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Employees' Personality Architecture Matters at Work: Predicting Motivation and Well-Being

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Abstract

Personality has a significant role in daily work life. Employees' patterns of thoughts, feelings, and behaviors (i.e., personality) are related to their motivation, well-being, decision-making, and job performance. The effects of personality are also dependent on the given environment such as job characteristics or job demands. It is therefore essential for organizations to consider employees' personalities when making hiring decisions, designing work tasks, and creating positive work environments.

However, there is no universally agreed personality model or theory. Instead, there are interindividual and intraindividual perspectives on personality, which provide different insights each. Interindividual perspectives focus on between-person differences and are based on the idea that a small number of dimensions can describe personality differences. Intraindividual perspectives focus on within-person dynamics and aim to provide explanations of varying intraindividual experiences and behaviors. The combination of both interindividual differences and intraindividual dynamics is referred to as personality architecture.

Personality Systems Interaction (PSI) theory (Kuhl, 2001) is a prominent example of a personality architecture approach. PSI theory distinguishes between seven sources of motivation (called personality levels) that shape what employees think and feel (i.e., experience) and what they do (i.e., behavior). According to PSI theory, a “fully functional” employee possesses two core competencies: action control and personal growth. Action control refers to the ability of fast and well-grounded decision-making and effective implementation of intentions, whereas personal growth refers to the ability to learn from mistakes and integrate difficult or even painful experiences into a network of personal experiences. The ability to exert both competencies is dependent on how the seven personality levels interact with each other. In organizational contexts, the competencies of action control and personal growth are related to employee motivation, well-being, decision-making, and performance.

The main research goal of this cumulative dissertation is to address how personality architecture relates to motivation and well-being at work. Specifically, the present dissertation investigates (1) whether interindividual differences in personal growth can predict day-specific motivation and well-being at work, (2) whether intraindividual dynamics in personal growth can predict day-specific motivation and well-being at work, and (3) whether demands of volitional inhibition or facilitation of emotions and actions can predict motivation and well-being at work.

The dissertation is divided into three empirical studies. The first study found that employees who enacted their achievement motive via Object Recognition and Extension Memory (i.e., by being able to deal with critical aspects in their performance and putting those critical aspects into a broader context) experienced higher levels of daily work engagement and flow experience. This was especially true in work environments with high degrees of ambiguous and unclear task requirements. The results of the second study indicate that positive stress beliefs moderate the relationship between upshifts in positive and negative affect and subjective vitality. Specifically, upshifts in positive affect are stronger related to subjective vitality when they are coupled with upshifts in negative affect in cases of high positive stress beliefs. The third study developed a quantitative scale of interactive work demands. Results indicate that four dimensions of interactive work demands have distinct negative consequences on indicators of motivation and well-being at work, with inner emotional labor having the strongest negative effect.

This dissertation contributes to our understanding of under which conditions personality architecture is related to work-related motivation and well-being. The results of the three cumulative studies show that interindividual differences and intraindividual dynamics in personal growth are positively related to indicators of work-related motivation and well-being. The potential benefits of dealing with one's mistakes and negative experiences (linked with increased levels of negative affect) offer a rare contribution to psychological literature that often focused on the potential downsides. Taken together, the dissertation provides new insights into the development of (day-specific) motivation and well-being at work based on personality architecture. The results offer impulses for occupational health management by highlighting the importance of dealing with negative experiences to become more competent in exerting action control and personal growth.

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Chapter 1
Personality at Work

Employees' personality has an essential role in daily work life. Already before employees start working at a company, their patterns of thoughts, feelings, and behaviors (i.e., personality) are essential factors in determining who is most motivated for task achievement (e.g., "Who has the strongest desire to be successful?"). When they start working, personality determines how work tasks translate into motivation, well-being, and performance (e.g., "Who shows the strongest motivation?"). In addition, personality determines the degree to which employees can cope with their work demands (e.g., "Why are some employees getting frustrated about annoying customers and others do not?").

When opening a textbook of psychology to get a thorough understanding of what personality precisely is, however, each chapter will give a (significantly) different answer (Carver & Scheier, 2016). Although there is no universally agreed personality model or theory, the different approaches to personality can be summarized as *interindividual* (i.e., between-person differences) and *intraindividual* (i.e., within-person dynamics) analyses (Cervone, 2005). Interindividual analyses are based on the idea that differences between persons can be described using a small number of dimensions. These dimensions are usually identified by aggregations of personality expressions across persons and situations that are correlated. For example, employees that are insecure about themselves are also likely to get stressed out easily. Those two correlated expressions of personality could, therefore, be aggregated into a single dimension (i.e., emotional stability).

In organizational contexts, the role of interindividual differences in personality is associated with employee well-being (e.g., Anglim et al., 2020), job satisfaction (e.g., Judge et al., 2002), commitment (e.g., Erdheim et al., 2006), decision-making (e.g., Buelow & Cayton, 2020), as well as job performance (e.g., Judge & Zapata, 2015). The effects of personality can be explained by differences between employees in how they experience (i.e., thoughts and feelings) and behave in certain situations. For example, a meta-analysis by Judge et al. (2002) showed that extraversion (i.e., the tendency to seek stimulation from one's environment) is a robust predictor of job satisfaction (i.e., the extent to which an individual is satisfied with his/her job). The authors also found that extraversion is a stronger predictor of job satisfaction for high-

stress jobs. High-stress jobs are typically characterized by high levels of time pressure and/or high levels of customer contact.

However, interindividual differences cannot be assumed to provide causal explanations for intraindividual dynamics in experience and action (e.g., Molenaar et al., 2003) as they "do not imply, test, or support causal accounts that are valid at the individual level" (Borsboom et al. 2003, p. 214). For example, an employee showed a strong stress reaction to negative supervisor feedback at first but was able to calm himself down very quickly. Interindividual analyses would struggle to classify this behavior as the employee showed two opposing reactions: The first stressful reaction indicates a rather emotionally unstable employee, however, the subsequent shift into a relaxed mode indicates emotional stability. In this case, interindividual analyses would not only provide an insufficient description of the observed behavior (both reactions would be aggregated to "average" emotional stability) but also lack sufficient explanation why the employee showed two opposing reactions (i.e., intraindividual dynamics).

To provide explanations for individual experiences and actions, intraindividual analyses focus on cognitive and affective dynamics that can *explain* the thoughts, feelings, and behaviors of an individual employee (Cervone, 2005; Kuhl et al., 2006). According to Kuhl (2001), intraindividual experiences and behaviors can be explained by seven sources of motivation: learned behaviors (e.g., Skinner, 1953), temperament (e.g., Eysenck, 1967), affects (e.g., Gray, 1987), stress coping (e.g., Kuhl, 1981), motives (e.g., McClelland, 1985a), cognition (e.g., Jung, 1936/2014), and volition (e.g., Ach, 1910). Going back to the example above, the first reaction could be explained by doubts about one's competence that were triggered by negative supervisor feedback. The sensitive reaction towards the feedback might be due to a strong fear of failure that guides individual experience and behavior (motives). The second reaction could be explained by the employee's ability to calm himself or herself down to reduce the negative stress response caused by the supervisor's feedback (volition). Importantly, those are only two *possible* explanations for the respective reactions.

Taken together, both inter- and intraindividual analyses of personality offer a unique perspective on human experience and behavior. Whereas interindividual analyses offer a framework to describe *how* employees differ in their personality (e.g., emotionally stable vs. emotionally unstable), intraindividual analyses offer explanations of *why* employees differ in their experiences and behaviors.

Personality Architecture

Analyses on the interindividual and intraindividual levels must not always be separate concepts, as psychological constructs can account for differences between employees *and* explain the experiential and behavioral dynamics of an individual employee (Cervone, 2005). The combination of both interindividual and intraindividual analyses are theories of p*ersonality architecture*. The personality architecture refers to the organization among mental systems that shape employees' characteristic patterns of experience and behavior (e.g., Cervone 2004; Kuhl et al., 2006; Kuhl et al., 2021).

Personality Systems Interaction (PSI) theory (Kuhl, 2001), one of the most prominent examples of personality architecture theories, integrates the seven sources of motivation (i.e., learned behaviors, temperament, affects, stress coping, motives, cognition, volition) into one coherent framework. For each of those seven sources of motivation (in PSI terms called *personality levels*), PSI theory distinguishes between two systems, one guiding experience and one guiding behavior (Kuhl & Baumann, 2021). The main functions of each level in guiding experience and behavior are displayed in Figure 1.

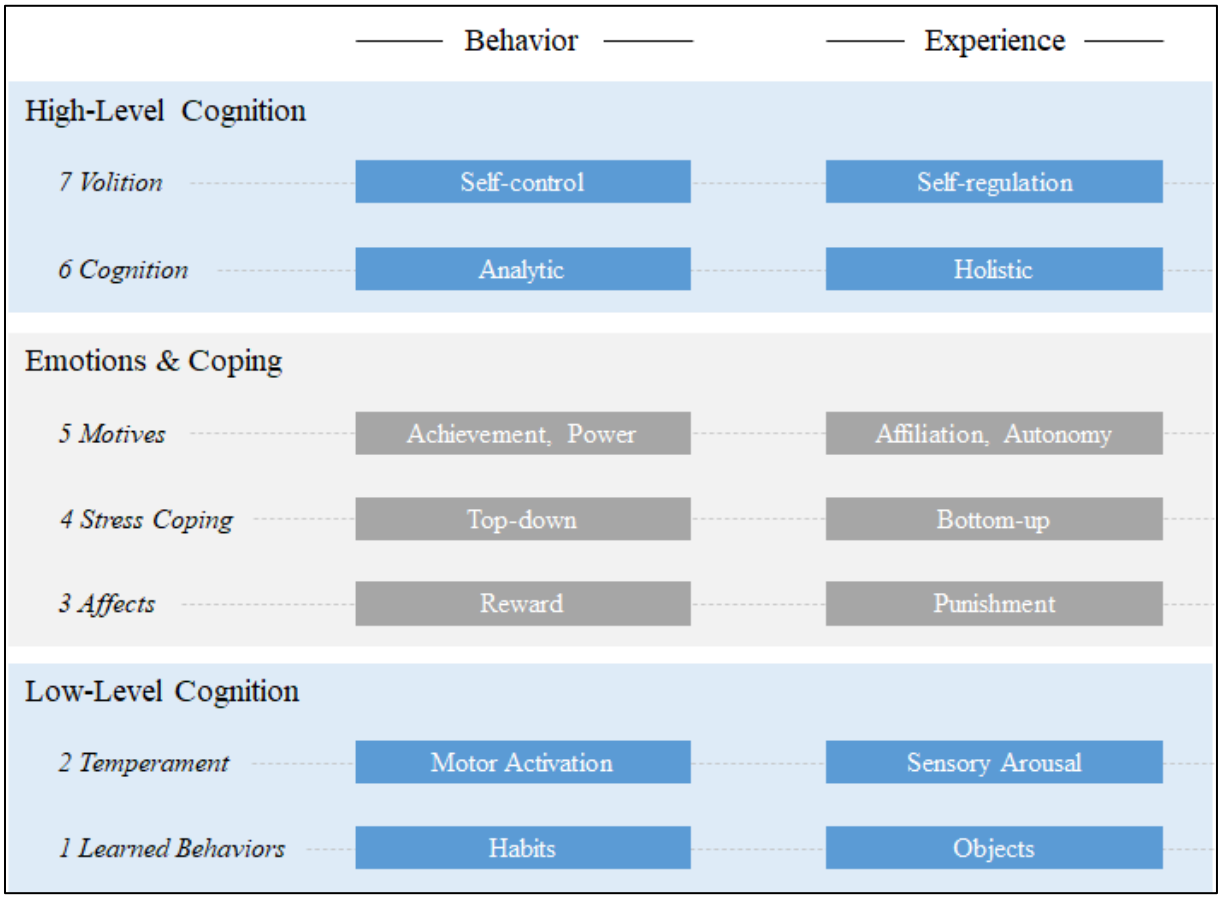
The dynamic interactions between those seven levels determine the degree of two core competencies central to personality functioning: *action control* and *personal growth* (Kuhl, 2001). According to Kuhl & Baumann (2021), action control describes the ability of fast and well-grounded decision-making and effective implementation of intentions, whereas personal growth describes the ability to learn from mistakes and to integrate difficult or even painful experiences into a network of personal experiences.

The role of personal growth in organizational settings is illustrated by the example of negative supervisor feedback from above. The employee needs to focus on what triggers the unpleasant feelings ("What exactly is my supervisor criticizing?"). According to PSI theory (Kuhl, 2001), low-level cognition on the experiential side (levels 1 and 2) would be responsible for focusing on unpleasant feelings (or "objects"). However, this focus may lead the employee to only see the negative and ignore other experiences that can help to put the negative experience into perspective ("This is the first time that I got criticized, I usually get positive feedback."). To put the negative experience into perspective, the employee must stop ruminating about the experience to think about, for example, how the negative feedback can be positively used in the future ("How can I avoid the mistake in the future?"). In PSI terms, this is what high-level cognition on the experiential side (levels 6 and 7) is responsible for. If one experiential function works without the other, employees might not learn from mistakes ("My supervisor has no idea

what he/she is talking about, I did a great job!") or get into a spiral of negative emotions ("I am a failure and not good enough for this job!").

Figure 1

Overview of personality levels and their main functions in Personality Systems Interactions (PSI) theory (adapted from Kuhl, 2001, 2009; Kuhl et al., 2006)



Note. PSI theory assumes interactions among all systems, especially at higher levels. Only the primary functions involved at each level are listed in the Figure (Kuhl et al., 2006).

An example of action control in organizational contexts can be illustrated by another employee who wants to start working on an important task but has problems getting going. The employee might have already set attainable goals and made detailed plans on how to achieve those goals ("What is the best way to achieve my goals?"). According to PSI theory (Kuhl, 2001), high-level cognition on the behavioral side (levels 6 and 7) would be responsible for building and storing intentions. However, at some point, the employee must stop ruminating about the best way to achieve the goals and commit to the plan ("Is this *really* the best way to achieve my goals?"). To get going, the employee must generate positive emotions to pave the way for the implementation of self-directed behavior. In PSI terms, this is what low-level cognition on the

behavioral side (levels 1 and 2) is responsible for. Positive emotions can be generated by, for example, anticipating positive outcomes of goal achievement ("I will feel great when the task is done!") or external feedback ("My supervisor said it is a great plan so I should just do it!").

The competencies of action control and personal growth directly relate to work-related outcomes. On one hand, employees with difficulties in action control tend to ruminate about what will happen if something goes wrong. If the ability to act is impaired by continued rumination, employees experience excessive and untimely thinking about unfinished intentions (Goschke & Kuhl, 1993), postponing or not carrying out one's intentions (Fuhrmann & Kuhl, 1998), and excessive procrastination when making decisions (Stiensmeier-Pelster, 1994) when faced with job stressors (e.g., time pressure, task complexity). On the other hand, employees with difficulties in personal growth tend to not use failures as opportunities to learn and do better next time. If the ability to cope with negative experiences is impaired by not dealing with negative experiences, employees are limited in their creativity (see Baumann & Kuhl, 2002) and have difficulties distinguishing whether they have chosen a task themselves or have been given it by another person (Kuhl & Kazén, 1994; Baumann & Kuhl, 2003). Therefore, the two competencies could explain differences in job performance (e.g., Diefendorff et al., 2006), procrastination (e.g., Jostmann & Koole, 2007; Kaschel et al., 2017; Kazén et al., 2008), and creativity (e.g., Bledow et al., 2011, 2013). Moreover, intraindividual dynamics of action control explained why an employer showed higher levels of work engagement (e.g., Bledow et al., 2011), creativity (e.g., Bledow et al., 2013), job performance and Organizational Citizenship Behavior (Yang et al., 2016) on one day than on another.

Research Questions of the Present Dissertation

The general research goal of the present dissertation is to predict work-related motivation and well-being by looking at how employees differ in the competencies of action control and self-growth in general, as well as looking at day-specific processes related to both competencies. While research in organizational contexts has focused on how action control relates to work-related outcomes ("getting things done"), it has paid less attention to the role of the second competence personal growth in the prediction of work-related motivation and well-being. However, it seems as important to be resilient in coping with stress and creating a balance between personal and occupational needs and goals (i.e., work-life balance). Evidence from experimental psychology suggests that individuals differ in their competence to shift their attention away from negative stimuli (e.g., Kuhl & Baumann, 2000; Koole & Jostmann, 2004) and access to their self (e.g., Koole et al., 2005; Baumann & Kuhl, 2002, 2003), two functions

needed for personal growth. These two functions help to understand how differences in personal growth relate to motivation and well-being at work.

Thus, there is a need for a better understanding of under what conditions differences in the competence of personal growth between employees relate to work-related motivation and well-being. As suggested by developmental genetics (e.g., Belsky & Pluess, 2009), and experimental psychology (e.g., Kuhl & Kazén, 1994; Baumann et al., 2005a, 2007), a restricted competence in personal growth (i.e., difficulties to deal with negative stimuli and accessing the self) is linked with reduced motivation and well-being in general. For instance, a limited competence to reduce negative affect can lead to self-infiltration (i.e., mistaking others' expectations or desires for one's own; Kuhl & Kazén, 1994) which increases the risk of developing psychosomatic symptoms (e.g., Baumann et al., 2005a, 2007). This leads to the first research question (RQ) of this dissertation:

RQ1: Under what conditions do interindividual differences in personal growth predict day-specific motivation and well-being at work?

Even though day-specific dynamics in personal growth have been related to indicators of daily motivation and performance at work (e.g., Bledow et al., 2011; Yang et al., 2016), indicators of daily well-being at work still lack empirical support. The reduced competence to deal with negative stimuli and access the self is related to the development of psychosomatic symptoms (Baumann et al., 2005a, 2007). Thus, shedding light on day-specific dynamics that explain why employees experience different levels of well-being between days is an important research endeavor. Whereas a focus on differences between employees can advocate for the benefits of personal growth in general, a focus on the cognitive and affective dynamics underlying personal growth can help to understand how employee well-being is formed daily. This leads to the second research question of this dissertation:

RQ2: Under what conditions do intraindividual dynamics in personal growth predict day-specific motivation and well-being at work?

Both demand- and resource-oriented perspectives are often combined in organizational settings to investigate how resources help to cope with the negative consequences of demands at work. For instance, the Job Demands-Resources model (Bakker & Demerouti, 2007) proposes that job demands (e.g., role conflict, role ambiguity, workload) lead to strain, whereas job resources (e.g., job autonomy, social support) lead to motivation. Job resources may also reduce (i.e.,

buffer) the negative consequence of job demands. Both strain and motivation are expected to increase (motivation) and decrease (strain) work performance.

PSI theory's operationalization of action control and personal growth as two observable competencies offers a *resource-oriented* perspective in organizational settings. The resource-oriented perspective captures the extent to which employees can self-regulate their behaviors and experiences. This resource-oriented perspective has great advantages in organizational practice as it avoids focusing on employee deficits that are stable over time such as personality traits. For example, a low score on "emotional stability" can risk limiting an employee to rigid categories (e.g., "neurotic") as well as creating concern that employee weaknesses will be exposed.

However, an additional perspective is a focus on the extent to which employees are demanded to exert action control and personal growth at work (i.e., *demand-oriented* perspective). This demand-oriented perspective captures the degree to which employees need to adjust their actions (e.g., being nice to an unfriendly customer or colleague) or emotions (e.g., tolerating that a customer/colleague is unfriendly). The volitional inhibition or facilitation of actions (e.g., impulse control, Schmidt & Neubach, 2007) and emotions (e.g., emotional dissonance, Hochschild, 1983) constitute one of the most significant demands at work, showing negative relations with well-being at work (for an overview, see Zapf, 2002). Demands of emotion regulation (e.g., Gross, 2001) and self-control (e.g., Kotabe & Hofmann, 2015) are widely explained by mechanisms very similar to those proposed by PSI theory (Baumann et al., 2018). Thus, PSI theory would benefit from an additional demand-oriented perspective that incorporates the explicit demands to exert action control and personal growth at work. This leads to the third and last research question of this dissertation:

RQ3: Can demands of volitional inhibition and facilitation of emotions and actions predict motivation and well-being at work?

Personality Systems Interaction (PSI) theory

Given that all three research questions are based on PSI theory (Kuhl, 2001), the underlying mechanisms proposed are now further explained. According to Kuhl et al. (2006), the experiential and behavioral systems on each of the seven levels can be further summarized into four macro systems. The first two macro systems called "Intuitive Behavior Control" and "Object Recognition" summarize low-level cognition of behavioral (Intuitive Behavior Control) and experiential (Object Recognition) systems of personality level 1 (learned behaviors) and personality level 2 (temperament). According to Kuhl & Baumann (2021),

Intuitive Behavior Control is responsible for executing habits and spontaneous actions. It takes in information from multiple senses and puts together the details of how to carry out an action. Object Recognition is responsible for identifying and separating new, unexpected, discrepant, or aversive objects from their context. Those objects can refer to cognitive concepts or categories, emotions, goals, or behavioral outcomes (Kuhl & Baumann, 2021).

Whereas Intuitive Behavior Control and Object Recognition capture how behavior and experience are guided by low-level cognition, the third and fourth macro systems capture how high-level cognition guides behavior and experience. These two macro systems called "Intention Memory" and "Extension Memory" summarize all behavioral (Intention Memory) and experiential (Extension Memory) systems of personality level 6 (cognition) and personality level 7 (volition). According to Kuhl & Baumann (2021), Intention Memory is responsible for holding an intention in working memory. It is therefore important for making decisions because it helps to stick to intentions and not get distracted or tempted to do something that might conflict with the original intention. Extension Memory is an implicit network of cognitive and emotional experiences that helps to identify appropriate courses of action based on past experiences. This extended memory is supported by parallel rather than sequential processing, and it is directly related to need-relevant experiences (Kuhl & Baumann, 2021).

In PSI theory (Kuhl, 2001), low- and high-level cognition are seen as antagonistic systems as one system inhibits the other. On the behavioral side, Intuitive Behavior Control (low-level cognition) is antagonistic to Intention Memory (high-level cognition). For example, when employees have a specific goal, they will have ideas on what to do to reach that goal (i.e., intentions). If such an intention is more complex and not to be attained with a single action, employees need to save that intention for later enactment. This process requires employees to actively maintain an uncompleted intention in memory (Intention Memory) and to implement the intention at a later point in time (Intuitive Behavior Control). The antagonistic relation between planning (Intention Memory) and action (Intuitive Behavior Control) is especially relevant for action control as it requires successful coordination between planning and action.

On the experiential side, Object Recognition (low-level cognition) is antagonistic to Extension Memory (high-level cognition). For example, if employees want to learn from their mistakes, they need to be aware of the experience (i.e., objects) that they want to integrate. Also, they need to be able to integrate this negative experience into the self, storing personal needs and experiences. This integration requires individuals to be able to recognize the source of negative emotions such as anxiety or pain (Object Recognition), but also to loosen that focus to see the

"big picture" (Extension Memory). The antagonistic relation between elementary perception (Object Recognition) and access to the self (Extension Memory) is especially relevant for personal growth as it requires successful coordination between elementary perception and self-access.

The extent to which employees use low-level or high-level cognition is mediated by emotion and coping systems (affects, stress coping, and motives) at the mid-level (personality levels 3-5). The successful coordination between the antagonists planning and action (action control) as well as elementary perception and self-access (personal growth) is determined by shifts in positive and negative affect.

According to Kuhl (2001) and Kuhl and Baumann (2021), the activation of Intention Memory and Intuitive Behavior Control is determined by positive affect. Downshifts (i.e., decreases; from high to low) in positive affect intensify Intention Memory but reduce activation of the Intuitive Behavior Control. Thus, downshifts in positive affect help employees to make well-grounded plans but prevent them to get into action. In contrast, upshifts (i.e., increases; from low to high) in positive affect intensify Intuitive Behavior Control and release the behavioral inhibition of the Intention Memory. Thus, upshifts in positive affect help employees to get into action but prevent hem to make thorough plans. Shifts in positive affect can be caused by external (e.g., positive supervisor feedback) or internal (e.g., self-motivation) factors.

