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Affect as a predictor of innovative behaviour in entrepreneurship

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Abstract:

This paper theorises that innovation by entrepreneurs is influenced by affective activation and valence. State affect (moods and emotions) has a proven link with behavioural and cognitive performance, yet evidence on this issue is seemingly fragmented, and further lacking from the entrepreneurship and innovation literatures. This article utilises the circumplex model of affect to reconcile these inconsistencies. High activating affect, both positively (inspired, excited) and negatively (worried, tense) valenced, is expected to correlate strongly with entrepreneurs' daily innovative behaviours. Furthermore, personality and affective dispositions are argued to moderate the strength of this relationship. Additionally, the role that mood regulation via sleep quality plays as a construct between mood and innovative work behaviour is explored. This leads to practical implications for entrepreneurs. Key measures are presented to help test four sets of propositions via a two week twice-daily experience sampling methodology with an entrepreneurial sample, and a conceptual model is presented.

Keywords: Innovative behaviour, Entrepreneurship, Affect, Mood, ESM, Circumplex model of affect.

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INTRODUCTION

The importance of innovation both for regional development as well organisational performance is widely acknowledged (Frenz & Lambert, 2012). Rosenbusch, Brinckmann and Bausch (2011) also demonstrated in their meta analysis, that innovation is greatly beneficial for small and medium-sized enterprises (SMEs). While most of the literature to date has focused on either innovation inputs (e.g. research and development) or innovation outputs (e.g. new product or services) as key measures of innovation, the innovative behaviours of entrepreneurs has received far less attention. Innovative behaviours are defined as “the intentional creation, introduction, and application of new ideas within a work role, group, or organization, in order to benefit role performance, the group, or the organization (Janssen, 2004, p. 202). Innovative behaviour has primarily been examined in an employee setting, based on the premise that in team innovation employees exchange ideas and knowledge and work together throughout the innovation process (Peralta, Lopes, Gilson, Lourenço, & Pais, 2014). Entrepreneurs however have high levels of autonomy in their work and can function both as an individual and as a “team” member at various times (Baron, 2008) – rendering their innovative behaviour a particularly interesting topic for analysis. The innovative process for employees, teams and entrepreneurs alike however is “grounded in complex social and organizational systems and can therefore be unpredictable and controversial” (Peralta et al., 2014).

By its very nature, innovation requires individuals to manage uncertainty and overcome obstacles. The innovation process can induce strong and contrary emotions, from excitement at the generation of the idea, to anxiety and frustration when faced with difficulties and ambiguity, and vice versa. Further, in entrepreneurship where the owner-manager of an enterprise is personally responsible for the ultimate success or failure of their firm, emotions are particularly salient (Cardon, Wincent, Singh, & Drnovsek, 2009). Despite the established importance of innovation for small and entrepreneurial firms, exploring what role affect plays in encouraging or inhibiting innovation, has received very little attention in entrepreneurship research.

In the field of entrepreneurship, the influence of affect has been explored by Baron and Tang as it relates to creativity and extrapolated firm-level innovation outputs (2011), by Foo, Uy and Baron from an effort perspective (2009; 2010), and Delgado-García, Rodríguez-Escudero and Martín-Cruz’s with the examination of entrepreneurial goals and satisfaction (2012). Further, in a study attempting to understand the influence of emotions on entrepreneurial evaluations Grichnik, Smeja and Welpé (2010) found partial support for their hypothesis that entrepreneurs inducted into a “positive emotional state” will evaluate new business opportunities more positively than those that have not been inducted into a positive emotional state.

Although these papers shed light on the importance of affect in examining innovation and raised awareness of affective research in the entrepreneurial context, they left many questions unanswered.

This paper seeks to build upon recent developments in the field and explore the influence of affect on the innovative work behaviours of entrepreneurs. Based on a review of the extant literature, a conceptual framework is presented and research propositions are developed.

DEFINING AFFECT

The terms mood, affect and emotion although similar, are distinct concepts which have at times, struggled to be clearly defined in many areas of organisational literature. Vague definitions or the utilisation of terms interchangeably is particularly prevalent in the literature of organisational behaviour and emotions in entrepreneurship (e.g. Cardon, Foo, Shepherd, & Wiklund, 2012).

Affect is the overarching term, broadly encapsulating feelings of both short-term and long-term nature. Trait affect, also known as dispositional affect, is one's disposition to experience certain emotions. It is thought that an individual is pre-wired to react in a positive or negative manner in relation to a given stimulus.

Emotions and moods therefore are conceptualized as kinds of affective subcategories. Emotions are said to be directed at specific stimulus, and short-term in nature. Some suggest that their true activation form only lasts up to a few seconds or minutes (Frijda, 1986). Such an affective state is intense in nature and the "stimulus" can be identified. Emotion is comprised of four components: (a) a form of expression, such as facial expressions; (b) autonomic changes patterns, such as heart-rate changes (c) is a subjectively differentiated feeling state, fear feels distinct to anger, and; (c) a form of adaptive behaviour, such as fight or flight responses (Watson, 2000).

