Psychology*, *50*, 1131–1138.

Donovan, M. D (1999). *Cognitive, affective, and satisfaction variables as predictors of organizational behaviors: A structural equation modeling examination of alternative models*. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

Fisher, C. (2000). Mood and emotions while working: Missing pieces of job satisfaction? *Journal of Organizational Behavior*, *21*, 185–202.

Fisher, C. D. (2002). Antecedents and consequences of real-time affective reactions at work. *Motivation and Emotion*, *26*, 3–30.

Fisher, C. D. & Noble, C. S (2000). *Affect and performance: A within-persons analysis*. Proceedings of the Academy of Management, Organizational Behavior Division, Annual Meeting of the Academy of Management, Toronto

George, J. M. (1989). Mood and absence. *Journal of Applied Psychology*, *74*, 317–324.

George, J. M. (1991). State or trait: Effects of positive mood on prosocial behaviors at work. *Journal of Applied Psychology*, *76*, 299–307.

George, J. M., & Brief, A. P. (1992). Feeling good-doing good: A conceptual analysis of the mood at work-organizational spontaneity relationship. *Psychological Bulletin*, *112*, 310–329.

Hanisch, K. A., & Hulin, C. L. (1990). Job attitudes and organizational withdrawal: An examination of retirement and other voluntary withdrawal behaviors. *Journal of Vocational Behavior*, *37*, 60–78.

Hanisch, K. A., & Hulin, C. L. (1991). General attitudes and organizational withdrawal: An evaluation of a causal model. *Journal of Vocational Behavior*, *39*, 110–128.

Hoffman, D. A., Griffin, M. A., & Gavin, M. B. (2000). The application of hierarchical linear modeling to organizational research. In K. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 467–511). San Francisco: Jossey-Bass.

Hom, P. W., Katerberg, R., & Hulin, C. L. (1979). Comparative examination of three approaches to the prediction of turnover. *Journal of Applied Psychology*, *64*, 280–290.

Hormuth, S. (1986). The random sampling of experiences *in situ*. *Journal of Personality*, *54*, 262–293.

Hulin, C. L. (1991). Adaptation, persistence, and commitment in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 2, pp. 405–505). Palo Alto, CA: Consulting Psychologists Press.

Hulin, C. L., Henry, R. A., & Noon, S. L. (1990). Adding a dimension: Time as a factor in the generalizability of predictive relationships. *Psychological Bulletin*, *107*, 328–340.

Iaffaldano, M., & Muchinsky, P. (1985). Job satisfaction and performance: A meta-analysis. *Journal of Applied Psychology*, *97*, 251–273.

Ilies, R., & Judge, T. A. (2002). Understanding the dynamic relationships among personality, mood, and job satisfaction: A field experience sampling study. *Organizational Behavior and Human Decision Processes*, *89*, 1119–1139.

Isen, A. M. (2000). Positive affect and decision making. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotions* (pp. 417–435). New York, NY: Guilford.

Isen, A. M., & Baron, R. A. (1991). Positive affect as a factor in organizational behavior. In L. L. Cummings & B. M. Staw (Eds.), *Research in organizational behavior* (Vol. 13, pp. 179–236). Hillsdale, NJ: Erlbaum.

Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, *127*, 376–407.

Kelley, S. W., & Hoffman, K. D. (1997). An investigation of positive affect, prosocial behaviors and service quality. *Journal of Retailing*, *73*, 407–427.

Lee, K., & Allen, N. J. (2002). Organizational citizenship behavior and workplace deviance: The role of affect and cognitions. *Journal of Applied Psychology*, *87*, 131–142.

Larsen, R. J., & Diener, E. (1992). Promises and problems with the circumplex model of emotion. In M. S. Clark (Ed.), *Emotion: Review of personality and social psychology* (Vol. 13, pp. 25–59). Newbury Park, CA: Sage.

Larson, R., & Csikszentmihalyi, M. (1983). The experience sampling method. In H. T. Reis (Ed.), *Naturalistic approaches to studying social interaction*. San Francisco: Jossey-Bass.

McGrath, J. E. (1981). Introduction. *American Behavioral Scientist*, *25*, 127–130.

Miller, N., & Carlson, M. (1990). Valid theory-testing meta-analyses further question the negative state relief model of helping. *Psychological Bulletin*, *107*, 215–225.

Miner, A. G. & Hulin, C. L. (2000, August). *Affect, attitude, behavior links in affective events theory.* Paper presented at the Second Biennial Conference on Emotions in Organizations, Toronto, ON.

Morris, W. N. (1989). *Mood: The frame of mind*. New York: Springer-Verlag.

Motowidlo, S. J. (1984). Does job satisfaction lead to consideration and personal sensitivity. *Academy of Management Journal*, *27*, 910–915.