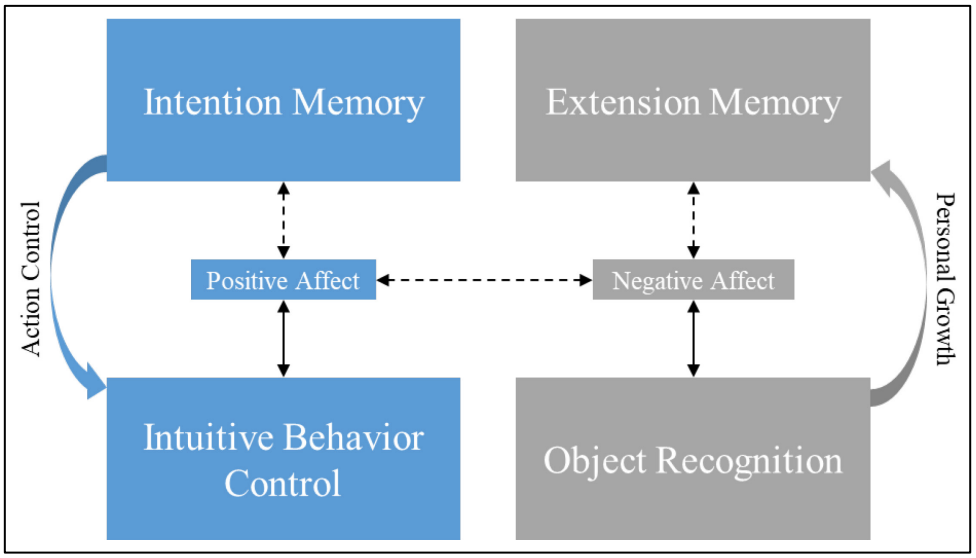
Following Kuhl (2001) and Kuhl and Baumann (2021), the activation of Object Recognition and Extension Memory is determined by negative affect. Upshifts in negative affect intensify Object Recognition and reduce access to the self. Thus, upshifts in negative affect help employees to focus on details and isolated (negative) experiences but prevent them to get in touch with their self (storing personal needs and experiences). In contrast, downshifts in negative affect strengthen access to the self and reduce attention toward threats and mistakes. Thus, downshifts in negative affect help employees to get in touch with their self but prevent them to focus on details and isolated (negative) experiences. Shifts in negative affect can be caused by external (e.g., being comforted by colleagues or friends) or internal (e.g., self-relaxation) factors.

Therefore, PSI theory suggests that the experience of negative affect (either by the general access to Object Recognition or upshifts in negative affect) can lead to personal growth—but only if the employee can cope with its negative consequences (Kuhl, 2001). The degree of how well employees can cope with negative stimuli is dependent on various cognitive and emotional factors. Those factors may be caused by other personality levels within the employee (e.g.,

achievement motive, beliefs about stress) or by the organizational environment (e.g., job characteristics). Besides work-related empirical evidence mentioned before, PSI theory has a substantial record of experimental (e.g., Kuhl & Kazén, 1999; Baumann & Kuhl, 2002; Baumann et al., 2005a; Koole & Jostmann, 2004; Koole & Kuhl, 2008) and neurobiological (e.g., Baumann et al., 2005b; Quirin et al., 2011a; Düsing et al., 2016; Quirin et al., 2011b) evidence that supports its underlying assumptions. Figure 2 displays the interplay of the four macro systems related to action control and personal growth.

Figure 2

Action control and personal growth in Personality Systems Interactions (PSI) theory (adapted from Kuhl et al., 2021)



Note. Action control and personal growth are determined by the interplay of Intuitive Behavior Control and Intention Memory (action control), as well as Object Recognition and Extension Memory (personal growth). Changes in positive and negative affect facilitate (solid straight arrows) or inhibit (dotted straight arrows) the activation of each macro system. Bent arrows schematically indicate the flow of information between macro systems as a function of the following mechanisms: Action control is facilitated by the upregulation of positive affect (see the solid line between positive affect and Intuitive Behavior Control), whereas personal growth is facilitated by the downregulation of negative affect (see the dotted line between negative affect and Extension Memory; Kuhl et al., 2021).

Taken together, PSI theory defines personality among two core competencies called action control and personal growth. Both competencies are a consequence of dynamic interactions between experiential (Extension Memory, Object Recognition) and behavioral (Intention Memory, Intuitive Behavior Control) macro systems. The activation of each macro system facilitates the arousal of a specific affective state and vice versa. System interactions account

for individual explanations in experience and behavior with interactions between all seven levels of personality (intraindividual analyses) but also for differences between individuals using characteristic patterns of system interactions.

Classification of Empirical Studies

The three empirical studies of this cumulative dissertation have been submitted to peer-reviewed journals. Two articles have already been published in the peer-review journals Motivation and Emotion (Study 1; Digutsch & Diestel, 2021) and the International Journal of Environmental Research and Public Health (Study 3; Digutsch et al., 2021). The second study has been published as a pre-print (Study 2; Digutsch et al., 2022).

Study 1

In the first study (see Chapter 2), we examined how different forms of achievement motive enactment (i.e., the way how employees strive for achievement-related stimuli using the four macro systems postulated by PSI theory) are related to day-specific flow experience and work engagement. Both variables represent positive indicators of psychological functioning and represent employees' vigor, dedication (engagement), and absorption (flow and engagement). The achievement motive is characterized by strivings for incentives related to achievement such as improving a skill or mastering a difficult task. These strivings can be motivated in two ways—either by focusing on single negative experiences (enactment via Object Recognition) or by putting these experiences into a broader context (enactment via Extension Memory). As proposed by PSI theory, access to both forms of enactment is necessary for personal growth, a core competence of personality functioning. Between-person variations in personal growth are thus captured by the dispositional access to both forms of achievement motive enactment.

Additionally, we expected role clarity to moderate the relation between achievement motive enactment and day-specific work engagement and flow experience. According to the plasticity hypothesis (Brockner, 1983), individuals are influenced by environmental (i.e., organizational) factors to different degrees according to their characteristics. When employees receive clear and consistent information about their tasks and goals (i.e., high role clarity), motivational processes have less influence on flow and work engagement (e.g., Bliese & Castro, 2000; Lang et al., 2007). However, when role clarity is low, we expected achievement motive enactment to have a stronger influence on day-specific flow experience and work engagement. To test our hypotheses, we conducted two daily diary studies. The first diary study tests the proposed interaction between the two forms of achievement motive enactment. The second study

replicated the proposed interaction and elaborates on the role of role clarity in the hypothesized two-way interaction.

Study 1 relates to the first research question by investigating if interindividual differences in personal growth (measured via achievement motive enactment) predict day-specific flow experience and work engagement as indicators of motivation and well-being. The proposed conditions under which interindividual differences in personal growth relate to those outcomes are (a) when employees enact their achievement motive via both Object Recognition and Extension Memory and (b) when employees experience low role clarity.

Study 2

My second study (see Chapter 3) investigated how affective shifts (i.e., the increase or decrease of positive and negative affect; Bledow et al., 2011) during off-job times (i.e., evening of day 1 to morning of day 2) relate to subjective vitality as an indicator of day-specific psychological functioning at work (Ryan & Frederick, 1997) the following morning. According to PSI theory, core competencies of personality functioning are the consequence of dynamic interactions between experiential and behavioral mental systems. The activation of each mental system facilitates the arousal of a specific positive and negative affective state and vice versa. Thus, we expected that shifts in positive and negative affect interact to predict subjective vitality in a way that subjective vitality is most pronounced when there is an upshift in both positive and negative affect.

In addition, we expected that positive stress beliefs moderate the interaction of positive and negative affective shifts. Positive stress beliefs refer to an implicit belief system that guides experience and action: Individuals with high positive stress beliefs tend to experience fewer negative effects of stress and are motivated to use stress to achieve positive outcomes in contrast to individuals with low positive stress beliefs (Crum et al., 2013). To test our hypotheses, we conducted a daily diary study over ten consecutive working days.

Study 2 relates to the second research question by investigating if intraindividual dynamics of personal growth (measured via shifts in positive and negative affect) predict day-specific subjective vitality as an indicator of well-being. The proposed conditions under which intraindividual dynamics of personal growth relate to subjective vitality are (a) when employees experience upshifts in both positive and negative affect during off-job times and (b) when employees have high positive stress beliefs.

Study 3

In the third study (see Chapter 4), we translated interactive work demands that are postulated in qualitative research (Böhle et al., 2014) into a quantitative scale. More precisely, four dimensions of interactive work demands were quantified: emotional labor directed to the self and others, cooperative work, and subjective acting. Interactive work demands relate to both competencies of action control and personal growth (see, for example, Baumeister et al., 1994; Morris & Feldman, 1996; Schmidt & Neubach, 2007; Böhle & Weihrich, 2020).

For example, employees might be required to express emotions that they do not actually feel (e.g., staying friendly and not getting frustrated about annoying customers). On the behavioral side, employees are required to think about the most adequate (non-)verbal reaction (Intention Memory) and express this adequate reaction toward the customer. On the experiential side, employees must endure the emotional dissonance felt when they must display emotions that do not actually feel (Extension Memory) and stay sensible for dissonant emotions and reactions of the customer (Object Recognition).

Study 3 related to the third research question by investigating if demands of volitional inhibition and facilitation of emotions and actions (measured via interactive work demands) can predict indicators of motivation and well-being at work. A quantitative scale of interactive work demands was developed and related to indicators of work-related motivation and well-being such as work engagement and emotional exhaustion.

Contributions of the Present Dissertation

The three studies within my cumulative dissertation offer three main contributions to the interface of Personality Psychology (and related literature on self-regulation, motivation, and volition) and Industrial and Organizational Psychology. First, we contribute to the explanations of why personality architecture is related to work-related outcomes such as motivation and well-being by capturing the functional processes underlying individual experience and action. So far, most used forms of personality assessment in organizational settings are between-person taxonomies (such as the Five Factor Model, McCrae & Costa, 1987) that might be good at describing personality differences (e.g., scoring employees on their “emotional stability” from low to high) but were not intended (and are not able) to explain intraindividual differences in experiencing and action. The classification of between-person taxonomies of, for example, employees as low or high in conscientious might be sufficient for certain tasks such as the screening of job applications. However, when a supervisor wants to understand why employees

behave in a certain (e.g., “lazy”) way to increase their intrinsic motivation, personality architecture approaches are likely to excel.

Second, we provide empirical evidence for the beneficial effects of personal growth on motivation and well-being at work. This evidence is important because personal growth is related to employees’ competence to revise their understanding of the world as they learn new information that does not fit with their expectations or views about themselves. This competence can be painful but seems necessary for an employee to grow and develop, as indicated by higher levels of motivation and well-being at work in contrast to employees with low competence in personal growth. Employees are strengthened by exposure to manageable adversity because it allows them to develop new skills and gain a deeper understanding of themselves and the world. Thus, we provide evidence that personal growth is associated with increased motivation and well-being at work.

Third, we further support PSI theory’s suggestion that the experience of negative emotions can lead to personal growth if the person can cope with its (temporary) negative consequences. This seems especially relevant in organizational contexts where employees’ needs (e.g., the need to work autonomously) are frustrated (Koole et al., 2019). When a working environment does not benefit employees' needs and desires, personal growth can potentially be used as a substitute or buffer. This dissertation considers interindividual differences (i.e., beliefs about stress) and organizational influences (i.e., role clarity) that indicate under what conditions personal growth contributes to increased levels of motivation and well-being at work. As stated by Koole et al. (2019), paying close attention to negative experiences can be a double-edged sword and is a very risky pathway to take.

Chapter 2
How Achievement Motive Enactment Shapes Daily Flow Experience and Work Engagement: The Interplay of Personality Systems

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In the present study, we examined how different forms of achievement motive interact to predict daily flow experience and work engagement. In particular, we conducted two diary studies to examine the main and interaction effects of motive enactment via Extension Memory (a macrosystem that enables holistic and experience-based information processing) and via the Object Recognition system (an alert-oriented macrosystem). In study 1, in line with personality systems interaction (PSI) theory, we found that motive enactment via Extension Memory fosters both day-specific flow and work engagement, whereas the conjunction of both forms of motive enactment has beneficial effects on flow and work engagement (two-way interaction). In study 2, we found that role clarity moderates the interaction of the two forms of enactment, indicating that the two-way interaction occurs when role clarity is low. Our results imply that the interplay of different dispositional forms of achievement motive enactment shapes how employees experience flow and engagement.

Keywords: PSI theory, Achievement motive enactment, Flow experience, Work engagement, Role clarity

Introduction

In different occupational and organizational settings, flow experience and work engagement have been repeatedly linked with psychological well-being (e.g., Peifer & Engeser, 2021; Rivkin et al., 2018) and job performance (e.g., Christian et al., 2011). Flow refers to peak experiences of energized motivation when people take on a task and is characterized by high involvement in an activity, a high sense of control, and a decelerated sense of time (Csikszentmihalyi & LeFevre, 1989; Csikszentmihalyi et al., 2005; Rivkin et al., 2018). People engage in flow experience when they perceive a balance between their skills and the demands of a given task (Csikszentmihalyi, 1975/2000, 1990; Csikszentmihalyi & Larson, 1987; Csikszentmihalyi & LeFevre, 1989; Nakamura & Csikszentmihalyi, 2002). Work engagement is defined as a positive, fulfilling, work-related state of mind characterized by absorption, vigor, and dedication (Schaufeli et al., 2002). By experiencing this motivational state, people fully engage themselves in a difficult task for the sake of the activity itself (Baumann & Scheffer, 2011). Both flow experience and work engagement show conceptual overlap but have differences in their duration (a peak experience vs. an ongoing state, respectively; Hallberg & Schaufeli, 2006; Sonnentag, 2003) and scope (Csikszentmihalyi et al., 2005; Schaufeli et al., 2002).

Although most research has primarily focused on fluctuating states of flow and work engagement, only a few studies have explored more dispositional predictors of stable patterns in both outcomes over time. For example, Csikszentmihalyi (1990) introduced the concept of the autotelic personality, which describes individuals who tend to position themselves in situations that enable frequent experiences of flow states (Asakawa, 2004). High autotelic personality scores are positively related to the need for achievement (Csikszentmihalyi et al., 1993) and a stable motivational disposition, which is characterized by a recurrent preference for affectively rewarding experiences related to improving one's performance (Atkinson, 1957; McClelland, 1985a). Past research has demonstrated that such motivational dispositions drive goal-directed behavior (e.g., Beckmann & Heckhausen, 2008). We argue that workplaces provide many situational cues that activate the achievement motives of employees, such as highly challenging tasks, goals, feedback, and performance systems (see goal-setting theory, Locke & Latham, 1990), thereby facilitating employees' flow experience (Csikszentmihalyi, 1990; Csikszentmihalyi et al., 2005). In line with our argument, Baumann and Scheffer (2010, 2011) investigated whether the stable need to seek and master difficulties, as intrinsic components of achievement motive, is related to flow experience. The results showed that

individuals who actively seek involvement in challenging tasks and enjoy the process of mastering these challenges are more likely to experience flow. These results were in line with the dialectical principle inherent in autotelic experiences, that is, the simultaneous presence of two opposing processes: differentiation and integration (Csikszentmihalyi et al., 1993).

Although other scholars have repeatedly explored personality as an antecedent of flow and work engagement, past research has failed to provide nuanced evidence on how and when personality traits predict both outcomes. The weak focus on personality traits is surprising given the substantial between-person variance (in contrast to within-person variance) in both flow experience and work engagement, suggesting that their respective levels are considerably influenced by personality traits and job characteristics (e.g., Diestel et al., 2015; Rivkin et al., 2018). Other personality approaches have usually focused on either motivation (e.g., achievement motive; Engeser & Rheinberg, 2008) or volition (e.g., action orientation: Baumann et al., 2016; Keller & Bless, 2008; Wojdylo et al., 2014), contributing to addressing the question of what people strive for or how they strive for it.

To shed light on both perspectives simultaneously, our study not only focuses on achievement motive itself but also on two components of achievement motive enactment. The conceptual difference between these components is grounded in personality systems interaction theory (PSI theory; Kuhl, 2000a). In summary, PSI theory distinguishes between four macrosystems (Intuitive Behavior Control, Object Recognition, Extension Memory, and Intention Memory) that have distinctive modulative functions for information processing and the regulation of behavioral and decision processes. The intuitive behavior system involves unconscious procedural knowledge about engagement in specific behavioral patterns such as sensorimotor and behavioral processes. The Object Recognition system focuses on threats, problems, and other stressful aspects of situations and thus acts as a kind of alarm system. Extension Memory (also referred to as the integrated self, Kuhl et al., 2015) is based on parallel-distributed and holistic processing and integrates experiences in coherent and sense-making self-related representations by integrating environmental factors with personal values and experiences. Intention Memory is based on sequential analytical processing and facilitates the formation of intentions, action planning, and goal setting.

Achievement motive can be enacted via these macrosystems, resulting in dispositional cognitive styles that shape the way individuals strive for motive-related incentives in their environments. While achievement motive enactment via the Object Recognition system causes individuals to focus on isolated negative experiences through which they become more alert

and sensitive to discrepancies in their need for achievement, achievement motive enactment via Extension Memory is driven by parallel instead of sequential and integrative processing of goal-relevant information and situational cues (Baumann & Kuhl, 2002). In occupational contexts, achievement motive enactment via the Object Recognition system involves the perception of a negative event (e.g., critical feedback from a supervisor) as a single experience ("object"), which requires tolerance of frustrating experiences. Enactment via Extension Memory turns those vulnerabilities into emotional strength by integrating isolated experiences into one's autobiographical network and overcoming negative affect (Kuhl et al., 2015). If one macrosystem works without the other, there are either no new learning experiences (low Object Recognition and high Extension Memory), or the experiences cannot be put into a broader context (high Object Recognition and low Extension Memory). Several studies have provided empirical support for this dynamic interplay of macrosystems (e.g., Bledow et al., 2011; Yang et al., 2016). Bledow et al. (2011) found that the shift between macrosystems results in disproportionally high work engagement, indicating that work engagement emerges from a dynamic interplay of affect that initiates those macrosystems.

Going beyond existing knowledge about the interactions of different affects, we predict that two macrosystems should interact in regulating achievement motive enactment, thereby fostering flow experience and work engagement. In light of the finding that the impact of traits on motivational processes is contingent upon job conditions (van den Berg & Feij, 2003), we also examine whether role clarity moderates the interaction effect of two forms of achievement motive enactment on day-specific work engagement and flow experience. Role clarity is defined as the degree to which employees receive clear and consistent information about their tasks and goals and other relevant job conditions (Kahn et al., 1964; Kauppila, 2013; Rizzo et al., 1970). Kahn (1990) identified role clarity as an antecedent of work engagement given its function as a resource, as clarity regarding work methods and processes is necessary for task completion and goal achievement (Bliese & Castro, 2000; Gillet et al., 2016) and has been positively linked with self-efficacy, performance, commitment and work engagement (e.g., Chen & Bliese, 2002; Halbesleben, 2010; Örtqvist & Wincent, 2006; Seppälä et al., 2015; Venz et al., 2018; Whitaker et al., 2007). In line with the plasticity hypothesis (Brockner, 1983), which states that individuals are influenced by environmental factors to different degrees according to their individual characteristics, we expect role clarity to moderate the interaction between achievement motive enactment via the Object Recognition system and achievement motive enactment via Extension Memory. When employees perceive high role clarity, motive enactment should be less relevant for flow and work engagement since a match between skills

and task requirements is provided by a clear task structure. In contrast, when role clarity is low, dispositional antecedents (i.e., achievement motive) have a stronger influence on flow and work engagement. Individuals differ in the way they identify and engage with their tasks and experience flow during task completion depending on their personalities (i.e., how they enact their achievement motive).

In our study, we seek to make four contributions to the literature on flow and work engagement. First, we shed light on the interplay of motivation and volition by going beyond existing knowledge about the impact of achievement motive on motivational states at work. We identify different dispositional tendencies in achievement motive enactment, thereby explaining how high levels of achievement motive facilitate flow and work engagement over the course of several working days. In particular, we consider not only the main effects of traits (e.g., achievement motive) but also the interaction effects of two forms of achievement motive enactment. In doing so, we seek to extend the scholarly understanding of the impact of achievement motive on flow and work engagement by using two different but complementary forms of achievement motive enactment, which form the mechanistic basis of general motive strength.

Second, by employing a daily diary study, we explicitly take temporal dynamics in flow and work engagement into account. In particular, our research design allows us to explore lagged main and interaction effects of personality systems on motivational states and thus control for temporal fluctuations and different situational contingencies over time (see Ohly et al., 2010 for an overview).

Third, we propose achievement motive enactment as a dispositional antecedent of flow and work engagement. As noted by Baumann and Scheffer (2011), stable dispositions and their interplay with each other constitute a neglected domain of research. Moreover, dispositional individual differences shape people's tendencies regarding the frequency of and ability for flow and work engagement (Csikszentmihalyi et al., 1993; Haworth et al., 1997; Kahn, 1990; Keller & Bless, 2008; Keller & Blomann, 2008). Fourth, we extend the research on the interplay between job characteristics and achievement motive enactment on work engagement and flow experience by introducing role clarity, which has previously been identified as an antecedent of work engagement, as a moderating variable (Kahn, 1990). Building upon existing knowledge on interactions between personality and working environment, we apply the plasticity hypothesis (Brockner, 1983) on the role of achievement motive in developing flow and work engagement.

In the following, we elaborate on how two forms of achievement motive enactment differentially relate to flow and work engagement. Then, we derive hypotheses about the main and interaction effects of the two forms of enactment on flow experiences and work engagement. We test these predictions through a daily diary study over five consecutive working days. In addition, we elaborate on the impact of role clarity on the hypothesized two-way interaction by analyzing a three-way interaction in a second diary study.

Day-specific flow and work engagement and achievement motive enactment

As stated before, a balance between individual skills and job demands is a prerequisite for experiencing flow and engaging in certain tasks at work (e.g., Csikszentmihalyi, 1975/2000, 1990). When achievement motive is enacted via Extension Memory, individuals can access their extensive semantic network that stores integrative experiences and fosters high-level intuitive information processing. This cautious, flexible, and holistic processing enables individuals to access implicit self-representations (i.e., prior memories, values, needs, experiences, and motives). Difficulties are likely to be perceived as challenges rather than potential hindrances. When achievement motive is not enacted via Extension Memory, individuals are at risk of pursuing goals and following tasks that are not congruent with their personalities. Past research has demonstrated that the congruence of implicit self-representations is essential for flow experience (e.g., Schüler et al., 2014). Consequently, we expect that the enactment of achievement motives via the integrated self facilitates day-specific flow and work engagement over time.

H1: Achievement motive enactment via Extension Memory is positively related to (a) day-specific work engagement and (b) day-specific flow experience.

As the opposite system to extension memory, the object recognition system primarily implies alert-driven attention regulation (Kuhl, 2000a). Such forms of regulation involve shifting an individual's attentional focus to threats, problems, or other stressful aspects of situations to detect discrepancies between the situation and the person's wishes or expectancies (Koole et al., 2019). Several experimental studies have provided convergent empirical evidence that access to implicit self-representations is reduced when the object recognition system is activated (Baumann & Kuhl, 2002; Kazén et al., 2003). As a result, people are less able to reduce negative affect (e.g., Koole & Jostmann, 2004). If individuals enact their achievement motive via the object recognition system, they become more alert and sensitive to discrepancies in external stimuli and internal "objects" of experience (Kuhl et al., 2006). The object recognition system is activated primarily in cases of an imbalance and hence causes employees to enact their

achievement motive in a way that impedes flow and work engagement. An imbalance occurs when the individual's skills and the challenge of the task are not matched, either because the individual's skills exceed the challenge (the individual feels bored), or the challenge exceeds the individual's skills (the individual feels anxious). Whereas awareness of this imbalance might be beneficial for goal monitoring, as it is sensitive to deviations from expectations, standards, or goal objectives, the negative affect associated with such an imbalance can impair flow and work engagement. Therefore, we expect achievement motive enactment via the object recognition system to hinder flow and work engagement.

H2: Achievement motive enactment via the Object Recognition system is negatively related to (a) day-specific work engagement and (b) day-specific flow experience.

Dynamic interplay of achievement motive enactment via the Object Recognition system and Extension Memory

According to PSI theory, not only is human personality characterized by dispositional tendencies in one of the four macrosystems, but its functioning is primarily driven by interactions between all four macrosystems. A main task for individuals is to achieve personal growth, meaning that an individual is open to new (i.e., unexpected or undesired) information that can be integrated into existing networks of autobiographical knowledge (Koole et al., 2019). A prerequisite for personal growth is the ability to flexibly switch between the Object Recognition system and Extension Memory. For instance, the activation of Extension Memory downregulates activities in the Object Recognition system, thereby allowing individuals to use parallel processing of both current and past personal experiences to integrate new experiences into existing networks of knowledge, experiences, and values (Baumann & Kuhl, 2002). If the opposite is the case (i.e., a strong activation of the Object Recognition system paired with a weak activation of Extension Memory), individuals become more alert and open to undesirable experiences, and they focus on isolated stimuli and objects (Yang et al., 2016).