Moods on the other hand are less intense in nature, and their precise stimulus is not as straightforward. Although an emotion arises as a response to a specific event, moods can be present due to stimulus, experience or even general internal processes (Watson, 2000). A given mood state tends to last a number of hours or days. To examine affect in organisational research the general held belief is that it is impractical to attempt to measure discrete emotions in every-day life as a true experience of an emotion is not common, and when they are experienced last a very short duration. For this reason the concludes " ...mood offers a much better conceptual framework for everyday affective experience than does emotion; indeed, models that emphasize the importance of basic, discrete emotions ultimately are ill-suited to the study of such experience" (Watson, 2000, p. 12). This however is not without its controversy, other authorities on the topic have presented conflicting conclusions: "it is apparent that discrete emotions are important, frequently occurring elements of everyday experience" (Brief & Weiss, 2002, p. 297). Yet not withstanding greater theoretical consensus is found in the notion that the study of affective states – what one is feeling in a given moment in organisational settings is better aligned to exploring mood as opposed to emotion.

AFFECT AS A DRIVER OF INNOVATIVE BEHAVIOURS

Much of the affect literature has been polarised towards the adoption of a singular dimension of affect such as valence predominantly, and to a lesser extent activation. Recent studies, however, which have adopted a multi-dimensional approach have produced richer insights (Warr, Bindl, Parker, & Inceoglu, 2014). The multi-dimensional perspectives have helped explain much of the inconsistencies in the singular dimensional literature, using arousal to delineate between emotions of the same valence and explain discrepancies.

Drawing on the circumplex framework (Yik, Russell, & Steiger, 2011), both valence and arousal can be conceptualised as interrelated dimensions. Based on those two dimensions, Warr et al. (2014)

define four affective states: high-activation unpleasant affect (HAUA), high-activation pleasant affect (HAPA), low-activation unpleasant affect (LAUA) and low-activation pleasant affect (LAPA).

A recent paper by Madrid, Patterson, Birdi, Leiva, and Kausel (2014) utilising the circumplex model of affect, revealed that activation as well as valence are of importance in understanding innovative work behaviours. Based on a sample of MBA students, findings suggested that high-activated positive mood (HAPA) had a significant and direct relationship with innovative work behaviour. Based on the circumplex framework and recent empirical evidence, the following is suggested:

Hypothesis 1a: High-activated positive affect will be positively correlated with innovative behaviour.

Due to the relatively recent nature of the activation perspective, few (if any) empirical studies have specifically explored the relationship between low activating positive affect and innovative behaviour. Although not explicitly intended, previous studies on “positive” affect have generally favoured the examination of high activating affect exclusively (Warr et al., 2014). Therefore conclusions under the banner of “positive” affect can not necessarily be applied to all range of positive emotions, particularly not those of low arousal (Warr et al., 2014). Baas, De Dreu and Nijstad’s (2008) analysis on the role of affective activation, demonstrated that creativity is enhanced most by positive mood states that are *high* as opposed to low activating. While creative behaviour does not necessarily imply innovative behaviour (Amabile, Barsade, Mueller, & Staw, 2005), given that low activated affect is related to “inactivity and avoidance, neglect of information, and low cognitive and motor performance” (De Dreu, Baas, & Nijstad, 2008, p. 741), a weak relationship between low activated affect and other behaviours associated with personal initiative and creativity could also be expected.

Hypothesis 1b: Low-activated positive affect will not be positively correlated with innovative behaviour.

This however, does not suggest that positive affect in isolation is either possible or desirable. There are conditions when negative affect is positive and positive affect is negative, as the consequence of affect is highly context dependent (George & Zhou, 2002). George and Zhou (2002) found that in accordance with mood-as-input model (Martin & Stoner, 1996), negative affect can have the benefit of signalling that the current conditions are not adequate and therefore additional effort is. This can become an avenue for producing more creative and useful ideas through greater effort. Anderson, De Dreu and Nijstad (2004) later built on George and Zhou’s findings to develop a conceptual model of distress-related innovation. They proposed that negative mood states in conjunction with job dissatisfaction and role conflict can act as (distress) drivers for innovation. As Janssen, Van de Vliert and West (2004, p. 130) suggested “generating creative ideas is often triggered by work-related problems, incongruities, and discontinuities which employees are confronted with at work”. Therefore negative affect when high activating may also be a useful determinant of innovative behaviour.

Hypothesis 1c: High-activated negative affect will be positively correlated with innovative behaviour.

