# Boon and Bane: How Perfectionism Shapes Employee Well-Being Through Health-Impairing and Motivational Processes

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**Boon and Bane: How Perfectionism Shapes Employee Well-Being Through Health-Impairing and Motivational Processes**

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*The eye is always caught by light, but shadows have more to say.*

Gregory Maguire

## Danksagung

*Der Lebenslauf ist nicht Teil der Veröffentlichung.*

## Contents

# Deutsche Zusammenfassung

Es scheint wenig verwunderlich, dass Perfektionismus in einer zunehmend kompetitiven Welt ansteigt (Curran & Hill, 2019). Diese multidimensionale Persönlichkeitsdisposition betrifft besonders den Lebensbereich der Arbeit und kann für Beschäftigte eine Quelle von erhöhtem Stress und vermindertem Wohlbefinden darstellen (Ocampo et al., 2020; Stoeber & Stoeber, 2009). Ziel der vorliegenden Dissertation war es, die ambivalente Rolle von Perfektionismus in diesem spezifischen Kontext zu verstehen, wobei ein Schwerpunkt darauf lag, die unterschiedlichen Zusammenhänge der Dimensionen "Self-Oriented Perfectionism" (SOP; äußerst hohe Ansprüche, die Personen für sich selbst haben) und „Socially Prescribed Perfectionism" (SPP; der Eindruck, dass andere Perfektion von einem selbst erwarten) mit dem Wohlbefinden von Beschäftigten zu erklären. Konkret wurde das „Job Demands-Resources"-Modell (JD-R, Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004) als orientierender Rahmen genutzt, um relevante Arbeitsanforderungen und Ressourcen zu identifizieren, auf die Perfektionismus sich auswirken könnte (Forschungsfrage 1). Als weiteres Ziel dieser Arbeit sollten gesundheitsschädliche und motivationale Prozesse des Modells betrachtet werden, um aufzuzeigen, über welche Mechanismen Perfektionismus mit dem Wohlbefinden von Beschäftigten zusammenhängt, sowie auf diesen Prozessen basierende Interventionsansätze (Forschungsfrage 2).

Die vier Manuskripte, welche die Grundlage dieser Dissertation bilden, bezogen sich jeweils auf eine oder mehrere dieser Forschungsfragen. Jedes der Manuskripte hatte dabei einen eigenen Fokus und behandelte bislang unbeantwortete Fragen bisheriger Forschung. Manuskript 1 beleuchtete die Frage, wie perfektionistische Mitarbeitende von potentiellen Teammitgliedern gesehen werden und in welchem Ausmaß sie an ihrem Arbeitsplatz eine soziale Einbindung erleben. In Manuskript 2 untersuchten wir, ob Zeitdruck als

Arbeitsanforderung in Kombination mit dem mentalen Abschalten von der Arbeit in der Freizeit (“Detachment“) als Erholungserfahrung erklärt, warum manche Perfektionisten vulnerabel für beeinträchtigten Schlaf sind. Manuskript 3 fokussierte die Frage, ob die drei Grundbedürfnisse nach Autonomie, Kompetenz und Zugehörigkeit eine Schnittstelle zu einerseits vermindertem aber auch gesteigertem Wohlbefinden von Beschäftigten darstellen können. Zuletzt untersuchten wir in Manuskript 4, ob bereits eine kurze App-basierte Achtsamkeitsintervention perfektionistische Kognitionen reduzieren sowie Detachment und die Schlafqualität verbessern kann.

In Manuskript 1 bauten wir auf dem „Perfectionism Social Disconnection“- Modell (Hewitt et al., 2006) und der darin enthaltenen Annahme auf, dass Perfektionismus zu interpersonellen Schwierigkeiten beitragen kann und untersuchten, inwiefern die verschiedenen Dimensionen unterschiedlich mit sozialen Arbeitsanforderungen und Ressourcen zusammenhängen. Studie 1 bezog sich dabei auf die Perspektive der Teammitglieder (experimentell; N = 184) und zeigte, dass Beschäftigte es vorziehen mit einem nicht perfektionistischen Teammitglied zu arbeiten, außer sie haben selbst hohe Ansprüche an ihr Umfeld. In Studie 2 (querschnittlich, N = 279), welche die Perspektive von perfektionistischen Beschäftigen selbst fokussierte, war SPP die einzige Dimension, die ein konsistentes Muster von geringer sozialer Eingebundenheit zeigte, das soziale Ausgrenzung und zwischenmenschliche Konflikte als soziale Arbeitsanforderungen und ein Fehlen von sozialer Unterstützung als Arbeitsressource umfasste.

In Manuskript 2 verknüpften wir die Perfektionismus-Literatur mit dem Stressor-Detachment Modell (Sonnentag & Fritz, 2015) und nahmen an, dass Unterschiede in der täglichen Generierung von Stress, operationalisiert als täglicher Zeitdruck, und im Detachment relevante gesundheitsschädliche Prozesse sein können, die erklären, warum üblicherweise SPP, nicht aber SOP mit schlechter Schlafqualität einhergeht. Die Ergebnisse der Tagebuchstudie ($N$ = 70) unterstützten Zeitdruck, eine aufgabenbezogene

Arbeitsanforderung, und anschließendes vermindertes Detachment als seriellen Prozess zwischen SPP und beeinträchtigtem Schlaf. Die angenommene entgegengesetzte serielle Mediation für SOP durch geringeren Zeitdruck, sowie Detachment als separater Mechanismus wurden nicht bestätigt, aber es zeigte sich ein positiver direkter Effekt von SOP auf Schlafqualität.

In Manuskript 3 setzten wir an der Self-Determination Theory und der Erfüllung der Bedürfnisse nach Autonomie, Kompetenz und Zugehörigkeit an (Deci & Ryan, 2000) und untersuchten die drei Bedürfnisse als gesundheitsschädliche und motivationale Pfade zwischen den Dimensionen von Perfektionismus und dem Arbeitsengagement, der Arbeitszufriedenheit und der Erschöpfung von Beschäftigten. Die Befunde einer Online-Studie über zwei Messzeitpunkte im Abstand von drei Monaten ($N$ = 328 zu MZP1 und $N$ = 138 zu MZP2) betonen die spezifischen Rollen der drei Bedürfnisse darin, die unterschiedlichen Zusammenhänge von SOP und SPP mit dem Wohlbefinden von Beschäftigten zu erklären. Dabei zeigte sich die Erfüllung des Autonomiebedürfnisses sich als besonders relevant für das Arbeitsengagement.

Schließlich betrachteten wir in Manuskript 4 Perfektionismus und die dazu gehörigen dynamischen Kognitionen als eine Antipode zur persönlichen Ressource der Achtsamkeit. Wir testeten, ob eine App-basierte Achtsamkeitsintervention perfektionistische Kognitionen reduzieren und Detachment und beeinträchtigten Schlaf als wichtige erholungsrelevante Konzepte verbessern kann. Im Vergleich zu Teilnehmenden in der Wartelisten-Kontrollgruppe ($n$ = 45) berichteten jene in der Interventionsgruppe ($n$ = 38) vorübergehend einen Anstieg der Achtsamkeit und eine Verringerung der sorgenbezogenen perfektionistischen Kognitionen. Es wurden keine signifikanten Veränderungen bezüglich der erholungsbezogenen Outcomes festgestellt. Dennoch liefern die Befunde dieser randomisierten kontrollierten Studie einen ersten Nachweis dafür, dass App-basierte

Achtsamkeitsinterventionen eine Möglichkeit darstellen, um dynamische Aspekte von Perfektionismus zu reduzieren.

Zusammenfassend betonen die vier Manuskripte den zweischneidigen Einfluss von Perfektionismus auf verschiedene Aspekte des Arbeitslebens und das Wohlbefinden von Beschäftigten. Es kommt dabei auf die spezifische Dimension an, ob Perfektionismus Fluch oder Segen ist. Unseren Ergebnissen zufolge hängt SPP darüber negativ mit dem Wohlbefinden zusammen, dass diese Dimension zu Arbeitsanforderungen beiträgt und den gesundheitsschädlichen Prozess anstößt und Ressourcen und den motivationalen Prozess hemmt. Demgegenüber hängt SOP positiv mit dem Wohlbefinden zusammen, weil diese Dimension, zumindest zu einem gewissen Grad, den gesundheitsschädlichen Prozess hemmt und gleichzeitig den motivationalen Prozess anstößt. Dynamische Aspekte von Perfektionismus können bereits durch niederschwellige Interventionen adressiert werden. Die Herausforderung, Perfektionismus in das JD-R Modell zu integrieren, Ansätze für zukünftige Forschung, um den konzeptionellen Rahmen dieser Dissertation zu stärken und zu erweitern, sowie praktische Implikationen werden diskutiert.

## English Summary

It is unsurprising that perfectionism is rising in a world that is increasingly competitive (Curran & Hill, 2019). This multidimensional personality disposition especially affects the domain of work and may place employees at risk for high stress and poor well-being (Ocampo et al., 2020; Stoeber & Stoeber, 2009). The present dissertation aimed to understand the ambivalent role of perfectionism in this specific context with an emphasis on explaining the different associations of self-oriented perfectionism (SOP; exceptionally high demands that people have for themselves) and socially prescribed perfectionism (SPP; the belief that others expect perfection from oneself) with employee well-being. Specifically, the job demands-resources (JD-R, Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004) model was used as a guiding framework to identify relevant job demands and resources (Research Question 1) that perfectionism may shape. Drawing on this model, this work also aimed to capture health-impairing and motivational processes that may explain by which mechanisms perfectionism relates to employee well-being and possible intervention approaches that build on these processes (Research Question 2).

The four manuscripts that are the basis of this dissertation each referred to one or more aspects of these research questions. Each of the manuscripts had a unique focus and related to questions that remained unanswered from previous research. First, Manuscript 1 addressed the question of how perfectionist colleagues are seen by potential team members and to what extent perfectionists experience social disconnection or integration in the workplace. Second, we investigated, in Manuscript 2, whether time pressure as a job demand in combination with the recovery experience of detachment (the mental disconnection from work during leisure time) explains why some perfectionists are vulnerable to impaired sleep. Third, Manuscript 3 focused on whether the three basic needs of autonomy, competence, and relatedness represent a crossroad linking the dimensions of perfectionism to either impaired or enhanced well-being

of employees. Lastly, in Manuscript 4, we investigated whether a short app-based mindfulness intervention may reduce perfectionistic cognitions and improve detachment and impaired sleep.