As a result of the interaction of both forms of motive enactment, individuals will most notably engage in flow and work engagement if they are able to simultaneously access both macrosystems when striving to achieve their goals (Kuhl, 2000a, 2001). According to Bledow et al. (2011), the initial negative relation of negative events to day-specific work engagement can become motivational potential, which is manifested as disproportionally high work engagement. That is, if individuals can focus on the problematic situation (Object Recognition system) and integrate those experiences into the broad semantic network of the self (Extension

Memory), the combination of both forms of enactment can enable individuals to develop and extend their self, which, in turn, fosters flow and work engagement (Bledow et al., 2011; Yang et al., 2016). This dynamic interplay of both macrosystems is called self-development, an internal mechanism that describes the ability to regulate negative affect, which enables the integration of new experiences into extended networks of individual prior experiences (Kuhl et al., 2006). Self-development has also been identified as a prerequisite for an integrated self, which is often used as a descriptive term that indicates significant behavioral achievements (Kuhl et al., 2006). In support of this line of reasoning, Bledow et al. (2011) and Yang et al. (2016) found that downshifts in negative affect enhanced the positive relations of upshifts in positive affect with high work engagement and organizational citizenship behavior.

An employee who strongly tends to enact his/her achievement motive only via the Object Recognition system is likely to experience a negative affective state when he/she receives negative feedback from his/her supervisor. This negative feedback impairs the affectively rewarding experiences related to improving one's performance that are necessary for flow and work engagement for individuals with high achievement motive. Without the opportunity to learn from this feedback, the person is likely to remain in a state that hinders flow and work engagement. However, if the person can integrate those experiences to learn and self-develop based on the negative feedback (i.e., to integrate the experiences into Extension Memory), flow and work engagement should increase.

H3: Achievement motive enactment via Extension Memory interacts with achievement motive enactment via the Object Recognition system in predicting (a) work engagement and (b) flow experience such that when achievement motive enactment via Extension Memory is high, the relations of achievement motive enactment via the Object Recognition system to both outcomes are positive, whereas when achievement motive enactment via Extension Memory is low, the relations of achievement motive enactment via the Object Recognition system to both outcomes are negative.

Study 1

Methods

Sample and Study Design

To test our proposed hypotheses, we conducted a daily diary study, as this study design offers several methodological benefits for the analysis of the relation between person-level predictors

and day-specific outcomes. Both flow experience and work engagement exhibited high levels of within-person variance in prior studies, thereby calling for diary studies, which allow for the thorough separation of different sources of variance (Rivkin et al., 2018; Sonnentag et al., 2010a). In addition, between-person variance in day-specific variables is contingent on person-specific factors (i.e., interindividual dispositions; Diestel et al., 2015; Kühnel et al., 2011). The repeated measures within the diary study ensured the reliable measurement of temporal fluctuation in both outcome variables at the individual level. Thus, our longitudinal design allowed for the prediction of states of flow and work engagement. Third, the use of multiple measures over the course of several workdays also helped reduce common-method variance caused by the sole use of self-report measures (Podsakoff et al., 2003).

The participants (German employees primarily from the service sector with regular contact with customers, clients, patients, or other individuals at work) were recruited via the e-mail distribution lists of several universities and social networks such as LinkedIn, XING, and Facebook. Overall, 62 employees (44.19% part-time) with an average age of 33.61 years (*SD* = 13.99) were included in this study. A total of 59.68% of the sample was women. On average, the participants completed 71.94% of the day-specific questionnaires. In advance of the day-specific measurements, the participants responded to a general questionnaire that assessed biographical variables and person-level constructs (e.g., achievement motive enactment). Over five consecutive workdays, the participants received e-mails to answer day-specific questions about work engagement and flow experience two hours after the end of work. After the participants received the e-mails, the surveys were accessible for 4 hours, with a reminder being sent after two hours. On weekends and public holidays, the diary study was suspended and continued the next regular working day. There was no drop-out between the general questionnaire and the day-specific measurements.

In line with Meier et al. (2013), we tested the deterioration of compliance over time by examining whether the day of study (ranging from 1 to 5) was related to missing data (0 = no missing data; 1 = missing data). The data suggest that the day of the study was unrelated to missing data (r = 0.02, n.s.), indicating that compliance did not deteriorate over time.

Measures

Achievement Motive Enactment. The Motive Enactment Test (MET; Kuhl, 1999; Kuhl & Henseler, 2004) was used to measure achievement motive enactment via both Extension Memory (e.g., “I can thoroughly identify myself with most of the tasks I assume” and “When I think about my previous achievements, I feel very good”) and the Object Recognition system

(e.g., “No matter how good my performance is, I still see critical aspects” and “A bad performance can truly pull me down”). The items were scored on a four-point rating scale ranging from 0 (“does not apply”) to 3 (“completely applies”).

Day-Specific Work Engagement. The German version of the Work Engagement Scale (Schaufeli et al., 2006) was used to measure day-specific work engagement. The scale has three subscales, namely, vitality, dedication, and absorption, and a total of nine items (e.g., “In this moment, I feel bursting with energy”). The responses are provided on a seven-point rating scale from 0 (“does not apply”) to 6 (“completely applies”).

Day-Specific Flow Experience. Four items from Rheinberg et al. (2003) were used to measure day-specific flow experience. The items were easily adapted for the content to refer specifically to the working day (e.g., “Today at work, I was focused entirely on what I was doing”). The participants were asked to provide their answers to the items on a seven-point rating scale from 1 (“not at all”) to 7 (“completely”).

Construct Validity of the Day-Level Variables

We conducted multilevel confirmatory factor analyses (MCFAs) to test the divergent validity of the day-level variables work engagement and flow experience. First, we tested a two-factor measurement model including the two variables as distinct factors. The fit indices for this model indicated a satisfactory fit: $\chi^2(128) = 211.38$, $p < 0.01$, root mean square error of approximation (RMSEA) = 0.054, comparative fit index (CFI) = 0.957, standardized root mean square residual within-person/between-person (SRMRw/ SRMRb) = 0.044/0.046. In contrast, a model integrating the two day-level variables into one common factor performed worse ($\chi^2(130) = 319.85$, $p < 0.01$, RMSEA = 0.081, CFI = 0.903, SRMRw/SRMRb = 0.061/0.061). Taken together, the results of the conducted MCFAs suggest that the two day-level variables work engagement and flow experience represented distinct constructs.

Analytical Procedure

Hierarchical linear modeling takes into account the independence of nested data since an interaction between the two levels is possible (Hox, 2002). All specifications and parameters were calculated using the program MLwiN (Rasbash et al., 2019). The null model contained only the intercept. In model 1, the person-level variables gender and age were added. In model 2, the person-level variables achievement motive enactment via the Object Recognition system and achievement motive enactment via Extension Memory were included as the main predictors. Model 3 included the interaction between the two predictors added in model 2. The person-level variables achievement motive enactment via the Object Recognition system and

achievement motive enactment via Extension Memory were centered around the grand mean (Enders & Tofighi, 2007) to reduce the risk of multicollinearity in the analysis of the hypothesized interaction effect.

Results

Table 1 displays the descriptive statistics, internal consistencies (Cronbach's alphas) and correlations among the study variables. Before testing our hypotheses, we examined the within-person (level 1) variance of work engagement and flow experience. The proportion of within-person variance was 41.3% for work engagement and 52.1% for flow experience, indicating substantial level 2 variance in both dependent variables. These high levels of day-specific fluctuation justified the application of multilevel modeling.

Table 1

Means, Standard Deviations, Internal Consistencies (Cronbach's Alphas), and Intercorrelations of the Study Variables

Variable		1	2	3	4	5	6
1.	Work Engagement	(0.95)	**0.79**				
2.	Flow Experience	**0.80**	(0.87)				
3.	AME-ORS[a]	-0.05	-0.05	(0.79)			
4.	AME-EM[b]	**0.36**	0.21	-0.20	(0.68)		
5.	Age	**0.37**	**0.50**	0.09	0.01	-	
6.	Gender[c]	0.15	0.22	-0.10	-0.22	0.25	-
	M	4.17	3.89	1.73	3.05	33.61	1.40
	SD	1.18	1.35	0.59	0.52	13.99	0.49

Note. The Cronbach's alpha for day-level variables is the mean internal consistency averaged over all measurement days. Correlations below the diagonal are person-level correlations ($N = 62$); those above the diagonal are day-level correlations ($N = 223$). Numbers in bold indicate $p < .05$. [a]Achievement motive enactment via the object recognition system [b]Achievement motive enactment via extension memory [c]Gender (1 = female, 2 = male).

Hypothesis Testing

According to Hypothesis 1, we predicted that achievement motive enactment via Extension Memory would be positively related to (a) day-specific work engagement and (b) day-specific flow experience. In line with this prediction, the multilevel estimates (see Table 2) revealed that achievement motive enactment via Extension Memory was significantly positively related to both work engagement ($\gamma = 0.42$, $SE = 0.13$, $p < 0.01$) and flow experience ($\gamma = 0.34$, $SE = 0.15$,

$p < 0.01$). In addition, Model 2 showed an improved fit compared with that of Model 1, as indicated by the difference in the log likelihood ratios for work engagement (Δ -2*log = 11.0, $df = 2$, $p < 0.01$) and flow experience (Δ -2*log = 6.6, $df = 2$, $p < 0.05$).

Hypothesis 2 proposed that achievement motive enactment via the Object Recognition system would be negatively related to (a) day-specific work engagement and (b) day-specific flow experience. However, contrary to this proposition, multilevel estimates revealed that achievement motive enactment via the Object Recognition system did not significantly predict either work engagement ($\gamma = -0.04$, $SE = 0.14$, n.s.) or flow experience ($\gamma = -0.09$, $SE = 0.15$, n.s.).

In Hypothesis 3, we predicted that achievement motive enactment via Extension Memory would interact with achievement motive enactment via the Object Recognition system in predicting (a) work engagement and (b) flow experience such that the presence of both enactment types would be most adaptive for self-regulation. In line with our prediction, multilevel estimates revealed that achievement motive enactment via Extension Memory and achievement motive enactment via the Object Recognition system significantly interacted to predict both work engagement ($\gamma = 0.33$, $SE = 0.12$, $p < 0.05$) and flow experience ($\gamma = 0.34$, $SE = 0.15$, $p < 0.01$). Model 3 showed an improved fit compared with that of Model 2, as indicated by the difference in the log likelihood ratios for work engagement (Δ -2*log = 7.8, $df = 1$, $p < 0.01$) and flow experience (Δ -2*log = 9.3, $df = 1$, $p < 0.01$). To facilitate the interpretation of the interactions, we depicted the interactions and performed simple slope tests, as recommended by Preacher et al. (2006). As Figure 3 shows, the interaction patterns are consistent with Hypothesis 3. In particular, for people high in achievement motive enactment via Extension Memory, the relationships between achievement motive enactment via the Object Recognition system and day-specific (a) work engagement and (b) flow experience were more positive ($\gamma = 0.39$, $t = 3.10$, $p < 0.01$; $\gamma = 0.43$, $t = 3.37$, $p < 0.01$, respectively) than for those low in achievement motive enactment via Extension Memory ($\gamma = -0.28$, $t = 1.78$, $p < 0.10$; $\gamma = -0.37$, $t = 2.36$, $p < 0.05$, respectively).

Table 2

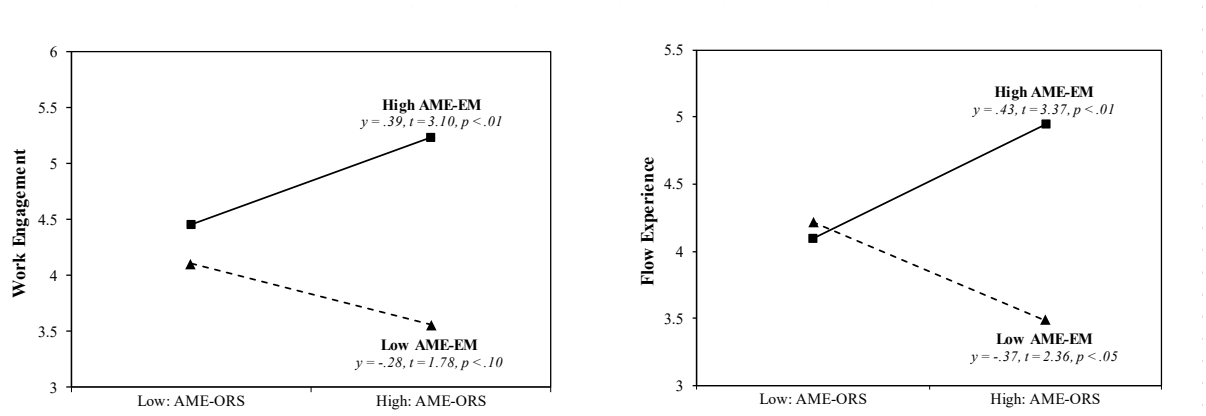
Multilevel Estimates for the Prediction of Work Engagement and Flow Experience

	Work Engagement								Flow Experience							
	Null Model		Model 1		Model 2		Model 3		Null Model		Model 1		Model 2		Model 3	
Effects	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE
Fixed effects																
Intercept	4.30**	(0.14)	4.29**	(0.14)	4.28**	(0.12)	4.34**	(0.12)	4.14**	(0.15)	4.12**	(0.14)	4.12**	(0.14)	4.19**	(0.13)
Age			0.24	(0.14)	0.21	(0.13)	0.23	(0.12)			0.30*	(0.15)	0.28	(0.14)	0.31	(0.13)
Gender			0.05	(0.14)	0.10	(0.13)	0.18	(0.13)			0.13	(0.15)	0.15	(0.15)	0.25	(0.14)
AME-ORS[a]					-0.04	(0.14)	0.06	(0.13)					-0.09	(0.15)	0.03	(0.14)
AME-EM[b]					0.42**	(0.13)	0.51**	(0.13)					0.34**	(0.15)	0.43**	(0.14)
AME-ORS x AME-EM							0.33**	(0.12)							0.40**	(0.13)
Random effects																
Level 1 intercept variance (day level)	0.59		0.59		0.59		0.59		0.99		0.99		0.99		0.99	
Level 2 intercept variance (person level)	0.84		0.82		0.66		0.57		0.91		0.83		0.73		0.60	
- 2*log (lh)	616.6		613.0		602.0		594.2		711.7		705.8		699.2		689.9	
Δ - 2*log (lh)			3.3		11.0**		7.8**				5.9*		6.6*		9.3**	
df			2		2		1				2		2		1	
R^2 (person level)			.024		.214		.321				.088		.198		.341	
Δ R^2 (person level)					.190		.107						.100		.143	

Note. Gender, age, AME-ORS, and AME-EM are person-level (Level 2) variables; work engagement and flow experience are day-level variables (Level 1). The R-squared values for the day level are not reported since the value is constant between models. * $p < .05$ ** $p < .01$ [a]Achievement motive enactment via the object recognition system [b]Achievement motive enactment via extension memory

Figure 3

Interaction Plots for Predicting Work Engagement and Flow Experience



Note. AME-ORS = Achievement motive enactment via the object recognitions system, AME-EM = Achievement motive enactment via extension memory

Additional Analyses

We further analyzed whether the effects of the two-way interaction on flow and work engagement changed over time. After extracting the individual slopes for the study day as a predictor of flow and work engagement, we tested whether the two-way interaction had a significant effect on the slopes. For both outcomes, the interaction was not significant (flow experience: $\gamma = 0.04$, $SE = 0.03$, n.s.; work engagement: $\gamma = 0.03$, $SE = 0.02$, n.s.). This finding indicates that the interaction effect is stable over time, at least over the course of the study. In addition, we tested whether the two-way interaction would predict the variance in both outcomes after the study day was controlled. The results indicated that the day did not have an influence on the variance for either flow or work engagement ($\gamma = -0.08$, $SE = 0.04$, n.s.; $\gamma = -0.01$, $SE = 0.03$, n.s., respectively). The interaction remained significant ($\gamma = 0.29$, $SE = 0.09$, $p < 0.01$; $\gamma = 0.15$, $SE = 0.06$, $p < 0.05$, respectively), signifying that even the study day was controlled, flow and work engagement were more pronounced under favorable conditions.

Discussion

We conducted a diary study to examine the main and interaction effects of achievement motive enactment via the Object Recognition system and Extension Memory on day-specific flow and work engagement. Our findings indicate that achievement motive enactment via Extension Memory is positively related to both work engagement and flow experience. Specifically, the more strongly individuals enact their achievement motive via Extension Memory, the higher their overall level of day-specific work engagement and flow experiences. This finding indicates that individuals with sufficient access to their extended networks of individual prior

experiences and self-representations experience higher levels of flow and work engagement at work. The predicted negative impact of achievement motive enactment via the Object Recognition system on flow and work engagement, however, could not be empirically supported. Thus, the achievement motive enactment via the Object Recognition system has no adverse impact on flow and work engagement at work. Moreover, we examined the interaction effects between achievement motive enactment via Extension Memory and achievement motive enactment via the Object Recognition system in the prediction of flow and work engagement. In line with previous studies investigating the dynamic interplay of the macrosystems postulated in PSI theory (e.g., Bledow et al., 2011; Yang et al., 2016), we found that the presence of both dispositional forms of enactment is most beneficial for flow and work engagement.

Study 2

Prior studies have shown that approximately 55–60% of the variance in flow (Diestel et al., 2015; Rivkin et al., 2018) and approximately 60–65% of the variance in work engagement (Sonnentag, 2003; Venz et al., 2018) can be explained by between-person variance, meaning variations that are caused by differences between persons. Accordingly, we reported 48% (flow experience) and 59% (work engagement) between-person variance in study 1, indicating stable patterns of flow experience and work engagement that consequently must be able to be predicted by level 2 variables. Even in cases of strong intraindividual variations over the course of a study, there are factors that are stable over time in predicting both outcomes. Differences between persons can be explained by differences in personality (traits), job characteristics, or their interaction. In this vein, van den Berg and Feij (2003) demonstrated that personality traits and job characteristics can have additive and nonadditive effects on behavioral outcomes. Our results from study 1 suggest that Extension Memory contributes to an emotional and holistic way of experiencing good access to stored experiential knowledge. This experience should be especially adaptive in situations when a large amount of information and contradictory or ambiguous elements require parallel processing (Scheffer & Manke, 2018). In work environments, individuals increasingly face ambiguous and unclear task requirements as organizations become more flexible and dynamic and establish new or expanded roles (Schmidt et al., 2014). Kahn (1990) identified role clarity as a resource that facilitates work engagement. In addition, Lang et al. (2007) demonstrated that role clarity can buffer the deleterious effects of job stressors on well-being since perceived clarity increases the likelihood of attaining one's personally valued goals (Bliese & Castro, 2000). Prior studies have demonstrated direct

(Seppälä et al., 2015) and indirect (Halbesleben, 2010) links of role clarity to engagement at work.

The Impact of Role Clarity on Achievement Motive Enactment

We propose that role clarity buffers the interaction of different forms of achievement motive enactment. Our propositions are derived from two lines of argument: the plasticity hypothesis and research on selective optimization and compensation (SOC) strategies on role clarity and work engagement. The plasticity hypothesis (Brockner, 1983) states that individuals are influenced by environmental factors to different degrees according to their individual characteristics. Prior research has revealed that employees with low self-esteem are more susceptible to work environment factors (e.g., role ambiguity) than their counterparts with high self-esteem (Ganster & Shaubroeck, 1991; Jex & Elacqua, 1999; Mossholder et al., 1981; Pierce et al., 1993). A similar pattern was found by Trépanier et al. (2013) and Gillet et al. (2016), who reported that the effects of motivation (free volitional choice vs. internal and/or external pressures) on anxiety and distress were moderated by role clarity. Prior research on SOC also suggests that the impact of role clarity on work engagement is moderated by resources that are linked to adaptiveness in adverse situations (Zacher & Frese, 2011). According to Venz et al. (2018), SOC compensates for low role clarity. Conversely, when the structure of a task is transparent and role clarity is given, there is no need for adaptive self-management. This finding indicates that role clarity makes the structure of the task clear and conveys meaningfulness. According to our lines of reasoning, we expect role clarity to moderate the interaction between achievement motive enactment via the Object Recognition system and via Extension Memory. When role clarity is low, the conjunction of both forms of achievement motive enactment (via the Object Recognition system and Extension Memory) should exert beneficial impacts on flow and work engagement. In this case, Extension Memory represents a protective mechanism that supports individuals in adjusting their goals to the current situation and optimizing the investment of available resources. Without this integrative function, individuals are likely to experience a mismatch between their skills and the challenge of a task (Venz et al., 2018). When there is a high level of clarity regarding task procedures, role conditions and goal achievement, motivational processes have less influence on flow and work engagement, as the match between the skills of the individual and the challenge of the task is enabled by the clear structure of the task (Bliese & Castro, 2000; Lang et al., 2007).

H4: Three-way interaction: Role clarity moderates the interaction effect of achievement motive enactment via Extension Memory and achievement motive

enactment via the Object Recognition system on (a) work engagement and (b) flow experience. In cases of low role clarity, the conjunction of achievement motive enactment via Extension Memory and achievement motive enactment via the Object Recognition system exerts beneficial effects on work engagement and flow experience, whereas in cases of high role clarity, neither form of achievement enactment interacts in predicting the two outcome variables.

Methods

Sample and Study Design

The procedure for recruiting the participants and completing the diary study was the same as that in study 1, with the only difference being that the study was conducted over 10 (instead of 5) consecutive workdays. Again, we ideally asked people who were employed in the services sector and who had daily work-related contact with clients, patients, or customers. In total, we recruited 223 people (response rate: 84.84%; 1892 daily measurement points). In contrast to that for study 1, the data collection for study 2 took place during the COVID-19 pandemic between April and May 2020. The first study was conducted before the pandemic and its far-reaching impacts, but it is important to note that work conditions (i.e., role clarity) in study 2 played a more prominent role in the outcome variables flow and work engagement. It is likely that the means of and variance in role clarity differed from what would have been measured before the outbreak. The percentage of home workers within study 1 was not recorded but given that we recruited individuals from the service sector, it is likely that the rate was fairly low. For study 2, 73.04% of participants worked exclusively from home during the data collection period. Before the COVID-19 outbreak, the share of teleworking hours among the participants' total working hours was 16.14% (*SD* = 26.8).

Measures

We assessed achievement motive enactment, work engagement, and flow experience with the same scales from study 1.

Role Clarity. Role clarity was measured using the Role Ambiguity Scale (Sodenkamp & Schmidt, 2000), which contains subdimensions for the clarity of work methods (e.g., "In my job, I know exactly how to proceed in order to do my job well.") and clarity of work processes (e.g., "In my job, I know exactly when to do a particular task."). The items are scored on a seven-point rating scale ranging from 1 (does not apply) to 7 (completely applies).

Control Variables. Previous research indicated that high stress impedes flow and work engagement (e.g., Peifer et al., 2014). The COVID-19 pandemic may have affected people in different ways. Therefore, we added emotional exhaustion as the focal dimension of burnout as a control variable. Emotional exhaustion was measured with eight items from the German translation (Büssing & Perrar, 1992) of the Maslach Burnout Inventory (Maslach et al., 1996). An exemplary item is "I feel emotionally drained by my work". The items are scored on a six-point rating scale ranging from 1 (never) to 6 (very often).

Construct Validity. As in study 1, we conducted multilevel confirmatory factor analyses (MCFAs) to test the divergent validity of the day-level variables work engagement and flow experience. First, we tested a two-factor measurement model including the two variables as distinct factors. The fit indices for this model indicated a satisfactory fit: $\chi^2(128) = 211.38$, $p < 0.01$, root mean square error of approximation (RMSEA) = 0.054, comparative fit index (CFI) = 0.957, standardized root mean square residual within-person/between-person (SRMRw/ SRMRb) = 0.044/0.046. In contrast, a model integrating the two day-level variables into one common factor performed worse ($\chi^2(130) = 1223.79$, $p < 0.01$, RMSEA = 0.067, CFI = 0.910, SRMRw/SRMRb = 0.040/0.041). Taken together, the results of the conducted MCFSs suggest that the two day-level variables work engagement and flow experience represent distinct constructs.

Results

Table 3 displays the descriptive statistics, internal consistencies (Cronbach's alphas) and correlations among the study variables. The analyses of variance suggest substantial Level 1 variance in the outcomes (work engagement: 47.5%; flow experience: 43.9%).

Hypothesis Testing

We tested our hypotheses by comparing four different models. In the null model, we included the intercept as the only predictor. In Model 1, we added the control variables age, gender, and emotional exhaustion. In Model 2, we entered achievement motive enactment via the Object Recognition system, achievement motive enactment via Extension Memory, and role clarity at Level 2. In Model 3, we added the two-way interactions between the variables introduced in Model 2. Finally, in Model 4, we introduced the three-way interaction achievement motive enactment via the Object Recognition * achievement motive enactment via Extension Memory * role clarity.