DISPOSITIONAL AFFECT AS MODERATOR BETWEEN AFFECT AND INNOVATIVE BEHAVIOUR

Dispositional affect is a tendency to respond to situations in stable, predictable ways. This trait is expressed by a predisposition to see things in a positive or negative way. Individuals high in positive dispositional affect tend to interpret events in a more positive light, leading to positive emotions while individuals high in negative dispositional affect tend to perceive situations more negatively, leading to negative emotions. Individuals high in negative affect tend to experience anxiety, guilt and fear, while those high in positive affect are more likely to experience positive emotions such as joy and enthusiasm (Watson, Clark, & Tellegen, 1988).

Given the range of studies that have proven dispositional affect to be a moderator between emotions and individual workplace behaviour (Cropanzano, James, & Konovsky, 1993; Barry M. Staw, Sutton, & Pelled, 1994; Staw & Barsade, 1993; Diener, Nickerson, Lucas, & Sandvik, 2002), it is reasonable to expect dispositional affect to also moderate the relationship between emotions and innovative behaviours. In the entrepreneurship literature, positive dispositional affect has been linked to the making of a broad set of workplace goals, as well as entrepreneurs' general satisfaction (Delgado-García et al., 2012). Further Arora, Haynie, and Laurence (2013) found positive dispositional affect to be positively related to changes in an entrepreneur's perceived self-efficacy (Arora et al., 2013). Baron and Tang (2011; 2012) found evidence of a link between entrepreneurial dispositional positive affect and creativity, which has positive implications for entrepreneurial innovative activities. Contrary to the established body of research praising positive dispositional affect for leading to positive outcomes, the authors propose that this relationship is curvilinear for entrepreneurs i.e. it is a positive relationship, until an inflection point when it then becomes negative. They argue that this curvilinear relationship is particularly relevant for dispositional positive affect of the entrepreneur and product innovation.

Hypothesis 2a: Positive dispositional affect will moderate the strength of the relationship between high activating positive affect and innovative behaviour

Hypothesis 2b: Negative dispositional affect will moderate the strength of the relationship between high activating negative affect and innovative behaviour

PERSONALITY TRAITS AS MODERATOR BETWEEN AFFECT AND INNOVATIVE BEHAVIOUR

The role of personality traits in impacting workplace behaviours, specifically innovation, has received little attention. Those studies that have explored this link, have predominantly used the Five Factor Model that consists of five broad dimensions of personality; openness, conscientiousness, extraversion, agreeableness, and neuroticism.

Openness to experience has been consistently hypothesised to be closely linked to innovation. Openness to experience was found by King, Walker and Broyles (1996) to moderate the relationship between creative ability and (creative) accomplishments, and Madrid et al., (2014) discovered that openness to experience moderated the relationship between high-activated positive moods and workers' innovative behaviour. Stock, Von Hippel and Schnarr (2014) found that individuals who

score high on openness to experience are more likely to have new product ideas (creativity), whereas individuals ranking high in conscientiousness and neuroticism are more likely to attempt to "commercially diffuse" their innovations. This suggests that conscientiousness may have interesting implications for tasks related to innovation championing and application. The majority of research however has found the opposite to be true, that those low in conscientiousness are closer linked with innovative behaviours (Patterson, 2002). As conscientiousness is concerned with order and norms, which is contrary to the realities of the innovative process (Barron & Harrington, 1972). Madrid et al. (2014) also found support for the theory that personality traits can moderate the relationship between affect and innovative behaviour. The relationship between high-activated positive affect and innovative behaviour was stronger for people high in openness to experience.

Hypothesis 3a: Openness to experience will moderate the strength of the relationship between high activating affect and innovative behaviour.

Hypothesis 3b: Extraversion will moderate the strength of the relationship between high activating affect and innovative behaviour.

Hypothesis 3c: Conscientiousness (a lack of) will moderate the strength of the relationship between high activating affect and innovative behaviour.

SLEEP QUALITY AS A MODERATOR BETWEEN AFFECT AND INNOVATIVE BEHAVIOUR

There is a growing stream of studies linking the impact of sleep quality to mood regulation, cognition and performance (Wagner, Barnes, & Scott, 2014). Although some have suggested that behaviours in organisations are impacted upon by self regulation (or the lack of it) due to sleep quality as well as quantity (Barnes, 2012), recent organisational evidence strongly suggests that sleep quality is a more accurate predictor of behaviour than quantity (Barnes, Lucianetti, Bhave, & Christian, 2014). Sleep quality has been associated with hostility, anger and fatigue (Lavidor, Weller, & Babkoff, 2003; Pilcher & Ott, 1998), as well as lack of emotion control and impaired decision-making (Miller & Cohen, 2001). A small number of organisational studies have examined a lack of sleep or bad sleep quality as contributing to negative workplace outcomes, including satisfaction (Scott & Judge, 2006), affect (Sonnentag, Binnewies, & Mojza, 2008), stress (Wagner et al., 2014), unethical conduct (Barnes, Schaubroeck, Huth, & Ghumman, 2011) and workplace deviance (Christian & Ellis, 2011). Low sleep quality has shown to have detrimental effects on cognition, resulting in impaired attention, low alertness and distorted risk analyses (Buysse et al., 2000) as well as a variety of lapses in attention (Lim & Dinges, 2010).