Concretely, in Manuscript 1 we built on the perfectionism social disconnection model (Hewitt et al., 2006) with its proposition that this disposition may contribute to interpersonal difficulties and examined the role of the perfectionism dimensions in differently shaping social demands and resources. Study 1 concerned the colleagues' perspective (experimental; $N$ = 184) and indicated that employees would favour working with a non-perfectionist colleague unless they have high demands for their colleagues themselves. In Study 2 (cross-sectional, $N$ = 279), which addressed the perfectionists' perspective, SPP was the only dimension that displayed a consistent pattern of social disconnection, including social exclusion and interpersonal conflicts as social job demands and a lack of social support as a resource.

In Manuscript 2, we linked the perfectionism literature and the stressor-detachment model (Sonnentag & Fritz, 2015) and assumed that differences in daily stress generation, operationalised as daily time pressure, and detachment may be relevant health-impairing processes explaining why SPP but not SOP is typically related to poor sleep quality. Findings from the diary study ($N$ = 70) provided support for time pressure, a task-related job demand, and subsequently reduced detachment as a serial process that underlies SPP and impaired sleep. The assumed opposite serial mediation concerning SOP via decreased time pressure and detachment as a separate mechanism were not confirmed, but a direct effect of SOP indicating restful sleep was revealed.

In Manuscript 3 we drew on self-determination theory and the concept of autonomy, competence, and relatedness satisfaction (Deci & Ryan, 2000) and examined the three needs as health-impairing and motivational pathways relating the dimensions of perfectionism to employees' work engagement, job satisfaction, and exhaustion. Results from a two-wave

online study conducted over 3 months ($N$ = 328 at T1 and $N$ = 138 at T2) emphasize the unique roles of the three needs in explaining the different relationships of SOP and SPP to employee well-being with autonomy satisfaction being especially relevant for work engagement.

Lastly, in Manuscript 4, we considered perfectionism with its more state-like cognitions as an antipode to the personal resource of mindfulness and tested the effectiveness of an app-based mindfulness intervention in reducing perfectionistic cognitions and improving detachment and impaired sleep quality as important concepts related to recovery. As compared to participants in the wait-list control group ($n$ = 45), those in the intervention group ($n$ = 38) reported a temporary increase in mindfulness and a decrease in perfectionistic concern cognitions. No significant changes in the recovery-related outcomes were found. However, findings from the randomised controlled trial provide initial evidence that app-based mindfulness interventions are a possibility to reduce state-like aspects of perfectionism.

To conclude, the four manuscripts highlight the duality of perfectionism in shaping various aspects of employees' working life and their well-being. Whether perfectionism can be considered as a boon or bane, depends on the specific dimension. According to our findings, SPP negatively relates to well-being in that it contributes to job demands and the health impairment process and inhibits resources and the motivational process. By contrast, SOP positively relates to well-being because this dimension hinders, at least to some extent, the health impairment process while it may also foster the motivational process. State-like aspects of perfectionism may be already addressed by low-threshold interventions. The challenge of integrating perfectionism in the JD-R model, avenues for future research to strengthen and extend the conceptual framework of this dissertation, and practical implications are discussed.

## Introduction

"*Citius, altius, fortius*" (Engl. “faster, higher, stronger”) has been used as a call to increase effort and constantly strive for advancement and outstanding performances. These three words are not only an appropriate motto for the Olympic Games, they equally apply to the challenges that employees and organisations face today. Both employees and organisations need to stand out from competitors, either to get the desired job, get promoted, or become the market-dominating company. This increasingly competitive mentality, along with growing individualism, materialism, and a demanding social environment, may explain why the personality disposition of perfectionism is on the rise (Curran & Hill, 2019). Prominent examples suggest that perfectionism may be considered a guarantor for success. One is Elon Musk with his vision of the perfect Tesla vehicle (Vance, 2015). Another example is Steve Jobs, who has been described as a passionate perfectionist driven by his aspiration to create flawless Apple products (Isaacson, 2012). Part of this passion was, however, also Jobs’ tendency to redesign products in case of the slightest doubt and a desire to work only with the best people. Therefore, the question of the costs caused by the pursuit of perfection inevitably arises.

A recent meta-analysis (Harari et al., 2018) demonstrated that although perfectionism is unrelated to job performance, it may place employees at risk for high stress and poor well-being. In modern organisations, employees already face highly demanding job characteristics, such as heavy workload, job insecurity, and work interfering with leisure time (American Psychological Association, 2013). Within this demanding context, employees have to function as teams (Devine et al., 1999; Kozlowski & Ilgen, 2006) and meet agreements on objectives and performance standards (Cleveland et al., 1989). All these demands and requirements collide with the rise of perfectionism. The need to investigate perfectionism in employees becomes even more evident given that the workplace is the area in which

individuals most frequently indicate to be perfectionistic (Slaney & Ashby, 1996; Stoeber & Stoeber, 2009).

Scholars agree that perfectionism is best conceptualised and investigated as a multidimensional construct (Stoeber, 2018a). Across different models, these dimensions can be assigned to two superordinate factors that are commonly referred to as perfectionistic strivings and perfectionistic concerns (Stoeber & Otto, 2006). A large body of research has demonstrated the relevance of the dimensions for employee well-being (see e.g., Ocampo et al., 2020 and Stoeber & Damian, 2016, for comprehensive reviews). Based on this research, we know that dimensions summarised as perfectionistic concerns show consistent maladaptive relationships with well-being, such as burnout. Dimensions summarised as perfectionistic strivings, on the contrary, do not necessarily share these maladaptive associations and may even show adaptive relationships with indicators of well-being, such as work engagement, especially when the overlap between the dimensions is statistically controlled for.

As opposed to the associations with well-being, comparatively little is known about how perfectionism may shape various aspects of employees' working life, such as job demands and resources. These aspects are decisive for the experience of stress and important antecedents of well-being according to the job demands-resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004). Research outside the workplace context indicates that perfectionism is highly relevant for the experience of stress and can be assumed to actively contribute to the presence of stressors (Hewitt & Flett, 2002). So far, only one study tested this assumption in employees and linked perfectionistic concerns to increased role stress as a job demand (Childs & Stoeber, 2012). In addition, no research has illuminated the interpersonal consequences of perfectionism at work (Ocampo et al., 2020) even though this disposition is known to have a salient interpersonal component (Hewitt & Flett, 1991). Relationships and interpersonal functioning may also be considered as stressors

or resources at work (Schaufeli & Taris, 2014). Thus, investigating the role of perfectionism in contributing to job demands and resources may be a promising avenue to apply existing knowledge of perfectionism and stress to the workplace context and gain a comprehensive view of how this phenomenon shapes employees' working life.

Further, scholars have only begun to focus on the processes that may underlie the different associations of perfectionism and well-being (Ocampo et al., 2020). In previous research, rumination about work and maladaptive coping were identified as processes that explain the relationship between perfectionistic concerns and negative indicators of well-being, such as burnout (Flaxman et al., 2018; Stoeber & Damian, 2016). These specific mechanisms are insufficient to explain why employees high in perfectionistic strivings tend to be highly engaged in their work. Thus, there is a need to advance theory on the rationale behind the intensively studied different main effects on well-being. Especially, relevant mechanisms in the applied context of work need to be identified to more fully understand why the dimensions of perfectionism relate differently to employee well-being. From a practical perspective, thorough knowledge of these processes is necessary to identify potential boundary conditions that exacerbate or attenuate the effects of perfectionism and represents the basis for designing purposive interventions that support perfectionists in the workplace. In addition, so far, interventions have focused on diminishing or managing the negative consequences of perfectionism in the clinical population but specific interventions for employees in applied settings, such as the workplace, remain to be tested (Ocampo et al., 2020).

Against this background, this dissertation aimed to contribute to the emerging field of research on perfectionism in employees by (1) investigating how the dimensions of perfectionism may shape job demands and resources and (2) looking at the processes underlying its different associations with well-being and related intervention approaches in more detail. This serves to understand why some perfectionists feel vigorous and energetic at

work whereas others feel exhausted and how well-being may be enhanced, especially among the latter.

In the following sections, I outline the theoretical and empirical background of this work before integrating the relevant constructs in a conceptual model and highlighting the central research questions. Next, I introduce the four manuscripts on which this dissertation is based. Afterwards, I discuss the core findings concerning the research questions and conclude with limitations, avenues for future research, and practical implications.

# Theoretical and Empirical Background

## A Dimensional Approach to Perfectionism

To start with a definition of the central construct of this work, perfectionism is a personality disposition that comprises exceptionally high-performance standards, striving for flawlessness, and the tendency towards overcritical evaluations of one's behaviour as core characteristics (Flett & Hewitt, 2002; Frost et al., 1990; Stoeber, 2018). In early conceptualisations, perfectionism was understood as a uni-dimensional construct (e.g., Burns, 1980). The current consensus in research is that this construct has a multidimensional nature (see Enns & Cox, 2002, for a review) in which differences concerning behaviour, individual functioning, and well-being are rooted.

The present work builds on Hewitt and Flett's (1991) model of perfectionism, which suggests the origin and direction of the perfectionist demands as the key distinctions between the dimensions: *Self-oriented perfectionism* (SOP) is the intrapersonal dimension and describes exceedingly high demands and expectations that persons have of themselves. Persons high in SOP strive for extraordinary high goals and consider being perfect as particularly important. Further, the model includes *socially prescribed perfectionism* (SPP) and *other-oriented perfectionism* (OOP) as interpersonal dimensions. SPP is characterised by the belief that significant others expect flawlessness and by the permanent concern of not living up to these high expectations. Persons high in this dimension aim to obtain others' approval and to avoid negative social evaluations. OOP, by contrast, comprises having exceedingly high standards for others and being highly critical if others fail to meet their expectations.

Over time, different models of perfectionism have been developed (Frost et al., 1990; Slaney et al., 2001), even simultaneously with the model proposed by Hewitt and Flett (1991). The common ground of these models is that the dimensions relate to two

superordinate and interrelated factors (Stoeber, 2018b). These factors are typically labelled as *perfectionistic strivings*, referring to high-performance standards, and *perfectionistic concerns*, including the fear of negative evaluation and concern over mistakes (see Stoeber & Otto, 2006, for a comprehensive review). SOP and SPP are considered key indicators of perfectionistic strivings and concerns (Stoeber & Damian, 2016; Stoeber & Gaudreau, 2017). The placement of OOP in this superordinate structure, by contrast, is still debated. Findings complicate its assignment to these superordinate factors, which is why OOP has been described as an other form of perfectionism (Ocampo et al., 2020). In line with recommendations (Stoeber & Otto, 2006), in this dissertation, I focused on SOP and SPP as key indicators of perfectionism, whereas OOP plays a minor role.