Table 3

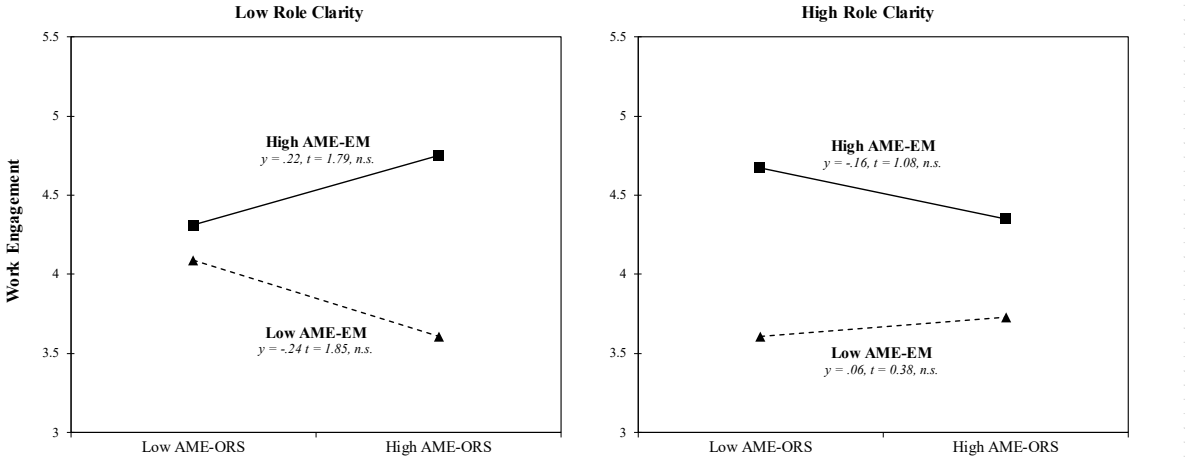
Means, Standard Deviations, Internal Consistencies (Cronbach's Alphas), and Intercorrelations of the Study Variables

Variable		1	2	3	4	5	6	7	8
1.	Work Engagement	(0.96)	**0.84**						
2.	Flow Experience	**0.89**	(0.90)						
3.	AME-ORS[a]	**-0.24**	**-0.15**	(0.84)					
4.	AME-EM[b]	**0.43**	**0.37**	**-0.39**	(0.67)				
5.	Role Clarity	0.09	0.05	-0.03	0.07	(0.91)			
6.	Emotional Exhaustion	**-0.24**	**-0.13**	**0.34**	**-0.34**	**-0.19**	(0.87)		
7.	Age	0.10	0.08	**-0.20**	0.09	**0.15**	-0.06	-	
8.	Gender[c]	-0.01	-0.02	**-0.18**	-0.01	**-0.15**	-0.01	0.02	-
	M	4.11	4.15	1.78	3.03	4.33	2.60	38.65	1.44
	SD	1.00	1.04	0.6	0.43	1.19	0.96	11.31	0.51

Note. The Cronbach's alpha for day-level variables is the mean internal consistency averaged over all measurement days. Correlations below the diagonal are person-level correlations ($N = 230$); those above the diagonal are day-level correlations ($N = 1892$). Numbers in bold $p < .05$. [a]Achievement motive enactment via the object recognition system [b]Achievement motive enactment via extension memory [c]Gender (1 = female, 2 = male).

Figure 4

Three-way Interaction Plots for Predicting Work Engagement

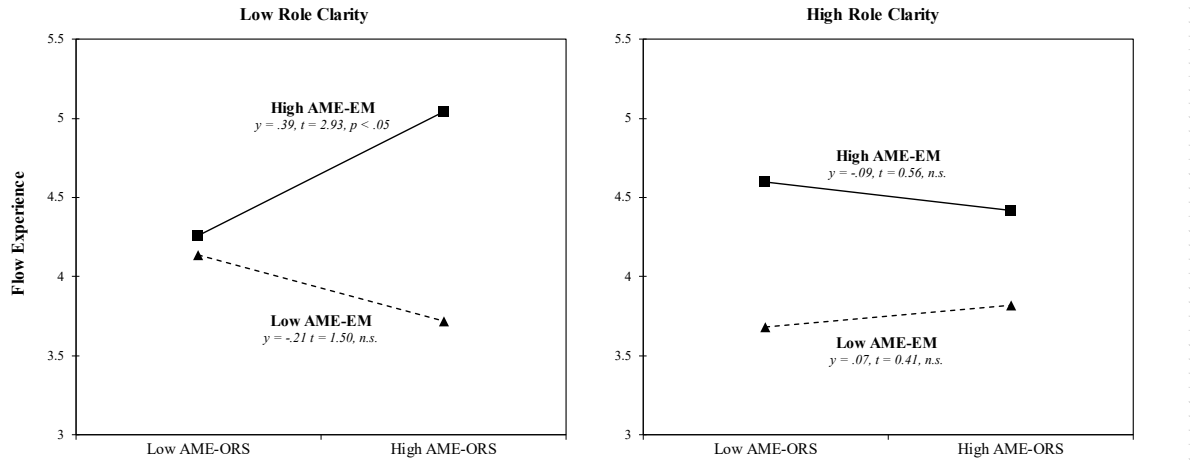


Note. AME-ORS = Achievement motive enactment via the object recognitions system, AME-EM = Achievement motive enactment via extension memory

In Hypothesis 4, we predicted a three-way interaction between achievement motive enactment via Extension Memory, achievement motive enactment via the Object Recognition system, and role clarity in predicting (a) work engagement and (b) flow experience. In line with our prediction, multilevel estimates revealed that the variables significantly interacted to predict work engagement (γ = -0.17, *SE* = 0.06, $p < 0.01$; see Table 4) and flow experience (γ = -0.19, *SE* = 0.07, $p < 0.01$; see Table 5). Model 4 showed an improved fit compared with that of Model 3, as indicated by the difference in the log-likelihood ratios for work engagement (Δ -2*log = 3.5, *df* = 1, $p < 0.01$) and flow experience (Δ -2*log = 3.9, *df* = 1, $p < 0.01$). To facilitate the interpretation of the interactions, we depicted the interactions and performed simple slope tests, as recommended by Preacher et al. (2006). As Figures 4 (work engagement) and 5 (flow experience) show, the interaction patterns are consistent with Hypothesis 4. In particular, the moderating effect of achievement motive enactment via Extension Memory on flow experience is stronger in cases of low role clarity (γ = 0.39, *t* = 2.93, $p < 0.05$) than in cases of high role clarity.

Figure 5

Three-way Interaction Plots for Predicting Flow Experience



Note. AME-ORS = Achievement motive enactment via the object recognitions system, AME-EM = Achievement motive enactment via extension memory

Table 4

Multilevel Estimates for the Prediction of Work Engagement

	Work Engagement									
	Null Model		Model 1		Model 2		Model 3		Model 4	
Effects	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE
Fixed effects										
Intercept	4.11**	(0.07)	4.12**	(0.20)	4.09**	(0.19)	4.06**	(0.19)	4.14**	(0.19)
Age			-0.01	(0.13)	-0.00	(0.12)	-0.00	(0.12)	-0.03	(0.12)
Gender			0.08	(0.06)	0.04	(0.06)	0.03	(0.06)	0.03	(0.06)
Emotional Exhaustion			-0.24**	(0.07)	-0.09	(0.07)	-0.09	(0.07)	-0.11	(0.07)
AME-ORS[a]					-0.05	(0.07)	-0.06	(0.07)	-0.03	(0.07)
AME-EM[b]					0.38**	(0.07)	0.39**	(0.07)	0.38**	(0.07)
Role Clarity (RC)					0.05	(0.07)	0.03	(0.07)	-0.05	(0.07)
AME-ORS x AME-EM							-0.05	(0.05)	0.06	(0.07)
AME-ORS x RC							-0.03	(0.07)	-0.02	(0.07)
AME-EM x RC							0.03	(0.07)	0.04	(0.07)
AME-ORS x AME-EM x RC									-0.17**	(0.06)
Random effects										
Level 1 intercept variance (day level)	0.94		0.94		0.94		0.94		0.94	
Level 2 intercept variance (person level)	0.85		0.80		0.68		0.69		0.66	
- 2*log (lh)	-2862.8		-2855.6		-2838.0		-2837.3		-2833.8	
Δ - 2*log (lh)			7.2**		17.6**		0.7		3.5**	
df			3		3		3		1	
R^2 (person level)			.059		.200		.188		.224	
Δ R^2 (person level)					.141		-.012		.036	

Note. Gender, age, emotional exhaustion, AME-ORS, AME-EM, and role clarity are person-level (Level 2) variables; work engagement is a day-level variable (Level 1). The R-squared values for the day level are not reported since the value is constant between models. * $p < .05$ ** $p < .01$ [a]Achievement motive enactment via the object recognition system [b]Achievement motive enactment via extension memory

Table 5

Multilevel Estimates for the Prediction of Flow Experience

	Flow Experience									
	Null Model		Model 1		Model 2		Model 3		Model 4	
Effects	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE
Fixed effects										
Intercept	4.15**	(0.07)	4.18**	(0.21)	4.13**	(0.20)	4.12**	(0.21)	4.21**	(0.20)
Age			-0.02	(0.14)	-0.01	(0.13)	-0.01	(0.13)	-0.04	(0.13)
Gender			0.08	(0.07)	0.05	(0.07)	0.05	(0.07)	0.04	(0.07)
Emotional Exhaustion			-0.13**	(0.07)	-0.01	(0.07)	-0.01	(0.08)	-0.03	(0.08)
AME-ORS[a]					0.01	(0.08)	0.01	(0.08)	0.04	(0.08)
AME-EM[b]					0.38**	(0.07)	0.38**	(0.08)	0.37**	(0.08)
Role Clarity (RC)					0.02	(0.07)	0.00	(0.08)	-0.08	(0.08)
AME-ORS x AME-EM							-0.01	(0.06)	0.11	(0.07)
AME-ORS x RC							-0.06	(0.07)	-0.05	(0.07)
AME-EM x RC							-0.00	(0.08)	0.01	(0.08)
AME-ORS x AME-EM x RC									-0.19**	(0.07)
Random effects										
Level 1 intercept variance (day level)	1.15		1.15		1.15		1.15		1.15	
Level 2 intercept variance (person level)	0.90		0.89		0.79		0.80		0.77	
- 2*log (lh)	-3039.3		-3036.8		-3023.4		-3023.0		-3019.1	
Δ - 2*log (lh)			2.5		13.4**		0.4		3.9**	
df			3		3		3		1	
R^2 (person level)			.011		.122		.111		.144	
Δ R^2 (person level)					.111		-.011		.033	

Note. Gender, age, emotional exhaustion, AME-ORS, AME-EM, and role clarity are person-level (Level 2) variables; flow experience is a day-level variable (Level 1). The R-squared values for the day level are not reported since the value is constant between models. * $p < .05$ ** $p < .01$ [a]Achievement motive enactment via the object recognition system [b]Achievement motive enactment via extension memory

General Discussion

Theoretical insights in positive psychology mainly draw from a large body of empirical evidence on flow and work engagement as fluctuating states and environmental conditions conducive to these states. When looking at dispositional precursors, research is mostly concerned with personality traits (e.g., conscientiousness). However, much less is known about how dispositional motives and their enactment shape both outcomes. In addressing this issue, we sought to identify how two forms of achievement motive enactment (via the Object Recognition system and via Extension Memory) interact with each other. PSI theory suggests that simultaneous access to both macrosystems is beneficial for flow and work engagement over time. In study 1, our results indicated that the conjunction of both dispositional forms of enactment exerts beneficial effects on general levels of day-specific flow experience and work engagement. In study 2, we tested whether role clarity moderated the interaction of both achievement motive enactment types. In support of our predictions, we found that when role clarity was low (i.e., high role ambiguity), simultaneous access to both macrosystems via both forms of achievement motive enactment interacted to predict flow experience and work engagement. In contrast, in cases of high role clarity (i.e., low role ambiguity), the simultaneous enactment of achievement motive via both macrosystems did not predict both flow and work engagement over time.

Theoretical Implications

Our research offers at least four implications for the literature on achievement motive enactment, day-specific work engagement, and flow experience. First, we not only contribute insights about motivation (what people strive for) and volition (how people strive) but also integrate both perspectives by examining interaction effects between motivation and volition. In doing so, we reveal that the Object Recognition system, a macrosystem that is linked to the presence of negative affect, can be even beneficial for flow and work engagement when both the Object Recognition system and Extension Memory are activated during the enactment of an achievement motive. Going beyond existing knowledge about affect modulation, according to which negative affect can even be beneficial for work engagement and task performance (e.g., Bledow et al., 2011; Yang et al., 2016), we provide more nuanced insights into the underlying mechanisms of personality systems interactions. On the one hand, when individuals deal with challenges or problems at work, important cues and information are provided through the stimulation of detailed object-related information processing. On the other hand, strong task-focused, goal-directed regulation of attention, behavior, and decision-making processes

are induced by repeatedly occurring negative affect, which can prevent obstacles to task completion and goal achievement.

Second, we advance empirical evidence on PSI theory by differentiating individual achievement motive via the two macrosystems, i.e., Extension Memory and Object Recognition system. If individuals enact their achievement motive via Extension Memory, they experience higher levels of day-specific flow and work engagement. Achievement motive enactment via the Object Recognition system, which causes employees to focus on potential hindrances and difficulties, can be an asset when employees also draw from their Extension Memory.

Third, the present study contributes to the understanding of the impact of achievement motive on flow and work engagement by examining two forms of achievement motive enactment. In line with previous research on individual differences and flow and work engagement (e.g., Kahn, 1990), we found that achievement motive enactment shapes people's tendencies regarding the frequency of and ability for flow and work engagement. The reported main and interaction effects represent unique insights into the dispositional antecedents of flow and work engagement that have been neglected in motivational research. More precisely, the demonstrated main effects indicate that achievement motive enactment can vary in its adaptiveness for flow and work engagement since the way the achievement motive is fulfilled differs. The interaction effect additionally indicates that simultaneous access to both forms of enactment is most beneficial for flow and work engagement, as it facilitates self-development. By exploring both underlying macrosystems in terms of how achievement motive shapes both motivational outcomes, our findings add to existing knowledge about affective shifts (Bledow et al., 2011; Yang et al., 2016). Whereas past research has proposed changes in affect to be indicators of a dynamic interplay between Object Recognition systems and Extension Memory, the present interaction patterns show how stable and dispositional tendencies in both underlying systems influence the impact of an important motivational driver on flow and work engagement, thereby explaining how and why achievement motives facilitate both outcomes.

Fourth, our results underline the importance of role clarity in the relation between achievement motive enactment and flow and work engagement. In line with the interaction of adaptive strategies and role clarity on work engagement reported by Venz et al. (2018), the integrative function of Extension Memory is necessary only when task procedures, role conditions and goal achievement are not clear. If they are clear, motivational processes have less influence on flow and work engagement, as a match between the individual's skills and the challenge of the task is enabled by the clear structure of the task (Bliese & Castro, 2000; Lang et al., 2007). Whereas

the data for study 1 were collected before the COVID-19 outbreak, the data for our second study were collected in April and May 2020, just after a national lockdown for crisis prevention in Germany was announced at the end of March. During that time, both employees and employers experienced many ambiguities regarding their tasks, responsibilities, futures, and other important facets of work. Clarity about work tasks and processes therefore played a crucial role in motivational states such as flow and work engagement.

Limitations and Suggestions for Future Research

Despite its several contributions, our study is not without limitations. First, all study variables were operationalized on the basis of self-report questionnaires, which imply the risk of common method bias (Podsakoff et al., 2003). However, in line with Siemsen et al. (2010), the effects of the current study likely reflect valid relations rather than common method artifacts since a high common method variance reduces the probability of detecting interaction effects. Nonetheless, future studies would benefit from different operationalizations of achievement motive enactment, such as neurophysiological measures (e.g., hemispheric laterality; Kuhl & Kazén, 2008).

Second, the drop-out rate in our first sample was approximately 28%, indicating that participants, on average, completed only approximately 3.5 out of 5 day-specific questionnaires. This could be seen as an indication of the low conscientiousness of some participants, which could have had an influence on the results. However, there was no deterioration of compliance over time, which indicates no statistical influence of the drop-out rate.

Third, our correlational data structure does not permit strong causal conclusions. However, the measurement of dependent and independent variables at separate times allows for more causal conclusions than a simple cross-sectional study at a single time (cf. Aguinis et al., 2013).

Fourth, based on our findings that forms of achievement motive enactment shape how employees experience flow and work engagement, we encourage scholars to examine the extent to which these dispositional antecedents are related to day-specific affects and their shifts (cf. Bledow et al, 2011). For example, as achievement motive enactment via Extension Memory represents a general ability, it is likely to interfere with affective shifts on a daily basis. Another interesting goal for future studies could be to examine whether the forms of achievement motive enactment via the two other macrosystems postulated in PSI theory (Intuitive Behavior Control and Intention Memory; Kuhl, 2000a) are also dispositional antecedents for flow and work engagement.

Fifth, our study focused on achievement motive given its strong link to flow and work engagement (e.g., autotelic personalities; Csikszentmihalyi et al., 1993). However, not all work behavior is solely goal-related and reflected in the achievement domain. Future research might consider the (moderating or mediating) impact of power and affiliation motive (cf. Mc Clelland, 1985).

Conclusion

Motive dispositions are important precursors of daily flow and work engagement. Whereas enacting the achievement motive with all of our experiential and integrative capacity (Extension Memory) is beneficial, achievement motive enactment with an alert-focus on finding negative aspects in an overall positive context (Object Recognition) is detrimental. However, people who combine these opposing enactment types in their personality show highest levels of flow and work engagement on a daily basis. This has practical implications for personnel selection and development. On one hand, companies may benefit from focusing enactment types when identifying potential candidates for job positions that require high achievement motives. On the other hand, personnel development can enhance integrative competencies, thereby facilitating enactment via Extension Memory.

Chapter 3

Affective Shifts During Off-Job Time and Next-Day Subjective Vitality: The Moderating Role of Positive Stress Beliefs

Digutsch, J., & Koch, T. J. S., & Diestel, S. (2022). Affective shifts during off-job time and next-day subjective vitality: The moderating role of positive stress beliefs. *PsyArXiv*. https://doi.org/10.31234/osf.io/hp45b

Shifts in positive and negative affect (i.e., changes between two points in time) have been used to explore the dynamics of when and how employees experience high psychological functioning. As affective shifts activate motivational and behavioral processes, those shifts have shown distinct patterns in relation to work engagement and performance over and above affect from one point in time. However, challenges remain in how affective shifts relate to other indicators of psychological functioning and how interindividual differences influence that relation. To address those gaps, we employed a daily diary study to examine how affective shifts (from the evening to the next morning) interact to predict subjective vitality (next morning), and whether positive stress beliefs (i.e., implicit beliefs that stress has enhancing consequences for one's well-being) moderate their interaction. Whereas we could not find a significant two-way interaction effect, results from our three-way interaction model revealed that positive stress beliefs moderated how upshifts in negative affect predict subjective vitality. Specifically, upshifts in positive affect were stronger related to subjective vitality when they were coupled with upshifts in negative affect in cases of high positive stress beliefs. For low positive stress beliefs, we could not find interaction effects in affective shifts predicting subjective vitality. We discuss the contributions of our findings to stress and affective shift literature along with practical implications.

Keywords: Affect, Affective Shifts, Subjective Vitality, Positive Stress Beliefs, Daily Diary Study

Introduction

The role of affect in the workplace has been of pivotal interest in research that explores the dynamics of when and how employees experience high psychological functioning (Barsade et al., 2003). Employees' affective experiences have, for example, been linked to well-being (e.g., Davidson, 2005), motivation (e.g., Erez & Isen, 2002), and job performance (e.g., Kaplan et al., 2009). Besides these relations of interindividual levels of affect, intraindividual shifts (i.e., changes) of affect over time (e.g., during or between workdays) have increasingly become the subject of research that sheds light on the antecedents of psychological functioning (e.g., Bledow et al., 2011, 2013; Yang et al., 2016). The scope of affective shifts provides important and far-reaching perspectives on how affect predicts well-being given that the consequences of affective experiences at any given time depend on preceding experiences of affect (Bledow et al., 2011). The relevance of studying shifts in positive (e.g., "active", "enthusiastic") and negative (e.g., "nervous", "distressed"; Watson et al., 1988) affect in conjunction is illustrated by the following example: When employees are faced with a challenging task, they may shift from feeling calm and relaxed (low in positive and negative affect) to feeling excited and anxious (high in positive and negative affect). These changes or shifts in both positive and negative affect activate motivational and behavioral processes, thereby relating to the extent to which employees engage in goal-directed behavior (Yang et al., 2016).

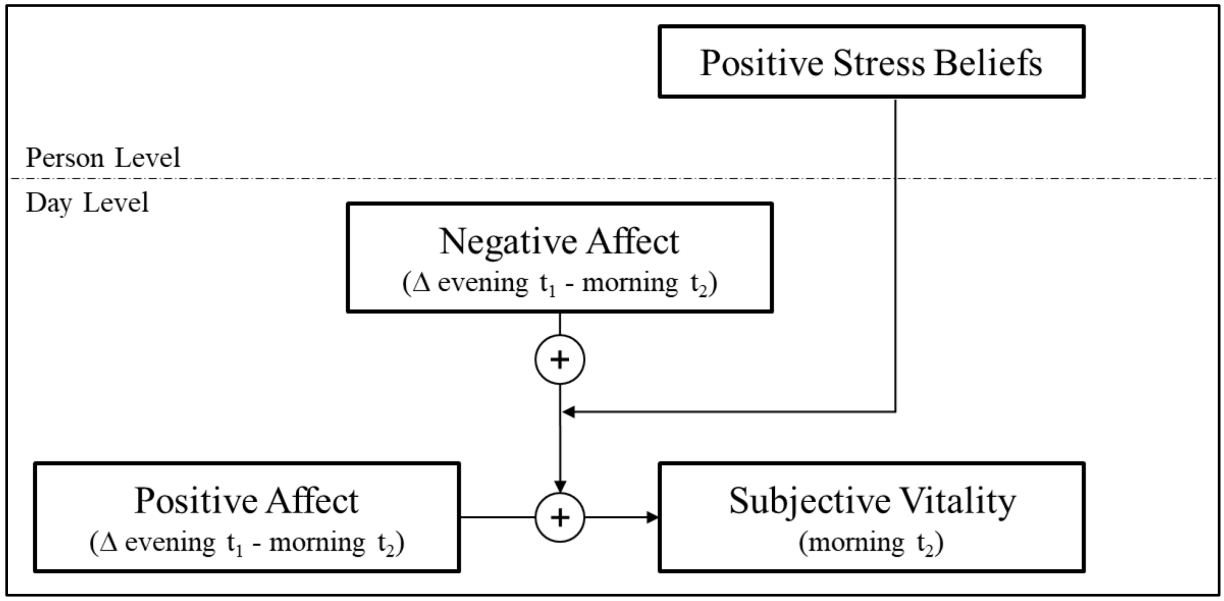
Recent studies could provide first empirical evidence of how affective shifts relate to work engagement and performance at work (e.g., Bledow et al., 2011; Yang et al., 2016). However, challenges remain concerning our understanding of how affective shifts relate to other indicators of psychological functioning that are needed to achieve positive outcomes for employees and their organizations (Dutton & Heaphy, 2003; Quinn & Dutton, 2005). Prior research did also not consider interindividual differences that influence the relation between 4 affective shifts and psychological functioning. This seems surprising given that individuals show great differences in affective experiences (e.g., Feldmann, 1995; Gross & John, 2003).

In the present study, we consider these gaps in the literature by investigating the role of shifts in positive and negative affect in predicting subjective vitality, an indicator of psychological functioning characterized by positive feelings of aliveness and of possessing personal energy (Ryan & Frederick, 1997). Based on Personality Systems Interaction (PSI) theory (Kuhl, 2000b), we argue that shifts in positive and negative affect interact to predict subjective vitality in a way that subjective vitality is most pronounced when there is an upshift in both positive and negative affect. PSI theory proposes different forms of perceptual and behavioral processes, which are triggered by shifts in positive and negative affect. In line with Yang et al. (2016), we

expect the time between workdays (i.e., off-job time) to be critical for the interpretation of daily affective experiences. Therefore, we first examine how affective shifts between the evening and the next morning interact to predict next-morning subjective vitality (two-way interaction). To consider interindividual differences in affective experience, we investigate how positive stress beliefs (the degree to which an individual believes that stress has enhancing consequences for well-being, as opposed to the belief that stress is debilitating for well-being (Crum et al., 2013) interact with the proposed dynamic of affective shifts in predicting subjective vitality (three-way interaction). Figure 6 shows our conceptual model.