Hypothesis 4a: Sleep quality will moderate the relationship between positive high-activating affect and innovative behaviours: that is to say that low quality sleep will weaken the relationship.

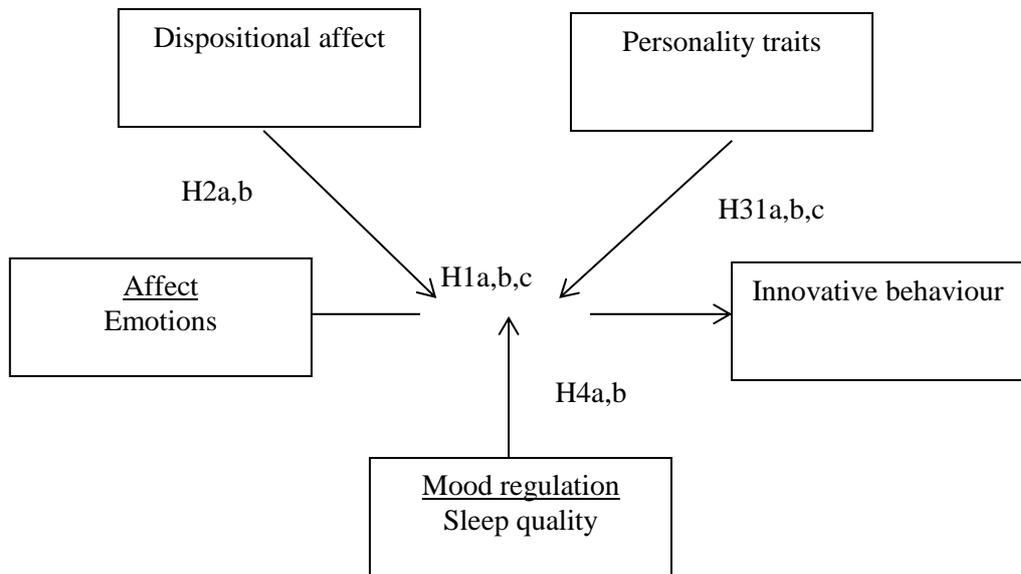
Hypothesis 4b: Sleep quality will moderate the relationship between negative high-activating affect and innovative behaviours: that is to say that low quality sleep will weaken the relationship.

A CONCEPTUAL MODEL: AFFECT AND INNOVATIVE BEHAVIOUR IN ENTREPRENEURSHIP

Figure 1 presents a general model for exploring the relationship between affect and innovative behaviour and the moderating role of dispositional affect, personality traits and sleep quality based on the arguments above. The theoretical model builds upon the second order of Affective Events Theory's (AET) (Weiss & Cropanzano, 1996) macro structure, to conceptualise the interaction between state affect, personal dispositions, mood regulation and innovative work behaviours in the entrepreneurial setting. Although entrepreneurial innovation has long been a topic at the forefront of attention, this contribution presents one of the few theoretical models which accounts for the role of affect on innovative behaviours. Additionally, it helps further bring the affective/cognitive discussion to the entrepreneurship literature, which with the exception of entrepreneurial passion (Cardon et al., 2009; Cardon, Zietsma, Saporito, Matherne, & Davis, 2005; Drnovsek, Slavec, & Cardon, 2014; Forest, Mageau, Sarrazin, & Morin, 2011), still harbours a plethora of unexplored opportunities for research (Baron & Ward, 2004).

The theoretical model deviates from traditional affective models in three areas. Firstly by positing that further delineating affect according to its arousal *and* valence in alignment with the circumplex model of affect is a more accurate tool to understand affect in relation to workplace behaviours. This is in contrast to conventional affective research which has polarised emotions according to their positive or negative dimension and posited the benefits of positive affect exclusively. The conceptualisation of affect through both its valence and arousal dimensions responds to recent calls in the literature to advance affective-workplace research by better integrating such theoretical advancements (Foo, Uy, & Murnieks, 2013; Lerner & Keltner, 2000), and has the potential to integrate seemingly conflicting findings present in the entrepreneurship literature thus far. Secondly, although the utilisation of affective dispositions is present in numerous pre-established models such as AET (Weiss & Beal, 2005), few theories have explored the role of personality traits in the affect-behaviour relationship. Thirdly, despite the practical implications of studying mood or emotion regulation in the work context, there is a paucity of research to date. Mood regulation as it relates to entrepreneurial behaviours not only indicates an area which is in need of further exploration, but an avenue for influencing desired outcomes (Isen, 2000) in entrepreneurship practice. While sleep quality specifically has demonstrated to have an (if not indirect) influence on numerous workplace behaviours and judgements, the incorporation of sleep in workplace research has only recently begun to gain momentum, and further has not yet found an audience in the entrepreneurship literature to the knowledge of these authors.