### *Perfectionistic Cognitions as Dynamic Aspects of Perfectionism*

The theoretical assumption of a stable disposition is also empirically supported, as perfectionism has been demonstrated to remain relatively stable over months and years (e.g., Sherry et al., 2013). Although this dissertation mainly concerns dispositional perfectionism, this section introduces perfectionistic cognitions as more dynamic and "state-like manifestations of perfectionism" (Hill & Appleton, 2011, p. 697). These cognitions have been described as ruminative, automatic thoughts that may arise in situations that indicate opportunities to display perfection or imperfection (e.g., especially demanding tasks) and thus activate the perfectionistic self-schema (Flett et al., 1998; Stoeber et al., 2010).

Mirroring the multidimensionality of its dispositional form, perfectionistic cognitions are best conceptualised in terms of *perfectionistic striving cognitions* (PSC) and *perfectionistic concerns cognitions* (PCC). Whereas PSC refer to thoughts about the relevance that high standards have for oneself, PCC refer to thoughts about failing, making mistakes, and eventual negative consequences (Prestele et al., 2020). Given the similarities in conceptualisations, dispositional perfectionism and perfectionistic cognitions are moderately to strongly related (e.g., Prestele & Altstötter-Gleich, 2019). Thus, it is unsurprising that PCC

but not PSC display similar negative relations as dispositional perfectionistic concerns with outcomes such as perceived stress (Prestele et al., 2020). In addition, PCC have been demonstrated to account for the negative associations of dispositional perfectionism and affective well-being, and both types of cognitions have been shown to explain incremental validity beyond dispositional perfectionism (Prestele et al., 2020; Stoeber et al., 2010).

## The Active Role of Perfectionism in Shaping Stressors and Resources

A central assumption on which the manuscripts were based is that perfectionists actively shape either functional or dysfunctional experiences in and with certain environments, such as the workplace, by stable patterns of behaviours and cognitions. This assumption is derived from previous research proposing the experience of stress (Hewitt & Flett, 2002; Sherry et al., 2016) as a linkage between perfectionism and well-being. A wide variety of terminology and different views exist on the concept of stress (Zapf & Semmer, 2004). In the following, stress refers to a subjectively experienced unpleasant state of tension and stressors describe stimuli that are very likely to trigger this unpleasant state (Semmer, 1994; Zapf & Semmer, 2004). The next sections provide a concise overview of this mechanism, which has been established by research outside the workplace, before it will be applied to this specific context.

### *Stress as a Mechanism*

The mediating hypothesis (Hewitt & Flett, 2002) assumes that perfectionism relates to impaired well-being and increased psychopathology through the generation, anticipation, and perpetuation of stress. People high in perfectionism are expected to engage in behaviours such as setting unrealistic goals that cause stressful situations (stress generation). Further, they are likely to anticipate, for instance, future failure, which may create stress (stress anticipation) or maintain stressful experiences by their ruminative response styles (stress perpetuation). Consequently, they should experience higher degrees of stress. In line with this, personality-

dependent stressors have been suggested to mediate the perfectionism-psychopathology link (Sherry et al., 2016). By their concerns about failing to meet others' expectations, perfectionists are, for instance, likely to engage in procrastinating behaviours (e.g., Flett et al., 1992) and thus contribute to stressors (personality-dependent).

Empirical evidence supports the mediating hypothesis in student samples, especially for SPP. This dimension has consistently been found to be related to impaired health and well-being via increased stress (e.g., Dunkley et al., 2003; Molnar et al., 2012). Findings concerning SOP, on the contrary, vary. SOP has been differently related to health and well-being via increased stress (Molnar et al., 2012), no stress (Dunkley et al., 2003), or even decreased stress (Molnar et al., 2020). The idea of personality-dependent stressors is also central in the perfectionism social disconnection model (PSDM; Hewitt et al., 2006), which will be described in the next section.

### *The Perfectionism Social Disconnection Model*

Building on the notion that the interpersonal aspects inherent in perfectionism play an important role in explaining adjustment difficulties and psychopathology, the PSDM (Hewitt et al., 2006) attributes an active role to perfectionists in contributing to social stressors and the experience of social disconnection. The initial model considered only SPP (Hewitt et al., 2006), but the expanded versions of the model (Hewitt et al., 2017; Sherry et al., 2016) include all dimensions of perfectionism. The model proposes two pathways that link perfectionism to poor functioning and impaired well-being. First, perfectionists can be expected to contribute to objective social disconnection, such as conflicts and impaired social networks, as they show dysfunctional interpersonal behaviours encompassing hostility, passive-aggressiveness, and distrust (Hewitt & Flett, 2004; Stoeber et al., 2017). Second, they are likely to experience subjective social disconnection because they are highly attentive to social rejection and negative evaluation (Flett et al., 1996, 2014).

Previous studies support both pathways of the model for SPP and the pathway of objective disconnection for OOP. Both dimensions are positively related to hostility and interpersonal conflict (e.g., Haring et al., 2003; Stoeber et al., 2017). Moreover, SPP was negatively related to social support in several studies (e.g., Molnar et al., 2012; Sherry et al., 2008). On a minor note, this evidence suggests that socially prescribed perfectionists unintentionally contribute to rejection and those interpersonal experiences they worry about (Hewitt et al., 2018). SOP, on the contrary, is mostly unrelated to conflicts or perceived social support (e.g., Haring et al., 2003; Sherry et al., 2008) and may even show associations that point towards social connection. Thus, individuals high in SOP have been found to report high empathy and trust (Stoeber et al., 2017). These findings, combined with the aforementioned findings on perfectionism and stress, underline that the dimensions may differently shape outcomes.

The PSDM and literature on stress as a relevant mechanism may be described as one-sided, as the focus is directed to how perfectionism relates to impaired functioning and poor well-being, whereas processes leading to functioning and well-being are neglected. Without explicitly referring to the term resources, research concerning the PSDM also investigates variables such as social support that are established as important resources in the workplace (Nielsen et al., 2017). A way of identifying relevant stressors and resources at work and investigating their consequences is by the guidance of the JD-R model (Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004). Hence, this model was used as a framework to apply existing knowledge of perfectionism and stress from basic research to the workplace context and consider processes linking the dimensions of perfectionism to either impaired or high levels of well-being.

## The Job Demands-Resources Model as a Guiding Framework for Identifying Processes Underlying Perfectionism and Employee Well-Being

In line with the tendency in organisational research to focus also on positive experiences and functioning at work (Luthans, 2002), the JD-R model provides a framework to understand the salutogenic and pathogenic aspects of work concerning employees' health and well-being. A plethora of cross-sectional and longitudinal evidence supports the model and its assumptions across several populations, countries, and occupations (see Bakker & Demerouti, 2017 and Lesener et al., 2019, for reviews and a meta-analysis).

The JD-R model starts with the fundamental proposition that, across every occupation, psychosocial work characteristics relevant for the experience of stress can be assigned to the categories of job demands and job resources (Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004). *Job demands* comprise those characteristics of a job that are related to either psychological or physiological costs (or both), as employees need to put higher effort into meeting them. Demerouti et al. (2001) point out that the concept of job demands is comparable to earlier descriptions of environmental stressors, such as noise and time pressure (Hockey, 1993). However, as understood in the JD-R model (Bakker & Demerouti, 2007), job demands are not necessarily negative but they may turn into negative job stressors when employees have not sufficiently recovered from the effort that is required to meet these demands (Meijman & Mulder, 1998). In the following, the term demands describes a broader category of aspects at work that may encompass stressors. *Job resources*, on the contrary, either promote the achievement of work goals, reduce demands and the aforementioned associated costs, or contribute to employees' development and growth. Examples of job demands are time pressure and social stressors, such as conflicts or exclusion, and examples of job resources are social support and goal clarity (Gerhardt et al., 2021; Schaufeli & Taris, 2014). As they may refer to tasks (e.g., time pressure, goal clarity) or interpersonal relationships (e.g., conflicts, exclusion, social support), among others, task-

related and social job demands and resources can be distinguished (Hu et al., 2016; Sonnentag & Frese, 2012).

As a second proposition of the model, two different processes explain the impairment and the enhancement of health and well-being (Bakker & Demerouti, 2007): the *health impairment process* by which chronic job demands deplete employees' energy and lead to strain (i.e., exhaustion) and the *motivational process* by which job resources play an intrinsic and extrinsic motivational role and relate to well-being[1] (i.e., engagement). Whereas early versions of the model explicitly referred to burnout and its antipode work engagement as core outcomes (e.g., Schaufeli & Bakker, 2004), continuous development and application of the model led to the inclusion of various indicators of strain and encompassed also health complaints, such as sleep problems (e.g., Brauchli et al., 2015), and well-being, such as job satisfaction (Tims et al., 2013, for a review; see also Bakker & Demerouti, 2017).

Consistent with this range of outcomes, this dissertation draws on broad definitions of employee well-being as a concept that may include many constructs (Danna & Griffin, 1999) and that is best represented by positive as well as negative indicators (Warr, 2013). Exhaustion, work engagement, and job satisfaction are well-established and commonly studied indicators of employee well-being (Mäkikangas et al., 2016), also in the context of the JD-R model (Tims et al., 2013), and were thus considered in this work. Exhaustion is a core dimension of burnout and defined as work-related fatigue resulting from the intensive physical, affective, and cognitive strain associated with persistent job demands (Demerouti et al., 2003). Work engagement, by contrast, is characterised by a positive and fulfilling state of mind, including feelings of vigour, dedication, and absorption (Schaufeli et al., 2002). Job satisfaction usually describes a global positive feeling that employees have about their job (Spector, 1997). According to Danna and Griffin (1999), employee well-being also

[1] Although Bakker and Demerouti (2007) label this construct "motivation", this thesis refers to it as "well-being," which is in line with Schaufeli and Taris (2014) and a broader conception of healthy functioning at work.

encompasses psychological and physical health, which is why impaired sleep quality will also be included as a form of health complaints.

Over time, researchers further investigated the detailed mechanisms underlying the health impairment and motivational processes. The concepts of recovery experiences (Sonnentag & Fritz, 2007), as well as basic psychological need satisfaction as a mini-theory within self-determination theory (Deci & Ryan, 2000), are among these mechanisms.

### *The Role of Detachment as a Recovery Experience*

The recovery experience of detachment, meaning the ability to mentally switch off from work during leisure time, plays a central role in the stressor-detachment model (Sonnentag & Fritz, 2015). The model assumes that work-related stressors, such as time pressure, inhibit detachment during leisure time and cause strain symptoms, such as exhaustion and impaired sleep. These effects may develop within short periods (e.g., days and weeks) or over years. Empirical evidence supports the notion that the presence of stressors impedes detachment as an important recovery experience and that detachment reduces strain (see Bennett et al., 2018, for a meta-analysis).