Figure 6

Research Model



Note. Affective shifts were captured as the change from evening scores (t1) to morning scores (t2)

Our study aims to offer three main contributions to the literature on affective shifts and stress. First, examining the interaction of shifts in positive and negative affect contributes to our understanding of how affective shifts relate to subjective vitality as an indicator of psychological functioning. As affective experiences permeate the workplace (Barsade & Gibson, 2012), it is important to understand the underlying dynamics in predicting subjective vitality which has been shown to derive from motivational (e.g., need satisfaction, see Ryan & Deci, 2008) and volitional (e.g., action orientation, see Schlinkert & Koole, 2018) processes.

Second, we assume positive stress beliefs to moderate how affective shifts relate to subjective vitality. This consideration of interindividual differences allows us to illustrate distinct interaction patterns in affect that help us understand in what individual contexts affective shifts

relate to subjective vitality. PSI argues that upshifts in negative affect offer a unique—but risky—pathway toward psychological functioning if employees possess sufficient coping resources (Koole et al., 2019). We believe positive stress beliefs constitute a dispositional coping resource as they help employees to overcome the harmful consequences of negative affect.

Third, our study offers starting points for practitioners regarding employee resilience. Organizations need to help employees cope with stress in a way that leads to enhanced psychological functioning (e.g., subjective vitality). Whereas external factors causing changes in affect (e.g., social interactions, time pressure) can rarely be controlled or majorly influenced, internal factors such as affect regulation (i.e., the volitional competence to up- and downregulate positive and negative affect) as well as positive beliefs about stress can directly be addressed via training programs and interventions (see Paustian-Underdahl et al., 2022 for an intervention example).

Subjective Vitality and Affective Shifts

Subjective vitality refers to one's conscious experience of possessing energy and aliveness based on the degree that one "is free of conflicts, unburdened by external controls, and feeling capable of effecting action" (Ryan & Frederick, 1997, p. 530). Previous research indicates that positive affective states relate to higher levels of subjective vitality (e.g., Sonnentag & Niessen, 2008; Shirom et al., 2008) and negative affective states relate to lower levels (e.g., Sheldon et al., 1996). The negative relation between negative affective states and subjective vitality can be explained by states of negative affect being associated with conflict and internally controlling events (Ryan, 1982; Ryan & Frederick,1997).

In contrast, PSI theory (Kuhl, 2000b) assumes that negative affective states are only negatively related to subjective vitality if individuals do not have sufficient coping resources to deal with its harmful effects. These coping resources are defined as two core competencies: action control and personal growth. Whereas action control refers to the ability to make quick and effective decisions, personal growth refers to the ability to identify and learn from mistakes (Kuhl & Baumann, 2021). According to PSI theory (Kuhl, 2000b), both competencies are facilitated by shifts in positive (action control) and negative affect (personal growth). When experiencing upshifts in positive affect, employees are more likely to think fast and jump into action due to "broaden-and-build" thinking and behavior (Fredrickson, 2005; Kuhl & Kazén, 1999): Positive affect extends ("broaden") human perception, resulting in more stimuli that can be perceived and processed by the novel cognitive connections. Those short-term effects will create a

positive spiral that will lead to long-term coping resources and positive emotions in the future ("build"). Downshifts in positive affect, however, are related to slow and thorough analytical thinking and behavior.

If employees experience upshifts in negative affect, they are more likely to focus on isolated, incongruent (i.e., unexpected, unwanted) objects such as errors or mistakes. This focus allows for processing new information that is not conceivable in terms of the person's existing base of autobiographical knowledge and experiences (Koole et al., 2019). Downshifts in negative affect allow employees to loosen that specific focus in a way that negative experiences can be put into a broader context (Kuhl, 2000b).

Previous studies support the idea that negative affect can be beneficial to psychological functioning under certain individual and organizational contexts. On an interindividual level, Bledow et al. (2022) showed that employees being able to focus on situations that conflict with their will but also disengage from those situations to initiate goal-striving showed higher levels of creativity than employees who were not able to do both. Moreover, Digutsch and Diestel (2021) found that day-specific work engagement and flow experience were most pronounced for employees with the ability to learn from failures and mistakes and the ability to learn from those mistakes. If an employee is not able to learn from mistakes and improve, he/she will remain in a state that prevents flow and work engagement. However, if the employee can use the mistakes to learn and grow, flow and work engagement should increase. On an intraindividual level, Yang et al. (2016) showed that upshifts in positive affect contributed to task performance more so when the upshifts were coupled with upshifts (rather than downshifts) in negative affect.

Therefore, when employees need to proactively tackle tasks and challenges and, at the same time, stay alert to potential threats and challenges, they need upshifts in both positive and negative affect. Whereas upshifts in positive affect without upshifts in negative affect may result in reduced alertness-enhancing and attention-focusing functions, upshift in negative affect without the uplifting motivational effects of upshifts in positive affect can hinder states of subjective vitality (Yang et al., 2016; Baumann & Kuhl, 2002; Kuhl, 2000b). Thus, we propose:

H1: Shifts in negative affect during off-job time moderate the positive relationship between change in positive affect during off-job time and subjective vitality the next morning, such that an upshift in positive affect is stronger positively related to subjective vitality when there is a corresponding upshift in negative affect.

Positive Stress Beliefs and Affective Shifts

The way employees perceive and interpret upshifts in negative affect is likely to be shaped by their positive stress beliefs. Those implicit belief systems refer to the degree to which employees believe that stress (as indicated by upshifts in negative affect) is enhancing their well-being in contrast to the belief that stress is deliberating for their well-being (Crum et al., 2013). Whereas most stress research draws on transactional stress theories (Lazarus & Folkman, 1987) that are driven by appraisal processes (perceived threat to well-being), the stress mindset theory (Crum et al., 2013) argues that how people think about stress in general (as enhancing or debilitating) will affect how they respond to stress (Paustian-Underdahl et al., 2022). Individuals with positive stress beliefs experience fewer negative effects of stress (e.g., "stress about stress"; Brady et al., 2018) and are motivated to accept and utilize stress to achieve enhancing outcomes (Crum et al., 2020).

According to PSI theory (Kuhl, 2000b), the relation between positive stress beliefs and subjective vitality can be explained by differences in experiential and behavioral responses to upshifts in negative affect: On the experiential side, positive stress beliefs influence employees' physiological response to negative affect by reduced production of the stress hormone cortisol in response to a stressful situation. The stress level influence determines how much an emergent emotion is influenced by basic elementary processes (e.g., "fight or flight" response) or more complex motivational, cognitive, and self-regulatory processes. On the behavioral side, employees with high positive stress beliefs are more likely to show a promotion focus instead of a prevention focus. When an employee is facing a stressful situation, he or she might avoid the situation (prevention focus) or focus on the driving factors of negative affect that can be utilized for enhancing subjective vitality (promotion focus). For example, upshifts in negative affect might indicate that a given work task is threatening a person's needs and goals. In this case, the driving factor would be the reduction of that threat that, in turn, likely enhances subjective vitality.

Empirical evidence supports PSI theory's suggestion that positive stress beliefs shape how affective shifts relate to subjective vitality. Employees with positive stress beliefs are more likely to take engage in actions that help meet the stressful situation's demands (Crum et al., 2013, 2020). Consistent with approach coping (Roth & Cohen, 1986), they tend to actively utilize stressful situations to enhance their well-being. When those employees also experience upshifts in positive affect, it signals high levels of readiness to act to cope with requirements and tasks. Luong et al. (2016) have also demonstrated that the effects of negative affect on psychological function are dependent on an individual's valuation of negative affect (i.e.,

beliefs about stress). In contrast, employees with low positive stress beliefs are likely to perceive fewer coping resources that come along with upshifts in negative affect and are more likely to avoid or ignore stressful situations (Paustian-Underdahl et al., 2022).

Taken together, we propose that positive stress beliefs moderate the interaction effects of affective shifts on subjective. More specifically, we argue that employees' stress beliefs shape the way the interaction of both changes in affect (i.e., upshifts in both positive and negative affect) predicts perceived subjective vitality the next morning.

H2: Positive stress beliefs moderate the interaction of shifts in positive and negative affect, such that the interaction between upshifts in positive affect and upshifts in negative affect on subjective vitality the next morning is stronger for employees with high positive stress beliefs compared to employees with low positive stress beliefs.

Methods

Study Design and Sample

We conducted a daily diary study to test our hypotheses. In particular, we used a preliminary questionnaire and two daily questionnaires for 10 consecutive workdays, excluding weekends and public holidays. An online survey software allowed participants to complete the questionnaires on computers, cell phones, or tablets. We collected the data between April 2018 and January 2019. After registration, participants received an email invitation directing them to the preliminary questionnaire, where they were able to set their starting point for the two-week diary period.

Participants then responded to the day-specific questionnaires ("evening questionnaire" and "next morning questionnaire"), which we distributed at two measurement points during each workday. The concrete times were individually adapted to the daily routine of our participants as indicated by their starting and ending times of the workday. Participants received the "evening questionnaire" 90 minutes before going to bed and they completed it on average at 8:37 p.m. (*SD* = 5:02). The "next morning questionnaire" was sent 60 minutes before work started and was completed on average at 8:25 a.m. (*SD* = 2:00). In case of participants had not reacted to the questionnaires after two hours, we sent a reminder. After 4 hours without reaction, we made the questionnaires inaccessible to avoid hindsight biases (cf., Reis & Gable, 2000).

We recruited German-speaking employees from the service sector through a work-related exhibition in various German cities. By completing the preliminary questionnaire, a total of 94 employees indicated their interest in taking part in the study. As we were interested in next-morning effects, we included 82 participants (87.2%) who responded to both daily questionnaires on at least two consecutive days. Out of 10 possible days of participation, participants answered on 8.1 days on average (*SD* = 1.7). As we couldn't compute next-morning effects for both Fridays, we could only include 448 out of 656 (82 participants * 8 consecutive days) possible observations (68.3%) in the final analyses.

Of those 82 participants (19.6% part-time), the mean age of our participants was 44.1 (*SD* = 10.6) years (ranging from 16 to 62 years), with 59.8% of them being female. The sample was made up of employees from a variety of industries, with the majority employed in IT and communication (14.3%), followed by public administration (12.1%), production and health services (11.4%), and education (10.3%). The remaining 52.0% worked in health, sciences, banking/finance/insurance, energy- and water supply, craft, traffic, construction, and "other" industries. Participants spent a total of 22.6 (*SD* = 11.9) years working in their respective fields and 11.2 (*SD* = 9.6) years working for their respective employers.

Measures

In the preliminary questionnaire, we included demographics and positive stress beliefs. The daily "morning questionnaire" measured positive and negative affect and subjective vitality, whereas the "evening questionnaire" includes the scales for measuring positive and negative affect. All scale scores were computed as the average of the (reversed) item scores. For the day-level variables, we report Cronbach's alpha on the within- and between-level as suggested by Geldhof et al. (2014).

Positive Stress Beliefs

We assessed the participants' positive stress beliefs using four items of the Beliefs About Stress Scale (BASS; Laferton et al., 2018). A sample item is "Being stressed enables me to reach my full potential". Participants answered on a 4-point Likert scale ranging from 1 (not at all) to 4 (a great deal). Cronbach's alpha was .90.

Day-Specific Positive and Negative Affect

We measured positive and negative affect with 12 items of the German version (Krohne et al., 1996) of the positive and negative affect schedule (PANAS; Watson et al., 1988). The positive affect items were "active", "interested", "excited", "strong", "inspired", and "alert". The negative affect items were "distressed", "upset", "irritable", "nervous", "jittery", and "afraid".

Participants were instructed to report how they felt at the moment on a 5-point Likert scale ranging from 1 (not at all) to 5 (a great deal). For morning affect, Cronbach's alpha (between/within) was .96/.87 for positive affect and .76/.72 for negative affect. For evening affect, Cronbach's alpha was .94/.89 for positive affect and .86/.79 for negative affect.

Day-Specific Subjective Vitality

We assessed subjective vitality using three items related to positive states when feeling energetic and alive (Ryan & Frederick, 1997) for the application on the day level within our study. Sample items are "I feel alive and vital after getting up today" and "I feel energized after getting up today". All items were scored using a 7-point Likert scale ranging from 1 (not at all) to 7 (a great deal). Cronbach's alpha was .98 (between) and .93 (within).

Control Variables

Since we measure affective shifts overnight and affective experiences and subjective vitality are largely affected by sleep quality, we controlled for sleep quality to ensure unbiased estimations of their within-person effects. We assessed sleep quality with a day-specific adaption of the one-item subjective sleep quality measure of the Pittsburgh Sleep Quality Index (Buysse et al., 1989) in the morning ("Overall, how would you rate the quality of your sleep last night?"). The answers were scored using a 4-point Likert scale ranging from 1 (very bad) to 4 (very good).

Construct Validity of the Day-Level Variables

To test whether all constructs represent distinct factors, we performed multilevel confirmatory factor analyses (MCFAs) using the R package "lavaan" (Rosseel, 2012). We tested a seven-factor measurement model including the seven variables as distinct factors. The fit indices for this model indicated an acceptable fit: $\chi^2(780) = 1870.10$, $p < .001$, RMSEA = 0.050, CFI = 0.892, TLI = 0.879, SRMRw/SRMRb = 0.046/0.090. Plausible six-factor models with positive affect morning and negative affect morning combined ($\Delta\chi^2(11) = 769.1$, $p < .001$), positive affect evening and negative affect evening combined ($\Delta\chi^2(11) = 1060.8$, $p < .001$), as well as positive affect morning and subjective vitality morning combined ($\Delta\chi^2(11) = 320.3$, $p < .001$) performed worse than the seven-factor model. According to the findings of the conducted MCFAs, all variables constitute different constructs.

Analytical Strategy

We used multi-level modeling to test our hypotheses on the day-specific relationships between affective shifts and subjective vitality. This procedure allows for taking level interdependence

and nested data structure into account (Hox et al., 2017). We used R's "lme4" package for all multi-level calculations (Bates et al., 2015).

In line with previous research on affective shifts (Bledow et al., 2013; Yang et al., 2016), we assessed shifts in positive and negative affect using residual change scores rather than differences in raw scores. This procedure is preferable compared to measuring raw score change as raw score change confounds the starting values at t1 and their degree of change (Bledow et al., 2013; Campbell & Kenny, 1999). The residual scores were obtained by regressing morning positive affect (t2) on evening positive affect (t1) and morning negative affect (t2) on evening negative affect (t1). The resulting residual values were subsequently saved as new variables and used to create the interaction term.

We centered all variables to reduce the likelihood of multicollinearity and to examine day-specific effects only (cf., group-mean centering, Enders & Tofighi, 2007). To do so, we centered the day-level variables positive and negative affect, subjective vitality, sleep quality, and the computed residuals around their respective person mean, as we were solely interested in day-specific relations. The person-level variable positive stress beliefs was centered around the sample mean. We modeled all paths between the study variables using robust maximum likelihood method of estimation.

We examined the hypothesized relations within a hierarchical approach and therefore specified several models. In the Null Model, we only included the intercept. In Model 1, we added sleep quality as a day-level control variable. In Model 2, we added day-specific positive affect (both morning and evening), negative affect (both morning and evening), and stress beliefs. We added morning positive and negative affect (t2) as random slopes to the random part of this model and all consecutive models. In Model 3, based on the calculations described above, the hypothesized interaction effect between shifts in positive and negative affect was tested. In the last step (Model 4), the two-way interaction terms (positive affect shift * stress beliefs and negative affect shift * positive stress beliefs), as well as the three-way interaction term (positive affect shift * negative affect shift * positive stress beliefs), were included.

We examined the patterns of the significant interaction effect using the Johnson-Neyman technique (Bauer & Curran, 2005; Dawson, 2014) to clarify whether our findings provide support to our hypotheses. Compared to other common methods to plot interactions (e.g., simple slopes, Aiken & West, 1991), the Johnson-Neyman technique allows us to visualize for which values of a moderator the effect of the predictor on the outcome is significant.

Results

Descriptive Statistics

Table 6 shows descriptive statistics and correlations between the study variables. To determine the percentage of variation attributable to the two analytical levels, we assessed the intra-class correlation (ICC) for the day-level variables. The variance decomposition supported the notion that day-specific variations existed and thus supported the use of multilevel modeling.

Test of Hypotheses

Multilevel estimates for predicting subjective vitality are depicted in Table 7.

In Hypothesis 1, we predicted that changes in negative affect during off-job time moderate the positive relation between upshifts in positive affect during off-job time and subjective vitality the next morning, such that an upshift in positive affect is more positively related to subjective vitality when there is a corresponding upshift in negative affect. However, multilevel estimates revealed that there was no significant interaction between shifts in positive and negative affect (γ = -0.01, SE = 0.14, p = .93). Thus, we did not find support for Hypothesis 1.

In Hypothesis 2, we proposed that positive stress beliefs moderate the two-way interaction of shifts in positive and negative affect, such that the interaction between upshifts in positive affect and upshifts in negative affect on next-day subjective vitality is stronger for high positive stress beliefs compared to low positive stress beliefs. In line with this prediction, multilevel estimates revealed that the variables significantly interacted to predict subjective vitality (γ = 0.35, SE = 0.12, $p < .01$). Model 4 showed an improved fit compared to Model 3, as indicated by the difference in the log-likelihood ratios (Δ -2*log = 10.72, *df* = 3, $p < .05$). Computing multilevel R2 according to Raudenbush and Bryk (2002), Model 4 explained about R^2 = 63% of the day-level variance.

Table 6

Descriptive Statistics, Intraclass Correlations, Cronbach's Alphas, and Correlations of all Study Variables

	Variable	*M*	*SD*	*ICC*	1	2	3	4	5	6	7
1	Positive affect (t_1)	2.91	1.01/0.77	.50	(.89/.94)	**-.32**	**.38**	**.52**	**-.23**	**.14**	
2	Negative affect (t_1)	1.45	0.67/0.45	.36	**-.30**	(.79/.86)	**-.18**	**-.18**	**.60**	**-.19**	
3	Subjective vitality (t_2)	4.25	1.45/1.02	.40	**.59**	**-.22**	(.93/.98)	**.83**	**-.30**	**.45**	
4	Positive affect (t_2)	3.13	0.90/0.70	.53	**.71**	-.20	**.90**	(.87/.96)	**-.33**	**.44**	
5	Negative affect (t_2)	1.47	0.64/0.46	.44	**-.27**	**.88**	**-.26**	**-.27**	(.72/.76)	**-.27**	
6	Sleep quality (t_2)	2.92	0.76/0.48	.29	**.29**	**-.29**	**.52**	**.52**	**-.35**	-	
7	Positive stress beliefs	2.48	0.80/-	-	.15	-.12	**.21**	.16	-.03	.07	(-/.90)

Note. Correlations above the diagonal are day-level correlations (N = 448), below the diagonal are person-level correlations (N = 84). Cronbach's alphas (within/between) are reported on the diagonal in parentheses. Standard deviations (*SD*) are reported on the within- and between-person levels, respectively (within/between). *ICC* = Percentage of between-person level variance (*ICC* = between-person level variance / (between-person level + within-person level variance)). Numbers in bold $p < .05$.

Table 7

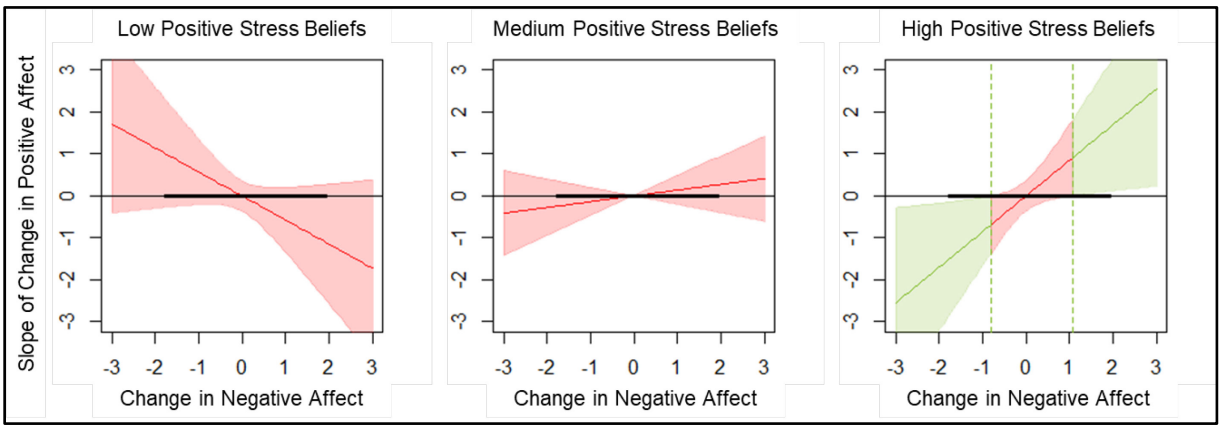
Multilevel Estimates

	Subjective vitality									
	Null Model		Model 1		Model 2		Model 3		Model 4	
Effects	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE
Fixed effects										
Intercept	4.27**	(0.12)	4.28**	(0.12)	4.26**	(0.11)	4.26**	(0.11)	4.27**	(0.11)
Sleep quality (t_2)			0.67**	(0.08)	0.20**	(0.07)	0.20**	(0.07)	0.21**	(0.07)
Positive affect (t_1)					-0.07	(0.06)	-0.07	(0.06)	-0.06	(0.06)
Negative affect (t_1)					-0.05	(0.08)	-0.05	(0.08)	-0.04	(0.08)
Positive affect (t_2)					1.29**	(0.09)	1.29**	(0.09)	1.29**	(0.09)
Negative affect (t_2)					-0.04	(0.11)	-0.04	(0.12)	-0.01	(0.11)
Positive stress beliefs (PSB)					0.26*	(0.11)	0.26*	(0.11)	0.28**	(0.11)
Negative affect[1] X Positive affect[1]							-0.01	(0.14)	0.14	(0.15)
Negative affect[1] X PSB									0.00	(0.08)
Positive affect[1] X PSB									-0.04	(0.11)
Negative affect[1] X Positive affect[1] X PSB									0.35**	(0.12)
Random effects										
Level 1 intercept variance (day level)	1.21		1.04		0.49		0.49		0.47	
Level 2 intercept variance (person level)	0.88		0.90		0.93		0.93		0.92	
- 2*log (lh)	1484.08		1425.74		1161.48		1161.46		1150.74	
Δ - 2*log (lh)			58.34**		264.26**		0.02		10.72*	
df			1		19		1		3	
R^2 (day level)			0.14		0.60		0.60		0.63	

Note. Positive stress beliefs are a person-level variable ($N_{between}$ = 84); all other variables are day-level variables (N_{within} = 448). Affect variables labelled t1 and t2 were measured in the evening and the next morning, respectively. [1]Residuals were used to measure affective shift (see method section for more details). * $p < .05$ ** $p < .01$

Figure 7

Johnson-Neyman Plot



Note. This Johnson-Neyman plot illustrates the effect of upshifts in negative affect (x-axis) on the conditional relation between upshifts in positive affect and subjective vitality (y-axis), given three levels of positive stress beliefs (from left to right: two standard deviations below average, average, two standard deviations above average). The upper and lower bounds of the 95% confidence interval around the conditional effect are shown as dashed lines. They indicate the range of upshifts in negative affect for which there is a significant ($p < .05$) effect between upshifts in positive affect and subjective vitality as shown by the area at which the confidence interval is entirely above or below zero (green area). The red area shows a non-significant effect. The bold black line represents the range of observed values in our dataset.

Figure 7 illustrates the effect of upshifts in negative affect (x-axis) on the conditional relation between upshifts in positive affect and subjective vitality (y-axis), given three levels of positive stress beliefs (from left to right: two standard deviations below average, average, two standard deviations above average). The upper and lower bounds of the 95% confidence interval around the conditional effect are shown as dashed lines. They indicate the range of upshifts in negative affect for which there is a significant effect between upshifts in positive affect and subjective vitality as shown by the area at which the confidence interval is entirely above or below zero (green area). As can be seen in the two left figures, upshifts in positive affect were unrelated to next-day subjective vitality in cases of low (left panel) or average (middle panel) positive stress beliefs, regardless of the upshifts in negative affect. In the case of high positive stress beliefs (right panel), the effect of upshifts in positive affect on subjective vitality is significant when upshifts in negative affect are below 0.88 its mean (lower bound of the 95% confidence interval) or above 1.18 its mean (upper bound). More precisely, when upshifts in negative affect are below 0.88 its mean, there is a significant negative effect of upshifts in positive affect on subjective vitality. When upshifts in negative affect are above 1.18 its mean, there is a

significant positive effect of upshifts in positive affect on subjective vitality. In between the lower and upper bound, there is no significant effect of upshifts in positive affect on subjective vitality. Overall, these findings are consistent with Hypothesis 2.