Figure 1: Conceptual model



METHODOLOGY

The proposed study primarily explores within-person affect as it naturally occurs in entrepreneurship (as opposed to in a laboratory). Entrepreneurs are being recruited via contacts at incubators and business associations, and next a snowball sampling method will be applied until the data of 100-200 participants have been collected. Entrepreneurs are offered feedback from the study, as an incentive for participation. The first activity for respondents is to complete an introductory questionnaire measuring stable variables such as traits and demographic information. Secondly, respondents download software to their smart phones for the experience sampling methodology (ESM) which ensues next. Generally ESM studies of this nature tend to collect data 3-5 times each work day, at random intervals, over a two to three week period with 100-200 respondents (Chandler, 2012; Fisher, 2000; Weiss, Nicholas, & Daus, 1999). Yet in the case of entrepreneurial studies, smaller datasets and fewer sampling periods have tended to be utilised also, as such a commitment may be unrealistic for most entrepreneurs (Uy, Foo, & Aguinis, 2009). Therefore data is being collected at random intervals two times per day over the course of two weeks. This is in accordance with Reis and Wheeler's (1991) suggestion that two weeks represents a generalizable sample of individuals' lives.

Measures

Innovative work behaviour. The measurement of innovative work behaviour was conducted daily via the ESM smart phone application, utilising five of De Jong and Den Hartog's (2010) 10 item innovative work behaviour measure. Only five items were measured to allow for rapid responses required of a high-frequency experience sampling methodology. Questions were slightly adapted to reflect short time periods. Items included: "during the past few hours, to what extent have you... Searched out new working methods, techniques or instruments.... Generated original solutions for problems... Wondered how things can be improved... Attempted to convince people to support an innovative idea.... Put effort in the development of new things" (1 = none, to 5 = a great deal).

Affective state. Eight items from Warr et al.'s (2014) Multi Affect Indicator were used to measure affective states twice per day via the ESM application, in accordance with the circumplex model of affect. Participants were instructed to "indicate the extent which [they] feel this way right now...". Measures include inspired, enthusiastic (HAPA), tense, worried (HANA), depressed, dejected (LANA), calm and related (LAPA). (1 = very slightly or not at all, to 5 = extremely).

Sleep quality. The Pittsburgh Sleep Diary (Monk et al., 1994) item "how do you evaluate this night's sleep?" (1 = very poor, to 5 = excellent) was utilised to measure sleep quality each morning via the ESM application.

Dispositional affect. Respondents were asked in the introductory survey to what extent they generally experience ten positive and ten negative emotions from the Positive and Negative Affect Schedule (PANAS) (1 = very slightly or not at all, to 5 = extremely) (Watson & Clark, 1994).

Personality trait. During the introductory survey respondents' personality traits were also measured via Gosling, Rentfrow and Swann's Ten-Item Personality Inventory (TIPI) (2003). Respondents were asked "To what extent do you agree or disagree with these statements? I see myself as..." extroverted (1 = disagree strongly, to 5 = agree strongly).

Control variables. Control variable data was gathered during the introductory survey on gender, age, ethnicity, education, employee number, business stage, and years of entrepreneurial experience, in conjunction with entrepreneurial self-efficacy (ESE). To measure ESE respondents were asked their level of confidence at successfully identifying new business opportunities, creating new products, thinking creatively, and commercializing an idea or developing something new, as developed by Zhao, Seibert and Hills (2005). (1 = no confidence, to 5 = complete confidence).

Data collection

One key difficulty with observing affect is to accurately understand the emotions that are being experienced (Dasborough, Sinclair, Russell-Bennett, & Tombs, 2008). Although the self-evaluation of emotions is incredibly common in emotion research, it does rely on the conjecture that emotions are not unconscious responses, but rather arise as the consequence of a mental appraisal of a given stimulus (Dasborough et al., 2008; Frijda, 1986;). Further, as Dasborough et al. (2008, p. 201) pointed out, these measures rely on the respondents' awareness of the presence of a given emotion, and the insight to understand what the specific emotion it is: "the accuracy of the reported (not experienced) emotional state is mediated by the respondents' emotional awareness"

The most effective ways of avoiding the issues associated self-reporting emotions discussed above therefore would be through the measurement of physical and verbal cues. For example the role of heart rate and facial clues have been used as measures of affect, or more recently researchers have begun devising new instruments to measure human behaviours (Anttonen & Surakka, 2005; Martin, Harlow, & Strack, 1992). Olguín Olguín, Gloor and Penland created wearable sensors to measure physical and speech activity, face-to-face interaction and physical proximity between people in a variety of contexts for example (2009a, 2009b). Although utilising such an instrument or the range of the newer neurobiological and physiological measurements for emotion research would be an exciting step forward, it is beyond the scope of the project. Instead the advancements in smart

phone technology and adoption have been leveraged as an avenue for data collection in this research.