The stressor-detachment model shows partial overlap with the health impairment process proposed by the JD-R model, considering that job demands may also comprise stressors, such as time pressure. Thus, detachment has been suggested as a relevant mechanism in the JD-R model and confirmed to mediate the effects of job demands on fatigue at work (Kinnunen et al., 2011).

### *Basic Psychological Need Satisfaction as a Linkage*

At the heart of self-determination theory (Deci & Ryan, 2000) lies the assumption that humans are inherently active and aim to proceed towards development, growth, and well-being. To follow this natural inclination, they rely on the basic psychological needs of autonomy, competence, and relatedness as universal nutriments. Referring to earlier approaches, Deci and Ryan (2000) described autonomy as the individuals' sense of ownership

over their behaviour (deCharms, 1968) and competence as the aspiration to attain desired outcomes and master situations within certain environments. Relatedness is understood as a fundamental desire to experience connection with others and to feel cared for by them (Baumeister & Leary, 1995). Self-determination theory assumes that satisfaction of these needs enables individuals to function optimally and experience psychological well-being, whereas frustration of needs frustration leads to impaired functioning and well-being. The concept of basic need satisfaction has been widely applied and established as an approach to investigate employees' motivation and well-being (Deci et al., 2017). A recent review and meta-analysis (Van den Broeck et al., 2016) empirically supports the relevance of need satisfaction for various well-being indicators.

Research has integrated the concept of need satisfaction in the JD-R model. According to Van den Broeck et al. (2008), need satisfaction bridges the associations of job demands with impaired well-being as well as of job resources and enhanced well-being. Thus, need satisfaction can be considered as a mechanism underlying the health impairment and motivational processes because job demands and resources can differently shape the satisfaction of the three needs.

### *Mindfulness as a Personal Resource*

In addition to the constructs already described above, researchers have focused on personal resources as another component of the JD-R model. As opposed to job resources that are immediately related to aspects of work, job resources refer to people's beliefs of their impact on and control over their environment (Hobfoll et al., 2003). They are proposed to have positive effects on motivation and well-being, to buffer the effects of job demands, and to develop reciprocally with job resources (Bakker & Demerouti, 2017; Xanthopoulou et al., 2009). Recently, mindfulness has been introduced as a personal resource that negatively relates to emotional demands and strains and buffers the effects of emotional demands (Grover et al., 2016).

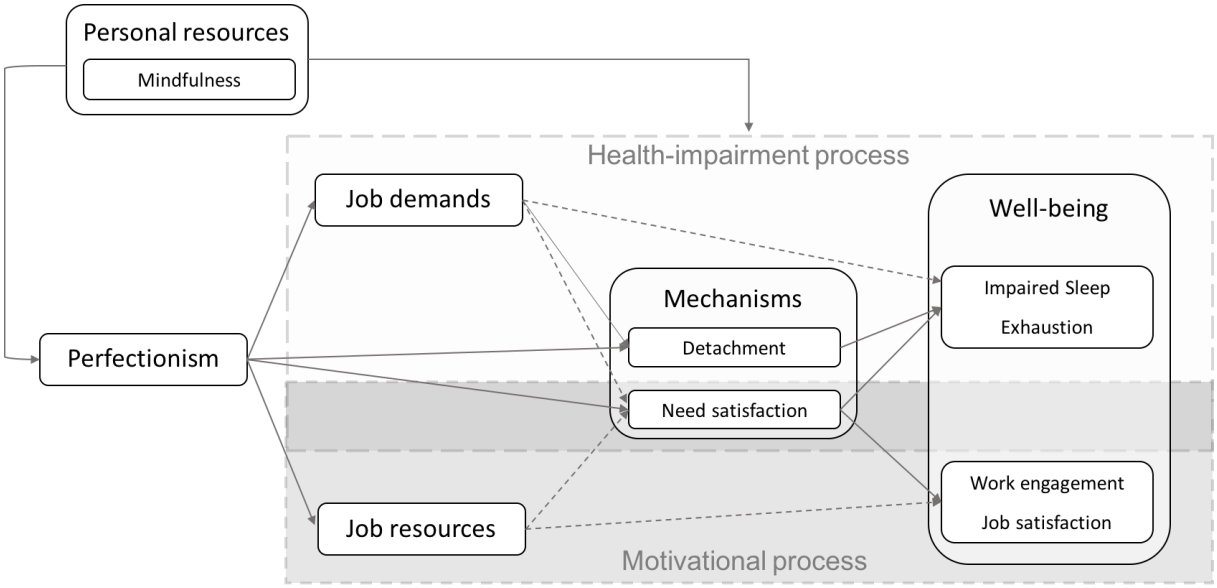
The concept of mindfulness is rooted in Buddhism and is described as intentionally and non-judgmentally directing one's attention to perceptions and experiences of the present moment (Kabat-Zinn, 2003). This shift in attention can be considered as a skill that may reduce stress and enable effective coping, which is why mindfulness-based interventions are increasingly employed in the workplace (Bartlett et al., 2019). Empirical evidence supports the effectiveness of these interventions in reducing employees' stress and enhancing their well-being (see Vonderlin et al., 2020, for a recent meta-analysis). Recently, also app-based and virtual mindfulness interventions have been found to support employees in recovering from work and experiencing less exhaustion and fewer sleep problems (e.g., Möltner et al., 2018; Querstret et al., 2017). Thus, promoting personal resources, such as mindfulness, seems to be a promising avenue for interventions in the workplace.

## Conceptual Framework

In the previous sections, I have highlighted the core constructs and theoretical background of the dissertation. In this section, I organise these constructs in an overall framework. Figure 1 represents a simplified conceptual model that links the basic assumptions of this work. It builds on the JD-R model (Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004) including detachment and need satisfaction as mechanisms (Kinnunen et al., 2011; Van den Broeck et al., 2008) and extends this framework by perfectionism.

Figure 1

*Simplified Conceptual Model of the Dissertation*




*Note.* The dotted lines indicate relations that are not tested in this dissertation but are assumed.

This model starts with the assumption that perfectionism shapes job demands and resources. This assumption is not only compatible with the idea of personality-dependent stressors (Sherry et al., 2016) and associated research evidence in the research area of perfectionism but also with the increased attention that is directed towards the role of individuals within the JD-R model. For example, job crafting has been introduced as a tool for

employees to reduce job demands or enhance the availability of job resources (Petrou et al., 2012; Tims et al., 2013). Similarly, perfectionism is understood to contribute to the presence of job demands and resources by stable patterns of behaviours and cognitions. Moreover, perfectionism is assumed to directly relate to detachment and need satisfaction as mechanisms within the JD-R model due to a dispositional tendency towards ruminative response styles and a clear motivational component inherent in perfectionism (Hewitt & Flett, 2002; Stoeber et al., 2018).

Manuscripts 2 and 3 illuminate these paths and provide a detailed description of this tendency and motivational aspects. Through the mechanisms of detachment and need satisfaction and their relevance in the health impairment and motivational process, perfectionism is expected to relate to diminished well-being as represented by impaired sleep quality and exhaustion, or enhanced well-being as represented by work engagement and job satisfaction. Although these outcomes refer either to the underlying health impairment or motivational process, they are considered to reflect positive and negative indicators of a comprehensive well-being construct (Danna & Griffin, 1999; Warr, 1990, 2013). This consideration is also in line with previous research in the context of the JD-R model (Tims et al., 2013). As another component, mindfulness is considered as a personal resource. Interventions that enhance mindfulness are known to effectively reduce employees' stress and enhance their recovery and well-being (Querstret et al., 2017; Vonderlin et al., 2020). As has been described above, dispositional perfectionism is relatively stable. Perfectionistic cognitions as a rather dynamic construct, however, offer the opportunity to be the target of interventions. These more state-like aspects of perfectionism may be comparatively easily affected by an increase in personal resources. Mindfulness has been suggested as an antipode to perfectionism and the associated mindset that is directed towards social evaluation, approval, and the avoidance of criticism (Flett et al., 2020). Drawing on these findings and suggestions, mindfulness is considered as a personal resource that may reduce perfectionistic

cognitions and address the health impairment process in terms of improving detachment and impaired sleep.

The detailed conceptual model that arises by integrating the constructs investigated in the manuscripts of this dissertation is depicted in Figure 2. In addition to the simplified conceptual model, this detailed model specifies the different dimensions and aspects of perfectionism and the concrete job demands and resources that were investigated. The research questions refer to different parts of the conceptual framework. Subsequently, the focus of each of them is described.

**Research Question 1: How do the Dimensions of Perfectionism Shape Social and Task-Related Demands and Resources?**

A large body of research has focused on how the dimensions of perfectionism relate to outcomes, with employee well-being and performance being especially popular (Harari et al., 2018; Ocampo et al., 2020). Although no association with performance was found (Harari, 2018), as has been described above, a clearer pattern emerged concerning the association of perfectionism and well-being. A large body of research supports the different relationships that the dimensions summarised as perfectionistic strivings (e.g., SOP) and perfectionism concerns (e.g., SPP) show to well-being (e.g., Ocampo et al., 2020). Notably, less attention has been directed to the question of how the dimensions of perfectionism relate to those aspects of working life that are central antecedents of well-being, as described by the JD-R model: job demands and job resources. As described earlier, the topic of stress has been addressed in basic research conducted outside the workplace. However, in the workplace context, only one study investigated how perfectionism contributes to the experience of stressors (i.e., role stress, Childs & Stoeber, 2012), whereas others focused on whether perfectionism enhances reactivity to specific stressors but not on their direct relationship (Reis & Prestele, 2020). So far, no research has illuminated the interpersonal consequences at work

(Ocampo et al., 2020). As proposed by the PSDM (Hewitt et al., 2006) and associated research, we know that perfectionism has a salient interpersonal component that is even included in its conceptualisation (Hewitt & Flett, 1991). Further, as pointed out in the theoretical section, research outside the workplace supports the mediating hypothesis and the PSDM for SPP, but not necessarily for SOP, which indicates that SOP and SPP may be differently related to the experience of social and task-related demands at work. To conclude, its association with job demands and resources may represent a promising starting point to comprehensively understand perfectionism at work.

Consequently, Research Question 1 aimed to shed light on how the dimensions of perfectionism, including OOP, shape social demands (conflicts, social exclusion) and resources (social support). Further, the association of SOP and SPP with time pressure as a common task-related demand in today's working life (Smith et al., 2011; Sonnentag & Frese, 2012) was addressed. Thus, Research Question 1 laid the groundwork for understanding that perfectionism may not only be relevant for employees' well-being but various aspects of their working life, including job demands and the availability of resources.