Discussion

In this study, we investigated the role of shifts in positive and negative affect in predicting next-morning subjective vitality as an indicator of well-being. We conducted a daily diary study over 10 workdays to investigate whether shifts in positive and negative affect during off-job time (i.e., from evening t1 to the next morning t2 predict subjective vitality the next morning t2). We further investigated whether this interplay is moderated by positive stress beliefs (i.e., three-way interaction). Whereas no significant two-way interaction effect could be found, results from our three-way interaction model revealed that positive stress beliefs moderated how upshifts in negative affect predict subjective vitality. Specifically, upshifts in positive affect were stronger related to subjective vitality when they were coupled with upshifts in negative affect in cases of high positive stress beliefs. Our findings contribute to the literature on affective shifts and their effects on employees' functioning (see Kuhl, 2000b; Bledow et al., 2011, 2013; Yang et al., 2016).

Theoretical Implications

Our main finding is that upshifts in negative affect moderate how upshifts in positive affect relate to subjective vitality when employees hold high positive stress beliefs (three-way interaction). This finding indicates that employees experienced the highest relative levels of subjective vitality when they experienced an upshift in both positive and negative affect during off-job time and had high positive stress beliefs. The interaction between affect and implicit theories as two separate but interrelated sources of human motivation is one of the core contributions of PSI theory (Kuhl, 2000b). As outlined before, up- and downshifts in affect regulate the activation of motivational macrosystems that differ in their influence on experience and behavior. We identified interindividual positive stress beliefs as a moderator of the interaction of upshifts in positive and negative affect. As Kuhl, Quirin, and Koole (2021) noted, the different levels of human motivation and cognition have traditionally been studied in separate lines of research which aggravates the investigation of interactions across motivational and cognitive processes. Our three-way interaction indicates that those different levels (as represented by affect and implicit beliefs) are interrelated and should not solely be studied in isolation.

Furthermore, our results offer a unique temporal perspective by examining off-job shifts in affects from the evening to the next morning interact to predict subjective vitality the next morning. As most of the shifts in our present study happened "overnight", we investigated the effects of between-day shifts, expecting homeostatic processes to recalibrate the next-day affective responses to salient stimuli (Goldstein & Walker, 2014), as most affective experiences are (re-)processed during sleep (Walker & van der Helm, 2009). Thus, our study implies that upshifts in negative affect are positively related to subjective virality, but it needs to be paired with upshifts in positive affect and high positive stress beliefs.

However, we did not find a moderating effect of upshifts in negative affect on the relation between upshifts in positive affect and subjective vitality (two-way interaction). There are two possible explanations for why our two-way interaction between shifts in positive and negative affect did not predict subjective vitality the next morning. First, PSI theory (Kuhl, 2000b) states that affect (which is object-specific and not a global source of energy) has an immediate impact on motivation (McClelland, 1985b; Cerasoli et al., 2014). This proposition might explain why affective shifts show significant moderating effects on indicators of well-being when choosing a smaller time frame (same-day effects in contrast to next-day effects). Second, previous studies used another time frame for the affective shift and another indicator of well-being. In the study by Bledow et al. (2011), upshifts in both positive and negative affect during the day predicted work engagement in the evening that was measured with two out of five items related to vigor ("I feel strong and vigorous in my work" and "At my work, I feel bursting with energy"). Work engagement includes vigor as one facet but also the facets of dedication and absorption (Schaufeli et al., 2002). Although the concepts of vigor and subjective vitality are closely related, it might be that the interaction of shifts in positive and negative affect reported by Bledow et al. (2011) predicted more strongly the other two facets of work engagement (i.e., dedication and absorption; Schaufeli et al., 2002). Thus, even for other periods used to measure affective shifts, subjective vitality might not be predicted by the interplay of shifts in positive and negative affect per se. The beneficial effect of upshifts in negative affect on the relation between upshifts in positive affect and subjective vitality might be restricted to specific individual or contextual contexts. This restriction is crucial for practical implications: Until the individual and contextual conditions are not well-established, the idea that upshifts in negative affect may set the stage for increased well-being and motivation remains a very risky pathway (Koole et al., 2019).

Limitations and Directions for Future Research

Our study has some limitations that need to be discussed. First, our study design limits causal conclusions because we did not employ an experimental design. However, considering our study design and evidence from past research (e.g., Bledow et al., 2011), reverse causality is rather unlikely due to the temporal separation of our measurements and the modeling of temporal change in both affect variables.

Second, we cannot conclude why individuals experienced shifts in affect. We suggest future studies to investigate potential mechanisms that may explain why shifts in affect relate to subjective vitality and other indicators of well-being and related variables showing conceptual overlap (e.g., fatigue, work engagement, flow experience). The potential mechanisms should be catered to the time spans affective shifts take place (e.g., before work, during work, after work, overnight). For instance, job characteristics and demands might act as potential mechanisms during on-job time, whereas recovery activities (e.g., hobbies, sports and physical exercise, or social activities) and recovery experiences (e.g., psychological detachment, relaxation, mastery experiences, and control during leisure time; Sonnentag & Fritz, 2007) might act as potential mechanisms during off-job time.

Third, all study variables were operationalized based on self-report questionnaires, which implies the risk of common method bias (Podsakoff et al., 2012). However, in line with Siemsen et al. (2010), the effects of the current study likely reflect valid relations rather than common method artifacts since a high common method variance reduces the probability of detecting interaction effects. Nonetheless, future studies would benefit from different operationalizations of affect such as implicit measures (e.g., Bartoszek & Cervone, 2022).

Practical Implications

Findings from our study have important practical implications for increasing employee subjective vitality. Energetic resources provided by subjective vitality are needed to achieve positive outcomes for themselves and for the organizations they work in (Dutton & Heaphy, 2003; Quinn & Dutton, 2005). Thus, organizations should consider shaping employees' implicit beliefs about stress with interventions. For example, Paustian-Underdahl et al. (2022) demonstrated that stress beliefs interventions can influence how business owners cope with the COVID-19 pandemic. The authors used a pre-and post-intervention design to measure the respective changes in beliefs about stress. They found that business owners with positive stress beliefs were more likely to approach stress in a way that leads to personal growth and

engagement in their businesses. Business owners with opposing beliefs, however, were more likely to adopt avoidance coping behaviors, which led to worse health and higher burnout.

Besides stress belief interventions, organizations should foster employees' ability to down- and upregulate affect, as well as provide resources to cope with negative affect. To alter employees' affective experiences during work, organizations could provide affect regulation training programs that focus on self-regulation techniques. The ability to self-regulate one's affective states has been demonstrated to foster health-promoting behaviors (Fuhrman & Kuhl, 1998), positive well-being (Baumann et al., 2005a), and job performance (Diefendorff et al., 2000). Guided applications on how to put self-regulation theory into practice have been published by Kuhl, Kazén, and Koole (2006) who propose a comprehensive assessment of a given person's self-regulatory and motivational characteristics using "Evolvement-Oriented Scanning" (EOS).

When employees can down- and upregulate negative affect, upshifts in negative affect do not necessarily have enhancing effects on subjective vitality as indicated by the three-way interaction reported in the present study. Upshifts in negative affect are only positively related to subjective vitality when stress is thought to have high enhancing consequences for one's well-being, health, and performance. Thus, organizations should foster competency training programs to make employees more comfortable with negative affect (Yang et al., 2016). The integration of negative experiences into a broader context is needed to evaluate how negative experiences can be enhancing for one's own goals, motives, and beliefs (Kuhl, 1981)—the foundation to develop positive stress beliefs.

Conclusion

When employees believe that stress has enhancing consequences for their well-being, upshifts in positive affect during off-job time are stronger related to their subjective vitality the next morning when they were coupled with upshifts (in contrast to downshifts) in negative affect. This underlines the importance of implicit beliefs about stress in how negative affective experiences (and not just positive affective experiences) can positively relate to indicators of well-being.

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Chapter 4
Capturing Interactive Work for Nurses—First Validation of the German IWDS-N as a Multidimensional Measure

Digutsch, J., Velana, M., Rinkenauer, G., & Sobieraj, S. (2021). Capturing interactive work for nurses—First validation of the German IWDS-N as a multidimensional measure. *International Journal of Environmental Research and Public Health*, *18*(15), 7786. https://doi.org/10.3390/ijerph18157786

The theoretical framework of interactive work provides a multi-dimensional perspective on the interpersonal demands of nurses in nurse-patient interactions. It is defined by four dimensions: emotional labor directed to the self and others, cooperative work, and subjective acting. While the framework stems from qualitative research, the aim of the current study is to translate it into a quantitative scale to enable measurement of the high interpersonal demands that so often remain implicit. For this reason, we conducted an online survey study (N = 157; 130 women, 25 men, 2 divers) among professional nurses in Germany (spring 2021) to test the derived items and subscales concerning interactive work, which resulted in a 4-factor model that was verified with confirmatory factor analysis (CFA). The survey further captured additional information on established constructs concerning job-related well-being (e.g., burn out, meaningfulness), job characteristics (e.g., work interruptions, time pressure) and individual resources (coping strategies) that are supposed to correlate with interactive work demand scales for nurses (IWDS-N), to determine the quantitative nature of their relations. The results show that the subscales of the IWDS-N have adverse effects on indicators of work-related well-being. Moreover, negative job characteristics, such as time pressure, are positively correlated with subscales of the IWDS-N and are therefore problem-focused coping strategies as an individual resource. The results emphasize that a multidimensional consideration of self-regulatory processes is useful to capture the subtle and complex nature of the interactive work demands of nurses. The current study is the first that developed a quantitative, multi-dimensional measure for interactive work demands, which can help make implicit demands in service work explicit.

Keywords: Interactive Work; Emotional Labor; Job Demands; Well-being, Coping Strategies

Introduction

Nurses play an integral role in each healthcare system and strive to create healing environments where they can use their skills and provide their service recipients with the best care (Chesak et al., 2019). In order to bring caring to health care systems, nurses are required to engage in emotional tasks that not only imply the emotional regulation of their deep feelings but also highlight the need to build relationships with their care recipients based on mutual trust (Gray, 2009). At the same time, they should comply with the rules for providing services defined by the organization (Hong & Kim, 2019). At the heart of the nursing profession is the interaction with others (Roth et al., 2019), who have their own needs, interests, and expectancies towards the services provided by their nurses (Müller & Thorein, 2018). The integrated model of interactive work (Böhle et al., 2006, 2014; Böhle & Weihrich, 2020; Dunkel & Weihrich, 2012) claims that a service can only be achieved by the successful interaction between the service provider and the service recipient in that the interaction is not proceeded unilaterally by the service provider; the recipients are also actively involved in the process, making both parties interrelated. Therefore, the service recipient is not regarded as a mere "object" of the work, i.e., they are not a purely passive consumer. On the contrary, the recipient is included as a subject and co-producer in work activities (Büssing & Glaser, 2003).

According to Böhle et al. (2014), interactive work is characterized by four pivotal demands: inner emotional labor, outer emotional labor, cooperative work, and subjective acting. Inner emotional labor refers to the conflict of the service provider between the emotions that are actually felt and the emotions that need to be displayed. Outer emotional labor relates to emotion regulation that is directed toward the service recipient. Cooperative work encompasses the establishment of a cooperative relationship with the service recipient and subjective acting refers to intuitive acting in vague or uncertain situations. Therefore, interactive work demands are an inherent part of a nurse's daily work life. Numerous qualitative studies relying on this integrated model identified that interactive work demands are linked with emotional and physical consequences, as well as work intensity (e.g., Roth et al., 2019; Böhle et al., 2014; Zenz & Becke, 2020). In addition, extensive quantitative research highlights the adverse effects of inner emotional labor on the indicators of work-related well-being, such as burnout or work engagement (e.g., Diestel & Schmidt, 2011; Diestel et al., 2015; Konze et al., 2017).

In our study, we seek to make two main contributions to the literature on interactive work. First, we aim to develop a quantitative measurement for the integrated model of interactive work by Böhle et al. (2014). So far, only qualitative measures have been used. Secondly, the way caregivers interact with each other and with their environment can be influenced by factors

related to the individual and nature's work. Therefore, we aim to gain insights into how interactive work relates to indicators of work-related well-being (e.g., burnout, fatigue, work engagement), job characteristics (e.g., job control), and different coping and management strategies within the category of individual resources.

Interactive Work Demands

The integrated model of interactive work has developed over many years (for the most recent review see Böhle & Weihrich, 2020). The concept provides a multifaceted perspective on the service industry and how services can successfully be obtained through the interaction of services provided and the service recipients. Labor in the service industry is defined as interactive work, which is characterized by four pivotal, intertwined demands from the service provider's side: inner emotional labor, outer emotional labor, cooperative work, and subjective acting. The wording of the first two dimensions is very nuanced in the language of origin, which poses the risk that dimensions in English will not be understood as distinct. For this reason, we decided to differentiate both dimensions with the addition of "inner" and "outer" to make the target of emotion management and regulation clear. We will further elaborate on the dimensions in the following sections.

Inner emotional labor is usually named emotional labor and refers to the management and regulation of one's affects and emotions. When individuals perceive discrepancies between actual, authentic feelings on the one hand and expected feelings and emotional rules of the organization, on the other hand, they experience emotional dissonance (Morris & Feldman, 1996). One example of this are flight attendants who have to smile to create an emotionally pleasant atmosphere. In comparison to the service sector in general, nursing additionally demands the management of supposed inappropriate emotions such as disgust, pity, or grief (Böhle et al., 2014). Outer emotional work also appears to play an essential role in maintaining the relationship between nurse and patient. The nurse can convey to the patient a sense of worth or of being used, in order to balance the relationship. This is, in part, elemental to maintaining the relationship and is crucial for some people to be able to care for them at all. In addition, outer emotional work can function as a basis of cooperative work, in that empathy provides a means for negotiating interests (Zenz & Becke, 2020).

Cooperative work focuses on the establishment of a cooperative relationship between service providers and service recipients to obtain the service. Both parties have to agree on the service and the process of obtaining it; agreement can be reached explicitly in talking about it, or implicitly when the circumstances are highly normative (e.g., nobody expects psychotherapy at

a fast-food restaurant). Disagreement on the service and the process can prevent successful service. Nevertheless, discrepancies in service expectations of service providers and service recipients cannot be fully ruled out. Service recipients are often not aware of this nor how they should and can contribute to the success of the service (Böhle & Weihrich, 2020; Dunkel & Weihrich, 2018). The more the service recipient is involved in service delivery, the greater the need for cooperation. In the context of nursing, nurses and patients must work together to achieve the service goal, such as daily body care, and the better the cooperation the better the achievement.

Subjective acting refers to the ability of service providers to intuitively react to uncertain situations. Subjective acting comes into its own in particular when it is necessary to act quickly in unplanned, unpredictable situations or to deal with imponderables. This seems to be particularly relevant in personal services, since working with and on people is fundamentally associated with imponderables and, for example, behavior and reactions cannot fully be planned in advance. This urges service providers to apply an explorative, dialogic-interactive approach, to trust their senses (e.g., odd smells or unusual sounds) and their experiential knowledge (Böhle et al., 2014; Böhle & Weihrich, 2020; Sevsay-Tegethoff, 2007). The demands of subjective acting easily translate into the nursing context when nurses have to react to situations, such as noticing odd smells during wound care.

Work-Related Well-Being as a Potential Consequence of Interactive Work Demands

While each dimension contributes to interactive work, the demands can be assumed as challenging and exhausting if required extensively. Therefore, we assume that the demands of interactive work are associated with work-related well-being outcomes, such as burnout or meaningfulness. In addition, we anticipate that certain job characteristics as well as individual resources are intertwined with interactive work demands. Well-being is operationalized across the literature in various ways and in the current paper, we refer to work-related outcomes that contribute to employee well-being. On the one hand, we use fatigue and burn-out (emotional exhaustion and depersonalization) as negative representations of well-being to cover emotional, mental, physical, and behavioral indicators of well-being. On the other hand, work engagement and meaningfulness represent the positive spectrum of work-related well-being.

Negative Indicators of Work-Related Well-Being

Interactive work is a form of work that requires high levels of goal-directed, flexible, and volitionally controlled behavior (Schmidt & Neubach, 2007). The control of emotions, thoughts, and behavior required for this is referred to as self-control (Baumeister et al., 1994).

Accordingly, flexible, goal-directed control and adaptation, as well as control of behaviorally effective processes (Muraven & Baumeister, 2000; Schmeichel et al., 2003), is necessary to continually realign one's own behavior with patient needs and organizational requirements. However, findings from psychological research indicate that exercising self-control comes at a cost (Muraven & Baumeister, 2000) and can translate into both short-term (e.g., ego depletion, need for recovery; Rivkin et al., 2015) and long-term states of exhaustion (e.g., burnout, Sonnentag et al., 2010b; for a review, see Hagger et al., 2010). These findings are mainly theoretical and are underpinned by the strength model of self-control (Muraven & Baumeister, 2000). This model is based on the central assumption that different forms of self-control claim the same limited regulatory resource (willpower). When self-control is exerted, this resource is claimed, causing it to be temporarily depleted and thereby causing performance losses in subsequent self-control. Research has provided compelling evidence that the exercise of inner emotional labor has adverse impacts on emotional, mental, physical, and behavioral indicators of work-related well-being (e.g., Diestel & Schmidt, 2011; Diestel et al., 2015; Häusser et al., 2010; Van der Doef & Maes, 1999; Zapf & Holz, 2006).

We assume that the other three dimensions rely on similar self-control mechanisms. We, therefore, expect all interactive work subscales to be positively related to emotional exhaustion, depersonalization, and fatigue (mental and physical). All dimensions require a high degree of goal-directed, flexible, and volitionally controlled behavior and thus access, at least in part, the limited regulatory resource of willpower.

Positive Indicators of Work-Related Well-Being

In contrast to negative representations of work-related well-being, Schaufeli et al. (2006) define work engagement as a positive, work-related state in the individual characterized by vigor, dedication, and absorption. Vigor is characterized by a high level of energy and mental resilience during work and a willingness to exert oneself at work despite difficulties. Dedication refers to feeling important, enthusiastic, inspired, and challenged about one's work. Absorption is characterized by full concentration as well as the feeling of being tied down by the work. We expect a negative relationship between work engagement with inner and outer emotional work. Given the unclear or nonexistent literature for cooperative work and subjective acting, we would predict no relationship between work engagement and cooperative work and work engagement and subjective acting as an initial hypothesis.

Similarly, meaningfulness is an integral part of work life, since it encourages employees to appraise their job as meaningful and concentrate on their tasks (Rosso et al., 2010). Work

meaningfulness includes three primary facets: positive meaning which is one's personal sense that what they are doing is charged with significance, meaning making through work that helps individuals with the ability to perceive the world around them and cultivate meaningfulness through experiences at work, and greater good motivations that imply that work is appraised as more meaningful if it has a greater impact on another's life. The literature suggests that those employees who consider their tasks meaningful are more likely to show high levels of work engagement and responsibility, even during times of crisis (Lips-Wiersma & Wright, 2012; Steger et al., 2012). For example, nurses ascribing a strong meaning to their job might exhibit a higher degree of emotional labor during the COVID-19 pandemic to comply with the desired behaviors embedded in organizational culture. In contrast, employees who ascribe a low meaning to their work are more prone to be distracted by the difficulties emerging from a stressful event (Steger et al., 2012) and may need a longer recovery period afterward (Arnold & Walsh, 2015).

Table 8 summarizes the hypothesized relationships between interactive work demands and work-related well-being.

Table 8

Hypothesized Relations Between Interactive Work Demands, Psychological Well-Being, Job Resources, and Individual Resources

Variables		Emotional Labor		Cooperative Work	Subjective Acting
		Inner	Outer		
Work-Related Well-Being					
1.	Emotional Exhaustion	+	+	+	+
2.	Depersonalization	+	+	+	+
3.	Fatigue	+	+	+	+
4.	Work Engagement	–	–	0	0
5.	Meaningfulness	0	0	+	+
Job characteristics					
6.	Work Interruptions	+	+	+	+
7.	Time Pressure	+	+	+	+
8.	Effort-reward-imbalance	+	+	+	+
9.	Job Control	–	–	0	0
Individual resources					
10.	Problem-focused Coping	–	–	+	+
11.	Emotion-focused Coping	+	+	0	0

Note. + = Hypothesized positive relation; – = hypothesized negative relation; 0 = no relation hypothesized.

Job Characteristics as Potential Predictors of Interactive Work Demands

Work Interruptions

It is well-known that surrounding work conditions can affect the work-related well-being of employees and consequently, their health status (Ganster & Rosen, 2013). Being interrupted by others is a common phenomenon in modern workplaces. Although work interruptions, in some cases, can transmit important information or stimulate daily work routines (Jett & George, 2003), they are broadly considered to have a negative impact on employees. Traditionally, work interruptions are associated with physical complaints, emotional exhaustion, and distress among employees (Lin et al., 2013). Apart from the high physiological and psychological workload, interruptions can lead to low-quality services. In some work settings (e.g., in aviation), interruptions are linked with error-prone decisions which can sometimes cause serious and fatal accidents (Chisholm et al., 2000) In the health sector, Chisholm et al. (2000) also revealed that physicians working in emergency departments faced roughly ten interruptions per hour, possibly affecting the quality of health care provision. Taking into consideration the stressful nature of clinical environments, one might argue that nurses' uncontrolled workload, which can be interrupted at any time by care-related critical activities, urges them to continuously shift their attention to different tasks, disrupting, however, their thought process and rendering them susceptible to medical errors. Equally, a constant feeling of not having enough time to execute all work tasks or being under pressure (Glazer & Gyurak, 2008) can be a source of job-related stress in the nursing profession, which may also result in an increased perception of interactive work demands.

Time Pressure

Gelsema et al. (2005) examined how job demands, such as work and time pressure, could influence the health status and well-being of nurses. In fact, they indicated that psychological outcomes (i.e., psychological distress, physical complaints, and emotional exhaustion) were strongly influenced by time and work pressure. On the other hand, it was suggested that less work and time pressure could improve job satisfaction and decrease emotional exhaustion. A later study investigating what could induce the most stress in nurses from European countries, as well as in the U.S., showed that time pressure was one of the most frequently mentioned factors of stress and anxiety among UK., Italian, and U.S. nurses (Glazer & Gyurak, 2008). In addition, a qualitative study conducted by Roth et al. (2019) indicates that nurses with high interactive work demands experience more time pressure than nurses with low interactive work demands. Therefore, as the pressure at work is implicated as a source affecting employees'

well-being and health, we expect that it would positively relate to the concept components of interactive work demands.

Effort-Reward Imbalance

Equally, when employees perceive organizations' decisions as unfair, they may generate strong negative emotions, such as anger and resentfulness (Van Yperen et al., 2000). Perceived injustice is thoroughly conceptualized by the model of an effort-reward imbalance (ERI; Rödel et al., 2004). According to this theoretical approach, social reciprocity is a fundamental principle of any social exchange at work that implies mutual cooperative investments and expected rewards analogous to effort investment. Any attempt to violate the balance between effort and respective rewards can lead to poor health and sustained stress reactions (Rödel et al., 2004) which, in turn, may cause undesired effects on the organization's proper function (Van Yperen et al., 2000). For example, nurses who perceived a great imbalance between extrinsic efforts spent and extrinsic rewards obtained were more likely to report higher levels of emotional exhaustion and depersonalization (Bakker et al., 2000). In addition, a higher effort-reward imbalance is significantly associated with depression and anxiety in the nursery (Kikuchi et al., 2014). In line with this, it might be argued that the imbalance between invested effort and received reward might intensify negative emotions and the way they are expressed to be in accordance with organizational rules, leading to higher levels of inner and outer emotional labor. Similarly, employees who perceive an injustice at the workplace might frequently feel forced to utilize their own experience to overcome a job burden and deal with challenges. Given that effort-reward imbalance can hamper employees' well-being and generally be a barrier to employees, we expected that it would positively relate to the demands of interactive work.

Job Control

Although numerous job characteristics are considered to negatively influence job-related outcomes, there are concepts of occupational research that function as job resources and enable the achievement of job-related goals and well-being. Particularly, job control helps employees develop an active approach to their working environment and determine how tasks are executed in terms of time and method (Gerich & Weber, 2020). According to Jackson et al. (1993), time control is an individual's opportunity to define their own time schedule, and method control implies individuals' authority to decide how tasks will be carried out. Previous research has proposed that job resources, such as job control, may ameliorate the effects derived from stress exposure on employees' job well-being and health (Spector, 2002). Job control may also change how potential stressors produce unpleasant emotions and in turn, how these emotions cause

distress. In addition, Mackey and Perrewé (2014) argue that future research should consider how job control affects this strain process. Based on these notions, one would assume that, when intensive control of deep feelings and their external expression is required, it might be less likely for employees to exert control during job-time. This led us to assume that job control would negatively relate to the perceived demands of inner and outer emotional labor.