Data collection is currently in progress.

a) Experience Sampling Methodology

As opposed to the paper and pencil experience sampling methodologies that existed previously, advances in technology allow for real-time collection of data. For example Ug, Foo and Aguinis (2009) completed one of the first electronic experience sampling methodologies to explore the relationship between affect and entrepreneurship.

As many entrepreneurs spend their time in various locations, as opposed to exclusively sitting at their computer, bi-daily questionnaires are administered via a specialised ESM application, MetricWire. The application pushes notifications to respondents two times a day via their smartphones and provides a quick and effective way to complete the short questionnaires.

RESULTS AND IMPLICATIONS

Preliminary results and implications will be presented at the conference.

REFERENCES

- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative Science Quarterly, 50*(3), 367–403.
- Anderson, N., De Dreu, C. K. W., & Nijstad, B. A. (2004). The routinization of innovation research: A constructively critical review of the state-of-the-science. *Journal of Organizational Behavior, 25*, 147–173.
- Anttonen, J., & Surakka, V. (2005). Emotions and heart rate while sitting on a chair. In *The SIGCHI conference on Human factors in computing systems* (pp. 491–499). New York, NY: ACM Press.
- Arora, P., Haynie, J. M., & Laurence, G. A. (2013). Counterfactual thinking and entrepreneurial self-efficacy: The moderating role of self-esteem and dispositional affect. *Entrepreneurship Theory and Practice, 37*(2), 359–385.
- Baas, M., De Dreu, C. K. W., & Nijstad, B. A. (2008). A meta-analysis of 25 years of mood-creativity research: Hedonic tone, activation, or regulatory focus? *Psychological Bulletin, 134*(6), 779–806.
- Barnes, C. M. (2012). Working in our sleep: Sleep and self-regulation in organizations. *Organizational Psychology Review, 2*(3), 234–257.
- Barnes, C. M., Lucianetti, L., Bhave, D., & Christian, M. S. (2014). You wouldn't like me when I'm sleepy: Leader sleep, daily abusive supervision, and work unit engagement. *Academy of Management Journal, In-print*.

- Barnes, C. M., Schaubroeck, J., Huth, M., & Ghumman, S. (2011). Lack of sleep and unethical conduct. *Organizational Behavior and Human Decision Processes*, *115*(2), 169–180.
- Baron, R. A. (2008). The role of affect in the entrepreneurial process. *Academy of Management Review*, *33*(2), 328–340.
- Baron, R. A. (2012). Opportunity recognition as pattern recognition: How entrepreneurs “connect the dots.” *Academy of Management Journal*, *20*(1), 104–119.
- Baron, R. A., & Tang, J. (2011). The role of entrepreneurs in firm-level innovation: Joint effects of positive affect, creativity, and environmental dynamism. *Journal of Business Venturing*, *26*(1), 49–60.
- Baron, R. A., & Ward, T. B. (2004). Expanding entrepreneurial cognition’s toolbox: Potential contributions from the field of cognitive science. *Entrepreneurship Theory and Practice*, *28*(6), 553–573.
- Barron, F., & Harrington, D. M. (1972). Creativity, intelligence, and personality. *Annual Review of Psychology*, *32*(1981), 439–476.
- Brief, A. P., & Weiss, H. M. (2002). Organizational behavior: affect in the workplace. *Annual Review of Psychology*, *53*, 279–307.
- Buysse, D. J., Thompson, W., Scott, J., Franzen, P. L., Germain, A., Hall, M., ... Kupfer, D. J. (2000). Daytime symptoms in primary insomnia: A prospective analysis using ecological momentary assessment. *Sleep Medicine*, *8*(3), 198–208.
- Cardon, M. S., Foo, M.-D., Shepherd, D. A., & Wiklund, J. (2012). Exploring the heart: Entrepreneurial emotion is a hot topic. *Entrepreneurship Theory and Practice*, *36*(1), 1–10.
- Cardon, M. S., Wincent, J., Singh, J., & Drnovsek, M. (2009). The nature and experience of entrepreneurial passion. *Academy of Management Review*, *34*(3), 511–532.
- Cardon, M. S., Zietsma, C., Saporito, P., Matherne, B. P., & Davis, C. (2005). A tale of passion: New insights into entrepreneurship from a parenthood metaphor. *Journal of Business Venturing*, *20*(1), 23–45.
- Chandler, M. M. (2012). *The antecedents and consequences of core affect variability at work*. University of Akron.
- Christian, M. S., & Ellis, A. P. J. (2011). Examining the effects of sleep deprivation on workplace deviance: A self-regulatory perspective. *Academy of Management Journal*, *54*(5), 913–934.
- Cropanzano, R., James, K., & Konovsky, M. A. (1993). Dispositional affectivity as a predictor of work attitudes and job performance. *Journal of Organisational Behaviour*, *14*, 595–606.
- Dasborough, M. T., Sinclair, M., Russell-Bennett, R., & Tombs, A. (2008). Measuring emotion: Methodological issues and alternatives. In N. M. Ashkanasy & C. L. Cooper (Eds.), *Research companion to emotion in organizations* (pp. 197–208). Cheltenham, UK: Edward Elgar Press.