**Research Question 2: What Mechanisms Underlie the Different Associations Between Perfectionism and Employee Well-Being and What are Related Intervention Approaches?**

Research Question 2 aimed at building the bridge between perfectionism and well-being. Specifically, it addressed the detailed processes that underlie the different associations of perfectionism and well-being. Knowledge of these processes is necessary to advance theory and more fully understand why some dimensions of perfectionism (i.e., SOP) may relate to high engagement and energy at work, whereas other dimensions (i.e., SPP) consistently relate to drained energy and health complaints. A conscious focus was placed on investigating the underlying processes concerning SOP and SPP as core indicators of the

superordinate factors of perfectionism. OOP has rarely been investigated in the context of employees' well-being (Childs & Stoeber, 2012), but rather for its own sake or concerning its interpersonal consequences and the stress it generates for significant others (Stricker et al., 2019). Considering the distinction between the health-impairing and motivational processes, Research Question 2 was composed of two sub-questions that refer to each.

***Research Question 2a: Which Health-Impairing Processes Explain the Association of Perfectionism with Well-Being and how can Interventions Address These?***

Researchers have begun to shift their attention from the different associations of perfectionism and well-being towards the processes that may underlie these associations. Based on transactional stress theory (Lazarus & Folkman, 1984) and the initiation-termination model of worry (Berenbaum, 2010), previous research found maladaptive coping and rumination about work to represent relevant processes in the association between perfectionistic concerns and negative indicators of well-being, such as burnout (Chang, 2012; Flaxman et al., 2018; Li et al., 2014). However, there may be more, and probably work-specific, processes that remain to be identified to gain a comprehensive understanding of underlying processes. In addition to the identification of health-impairing processes, it is of high practical relevance to investigate how interventions can address them to manage perfectionism at work and maintain employees' well-being (Ocampo et al., 2020). Thus, Research Question 2a draws on the health impairment process in the JD-R model and aimed at identifying further relevant processes, such as the interplay of demands and detachment, that may explain the association of perfectionism with well-being and interventions that can address these processes.

### *Research Question 2b: Which Motivational Processes Explain the Association of Perfectionism and Well-Being?*

Beyond the arguments just mentioned, the processes of maladaptive coping and rumination cannot explain why employees high in perfectionistic strivings may show engagement and full investment at work. In line with the aforementioned tendency in organisational research to consider not only poor functioning but also investigate what makes employees flourish and develop at work (Luthans, 2002), the construct of perfectionism also holds the potential to understand thriving at work. Research Question 2b draws on this potential and aimed to broaden our understanding of motivational processes, such as need satisfaction, that may also explain the association of perfectionism with enhanced well-being (i.e., high work engagement).

## Overview of the Manuscripts

This section provides a concise description of the four manuscripts and their core findings. Table 1 lists which of the research questions are addressed in each of the manuscripts. As depicted in Figure 2, each of the manuscripts refers to associations described in the conceptual model.

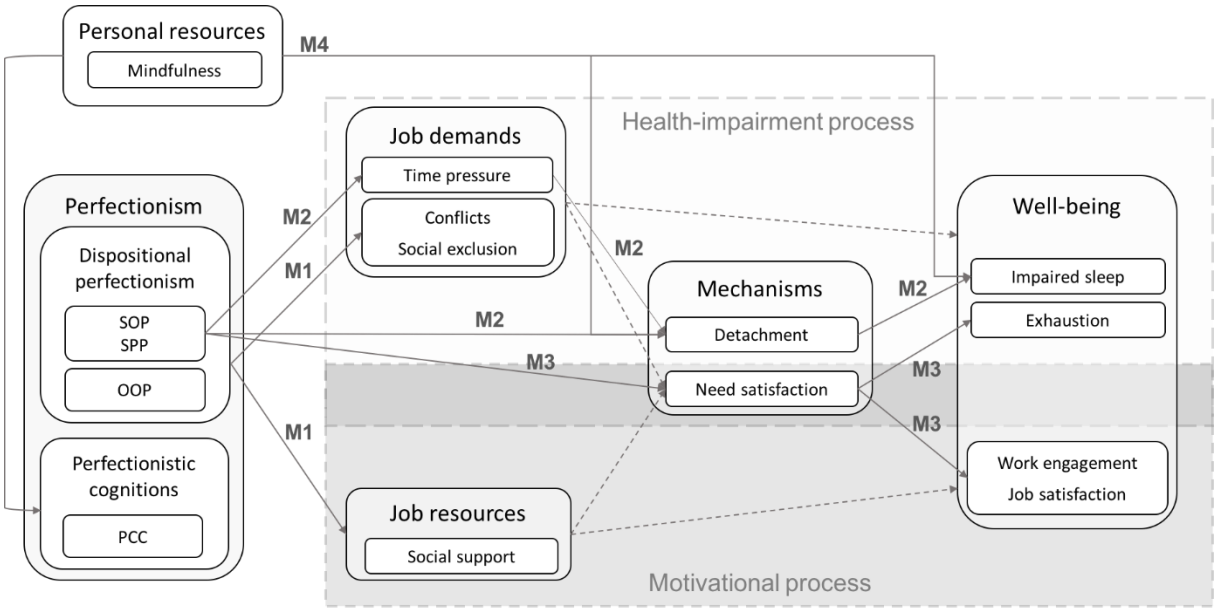
Table 1

*Overview of Research Questions*

| | Research Question | Manuscript 1 | Manuscript 2 | Manuscript 3 | Manuscript 4 |
|---|---|---|---|---|---|
| 1 | How do the dimensions of perfectionism shape social and task-related demands and resources? | x | x | | |
| 2 | What mechanisms underlie the different associations between perfectionism and well-being and what are related intervention approaches? | | x | x | x |
| 2a | Which health-impairing processes explain the association of perfectionism with well-being and how can interventions address these? | | x | x | x |
| 2b | Which motivational processes explain the association of perfectionism and well-being? | | | x | |

*Figure 2*

*Detailed Conceptual Model of the Dissertation*




*Note.* M1 refers to the relations tested in Manuscript 1, M2 to the relations tested in Manuscript 2, M3 refers to the relation tested in Manuscript 3, and M4 to those tested in Manuscript 4. The dotted lines indicate relations that are not tested in this dissertation but are assumed.

## Manuscript 1: The Perfect Colleague? Multidimensional Perfectionism and Indicators of Social Disconnection in the Workplace

**Citation:** Kleszewski, E. & Otto, K. (2020). The perfect colleague? Multidimensional perfectionism and indicators of social disconnection in the workplace. *Personality and Individual Differences*, 162. https://doi.org/10.1016/j.paid.2020.110016.

### *Rationale and Theoretical Background*

Manuscript 1 dealt with the fundamental questions of what impressions employees have of perfectionist colleagues and to what extent perfectionists experience integration or social disconnection at work. The Perfectionism Social Disconnection Model (PSDM; Hewitt et al., 2006) builds on the assumption that social components inherent in perfectionism may lead to interpersonal distress and adjustment difficulties and thus posits an active role to perfectionists in generating distress. Previous research has mainly investigated the PSDM in undergraduate students (e.g., Sherry et al., 2008). Findings indicate that the model may not apply to the same extent to all dimensions of perfectionism; especially SOP may even show a tendency towards social connection (e.g., Stoeber et al., 2017). However, it remains to be investigated how the dimensions affect interpersonal work experiences. Social relationships and interpersonal functioning are indispensable parts of modern work (i.e., teamwork; Devine et al., 1999) and may represent important resources or demands at work (Schaufeli & Taris, 2014). Thus, Manuscript 1 relates to Research Question 1 by focusing on the role of perfectionism in shaping employees' social demands and resources. We addressed these questions across two studies to combine the colleagues' (Study 1) and the perfectionists' perspective (Study 2).

### *Methods*

We applied two quantitative methodological approaches. Study 1 was conducted as an online experiment comprising a sample of 184 employees involved in teamwork. We measured the participants' perfectionism and randomly assigned them to one of four vignettes

describing a self-oriented, other-oriented, socially prescribed, or non-perfectionist colleague. Afterwards, participants rated these colleagues regarding their social skills and work competence and indicated their willingness to work with the described person (interpersonal attraction). We conducted a one-way ANOVA and Tukey's HSD test to examine differences in the ratings of the vignettes and moderated regression analyses to test whether the ratings differed depending on the participant's perfectionism. Study 2 was a field study and employed a cross-sectional online questionnaire. Again, the sample consisted of employees involved in teamwork ($N$ = 279), who answered measures of perfectionism, social support, social exclusion, and conflicts at work. Data were analysed using bivariate and multiple regressions.

***Results***

The results were largely consistent with our predictions. In Study 1, all perfectionist vignettes received lower ratings of social skills and attraction compared to the non-perfectionist vignette, with the other-oriented perfectionist displaying significantly lower ratings than the other perfectionists. Concerning competence, the self-oriented and other-oriented colleagues had the highest ratings. Further, the regression analyses revealed that ratings of social skills and attraction differed depending on the participants' perfectionism. In Study 2, SPP and OOP displayed unique relationships with indicators of social disconnection, although OOP was related to task and relationship conflict only. SOP, on the contrary, was negatively related to relationship conflict.

***Discussion***

Our findings indicate that employees generally prefer working with a non-perfectionist colleague unless they have exceedingly high expectations for their colleagues themselves. Nevertheless, only SPP seems to be related to a consistent pattern of social disconnection, including social exclusion. Thus, Manuscript 1 provides evidence that the dimensions of

perfectionism differ in experiences of social integration and thus the presence of social demands and resources at work.

## Manuscript 2: Far from Perfect Sleep – A Diary Study on Multidimensional Perfectionism in the Context of the Stressor-Detachment Model

**Citation:** Matick, E., Kleszewski, E. & Otto, K. (submitted). Far from perfect sleep – A diary study on multidimensional perfectionism in the context of the stressor-detachment model. *Stress and Health.*

### *Rationale and Theoretical Background*

The double-edged nature of perfectionism concerning employee well-being is empirically well supported (see Harari et al., 2018 and Ocampo et al., 2020; for recent reviews and a meta-analysis). Nevertheless, knowledge of the mechanisms that drive these different effects is limited (Ocampo et al., 2020), but necessary to advance theory. Manuscript 2 addressed differences in daily stress generation and recovery as precursors of employees' daily impaired sleep quality as a negative well-being outcome. Linking the perfectionism literature and the stressor-detachment model (Sonnentag & Fritz, 2015), we proposed time pressure and detachment as relevant mechanisms that may explain why socially prescribed but not self-oriented perfectionists are vulnerable to impaired sleep. Thereby, we extend previous research (Reis & Prestele, 2020) by conceptualising time pressure as a personality-dependent stressor that may trigger the cascade of low detachment. Manuscript 2 provides answers to Research Question 1 by investigating how perfectionism relates to daily time pressure as a task-related demand. Further, this manuscript addresses Research Question 2a and considers the conjoint role of daily time pressure and the recovery experience of detachment for the association of perfectionism and impaired sleep.