Table 8 summarizes the hypothesized relations between interactive work demands and job characteristics.

Individual Resources as Potential Predictors of Interactive Work Demands

Individuals who experience stressful events at work derived from job-related characteristics will possibly develop health problems and poor psychological well-being. In an attempt to overcome stress, individuals may activate different coping strategies depending on the situational characteristics, the individuals' appraisals, and their resources available to handle the demanding situation (Knoll et al., 2005). According to Lazarus and Folkman (1984), coping strategies for alleviating the impact of a stressor can be differentiated between problem-focused and emotion-focused coping. Problem-focused coping refers to responses directed to modify or change situational aspects. As suggested by Carver et al. (1989), problem-focused coping embraces active coping, suppression of competing activities, planning, seeking instrumental social support, and restraint coping. Emotion-focused coping aims at managing emotions or cognitions, without altering the stressor or other aspects of the situation. Emotion-focused strategies include acceptance, positive reinterpretation, emotional social support, and denial.

Teo et al. (2013) showed that effective coping strategies helped nurses overcome the aftermath of organizational changes by reporting higher job satisfaction. However, they did not report what types of coping were particularly successful to deal with organizational tensions. Although coping can have a mediating effect on stressors and job-related variables, findings seem to be inconclusive. Following this, we expected that nurses' problem-focused coping will positively relate to the perception of cooperative work and subjective acting demands. In addition, emotion-focused coping will positively relate to the perception of inner and outer emotional labor. However, we did not expect a significant relationship between problem-focused coping and emotional labor. One might claim that actively seeking solutions for job-related problems might effectively apply to situations that are associated with subjective acting, and consequently urge situational modifications. Similarly, one might expect that emotion-focused strategies would be more effective in situations that demand primarily emotion suppression. Therefore,

we do not expect a significant relationship between emotion-focused coping and cooperative work or subjective acting.

Table 8 summarizes the hypothesized relations between interactive work demands and individual resources.

Methods

Research Design and Participants

In order to develop a quantitative scale for interactive work, we conducted a cross-sectional survey study among nursing staff in Germany. Participants (N = 157) were recruited based on their professions as nurses including those working at hospitals, nursing homes, and other organizations that provide professional care work. In 2019, about 4.5 million people worked in the nursing profession in Germany (Central Bureau for Statistics, 2015). Participants were not compensated but had the chance to take part in a prize draw. The survey, which was promoted through multiple social media postings, was available from March 2021 to May 2021. In total, 157 participants (130 women, 25 men, and 2 divers) finished the survey. They ranged in age from 22 to 63 years (M = 38.19; SD = 10.75) and experience as professionals from 2 to 47 years (M = 18.34; SD = 10.80). The majority have worked in hospitals (n = 122), followed by those in geriatric nursing (n = 19) and outpatient care (n = 9) and "something different" (n = 8). Eighty-four participants had full-time contracts, while 73 had part-time contracts. Moreover, they were indicated to work overtime 4.34 h/week (SD = 5.99) on average. Most participants work in North-Rhine Westfalia (45%), followed by Bavaria (14%) and Lower Saxony (9%). Except for Saxony-Anhalt, every German state had at least one representative.

Measures

In addition to the development of the IWDS-N, we captured different concepts that relate to job resources and coping styles/personal resources to provide more information on the concept of interactive work. We correlated the following concepts in order to address our hypotheses/research questions.

Work-Related Well-Being

For every variable in the section below, the scale score was calculated as the average of the single-item scores.

Emotional exhaustion was assessed with eight items from the German translation (Büssing & Perrar, 1992) of the Maslach Burnout Inventory (Maslach & Jackson, 1996). This burnout

dimension refers to feelings of being emotionally overextended of emotional and physical resources resulting from the demands of one's work. An exemplary item is "I feel emotionally drained by my work.". Participants responded on a six-point Likert scale (1 = not at all; 6 = very strong).

Depersonalization was captured with six items from the German translation (Büssing & Perrar, 1992) of the Maslach Burnout Inventory (Maslach & Jackson, 1996). This burnout dimension is characterized by a cynical attitude toward people with whom one has to interact at work. An exemplary item is "I became more callous toward people since I took this job.". Participants responded on a six-point Likert scale (1 = not at all; 6 = very strong).

Fatigue was measured with 12 items of the German version (Frone et al., 2018) of the Three-Dimensional Work Fatigue Inventory (3D-WFI; Frone & Tidwell, 2015). Given the overlap between the emotional fatigue subscale and the burnout dimension of emotional exhaustion, we only used physical and mental fatigue from the inventory. Exemplary items are "How often did you feel physically exhausted within the last weeks?" (physical) and "How often did you feel mentally exhausted within the last weeks?" (mental). Participants responded on a six-point Likert scale (1 = never; 6 = always).

Work Engagement was assessed with nine items by Schaufeli et al. (2006). The scale consists of the subscales vitality, dedication, and absorption. An exemplary item is "When I am working, I forget everything else around me.". Participants responded on a six-point Likert scale (1 = totally disagree; 7 = totally agree).

Meaningfulness was measured with the Work as Meaning Inventory (WAMI) by Steger et al. (Steger et al., 2012). One exemplary item is "I have a good sense of what makes my job meaningful.". Agreements were provided on a five-point Likert scale (1 = absolutely untrue; 5 = absolutely true).

Job Characteristics

Work Interruptions were captured with four items by Lin et al. (Lin et al., 2013). Participants indicated their agreement to statements such as "I am frequently interrupted by others." on a four-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Time Pressure was captured with three items by Prümper et al. (1995) An exemplary item is "At work, I am often pressed for time." Responses were provided on a five-point Likert scale (1 = not at all; 5 = fully).

Effort–reward-imbalance was measured with five items by Van Yperen et al. (2000). Items include statements such as "You work yourself too hard considering your outcomes.". Agreements were given on five-point Likert scales (1 = never; 5 = very often).

Job Control was assessed through the sub-scales timing (three items, e.g., "At work, I can set my own pace of work.") and method control (three items, e.g., "At work, I can decide how to go about getting my job done.") by Jackson et al. (1993). Participants responded on a four-point Likert scale (1 = not at all; 4 = a great deal).

Individual Resources

Coping Strategies were captured with the German version (Vollrath & Torgersen, 2000) of the COPE measures (Carver et al., 1989). In line with Sonnentag and Fritz (2007), we measured four coping strategies representing problem-focused coping (active coping, planning, restraint coping, use of instrumental social support) and two strategies representing emotion-focused coping (denial, use of emotional social support). Responses were given on a four-point Likert scale (1 = not at all; 4 = fully).

Analytical Procedure

To develop an item pool, we first studied the literature and available measures for each dimension of the integrated model of interactive work by Böhle et al. (2014). The subscale of inner emotional labor shows great conceptual overlaps with emotional dissonance (Zapf et al., 1999) and surface acting (Brotheridge & Lee, 2008), two well-established concepts in psychological literature. Thus, we oriented ourselves on those concepts for item pool development. To examine the content validity of our interactive work measures, we asked two professionals with work experience in nursing occupations to evaluate our items. Both verified the content of our items, as well as their fit and clarity for nurses in general. Then, we reduced the number of items and examined construct validity with the help of exploratory factor analysis. The discriminant validity of all subscales was tested using confirmatory factor analysis. Then, convergent validity was tested by examining the relations between interactive work demands and indicators of work-related well-being.

Results

Development of the Interactive Work Scale for Nurses (IWS-N)

We selected and developed items taking the following criteria into account: (1) items needed to reflect the core definitions of each dimension rather than antecedent boundary conditions; (2)

specific work setting terminology was avoided such that the scale would apply to all nursing contexts. All items were formulated as work demands that express whether a certain action or behavior is required by the job. Responses were made on a five-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree).

Table 9

Factor Loadings and Alphas for Interactive Work Demands Measures

Item	Emotional Labor		Cooperative Work	Subjective Acting
	Inner	Outer		
I have to display feelings that do not match with what I actually feel toward the patients.	0.88			
I have to show feelings in my interactions with patients that do not correspond with the feelings that I actually experience.	0.93			
I have to endure conflicts between my own feelings and the feelings I should show toward the patients.	0.80			
I have to express certain feelings that I don't actually feel.	0.84			
I always have to establish a positive atmosphere when interacting with patients.		0.71		
I have to help patients cope with negative feelings (e.g., anxiety, sadness).		0.65		
I have to be good at comforting patients.		0.71		
I have to team up with the patients to achieve positive outcomes.			0.66	
I have to involve the patients in my work.			0.79	
I have to be an attachment figure for the patients.			0.76	
I have to maintain a trusting relationship with the patients.			0.63	
I have to pay close attention to the body language of the patients.				0.68
I have to read between the lines during interactions with patients.				0.82
I have to actively draw on my sensations during interaction with the patients.				0.86
Cronbach's alpha	0.92	0.76	0.81	0.84

Note. Only factor loadings > 0.30 are shown.

To select the best-fitting items for each subscale, we examined item difficulty by evaluating item scores as indicated by mean, standard deviation, median, skewness, and kurtosis. Two strongly skewed items were excluded from further analyses. The means of all remaining items ranged from 3.14 to 4.46, all standard deviations exceeded 0.50, which is an indicator of adequate variability (Stumpf et al., 1983). Mean and skewness values indicate a tendency for high scores for each dimension.

To examine the factor structure, an exploratory factor analysis (principal components analysis) was used with an oblique rotation (i.e., oblimin), as we assumed dependency among the four factors. This assumption is based on the significant conceptual overlap of all four factors as

indicated by (Böhle et al., 2014; Böhle & Weihrich, 2020). In line with our theoretical model, four factors were suggested by a parallel analysis, supporting the four-factor solution. We excluded items that did not meet the factor loading cut-off criterion of 0.30 (Nunnally & Bernstein, 1994). To further optimize the scale length and the distinctiveness of each factor, we stepwise removed items with lower factor loadings. In the final set of 14 items, all items had a minimum pattern loading of |0.63| as no cross-loadings above |0.21| emerged (see Table 9). All factors explain 60.9% of the variance, with each factor explaining between 11.0% and 21.3% of the variance.

To test the discriminant validity of the subscales, we conducted a confirmatory factor analysis (CFA) with robust standard errors. We tested a four-factor model including the four dimensions as distinct factors. The fit indices for this model indicated an acceptable fit: χ^2 (71) = 148.08, $p < 0.001$, comparative fit index (CFI) = 0.93, Tucker-Lewis index (TLI) = 0.91), root mean square error of approximation (RMSEA) = 0.09, standardized root mean square residual (SRMR) = 0.06. Afterward, we integrated all dimensions into one common factor (χ^2 (77) = 536.62, $p < 0.001$, CFI = 0.53, TLI = 0.44, RMSEA = 0.21, SRMR = 0.18). This model performed worse in comparison to the four-factor model (χ^2 (6) = 222.48, $p < 0.001$). Moreover, all possible two-factor models (χ^2 (5) ≥ 589.27, $p < 0.001$) and three-factor models (χ^2 (3) ≥ 104.00, $p < 0.001$) performed worse than the four-factor model. All goodness-of-fit statistics are displayed in Table 10.

Table 10

Goodness-of-Fit Statistics

Model	χ^2	*df*	CFI	TLI	RMSEA	SRMR
One-factor model	536.62	77	0.53	0.44	0.21	0.18
Best fitting two-factor model[a]	384.15	76	0.72	0.66	0.17	0.12
Best fitting three-factor model[b]	240.09	74	0.84	0.81	0.13	0.10
Four-factor model	148.08	71	0.93	0.91	0.09	0.06

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. [a]Emotional Labor (Inner and Outer) items loading on the first factor, Cooperative Work and Subjective Acting items loading on the second factor. [b]Emotional Labor (Inner and Outer) items loading on the first factor, Cooperative Work items loading on the second, and Subjective Acting items loading on the third factor.

In summary, the results of the conducted CFAs provide further evidence of the scale's internal structure. For further analyses, we used the unweighted means of all scale items as indicators for the respective scales. The complete set of items in both English and German can be found in Appendix A.

Table 11

Means, Standard Deviations, Zero-Order Pearson-Correlations, and Alphas of all Study Variables

Variable		*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Interactive Work Demands																		
1.	Emotional Labor (inner)	3.42	1.13	0.92														
2.	Emotional Labor (outer)	4.21	0.68	0.43	0.76													
3.	Cooperative work	4.39	0.72	0.20	0.21	0.81												
4.	Subjective Acting	4.13	0.80	0.37	0.36	0.39	0.84											
Work-Related Well-Being																		
5.	Emotional Exhaustion	3.73	1.20	0.37	0.28	0.04	0.19	0.91										
6.	Depersonalization	2.66	1.17	0.26	0.06	-0.17	-0.02	0.53	0.85									
7.	Fatigue	3.63	0.85	0.26	0.26	0.05	0.24	0.78	0.40	0.95								
8.	Work Engagement	4.47	1.14	-0.23	-0.07	0.00	-0.05	-0.52	-0.48	-0.37	0.90							
9.	Meaningfulness	3.73	0.73	-0.03	0.03	0.26	0.19	-0.27	-0.37	-0.11	0.50	0.83						
Job characteristics																		
10.	Work Interruptions	3.96	0.87	0.31	0.17	0.08	0.25	0.49	0.25	0.38	-0.25	-0.09	0.89					
11.	Time Pressure	4.09	0.91	0.37	0.40	0.15	0.29	0.58	0.26	0.47	-0.22	-0.09	0.52	0.82				
12.	Effort–reward imbalance	3.67	0.97	0.31	0.33	-0.04	0.10	0.69	0.36	0.59	-0.40	-0.15	0.38	0.55	0.86			
13.	Job Control	2.42	0.78	-0.26	-0.23	0.14	-0.08	-0.26	-0.30	-0.27	0.24	0.05	-0.20	-0.31	-0.26	0.89		
Individual resources																		
14.	Problem-focused Coping	2.73	0.38	0.17	0.24	0.30	0.25	0.13	-0.15	0.16	0.04	0.21	0.17	0.18	0.06	0.00	0.48	
15.	Emotion-focused Coping	2.40	0.57	0.18	0.09	0.16	0.09	0.16	-0.03	0.13	-0.08	0.11	0.03	0.07	0.17	-0.03	0.41	0.35

Note. Alphas are displayed on the diagonal. $N = 157$; all correlations $r \geq |0.16|$ are significant with $p < 0.05$.

Hypotheses Testing

Table 11 displays the descriptive statistics, internal consistencies (Cronbach's alphas), and correlations between all study variables. All interactive work demand subscales correlated moderately with each other.

Work Engagement was negatively related to inner emotional labor. Emotional exhaustion was positively related to all subscales except for cooperative work. Depersonalization was positively related to inner emotional labor but negatively related to cooperative work. Fatigue was positively related to all subscales except for cooperative work. Meaningfulness was positively related to cooperative work and subjective acting but not to both inner and outer emotional labor. Taken together, analysis largely confirmed our hypotheses for work-related well-being except for depersonalization.

Job Control was negatively related to both inner and outer emotional labor but not to cooperative work and subjective acting. Effort–reward imbalance, time pressure, and work interruptions were all positively related to all subscales except for cooperative work. Again, analysis largely confirmed our hypotheses. However, the subscale cooperative work was not related to any job characteristic. Both problem- and emotion-focused interpersonal emotion management were positively related to all subscales except for subjective acting. Whereas problem-focused coping was positively related to all subscales, emotion-focused coping was positively related to inner emotional labor and cooperative work but not outer emotional labor and subjective acting.

Taken together, the overall pattern of correlations supported our hypotheses. Exceptions have to be made for the hypothesized relations between the subscale cooperative work and emotional exhaustion, fatigue, effort-reward imbalance, time pressure, and work interruptions which have not been found in our data. For depersonalization, the opposite relation (negative instead of positive) has been found.

Additionally, we tested whether the four dimensions of interactive work differ regarding the sociodemographic variables age, gender, employment type (full- vs. part-time), tenure (in years), and type of care facility (hospital, outpatient, or stationary care facilities, other). Results indicate that the higher the age, the lower inner emotional labor demands nurses experience ($r = 0.02$, $p < 0.05$). For outer emotional labor, women report more higher demands than man ($t(46.47) = 2.63$, $p < 0.05$). For all other variables, no significant differences were found.

Discussion

The aim of the current study was to develop a scale for interactive work to make implicit work demands of emotional labor, cooperative work, and subjective acting measurable. Based on the literature on interactive work we derived items that captured the core aspects of interactive work in the context of nursing, resulting in the interactive work demand scale for nurses (IWDS-N). In addition, we explored associations of potential outcomes concerning work-related well-being and antecedents referring to job resources and individual resources. The results show that we were available to obtain an interactive work scale with four distinct dimensions that obtained good scale metrics. The subscale outer emotional labor, as well as inner emotional labor, obtained good reliability. Since both dimensions referring to emotion regulation and emotional dissonance are well examined as constructs in work-related research settings (e.g., Morris & Feldman, 1996; Little et al., 2012; Wharton, 2009), it is not astonishing that the majority of our hypothesized expectations were met.

Referring to work-related well-being, we found that the perceptions of outer emotional labor are associated with negative work outcomes as hypothesized, in that increased demand perceptions of inner emotional labor are positively correlated with symptoms of burnout and fatigue, while work engagement is negatively correlated. This is in line with former findings by, e.g., (Diestel & Schmidt, 2011; Zapf & Holz, 2006). Moreover, the results revealed the assumed relations with job characteristics respectively. So, the higher the imbalance of invested effort in the job, the higher the time pressure on the job, the more work interruptions occur, and the lower the perceived control on how and when single tasks are conducted, the higher the perceptions of managing one's own emotional states. In addition, we found associations between individual resources focusing on strategies to overcome obstacles or problems. We found evidence of the hypothesized positive correlations between the perception of inner emotional labor and emotion-directed coping strategies. In an exploratory manner, we found that problem-based coping is also positively correlated with inner emotional labor. It seems that no matter which strategy is applied, independent of the question of whether the strategy is affective or behavioral in nature, it goes along with intensified perceptions of emotional regulation demands. Thus, it seems that coping increases awareness of problem-solving and emotional demands likewise.

Outer emotional work showed a similar pattern of results. However, we could not find the predicted negative associations with work engagement, nor the positive associations with depersonalization, which was rather astonishing. We assumed that the more participants depersonalize from their patients, the higher the perceived demands to manage patients'

emotions because patients would rather be perceived as objects that need to be managed to get the job done. However, this was not the case in the current sample; participants seem to dissociate themselves from this idea and perceive their patients as subjects and managing others' emotions as part of their job, which could also act as an explanation for the missing negative links between work engagement and outer emotional labor. Nevertheless, we found negative associations between detrimental job characteristics and the perceived demands of outer emotional labor. The strains that are experienced through time pressure, work interruptions, low job control, and an effort-reward imbalance seem to translate into an intensified perception of the demand to manage patients' emotions. This is also in line with former research (e.g., Konze et al., 2017; Glazer & Gyurak, 2008; Bakker et al., 2000).

As predicted, we found that strategies of interpersonal emotion management are positively correlated with the demand of managing others' emotions. In contrast to our assumptions, which were exploratory in nature, we found a positive relationship in terms of problem-focused coping and no correlation between emotion-focused coping with the need to manage the emotions of others. We are inconclusive about the missing link between outer emotional labor and emotional coping, which refer to the same emotional resource in the individual. However, we assume that the association of outer emotional labor with behavioral coping strategies could be explained by the active character of outer emotional labor, since it requires behavioral action, whether it is about telling a joke to enlighten patients or merely about smiling at patients.

Since both emotional subscales are well-examined as constructs in work-related research settings, it is not astonishing that the majority of our hypothesized expectations were met. In contrast, the subscales of cooperative work and subjective acting are dimensions that have not been operationalized as of now, which shaped the exploratory process of item construction and the assumptions concerning relations with other constructs. However, both scales obtained good scale metrics; the exploratory nature is, indeed, mirrored by our findings.

The sub-dimension of cooperative work refers to the collaboration, which is needed between a service provider and the service receiver to achieve the service. The analysis revealed mixed results concerning the relationship between the demand to actively engage in cooperative work and work-related well-being concepts. As proposed, we found positive associations between cooperative work and the perception of meaningfulness. Further research needs to untangle whether the demand for cooperative work can be the source of meaningfulness or vice versa, that those striving for meaningfulness chose jobs with high cooperative work demands.

Contrary to our assumptions, we found that the less depersonalization the more cooperative work demands are perceived. While we originally suggested that objectifying patients would lead to an intensified perception of cooperative work in terms of a forced strain that becomes more salient, the analysis showed the opposite relation. The more patients are seen as individuals who are subject to empathy with their own needs, the higher the urge to engage in cooperative work. Again, it seems that our participants highly protected their ideas of patients in need, which is part of their job. This also resonates with the null correlations found for emotional exhaustion and fatigue. Future studies should address this and examine which other concepts, such as personality traits (e.g., altruism) may mediate this relationship.

The job characteristics were not all correlated with the demands of cooperative work, indicating that the subscale of cooperative work is independent of job control, effort-reward imbalance, time pressure, and work interruptions. Compared with these individual resources in the form of problem-focused and emotion-focused coping strategies are positively correlated with cooperative work demands. The salience for dealing with problems or difficulties seems to be intertwined with the demands of engaging in cooperative work. Maybe this could hint at the way cooperative work is initiated, that it can be achieved through emotional strategies or behavioral strategies. Future studies should further examine the underlying processes.

The demands of Subjective Acting as the fourth sub-dimension of interactive work refers to the perception of how much employees trust their senses, deal with uncertainty and refer to their implicit (professional) knowledge. The analysis reveals positive correlations with emotional exhaustion, fatigue, and meaningfulness. This indicates that the perceived demands of subjective acting are not entirely perceived as something that goes along with higher fatigue or emotional exhaustion; rather, it is associated with meaningfulness, which represents a positive outcome of work-related well-being. According to findings on the other three dimensions, our assumption of a positive relation between depersonalization and subjective acting needs to be rejected, since we found no significant correlation at all, such as for outer emotional labor. In contrast, we found evidence for all predicted correlations concerning job characteristics, indicating detrimental relationships. In terms of individual resources, the analysis confirmed our assumptions about coping strategies; that is, problem-based coping is related to subjective acting while emotion-based coping is not.

Theoretical and Practical Implications

Compared to other concepts and frameworks that focus on a single construct or a domain of constructs, the interactive work model incorporates four distinct subdimensions that refer to

emotion regulation demands, concerning one's owns emotions and others' emotions, demands that aim to create a cooperative relationship and subjective acting that refers to trust in one's own senses and knowledge. From a theoretical perspective, we added information on how interactive work relates to concepts commonly used by scholars in organizational psychology, sociology, or communication, such as fatigue and meaningfulness with work-related well-being, job control boundaries within the job characteristic category, and different coping strategies within the category of individual resources. The results revealed that relationships to these additional constructs pose differently depending on the particular subscale. Therefore, the complexity of relationships emphasizes the need to consider multiple dimensions to estimate the demanding or elevating nature of service work. However, it has to be acknowledged that the presented correlations are descriptive since the method did not allow for further testing of causality. This is subject to further empirical testing; cross-validations with different samples in different countries are needed to prove the validity of the scale.

In developing the IWDS-N, we strived to make a concept measurable that was an exclusive qualitative concept beforehand so that this valuable, multi-dimensional concept could be easily applied to a broader range of branches and occupations in service work. Since the demands of interactive work used to stay implicit rarely become appreciated and remunerated, the scale could help to make these demands explicit. Moreover, this could inspire a systematic categorization of jobs in service work that require outer and inner emotional labor, cooperative work, and subjective acting.

Limitations and Suggestions for Future Research

Our study has some limitations. The study provided first evidence for a valid multidimensional measurement, this implies that we could not compare our data and measurements with former studies, since the framework of interactive work was an exclusive qualitative approach. The convergent and divergent validity; therefore, they should be tested in future studies. Concerning the study conduct, we did not focus on extended pilot testing with the target group; however, we derived the items for the IWDS-N from the qualitative material on interactive works and especially from recurrent declarations by nurses. In addition, the items were reviewed and approved by professionals in nursing and medicine in advance; afterward, the questionnaire was pretested numerous times by the authors to ensure effective survey operation. As of now, we could not provide test-retest reliability; future studies could help to address this limitation and could benefit from larger sample size to increase the power of the findings.