- De Dreu, C. K. W., Baas, M., & Nijstad, B. a. (2008). Hedonic tone and activation level in the mood-creativity link: toward a dual pathway to creativity model. *Journal of Personality and Social Psychology, 94*(5), 739–756.
- De Jong, J. P. J., & Den Hartog, D. N. (2010). Measuring Innovative Work Behaviour. *Creativity and Innovation Management, 19*(1), 23–36.
- Delgado-García, J. B., Rodríguez-Escudero, A. I., & Martín-Cruz, N. (2012). Influence of affective traits on entrepreneur's goals and satisfaction. *Journal of Small Business Management, 50*(3), 408–428.
- Diener, E., Nickerson, C., Lucas, R., & Sandvik, E. (2002). Dispositional affect and job outcomes. *Social Indicators Research, 59*, 229–259.
- Drnovsek, M., Slavec, A., & Cardon, M. S. (2014). Cultural context, passion and self-efficacy: do entrepreneurs operate on different “planets”? In *Handbook of Entrepreneurial Cognition*.
- Fisher, C. D. (2000). Moods and emotions while working: Missing pieces of job satisfaction? *Journal of Organizational Behavior, 21*(2), 185–202.
- Foo, M.-D., Uy, M. A., & Baron, R. a. (2009). How do feelings influence effort? An empirical study of entrepreneurs' affect and venture effort. *The Journal of Applied Psychology, 94*(4), 1086–94.
- Foo, M.-D., Uy, M. A., & Murnieks, C. Y. (2013). Beyond Affective Valence: Untangling Valence and Activation Influences on Opportunity Identification. *Entrepreneurship Theory and Practice, In-Press*, n/a–n/a.
- Forest, J., Mageau, G. A., Sarrazin, C., & Morin, E. M. (2011). “Work is my passion”: The different affective, behavioural, and cognitive consequences of harmonious and obsessive passion toward work. *Canadian Journal Of Administrative Sciences Revue Canadienne Des Sciences De L'Administration, 28*(1), 27–40.
- Frenz, M., & Lambert, R. (2012). *Mixed modes of innovation: an empiric approach to capturing firms' innovation behaviour* (No. 2012/06,). France, Paris.
- Frijda, N. H. (1986). *The emotions*. Cambridge, UK: Cambridge University Press.
- George, J. M., & Zhou, J. (2002). Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *Journal of Applied Psychology, 87*(4), 687–697.
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*(6), 504–528.
- Grichnik, D., Smeja, A., & Welpel, I. M. (2010). The importance of being emotional: How do emotions affect entrepreneurial opportunity evaluation and exploitation? *Journal of Economic Behavior & Organization, 76*(1), 15–29.
- Isen, A. M. (2000). Some perspectives on positive affect and self-regulation. *Psychological Inquiry, 11*(May 2015), 184–187.

- Janssen, O. (2004). How fairness perceptions make innovative behavior more or less stressful. *Journal of Organizational Behavior*, 215(June 2003), 201–215.
- Janssen, O., Van de Vliert, E., & West, M. A. (2004). The bright and dark sides of individual and group innovation: A special issue introduction. *Journal of Organizational Behavior*, 25, 129–145.
- King, L. A., Walker, L. M., & Broyles, S. J. (1996). Creativity and the five-factor model. *Journal of Research in Personality*, 30, 189–203.
- Lavidor, M., Weller, A., & Babkoff, H. (2003). How sleep is related to fatigue. *British Journal of Health Psychology*, 8, 95–105.
- Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition & Emotion*, 14(4), 473–493.
- Lim, J., & Dinges, D. F. (2010). A meta-analysis of the impact of short-term sleep deprivation on cognitive variables. *Psychological Bulletin*, 136(3), 375–389.
- Madrid Cabezas, H. P., Patterson, M. G., Birdi, K. S., Leiva, P. I., & Kausel, E. E. (2014). The role of weekly high-activated positive mood, context, and personality in innovative work behavior: A multilevel and interactional model. *Journal of Organizational Behavior*, 35(2), 234–256.
- Martin, L. L., Harlow, T. F., & Strack, F. (1992). The role of bodily sensations in the evaluation of social events. *Personality and Social Psychology Bulletin*, 18(4), 412–419.
- Martin, L. L., & Stoner, P. (1996). Mood as input: What we think about how we feel determines how we think. In L. L. Martin & A. Tesser (Eds.), *Striving and feeling: Interactions among goals, affect, and self-regulation* (p. 407). Mahwah, NJ: Lawrence Erlbaum Associates Inc.
- Miller, E. K., & Cohen, J. D. (2001). An integrative theory of prefrontal cortex function. *Annual Review of Neuroscience*, 24, 167–202.
- Monk, T. H., Reynolds, C. F., Kupfer, D. J., Buysse, D. J., Coble, P. A., Hayes, A. J., ... Ritenour, A. M. (1994). The Pittsburgh sleep diary. *Journal of Sleep Research*, 3, 111–120.
- Olguín Olguín, D., Gloor, P. A., & Pentland, A. S. (2009a). Capturing individual and group behavior with wearable sensors. In *Human behavior modeling* (pp. 68–74). Palo Alto, CA: AAAI.
- Olguín Olguín, D., Gloor, P. A., & Pentland, A. S. (2009b). Wearable sensors for pervasive healthcare management. In *3rd International Conference on Pervasive Computing Technologies for Healthcare* (Vol. 66). London, England.
- Patterson, F. (2002). Great minds don't think alike? person-level predictors of innovation at work. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (17th ed., Vol. 17, pp. 115–144). John Wiley & Sons, Ltd.
- Peralta, C. F., Lopes, P. N., Gilson, L. L., Lourenço, P. R., & Pais, L. (2014). Innovation processes and team effectiveness: The role of goal clarity and commitment, and team affective tone. *Journal of Occupational and Organizational Psychology*, In–press.