Motowidlo, S. J., Packard, J. S., & Manning, M. R. (1988). Occupational stress: Its causes and consequences for job performance. *Journal of Applied Psychology*, *71*, 618–629.

Munson, L. J (2000). *Assessing the influence of personality, affectivity, and mood on job satisfaction and job behaviors: A test of alternative models*. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington, MA: Lexington Books.

Organ, D. W. (1990). The motivational basis of organizational citizenship behavior. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 12, pp. 43–72). Greenwich, CT: JAI Press.

Organ, D. W., & Moorman, R. H. (1993). Fairness and organizational citizenship behavior: What are the connections? *Social Justice Research*, *6*, 5–18.

Organ, D. W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology*, *48*, 775–802.

Pelled, L. H., & Xin, K. R. (1999). Down and out: An investigation of the relationship between mood and employee withdrawal behavior. *Journal of Management*, *25*, 875–895.

Petty, M., McGee, G., & Cavender, J. (1984). A meta-analysis of the relationships between individual job satisfaction and individual job performance. *Academy of Management Review*, *9*, 712–721.

Podsakoff, P. M., MacKenzie, S. B., Paine, J. B., & Bachrach, D. G. (2000). Organizational citizenship behaviors: A critical review of the theoretical and empirical literature and suggestions for future research. *Journal of Management*, *26*, 513–563.

Puffer, S. M. (1987). Prosocial behavior, noncompliant behavior, and work performance among commission salespeople. *Journal of Applied Psychology*, *72*, 615–621.

Raudenbush, S., Bryk, A., & Congdon, R. (2000). *HLM for Windows (Version 5). [Computer software]*. Lincolnwood, IL: Scientific Software International.

Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, *39*, 1161–1178.

Russell, J., & Carroll, J. M. (1999). On the bipolarity of positive and negative affect. *Psychological Bulletin*, *125*, 3–30.

Scholl, R. W., Cooper, E. A., & McKenna, J. F. (1987). Referent selection in determining equity perceptions: Differential effects on behavioral and attitudinal outcomes. *Personnel Psychology*, *40*, 113–123.

Schwartz, J. E., & Stone, A. A. (1998). Strategies for analyzing ecological momentary assessment data. *Health Psychology*, *17*, 6–16.

Smith, C. A., Organ, D. W., & Near, J. P. (1983). Organizational citizenship behavior: Its nature and antecedents. *Journal of Applied Psychology*, *68*, 453–463.

Smith, P. C., Kendall, L., & Hulin, C. L. (1969). *The measurement of satisfaction in work and retirement*. Chicago: Rand McNally.

Staw, B. M. (1986). Organizational psychology and the pursuit of the happy/productive worker. *California Management Review*, *28*, 40–53.

Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, *110*, 67–85.

Tellegen, A., Watson, D., & Clark, L. A. (1999). On the dimensional and hierarchical structure of affect. *Psychological Science*, *10*, 297–303.

Teuchmann, K., Totterdell, P., & Parker, S. K. (1999). Rushed, unhappy, and drained: An experience sampling study of the relations between time pressure, perceived control, mood, and emotional exhaustion in a group of accountants. *Journal of Occupational Health Psychology*, *4*, 37–54.

Totterdell, P. (1999). Mood scores: Mood and performance in professional cricketers. *British Journal of Psychology*, *90*, 317–322.

Totterdell, P. (2000). Catching moods and hitting runs: Mood linkage and subjective performance in professional sports teams. *Journal of Applied Psychology*, *85*, 848–859.

Totterdell, P., & Holman, D. (2003). Emotion regulation in customer service roles: Testing a model of emotional labor. *Journal of Occupational Health Psychology*, *8*, 55–73.

Watson, D. (2000). *Mood and temperament*. New York: Guilford Press.

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, *98*, 219–235.

Weiss, H. M. (2002). Deconstructing job satisfaction: Separating evaluations, beliefs and affective experiences. *Human Resource Management Review*, *12*, 173–194.

Weiss, H. M. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior*, Vol. 19 (pp. 1–74). Greenwich, CT: JAI Press.

Weiss, H. M., Nicholas, J. P., & Daus, C. S. (1999). An examination of the joint effects of affective experiences and job satisfaction and variations in affective experiences over time. *Organizational Behavior and Human Decision Processes*, *78*, 1–24.

West, S. G., & Hepworth, J. T. (1991). Statistical issues in the study of temporal data: Daily experiences. *Journal of Personality*, *59*, 609–662.

Zohar, D. (1999). When things go wrong: The effect of daily work hassles on effort, exertion and negative mood. *Journal of Occupational and Organizational Psychology*, *72*, 265–283.