Moreover, our reported relations between study variables are zero-order correlations that do not imply causality. It remains to be further proven whether interactive work demands impair indicators of work-related well-being or vice versa. Even if the strong conceptual overlap between the subscale inner emotional labor and emotional dissonance constitutes a strong clue for causality (e.g., Morris & Feldman, 1996), we suggest longitudinal studies to validate this assumption. The current study considers the direct effects between interactive work demands and potential outcomes and predictors. Given the extensive research on moderators and mediators affecting the relationship between job demands and its outcomes (e.g., Rivkin et al., 2015, 2016), the reported relations should be interpreted with caution. We highly encourage scholars to examine the underlying mechanisms of interactive work and the conditions affecting its consequences. Prior research indicates substantial day-specific fluctuations of emotional dissonance, which has led researchers to conduct multi-level analyses (e.g., Diestel & Schmidt, 2011; Diestel et al., 2015). For this reason, future research should distinguish between day- and person-level variance of interactive work demands.

Another improvement could address the measures used, especially the measurement of coping styles: we recommend using a different measurement of emotional- and problem-based coping styles, which may obtain better reliability metrics and, hence, more statistically powerful results. In addition, we did not use a validated German adaptation for the scales of work engagement, meaningfulness, work interruptions, effort-reward imbalance, and job control. Although self-report questionnaires were absolutely sufficient for the purpose of the current study, future projects could use, for example, physiological studies suitable for field studies in the nursing context (e.g., Chida & Steptoe, 2009; Dickerson & Kemeny, 2004; Dishman et al., 2000; Vrijkotte et al., 2000), for example, heart rate (HR); heart rate variability (HRV); locomotor activity; and cortisol would be obvious indicators to identify the workload. In order to deal with the difficulty in measuring mental stress, HR and HRV are considered parameters of general activation. These parameters allow us to describe the vegetative balance of the organism and through the corresponding stress parameters, conclusions can be drawn about previous mental stress experiences. In addition, HRV can be used as an indicator of the psychophysical states of the organism and as an indicator of the limitations of an adaptive capacity with respect to stress (for an overview with respect to HR and HRV, see Sammito et al., 2014). With respect to psychological stress, there are emerging methods that allow the identification of episodes of non-metabolic HRV reduction as an indicator of psychological stress in everyday life; for example, by taking into account locomotor activity (Brown et al., 2020). In addition, the stress hormone cortisol (surveyed via saliva samples) could also provide

important information about psychological stress and recovery processes (Chida & Steptoe, 2009).

Conclusion

The concept of interactive work is correlated with different job-related well-being constructs. However, correlation directions need to be differentiated for each subscale; not every relationship is shaped in the same way. The same is true for job characteristics and individual resources and the four subscales of interactive work. Further research is needed to determine the exact nature of relationships and whether our tentative assumptions that job characteristics and individual resources are potential predictors of interactive work and work-related well-being as an outcome of interactive work are correct. Moreover, since we have conducted the study in Germany, the items and constructs should become subject to international examination to determine their validity. The framework of interactive work is unique in its combination of four sub-scales that go beyond the emotional demands of service work. It gives the chance to make service work, with its complex inherent demands that otherwise stay disregarded and unpaid, quantifiable, and valuable.

Chapter 5
General Discussion

General Summary

The present dissertation aimed to contribute to three research questions:

> *RQ1: Under what conditions do interindividual differences in personal growth predict day-specific motivation and well-being at work?*
>
> *RQ2: Under what conditions do intraindividual dynamics in personal growth predict day-specific motivation and well-being at work?*
>
> *RQ3: Can demands of volitional inhibition or facilitation of emotions and actions predict motivation and well-being at work?*

Three empirical studies in this cumulative dissertation contributed to answering the research questions. In the following, the most important results are summarized. Afterward, theoretical and practical implications as well as limitations of this dissertation are discussed.

In Study 1, we expected interindividual differences in achievement-related personal growth to be related to daily work engagement and flow experience. When faced with achievement-related stimuli at work (e.g., supervisor feedback), personal growth requires employees to be able to deal with critical aspects in their performance (achievement motive enactment via Object Recognition) *and* to put those critical aspects into a broader context to learn from them (achievement motive enactment via Extension Memory). We conducted two diary studies that examined the main and interaction effects of both forms of achievement motive enactment on daily work engagement and flow experience. Results indicate that daily work engagement and flow experience was most pronounced under the conjunction of both forms of motive enactment (two-way interaction). That is, when achievement motive enactment via Extension Memory is high, the relations of achievement motive enactment via Object Recognition to both outcomes are positive, whereas when achievement motive enactment via Extension Memory is low, the relations of achievement motive enactment via Object Recognition to both outcomes are negative.

In addition, we found that role clarity (i.e., the degree of ambiguous and unclear task requirements) moderates the interaction of the two forms of enactment. Only in cases of low role clarity, the conjunction of achievement motive enactment via Extension Memory and Object Recognition exerts beneficial effects on daily work engagement and flow experience (three-way interaction). Our results imply that employees experience higher levels of daily work engagement and flow experience when they enact their achievement motive via the two macro systems that, as postulated by PSI theory (Kuhl, 2001), are needed for personal growth (Object Recognition and Extension Memory). Achievement-related personal growth seems especially relevant in work environments with high degrees of ambiguous and unclear task requirements. If task requirements are ambiguous or unclear, employees are likely to experience a mismatch between their skills and the challenge of a task. Here, Extension Memory represents a protective mechanism that supports employees in optimizing their investment of available resources.

In Study 2, we expected shifts in positive and negative affect (i.e., changes between two points in time) to interact in predicting subjective vitality. Whereas shifts in positive affect regulate the activation of the macro systems Intuitive Behavior Control (upshifts in positive affect) or Intention Memory (downshifts in positive affect), shifts in negative affect regulate the activation of the macro systems Object Recognition (upshifts in negative affect) and Extension Memory (downshifts in negative affect). We hypothesized that the experience of subjective vitality in the morning is most pronounced when employees experienced upshifts in both positive and negative affect since the last evening (two-way interaction). In addition, we investigated whether positive stress beliefs (i.e., implicit beliefs that stress has enhancing consequences for one's well-being) moderate the two-way interaction.

The results of our diary study indicate no empirical support for the proposed two-way interaction. Interestingly, results from our three-way interaction model revealed that positive stress beliefs moderated how upshifts in negative affect predict subjective vitality. Specifically, upshifts in positive affect were stronger related to subjective vitality when they were coupled with upshifts in negative affect in cases of high positive stress beliefs. For low positive stress beliefs, we could not find interaction effects in affective shifts predicting subjective vitality. Therefore, upshifts in negative affect seem to contribute to the positive effects of upshifts in positive affect on subjective vitality, but only when employees believe that stress has positive consequences for their well-being. Thus, positive stress beliefs influence employees' responses to negative affect. When faced with upshifts in negative affect, employees with high positive stress beliefs are more likely to take engage in actions that help meet the stressful situation's

demands. When those employees also experience upshifts in positive affect, it signals high levels of readiness to act to cope with requirements and tasks.

In Study 3, we translated interactive work demands that are postulated in qualitative research into a quantitative scale. The integrated model of interactive work (Böhle et al., 2014) explains how services can be successfully obtained through the interaction of services provided and the service recipients. Labor in the service industry is defined as interactive work, which is characterized by four pivotal, intertwined demands from the service provider's side: inner emotional labor, outer emotional labor, cooperative work, and subjective acting. Interactive work demands capture the degree to which employees are required to exert action control and personal growth at work (i.e., volitional inhibition and facilitation of actions and emotions). More precisely, four dimensions of interactive work demands were quantified: emotional labor directed to the self and others, cooperative work, and subjective acting. Given their extensive number of interactions with patients at work, we focused on the specific profession of nurses.

The results show that the four dimensions have adverse effects on indicators of motivation and well-being at work. Inner emotional labor demands seem to have the strongest negative consequences on indicators of employee motivation and well-being. The other three dimensions (i.e., outer emotional labor, cooperative work, subjective acting) show mixed relations with indicators of employee motivation and well-being. For instance, outer emotional labor is negatively related to emotional exhaustion and fatigue, but unrelated to work engagement or perceived meaningfulness of the work. Cooperative work and subjective acting, however, are positively related to meaningfulness (i.e., the higher the demands, the higher the perceived meaningfulness) but unrelated to emotional exhaustion and fatigue.

Theoretical Contributions

Contributions to RQ1 (interindividual differences in personal growth)

Regarding the first research question, the dissertation contributed to our understanding of under what conditions interindividual differences in personal growth predict day-specific motivation and well-being at work. Especially the first study helped to answer this research question by showing that the highest levels of work engagement and flow experience at work were experienced when (a) employees enact their achievement motive via Object recognition and Extension memory, and (b) experience low role clarity at work.

The first condition implies that interindividual differences in personal growth—increased attention to signs of risks or quality deficiencies (Object Recognition) and the ability to deal

with failures (Extension Memory)—are positively related to indicators of motivation and well-being at work. Personal growth seems to be more than the sum of its two components (i.e., Object Recognition and Extension Memory) because their interaction explained more variance in work engagement and flow experience than each macro system on its own. Thus, this dissertation not only contributes to insights about motivation (what people strive for) and volition (how people strive) but also integrates both perspectives by examining their interaction effect. This integration is important given that employee behavior and experience are not solely driven by either motivation or volition (Kuhl, 2001).

The potential benefits of Object Recognition (a macro system that is linked with increased levels of negative affect) offer a rare contribution to psychological literature. Most often, increased levels of negative affect are linked to negative work outcomes (for an overview, see Thoresen et al., 2003). For example, Self Determination Theory (SDT, Ryan & Deci, 2000), suggests that need frustration (here: achievement motive enactment via Object Recognition) is not beneficial for motivation and well-being at work. This is because need frustration does not provide employees with any opportunities for personal growth that need satisfaction would have offered them (Koole et al., 2019).

Koole et al. (2019) explained why need frustration has received ambiguous evaluations by comparing the meaning of personal growth between PSI theory and SDT. According to the authors, SDT refers to "assimilative" personal growth, whereas PSI refers to "accommodative" personal growth, referring to Piaget's (1950) terminology. While assimilative personal growth refers to fitting new information into pre-existing schemas and structures within the self, accommodative personal growth refers to fundamentally altering existing schemas and structures within the self to make room for new information. Thus, accommodative personal growth requires the employee to confront painful experiences ("learning from mistakes") and assimilative personal growth describes employees' natural tendencies of becoming functional people. Our findings contribute to the benefits of *accommodative* personal growth on employee motivation and well-being.

The second condition implies that the benefits of accommodative personal growth on employee motivation and well-being are especially relevant in situations of ambiguity when task procedures, role conditions, and goal achievement are not clear (i.e., low role clarity). PSI theory noted that accommodative personal growth offers a risky pathway toward personal growth as it necessitates employees to possess sufficient coping resources (Koole et al., 2019).

Therefore, besides the two conditions mentioned before, future research should be inspired to further investigate when and how employees benefit from accommodative personal growth.

Taken together, interindividual differences in personal growth are positively related to indicators of motivation and well-being at work, especially in cases of low role clarity.

Contributions to RQ2 (intraindividual dynamics in personal growth)

Regarding the second research question, the dissertation contributed to our understanding of under what conditions intraindividual dynamics in personal growth predict day-specific motivation and well-being at work. Especially the second study helped to answer this research question by showing that shifts in positive and negative affect predict day-specific subjective vitality as an indicator of well-being. The conditions under which intraindividual dynamics of personal growth related to subjective vitality were (a) when employees experienced upshifts in both positive and negative affect during off-job times and (b) when employees had high positive stress beliefs.

The first condition implies that upshifts in negative affect might not be an undesired process on its own, but it is necessary to have the competence to deal with its negative consequences for employee well-being. Shifts in negative affect from low to high (i.e., upshifts) were positively related to subjective vitality, but they needed to be paired with upshifts in positive affect and high positive stress beliefs. The combination of upshifts in positive affect and high positive stress beliefs contribute to employees' competence to deal with its negative consequences. Thus, we contribute to the literature on personality, motivation, and volition by showing interactions between cognitive (i.e., positive stress beliefs) and emotional (i.e., affective shifts) levels of personality predict day-specific subjective vitality.

The adaptive function of upshifts in negative affect has been noted in other studies before. For instance, research indicates that employees show their highest levels of task performance (Yang et al., 2016) and work engagement (Bledow et al., 2011) when they experience upshifts in both positive and negative affect. The present dissertation extends this line of research by examining subjective vitality as another beneficial effect of upshifts in negative affect. Understanding how daily subjective vitality arises seems important given that subjective vitality is seen as one of the main indicators of being a "fully functional" person (Roger, 1961). Being a fully functional person refers to being mature, responsible, and decisive, and can also be loosely described with more mundane expressions such as "developing the person's potential" or "becoming who you really are" (Koole et al., 2018)—the idea behind humanistic approaches to personality.

Taken together, intraindividual dynamics in personal growth are positively related to indicators of motivation and well-being at work, especially when employees believe that stress can have positive consequences for their well-being.

Contributions to RQ3 (volitional inhibition and facilitation of emotions and actions)

Regarding the third research question, the dissertation contributed to our understanding of demands of volitional inhibition and facilitation of emotions and actions that can predict indicators of motivation and well-being at work. Especially the third study helped to answer this research question by showing that interactive work demands relate to indicators of work-related motivation and well-being.

The interactive work demands scale extends our ability to capture the extent to which employees (here: nurses) are required to exert action control and personal growth when interacting with people at work. This demands-oriented perspective captures the degree to which employees need to adjust their actions (e.g., being nice to an obnoxious customer) or emotions (e.g., tolerating that a customer is obnoxious). Moreover, the study provides empirical evidence that shows how those demands relate to employee motivation and well-being.

The development of a quantitative scale allows future studies to address under what conditions interactive work demands relate to employee motivation and well-being. For example, in line with PSI theory (Kuhl, 2001), interactive work demands might only negatively relate to employee motivation and well-being, when an employee cannot employ action control or personal growth competencies in response to those demands.

Taken together, demands of volitional inhibition and facilitation of emotions and actions can predict indicators of motivation and well-being at work.

Limitations and Suggestions for Future Studies

The present dissertation has some limitations that need to be discussed. First, whereas the dissertation contributes to the role of personality architecture in predicting employee motivation and well-being, it only considered an isolated perspective of personality architecture. Regarding the first research question, differences in personal growth were only related to the achievement motive. Although the achievement motive is highly relevant for the chosen indicators of motivation and well-being (e.g., Baumann & Scheffer, 2011), motivation and well-being at work are not solely goal-related and are reflected in the achievement domain. Therefore, future research might consider how personal growth related to, for example, the power and affiliation motive (cf. McClelland, 1985a) relates to motivation and well-being at work. In addition, the

role of environmental contexts on how personal growth relates to employee motivation and well-being is most likely not limited to role clarity. Future studies might consider, for example, the extent to which macro systems are stimulated by the environment: How often do negative supervisor feedback occur? Is there a trustful relationship with colleagues that helps to cope with negative experiences? The account of situational/organizational influences is meaningful because an employee's behavior is considered a function of personality *and* environment (Lewin, 1943).

Regarding the second research question, intraindividual affective processes were modeled during a particular period (evening to next morning) but affective shifts can occur between any two points in time (e.g., before work, during work, after work, overnight). Future studies should investigate the role of each period to get a better understanding of temporal influence and additionally investigate potential mechanisms that may explain why shifts in affect relate to employee motivation and well-being. A better understanding of mechanisms behind shifts in affect help to understand how employees can successfully exert daily action control and personal growth at work. On basis of the empirical results of this present dissertation, it cannot be concluded why employees experience shifts in positive and negative affect. For instance, job characteristics, work demands, as well as recovery activities and experiences might act as potential mechanisms during on- and off-job time.

Regarding the third research question, our implications are limited to the professions of nurses and rely on small sample size. Whereas the necessary sample size is dependent on various factors, some rules of thumb are 10 participants for each scale item (Nunnally, 1978), 200-300 participants (Comrey, 1988), or that replication is needed in cases of less than 300 participants (Guadagnoli & Velicer, 1988). Thus, the generalization of our reported relations between interactive work demands and employee motivation and well-being is strongly limited. Future studies should replicate our findings with a larger sample size. Given our 157 participants in Study 3, replication with a doubled sample size would be desired. If the results can be replicated, interactive work demands allow researchers and applicants to quantify the extent to which nurses are required to volitionally inhibit and facilitate their emotions and actions which, in turn, predicts their work-related motivation and well-being. In addition, the scale is restricted to the specific occupation of nurses. A general interactive work demands scale would help to show that those demands (and their effects) are not specific to the organizational context of nurses but apply to employees in general.

Second, the personality assessments in this dissertation are limited by only considering subjective reports of what employees think they do, not necessarily objective records of what they do (see Stachl et al., 2021). Given that PSI theory (Kuhl, 2001) defines action control and personal growth as observable competencies, self-reports might be limited in only capturing subjective observations. To overcome this limitation, digital traces of experience and behavior might be used. For example, if employees use a navigation system to get to work or use a search engine, they inevitably leave digital records of their actions. In 2025, the average person will create around 59 Gigabytes of digital records every day, according to recent estimates (Desjardins, 2019). Those digital records can be used to obtain estimates of personality, an approach called computational personality assessment (Stachl et al., 2021). According to Stachl et al., (2021), digital records represent a more objective idea of employee behavior than self-reports. Additionally, because this process is automated and does not require any input from the employee being assessed, it is much less time-consuming and expensive than traditional survey-based methods (Stachl et al., 2021).

Third, all variables across the three empirical studies solely rely on survey responses. This operationalization implies the risk of common method bias (Podsakoff et al., 2012) which refers to the lack of traceability as to whether the explanation of variance is only based on methodological artifacts from the questionnaires. However, regarding the reported interaction effects in the first and second studies, the reported effects likely reflect valid relations rather than common method artifacts since those artifacts would have decreased (and not increased) the probability of detecting interaction effects (Siemsen et al., 2010). Nonetheless, future studies would benefit from different operationalizations. For example, affect (second study) and motives (first study) can also be measured with implicit measures (e.g., Bartoszek & Cervone, 2022; Kuhl & Scheffer, 1999) that tap into subconscious (instead of conscious) representations of affect and motives.

Fourth, all empirical studies within this cumulative dissertation use correlative designs instead of experimental designs. Correlative designs do not allow causal conclusions. For example, a correlation between positive affect and subjective vitality does not imply that increases in subjective vitality are caused by increases in positive affect just because both were observed at the same time. However, the first and second studies used study designs that allowed for the temporal separation of measurements which makes reverse causality rather unlikely. In addition, the hypotheses in the empirical studies rely on assumptions of PSI theory that have a substantial record of experimental (e.g., Kuhl & Kazén, 1999; Baumann & Kuhl, 2002;

Baumann et al., 2005a; Koole & Jostmann, 2004; Koole & Kuhl, 2008) and neurobiological (e.g., Baumann et al., 2005b; Quirin et al., 2011a, 2001b; Düsing et al., 2016) support.

Practical Contributions

The findings of this cumulative dissertation have two important practical implications. First, employees should become more comfortable with the experience of negative affect. Increases in negative affect facilitate Object Recognition which can help employees to become more aware of their surroundings and can help them better identify potential threats or opportunities. This focus can be advantageous in certain situations and should be part of an employer's experiential and behavioral repertoire. Organizations should foster competency training programs that help employees deal with negative emotions so that they can see how these experiences can help them achieve their goals. In those training programs, employees should explore the extent to which negative emotions can be positive for their goal-achievement. One example to do that is cognitive reframing (Clark, 2013). For example, employees might experience sweaty palms, weak knees, and a fast-beating heart before an important presentation at work. Those sensations are likely to be perceived as "stress" and may cause undesired consequences. The goal of cognitive reframing is to change the way employees think about and respond to this situation, either by changing the perception of, or response to the situation. Sweaty palms, weak knees, and a fast-beating heart are also likely experienced on a first date. Here, those sensations likely indicate excitement rather than anxiety. Thus, in the case of the presentation, employees might experience those sensations due to excitement and not anxiety. Employees with the ability to reframe their sensations are likely to develop positive stress beliefs. These positive stress beliefs, in turn, may imply positive effects on subjective vitality at work—as shown in this dissertation.

Second, employees should become more competent in action control and personal growth. As pointed out in this dissertation, employees benefit from the ability to switch between all four macro systems to exert action control and personal growth efficiently. Both competencies support employees to exert self-control in stressful situations (e.g., being able to enact intentions) and self-regulation (e.g., being able to calm oneself down). Organizations can support employees' action control and personal growth in various ways. Some promising techniques for self-regulation are self-motivation training using mental contrasting (e.g., Schunk et al., 2022; Baumann & Kuhl, 2020; Friedrichs et al., 2022). Mental contrasting is divided into two steps. In the first step, employees imagine the positive effects of an achieved goal. Then, they contrast these with the obstacles they face on the way to the goal. For example,

in a 30-minute self-motivation exercise by Baumann and Kuhl (2020), a narrator guided participants through a mental journey that started in a green meadow by a mountain lake. The narrator alternated between fantasies about the desired future and reflections on the difficulties in reality (i.e., mental contrasting). At the end of the journey, the protagonist met a meaningful figure who encouraged and supported him/her in reaching his/her goals. The authors showed increased levels of self-regulated motive enactment for participants low in self-regulation, compared to control conditions and controlling for baseline levels. Thus, contrasting the positive and negative aspects of a situation likely helps employees to become more competent in action control and personal growth.

Conclusion

Employees' personality has an essential role in predicting daily motivation and well-being at work. This cumulative dissertation suggests that personal growth, the ability to learn from mistakes and painful experiences, represents a core competence of personality functioning. Employees experience the highest levels of vitality, flow, and engagement when they can focus on unexpected, dissonant, or painful details (such as negative supervisor feedback) but also learn from those experiences by integrating them into a broader network. The effect of personal growth is moderated by internal (e.g., affect regulation, beliefs about stress) and external (e.g., role clarity) factors. Thus, organizations should support employees to become more comfortable with negative experiences by changing the way employees perceive stress or by developing coping mechanisms that help to self-regulate stress.

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Appendix

Appendix A

English and German Items of the IWDS-N

Emotional Labor (inner)	
1.	I have to display feelings that do not match with what I actually feel toward the patients. *Ich muss nach außen hin Gefühle zeigen, die nicht mit dem übereinstimmen, was ich den zu Pflegenden gegenüber tatsächlich fühle.*
2.	I have to show feelings in my interactions with patients that do not correspond with the feelings that I actually experience. *Ich muss im Umgang mit den zu Pflegenden Gefühle zeigen, die meinen eigentlich erlebten Gefühlen nicht entsprechen.*
3.	I have to endure conflicts between my own feelings and the feelings I should show toward the patients. *Ich muss Konflikte zwischen meinen eigenen Gefühlen und den Gefühlen, die ich nach außen hin/den zu Pflegenden gegenüber zeigen sollte, aushalten.*
4.	I have to express certain feelings that I don't actually feel. *Ich muss bestimmte Gefühle zum Ausdruck bringen, die ich eigentlich nicht empfinde.*
Emotional Labor (outer)	
5.	I always have to establish a positive atmosphere when interacting with patients. *Ich muss im Umgang mit den zu Pflegenden stets eine positive Stimmung herstellen.*
6.	I have to help patients cope with negative feelings (e.g., anxiety, sadness). *Ich muss den zu Pflegenden helfen, negative Gefühle (z.B. Ängste, Traurigkeit) zu bewältigen.*
7.	I have to be good at comforting patients. *Ich muss den zu Pflegenden gut zusprechen können.*
Cooperative work	
8.	I have to team up with the patients to achieve positive outcomes. *Ich muss mit den zu Pflegenden zusammenarbeiten, um ein gutes Ergebnis zu erzielen.*
9.	I have to involve the patients in my work. *Ich muss die zu Pflegenden in meine Arbeit mit einbinden.*
10.	I have to be an attachment figure for the patients. *Ich muss eine Bezugsperson für die zu Pflegenden sein.*
11.	I have to maintain a trusting relationship with the patients. *Ich muss eine vertrauensvolle Beziehung zu den zu Pflegenden pflegen.*
Subjective Acting	
12.	I have to pay close attention to the body language of the patients. *Ich muss sehr auf die Körpersprache der zu Pflegenden achten.*
13.	I have to read between the lines during interactions with patients. *Ich muss während der Interaktion mit den zu Pflegenden zwischen den Zeilen lesen.*
14.	I have to actively draw on my sensations during interaction with the patients. *Ich muss während der Interaktion mit den zu Pflegenden aktiv auf meine Sinneseindrücke zurückgreifen.*

Note. Only German items have been used in this study. The English translations are for documentation purposes only and may benefit from professional translation and validation of an English-speaking sample.