- Pilcher, J. J., & Ott, E. S. (1998). The relationships between sleep and measures of health and well-being in college students: a repeated measures approach. *Behavioral Medicine, 23*, 170–178.
- Reis, H. T., & Wheeler, L. (1991). Advances in experimental social psychology. *Advances in Experimental Social Psychology, 24*, 269–318.
- Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing, 26*(4), 441–457.
- Scott, B. A., & Judge, T. A. (2006). Insomnia, emotions, and job satisfaction: A multilevel study. *Journal of Management, 32*(5), 622–645.
- Sonnentag, S., Binnewies, C., & Mojza, E. J. (2008). “Did you have a nice evening?” A day-level study on recovery experiences, sleep, and affect. *Journal of Applied Psychology, 93*(3), 674–684.
- Staw, B. M., & Barsade, S. G. (1993). Affect and managerial performance: A test of the sadder-but-wiser vs. happier-and-smarter hypotheses. *Administrative Science Quarterly, 38*(2), 304–331.
- Staw, B. M., Sutton, R. I., & Pelled, L. J. (1994). Employee positive emotion and favorable outcomes at the workplace. *Journal of Organizational Behaviour, 5*(1), 51–71.
- Stock, R. M., von Hippel, E. A., & Schnarr, L. (2014). *Impacts of personality traits on user innovation success*.
- Uy, M. A., & Foo, M.-D. (2010). Feeling, thinking, doing: Affective influences on goal progress and entrepreneurial efforts. *Frontiers of Entrepreneurship Research, 30*(5), 1–15.
- Uy, M. A., Foo, M.-D., & Aguinis, H. (2009). Using experience sampling methodology to advance entrepreneurship theory and research. *Organizational Research Methods, 13*(1), 31–54.
- Wagner, D. T., Barnes, C. M., & Scott, B. A. (2014). Driving it home: How workplace emotional labor harms employee home life. *Personnel Psychology, 67*(2), 487–516.
- Warr, P., Bindl, U. K., Parker, S. K., & Inceoglu, I. (2014). Four-quadrant investigation of job-related affects and behaviours. *European Journal of Work and Organizational Psychology, 23*(3), 342–363.
- Watson, D. (2000). *Mood and temperament*. NY, New York: Guilford Press.
- Watson, D., & Clark, L. A. (1994). The PANAS-X : Manual for the Positive and Negative Affect Schedule - Expanded Form.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063–1070.
- Weiss, H. M., & Beal, D. J. (2005). Reflections on affective events theory. In N. M. Ashkanasy, W. J. Zerbe, & C. E. J. Härtel (Eds.), *Research on emotion in organizations* (1st ed., Vol. 1, pp. 1–21). Oxford, UK: Elsevier/JAI Press.

- Weiss, H. M., & Cropanzano, R. (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* (18th ed., pp. 1–77). 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 beliefs on job satisfaction and variations in affective experiences over time. *Organizational Behavior and Human Decision Processes*, *78*(1), 1–24.
- Yik, M., Russell, J. A., & Steiger, J. H. (2011). A 12-Point circumplex structure of core affect. *Emotion (Washington, D.C.)*, *11*(4), 705–31.
- Zajonc, R. B. (1980). Feeling and thinking: preferences need no inferences. *American Psychologist*, *35*(2), 151–175.
- Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, *90*(6), 1265–72.