### *Methods*

We conducted a diary study and collected data from 70 employees over 5 consecutive working days. During the week, the participants' time pressure and impact of COVID-19 on

the daily work routine were assessed after work. Each morning, the participants rated their detachment during bedtime and sleep quality of the last night. Measures of perfectionism and demographic variables were included in a baseline questionnaire. We estimated a multilevel path model using a 2-1-1-1 design to test the impact of the Level 2 predictor variables (perfectionism) on the Level 1 dependent variable (sleep quality) via the separate (detachment) and serial mediation of Level 1 mediator variables (time pressure and detachment). Further, we included gender, age, and the impact of COVID-19 at work as control variables.

***Results***

Confirming our expectations, the results provided support for the serial mediation of time pressure and detachment linking SPP to impaired sleep quality. On the contrary, the expected opposite serial mediation concerning SOP via decreased time pressure was not confirmed. Both perfectionism dimensions displayed negative descriptive, though not significant, associations with detachment when time pressure was included in the path model. However, a direct positive effect of SOP on sleep quality was found.

***Discussion***

Manuscript 2 underlines differences in daily stress generation as a key distinction between the dimensions of perfectionism and provides support for time pressure and subsequent detachment as a serial process explaining why socially prescribed perfectionists experience low sleep quality. Thus, this manuscript supports the active role of socially prescribed perfectionists in the generation and experience of time pressure. These findings also strengthen the stressor-detachment model (Sonnentag & Fritz, 2015) at the day level and highlight the necessity to consider both processes in work (i.e., stressors) and non-work areas (i.e., recovery) to understand in detail how perfectionism may translate into poor well-being. Further, the direct positive effect of SOP and sleep quality points towards the need to investigate different underlying mechanisms for SOP and SPP.

**Manuscript 3: A Matter of Needs – Basic Need Satisfaction as an Underlying Mechanism Between Perfectionism and Employee Well-Being**

**Citation:** Kleszewski, E. & Otto, K. (submitted). A matter of needs – Basic need satisfaction as an underlying mechanism between perfectionism and employee well-being. *Journal of Occupational and Organizational Psychology.*

***Rationale and Theoretical Background***

Whereas Manuscript 2 focused on the differences in stress generation and recovery and their role in explaining employee well-being, Manuscript 3 concentrated on the fundamental motivational differences inherent in perfectionism. These motivational differences may broaden our understanding of processes by which the dimensions of perfectionism may contribute to high vitality and optimal functioning or exhaustion and poor functioning. We referenced self-determination theory and its concept of basic need satisfaction (Deci & Ryan, 2000) and proposed perfectionism as a dispositional form of motivation that affects whether employees experience autonomy, competence, and relatedness satisfaction at work. Extending previous research from the clinical or sports contexts (e.g., Boone et al., 2014; Jowett et al., 2016), we aimed to contribute to a more detailed understanding of how each of the three needs links the dimensions of perfectionism to engagement, satisfaction, and exhaustion as indicators of well-being. Using Warr's framework of well-being (1990, 2013), we attributed a unique position to autonomy satisfaction in fostering optimal, active functioning. Thus, Manuscript 3 addresses Research Question 2 by illuminating satisfaction of the three needs as health-impairing (Research Question 2a) and motivational mechanisms (Research Question 2b) that underlie the different associations of perfectionism and well-being.

***Methods***

We conducted a two-wave online study with a 3-month interval. The final sample comprised 328 employees at Time 1 and 138 employees at Time 2. Path analysis was used to

test a multiple mediation model including SOP and SPP (T1) as independent, the three separate needs (T1) as mediating, and the indicators of well-being (T2) as dependent variables. We controlled the T2 well-being indicators for the autoregressors at T1 as well as for the impact of the COVID-19 pandemic on the participants' working life and negative life events. In addition, gender, age, and organisational tenure (T1) were included as control variables in the path model.

***Results***

In line with the hypotheses, SOP was positively related and SPP was negatively related to satisfaction of the three needs. The dimensions of perfectionism were differently related to work engagement and job satisfaction through autonomy satisfaction. Differences in competence satisfaction accounted for the different relations of perfectionism, with job satisfaction and differences in relatedness satisfaction explaining its relations with exhaustion. However, contrary to our expectations, the paths from autonomy and competence satisfaction to exhaustion and from relatedness satisfaction to job satisfaction and their respective indirect effects were not significant. On a minor note, the manuscript included an additional analysis revealing that competence satisfaction links OOP to job satisfaction and a cross-lagged analysis of need satisfaction and well-being ruling out reversed causality.

***Discussion***

Overall, our findings highlight the motivational differences inherent in perfectionism and the active role of perfectionists in shaping different experiences of need satisfaction that translate into high or poor well-being. Thereby, autonomy, competence, and relatedness satisfaction can be considered to have unique positions in fostering employee well-being according to Warr's framework (1990, 2013), with autonomy satisfaction fuelling work engagement as an active form of well-being. Thus, Manuscript 3 provides support for the three needs as separate mechanisms between perfectionism and employee well-being.

**Manuscript 4: Effects of an App-Based Mindfulness Training on Employees' Perfectionism and Recovery: A Brief Report on a Randomised Wait-List Control Trial**

**Citation:** Kleszewski, E., Matick, E. & Otto, K. (submitted). Effects of an app-based mindfulness training on employees' perfectionism and recovery: A brief report on a randomised wait-list control trial. *Current Psychology.*

***Rationale and Theoretical Background***

Building on the findings from Manuscript 2, in Manuscript 4 we aimed to shed light on mindfulness as a potential intervention approach that may equally address perfectionistic cognitions and the health-impairing processes. Drawing on previous work, we considered mindfulness as a personal resource (Grover et al., 2016) and an antipode to perfectionism (Flett et al., 2020). Thereby, we aimed to extend previous findings on online and app-based mindfulness interventions at work (e.g., Möltner et al., 2018; Querstret et al., 2017) in two ways. First, we aimed to demonstrate initial evidence for the effects of an app-based mindfulness intervention on perfectionistic concern cognitions (PCC). Second, we investigated whether also an easily accessible and short app-based mindfulness intervention may improve detachment and impaired sleep quality as relevant components for recovery according to the stressor-detachment model (Sonnentag & Fritz, 2015). Thus, Manuscript 4 concerns Research Question 2a by investigating how interventions can address the underlying health-impairing processes between perfectionism and well-being.

***Methods***

We employed a randomised wait-list control design with three measurement occasions. Participants' mindfulness, perfectionism, perfectionistic cognitions, detachment, and sleep quality were assessed before the intervention (T1) after completing the app-based mindfulness course of 10 short units (T2, after 2 weeks) and at a follow-up after 2 more weeks (T3). Participants in the wait-list control group received the intervention after responding to the T3 questionnaire. The final sample was composed of 87 employees.

ANCOVAs were used to test differences in the outcomes between the two groups at T2 and T3. The respective T1 scores as well as gender and age were included as covariates in the analyses.

***Results***

In line with our hypotheses, participants in the intervention group ($n$ = 38) reported significantly higher levels of mindfulness and lower levels of PCC after completing the app-based mindfulness (T2) compared to participants in the wait-list control group ($n$ = 45). However, no significant differences between the groups in terms of detachment and sleep quality were found. Further, the significant group differences did not hold until the short-term follow-up (T3).

***Discussion***

On the one hand, the findings of Manuscript 4 point towards the benefits of app-based mindfulness interventions. Such interventions may temporarily reduce PCC and thus represent a possibility to address the cascade linking perfectionism to impaired well-being early. On the other hand, our findings indicate boundaries of these interventions, as beneficial effects may disappear rapidly after completing those courses and important indicators of recovery, such as detachment, were not improved. Thus, as has been demonstrated in previous intervention studies work (e.g., Möltner et al., 2018; Querstret et al., 2017), more intensive and ongoing practice of mindfulness may be needed to maintain and enlarge these initial effects.

# General Discussion

Perfectionism is on the rise (Curran & Hill, 2019). This development will inevitably encounter the already demanding work in modern organisations (American Psychological Association, 2013). Thus, it is necessary to investigate how perfectionism operates in the workplace to understand and react to its ambiguous role concerning employee well-being. This dissertation contributes to the stream of research on perfectionism in employees in several ways. First, this dissertation demonstrates the relevance of this phenomenon for various aspects of employees working life, such as job demands and resources (Manuscripts 1 and 2). Further, it extends the theory of perfectionism by identifying health-impairing and motivational processes that underlie the associations between perfectionism and impaired or enhanced well-being and related intervention approaches (Manuscripts 2–4). Thus, this dissertation not only emphasises that perfectionists can be seen as active creators of stress-related job characteristics and experiences, it extends previous research on mechanisms (Chang, 2012; Flaxman et al., 2018; Li et al., 2014) by those that may explain why the dimensions of perfectionism may relate differently to high engagement and energy at work or drained energy and health complaints. Figure 3 illustrates the findings of this dissertation.

## Discussion of Research Question 1

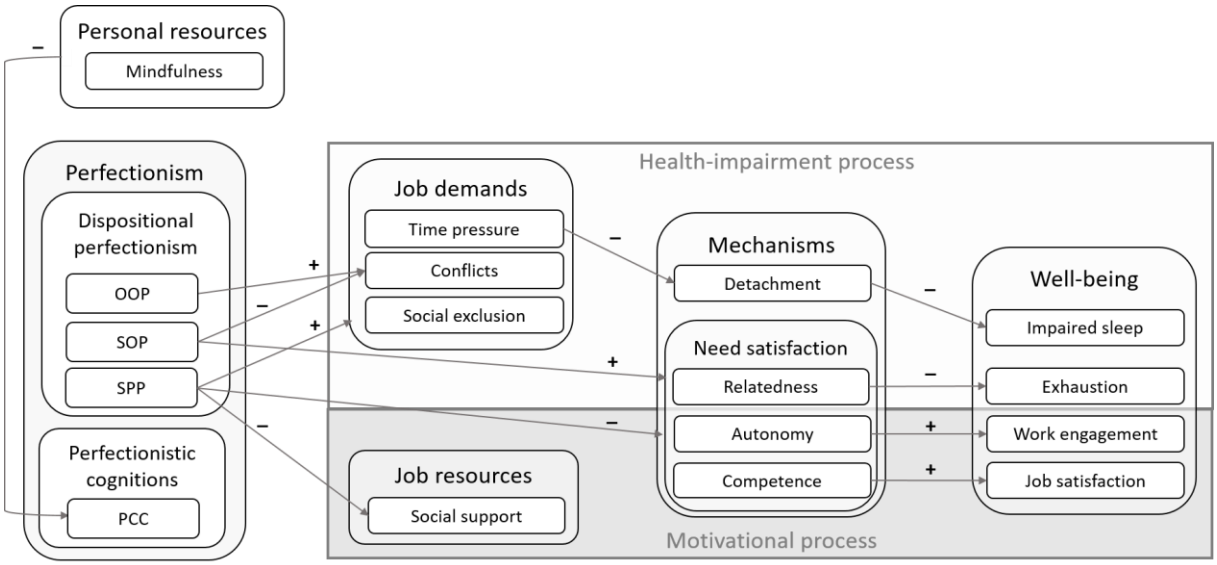
Research Question 1 addressed how the dimensions of perfectionism may contribute to social and task-related demands and resources. Manuscript 1 focused on the roles of SOP, SPP, and OOP in shaping employees' social demands and resources. Specifically, we investigated to what extent perfectionists experience integration or social disconnection at work across two studies that combined the colleagues' (Study 1) and the perfectionists' perspective (Study 2). Our findings support that employees generally prefer working with a non-perfectionist colleague and that the dimensions of perfectionism differ in the presence of social demands and resources at work. However, only SPP was related to all indicators of

social disconnection that were interpersonal conflicts, social exclusion, and a lack of social support. OOP was related to interpersonal conflicts, whereas SOP was even negatively related to relationship conflicts. The findings concerning SPP and OOP align with the PSDM (Hewitt et al., 2006) that attributes an active role to perfectionists in generating interpersonal distress. The association of SOP with relationship conflict highlights that the PSDM may not necessarily apply to this dimension and provides further support for a tendency towards social connection (e.g., Stoeber et al., 2017).

Manuscript 2 investigated how SOP and SPP relate to daily time pressure as a task-related demand. As expected, SPP was positively related to daily time pressure, which is consistent with the mediating hypothesis (Hewitt & Flett, 2002) and associated findings linking SPP to increased stress (e.g., Dunkley et al., 2003; Molnar et al., 2012). The finding that SOP was unrelated to daily time pressure aligns with the overall varying findings concerning SOP and the mediating hypothesis (e.g., Dunkley et al., 2003; Molnar et al., 2012) but is contrary to recent findings linking SOP to decreased stress (Molnar et al., 2020).

Figure 3

*Findings of the Dissertation*



Considered together, it can be concluded that SPP may consistently contribute to the presence of task-related and social demands and a lack of social resources. Thus, this dimension shapes both job demands and resources unfavourably. SOP, by contrast, may be of less relevance for job demands and resources, although it may depend on the specific demand. This dimension may be negatively related to social demands (i.e., conflicts), but can be assumed to be unrelated to task-related demands and social resources according to the present findings. Our findings also highlight that OOP may contribute to interpersonal conflicts as social demands. These may have consequences for the functioning of and climate in teams (Lehmann-Willenbrock et al., 2011) and thus potentially cause distress for team colleagues working with employees high in OOP.

**Discussion of Research Question 2**

Research Question 2 was concerned with the mechanisms that underlie the different associations between perfectionism and employee well-being and related intervention approaches. This superordinate question was approached by two sub-questions. Of these, Research Question 2a focused on the role of health-impairing processes in explaining these associations as well as on possible interventions addressing these processes. In contrast, Research Question 2b focused on the role of motivational processes in accounting for the association of perfectionism and well-being.

Concerning Research Question 2a, Manuscript 2 investigated the conjoint role of daily time pressure and daily detachment as a recovery experience for employees' impaired sleep, using a diary design. The results provided support for the assumed serial process of time pressure and subsequently reduced detachment as a linkage between SPP and impaired sleep quality. However, the expected opposite effect for SOP was not confirmed, which is incongruent with recent findings linking SOP to enhanced sleep quality via decreased stress (Molnar et al., 2020). However, consistent with Molnar et al. (2020), our results indicated that

employees high in SOP may enjoy restful sleep as reflected by a direct positive effect of SOP on sleep quality. Further, both dimensions of perfectionism were unrelated to detachment and also the negative association of SPP and detachment was no longer significant once time pressure was accounted for. This finding is contrary to the proposition that both dimensions of perfectionism should have a dispositional tendency towards ruminative response styles (Hewitt & Flett, 2002) and meta-analytical findings supporting this proposition (Xie et al., 2019). However, this finding aligns with previous research on perfectionism in the context of the stressor-detachment model (Reis & Prestele, 2020) and underlines the importance of simultaneously investigating job demands and recovery experiences as health-impairing processes.

Drawing on these findings, we investigated in Manuscript 4 whether an easily accessible and short app-based mindfulness intervention may enhance detachment and impaired sleep quality. Beyond addressing this relevant process and well-being outcome, we examined the intervention's effectiveness in reducing perfectionistic cognitions as state-like aspects of perfectionism. The results supported a short-term reduction of PCC among participants in the intervention group, which is in line with the proposition that perfectionists may benefit from increased mindfulness (Flett et al., 2020). Simultaneously, our findings highlighted the necessity of more intensive and continued mindfulness practice to maintain these beneficial effects and affect further processes involved in health impairment.

Manuscript 3 was based on a two-wave online study with a 3-month interval and focused on autonomy, competence, and relatedness satisfaction as further health-impairing processes. Specifically, the dimensions of perfectionism were expected to relate differently to exhaustion as an indicator of impaired well-being via its association with the three needs. We also expected the three needs to function as distinct mechanisms concerning work engagement and job satisfaction. As these are indicators relating to the motivational process of the JD-R model, associated findings will be discussed in the next section referring to

Research Question 2b. In line with recent recommendations to consider the three needs as related yet separate constructs (Van den Broeck et al., 2016), our findings revealed that they accounted for distinct associations between perfectionism and impaired well-being. SOP was negatively and SPP was positively related to exhaustion via relatedness satisfaction only, indicating that this need may be especially relevant in the health impairment process. The different associations of perfectionism with relatedness satisfaction align with findings from Manuscript 1 and strengthen the notions that SOP may be related to social connection, whereas SPP is consistently related to feelings of social disconnection (e.g., Stoeber et al., 2017).

Considering that need satisfaction may be a crossroad to impaired or enhanced well-being, Manuscript 3 also addressed Research Question 2b with its focus on motivational processes. As mentioned above, we expected the three needs to represent distinct mechanisms concerning work engagement and job satisfaction. Thereby, we referenced Warr's framework of well-being (1990, 2013) and attributed a unique role to autonomy satisfaction in fostering work engagement. Supporting this unique position among the three needs, autonomy satisfaction accounted for the different associations of perfectionism with engagement, and both autonomy and competence satisfaction explained its different associations with job satisfaction. Overall, these findings are consistent with previous studies (Kovjanic et al., 2012; Trépanier et al., 2013) and a meta-analysis (Van den Broeck et al., 2016) indicating that autonomy satisfaction is especially relevant for employee well-being. Thus, they extend findings on perfectionism and overall need satisfaction in clinical and sports contexts (Boone et al., 2014; Jowett et al., 2016) and emphasise need satisfaction as a mechanism that accounts for different associations of perfectionism and well-being across several contexts.

In sum, the findings from Manuscripts 2 and 3 support increased time pressure and subsequently low detachment and a lack of relatedness satisfaction as health-impairing processes that merit consideration in explaining the association of SPP and poor well-being

(i.e., impaired sleep quality and exhaustion, respectively). Complementary to this, relatedness satisfaction may link SOP to reduced exhaustion. Further, autonomy and competence satisfaction were identified as motivational processes that may not only explain why employees high in SPP show low work engagement and job satisfaction but also why employees high in SOP may display high engagement and satisfaction at work. In addition, as demonstrated by Manuscript 4, increasing mindfulness among perfectionists may be a promising avenue to reduce PCC, which represent a pathway to increased stress (Prestele et al., 2020).

Of course, the manuscripts only represent a section of various constructs that may be considered relevant in the JD-R framework. Nevertheless, the findings of this dissertation overall indicate that SPP can be considered to negatively relate to employee well-being through contributing to the health impairment process while also hindering the potential of the motivational process. SOP, on the contrary, can be seen to partly hinder the health-impairment process and to draw, to some extent, on the potential of the motivational process, which may explain its positive relations with employee well-being.

**Towards an Integration of Perfectionism in the JD-R Model**

The previous section concerned a discussion of the findings with regard to the research questions guiding this dissertation. However, the present findings inevitably raise the question of how to integrate perfectionism in the overall JD-R framework and point towards boundaries of this framework.

Perfectionism has been suggested as a possible personal demand worthy of being studied in the JD-R model (Lorente Prieto et al., 2008). As an antagonist to personal resources, the concept of personal demands has been introduced and described as “the requirements that individuals set for their own performance and behaviour that force them to invest effort in their work and are therefore associated with physical and psychological costs”

(Barbier et al., 2013, p. 751). According to Bakker and Demerouti (2017), personal demands may be relevant for the health impairment or motivational processes depending on the specific personal demand. This may apply to SPP, which is involved in negatively affecting both processes. Nevertheless, employees high in SPP do not experience requirements as self-set, which is why I suggest to expand the definition by Barbier et al. (2013) and understand personal demands as the requirements that individuals set or perceive to be set for their own performance and behaviour that force them to invest effort in their work and are therefore associated with physical and psychological costs.

Concerning SOP, the findings of this dissertation do not indicate that this dimension is associated with such costs and thus fits the definition of a personal demand. SOP was even negatively related to certain job demands (i.e., conflicts). It may be speculated that SOP rather shows associations indicative for personal resources, which are assumed to show positive effects on motivation and well-being, buffer the negative effects of job demands, and mutually develop with job resources (Bakker & Demerouti, 2017; Xanthopoulou et al., 2009). However, the categorisation of SOP as a personal resource may be too far ahead given that its buffering effect on job demands was not examined and its association with social support as a job resource was lacking. As will be discussed in the avenues for future research directions, its relations with further job resources remain to be investigated to come to a well-founded conclusion on its relation with job resources. Researchers argue that findings concerning personal resources may differ depending on the types and combination of personal resources, job resources, job demands, and outcomes and that more research is needed to fully understand the role of personal resources in the JD-R model (Schaufeli & Taris, 2014).

Although its findings are based on selected job demands and resources and perfectionism as a specific disposition, this dissertation may give impulses for future integration of personality into this framework. The example of SOP shows that some personality dispositions may not be definitively classified as personal demands or resources.

Further, more conceptual clarity is needed on what characterises personal demands and resources. Thus, instead of categorising personality dispositions that may comprise unique patterns of behaviours and cognitions, the JD-R model may benefit from integrating personality as a broader category. This category should consider that personality may affect job demands, resources, and the processes that link them to well-being in a complexity that may exceed the two-fold category of personal demands and resources as it is currently defined.

**Strengths and Limitations**

This dissertation has several strengths but also limitations that should be considered for the interpretation of the findings. As a major strength, the manuscripts address recent calls to think ahead cross-sectional designs when investigating perfectionism (Stoeber, 2018b) and include a variety of methodological approaches to provide answers to the research questions. Thus, an online experiment using vignettes was used in addition to a cross-sectional questionnaire in Manuscript 1 to provide a thorough investigation of perfectionism and social disconnection at work from multiple perspectives. In Manuscript 2, a diary design was employed to examine the detailed mechanisms underlying the different associations between perfectionism and daily impaired sleep from a within-person perspective. Diary designs have several advantages, such as the reduced risk of retrospective biases (Ohly et al., 2010). Manuscript 3 was based on two waves of data separated by 3 months and concerned an investigation of autonomy, competence, and relatedness satisfaction as separate mechanisms linking perfectionism to well-being over time. In Manuscript 4, we employed a randomised controlled wait-list control design to investigate the effects of an app-based mindfulness intervention on employees' perfectionistic cognitions, detachment, and sleep quality.

Another strength can be seen in the focus on the workplace as a specific context and the samples of employees included in each of the manuscripts. As opposed to previous studies

that focused on student samples (e.g., Stoeber et al., 2017), this dissertation investigated perfectionism in an applied context, which represents the context that is most frequently affected by this disposition (Slaney & Ashby, 1996; Stoeber & Stoeber, 2009). Further, each of the samples consisted of employees from different branches of the economy, which contributes to the generalisability of the findings.

Despite the variety of methodological approaches, all findings are based on self-reported measures, which can be influenced by common method bias (Podsakoff et al., 2003). Even though self-reported measures can be considered highly appropriate for assessing subjective experiences, such as need satisfaction (Van den Broeck et al., 2016; see also Chan (2009), for a detailed discussion), external ratings or objective measures, such as colleagues' ratings of conflicts or sleep actigraphy (Littner et al., 2003), may provide valuable information beyond self-reported measures. In addition, more objective measures or the use of multiple sources may be important to understand the role of subjective perceptions. For example, employees high in SPP may already appraise discussions as severe conflicts with their colleagues or an average workload as high time pressure.

Closely related to the methodological approaches is the question of whether findings can be causally interpreted. As perfectionism is conceptualised as a personality disposition that has been demonstrated to remain comparatively stable over time (e.g., Sherry et al., 2013), a natural causal precedence can be assumed for its associations with the investigated processes and outcomes. This question may be more central concerning paths postulated by the JD-R model. In Manuscript 3, we controlled T2 well-being for the T1 manifestations and thus may deduce conclusions about a causal relationship between the three needs and well-being. Further, the intervention design in Manuscript 4 allowed causal inferences. This does not necessarily apply to the findings from the diary study in Manuscript 2. Although the constructs were measured several times across the week, detachment and sleep quality were

simultaneously captured in the daily survey before work. Therefore, the serial mediation should be interpreted with caution.

Another limitation is that this dissertation focuses on Hewitt and Flett's (1991) model of perfectionism only. Further conceptualisations of perfectionism exist that capture additional aspects of perfectionistic concerns, such as discrepancy (Slaney et al., 2001), doubt about actions, and concern over mistakes (Frost et al., 1990). A combination of different models of perfectionism may contribute to covering the full range of the construct.

Moreover, no conclusion can be drawn about the incremental variance of the present findings. Firstly, the conceptual model has not been tested as a whole. Thus, it remains open for investigation which processes that have been identified in this dissertation are of particular importance and to what extent they explain additional variance beyond the processes known from previous research: coping and rumination. Secondly, the question of incremental variance of perfectionism beyond broader personality traits in the context of the JD-R model remains unanswered. Perfectionism has been demonstrated to explain incremental variance in work-related outcomes (Clark et al., 2010). Nevertheless, conscientiousness and neuroticism have been included as control variables in previous studies to examine the unique contribution of the perfectionism dimensions (e.g., Dunkley et al., 2014; Flaxman et al., 2018).

**Avenues for Future Research**

To begin with, the conceptual framework behind this dissertation lays the ground for several questions that may be answered by future research. Beyond the above-mentioned need to test the framework more comprehensively, more research on different job demands and resources is needed. Manuscripts 1 and 2 referred to task-related and social demands. Beyond these, it would be interesting to consider further demands, for example, job insecurity as a career-related stressor (Sonnentag & Frese, 2012). It could be argued that perfectionistic concerns make individuals vulnerable for worries not to fulfil work tasks adequately, which

may contribute to an increased feeling of insecurity about their jobs. Equally, further job resources should be investigated. According to the high expectation they set themselves or see set for them by others, perfectionists may be prone to perceive, for instance, less goal clarity and thus difficulties in deciding when a goal is fulfilled.

The conceptual framework included further associations that can be assumed based on previous research but have not been tested in this dissertation. For example, the link between SPP and interpersonal conflicts was established in Manuscript 1. A logical step would be to examine the direct health-impairing consequences (i.e., exhaustion) of this demand according to the JD-R model but also possible indirect paths. Manuscript 2 highlighted the conjoint role of demands and subsequent detachment in explaining health complaints. Conflicts may, comparable to time pressure in Manuscript 2, explain the association of SPP with impaired sleep quality via a lack of detachment as indicated by previous research on social stressors on sleep (Pereira & Elfering, 2014). They may also contribute to reduced relatedness satisfaction and by this increase employees' exhaustion because need satisfaction is known to partially mediate the association of job demands and exhaustion (Van den Broeck et al., 2008). Especially the motivational process with the direct link between job resources and well-being and its indirect link through need satisfaction (Van den Broeck et al., 2008) merits consideration in future research, as these mechanisms have not been tested concerning perfectionism so far.

The conceptual framework may also be extended by further mechanisms. The positive direct effect of SOP and sleep quality in Manuscript 2 indicates that more processes remain to be uncovered. The core findings of this dissertation also show that SOP and SPP can show (i.e., need satisfaction) but not necessarily need to show opposing relationships (i.e., time pressure) with the variables included in the framework. Thus, future research may benefit from illuminating different underlying processes that account for the unique characteristics of the perfectionism dimensions. For example, positive thinking about work and an associated

positive affective state could explain why employees high in SOP enjoy a restful sleep. First evidence for this assumption can be found in previous research that linked perfectionistic strivings to positive thinking about work and SOP to positive affect (Flaxman et al., 2018; Molnar et al., 2006). As shown by previous research (Prestele et al., 2020), PCC may be considered as a mechanism that links dispositional perfectionism to increased stress and may thus be integrated into the model in more detail, for example, as precursors of job demands, resources, detachment, or need satisfaction.

Furthermore, future research may investigate potential moderators that may be relevant for the conceptual framework. Self-determination theory (Deci & Ryan, 2000) also highlights the role of the social context in shaping an individual's need satisfaction. In this regard, a central role may be attributed to leadership, which could confirm or buffer perfectionists' concerns. For instance, employees high in SPP may experience less need satisfaction under a highly controlling and resentful leader (Otto et al., 2021). Apart from knowing particularly adverse contexts, future studies could examine the role of supportive contexts. It could be that socially prescribed perfectionists experience more relatedness satisfaction when the team climate is positive. Alike, transformational leadership has been found to relate to need satisfaction (e.g., Kovjanic et al., 2012) and may represent such a supportive context. Further, mindfulness has been suggested to increase awareness of and responsibility for oneself and thus to enhance the fulfilment of basic needs (Ryan, 2012), which is why a combined examination of perfectionism, mindfulness, and need satisfaction would be interesting.

In the same vein, future research may consider the interplay of perfectionism with certain stressors. In addition to the mediating hypothesis, Hewitt and Flett (2002) also suggested that perfectionism intensifies the reaction to the stress they face (stress enhancement). This suggestion is concordant with the general vulnerability hypothesis (Enns et al., 2005) describing perfectionism as a vulnerability factor that can maximise the negative

impact of stress and associated research (see Dunkley et al., 2016, for a review). A recent study (Reis & Prestele, 2020) found no support for the interaction between perfectionism and job demands (i.e., unfinished tasks and role ambiguity). Thus, the investigation of further demands, such as time pressure or conflicts, could provide more detailed information about the specific job demands perfectionism may intensify.

Also of note, OOP was not the focus of this dissertation and a thorough discussion of where to position this dimension in the superordinate structure of perfectionism is beyond the scope of the present work (see e.g., Ocampo et al., 2020). However, the findings from Manuscript 1 demonstrate that this dimension deserves more research on its own sake. This dimension may be included in future studies on interpersonal functioning in teams to understand its potentially harmful effects on the team members' well-being and task performance.

Lastly, an intriguing question that has been recently raised concerns the combined effect of perfectionism (Stoeber et al., 2020). As the dimensions of perfectionism show substantial overlap, results are typically controlled for the respective other dimension (e.g., Stoeber et al., 2017). Stoeber et al. (2020) concluded that perfectionism may have a combined maladaptive effect given that the adaptive effects that are reported throughout the literature are usually smaller than the maladaptive effects. However, they also stated that a systematic examination of this topic is lacking. Future research on perfectionism in employees may thus begin to consider the unique as well as the combined effects on various outcomes.

### Practical Implications

Considering that the dimensions of perfectionism are boon (i.e., SOP) and bane (i.e., SPP), several practical implications can be drawn. Both individuals and organisations seem to profit from employees high in SOP as indicated by few conflicts with coworkers, need satisfaction, and high work engagement. However, this does not necessarily mean that SOP

should be encouraged because the opposite can be concluded for SPP and the two dimensions may show substantial overlap. An important prerequisite is, therefore, the awareness among practitioners that there is also a dark side.

On the individual level, it may be particularly important to support employees in the reduction of and coping with maladaptive dimensions of perfectionism. A recent meta-analysis provides support for the effectiveness of cognitive-behavioural therapy in reducing perfectionism, even when it is delivered in form of guided self-help (Galloway et al., 2021). Personal counselling may include cognitive-behavioural and mindfulness-based elements to support perfectionistic individuals. However, counselling may not be delivered in the same intensity as therapy, and perfectionism displays a certain stability over time (e.g., Sherry et al., 2013). Although mindfulness interventions may be a way to temporarily reduce PCC, continued practice may be needed to maintain this effect. Thus, further approaches are needed that address the identified processes from this work to promote well-being. Also on the individual level, interventions promoting boundary management and detachment may help employees high in SPP to recover from work (Kinnunen et al., 2016). Concerning the team level, interventions training communication, collaboration, and perspective-taking have been shown to enhance employees' need satisfaction (Jungert et al., 2018). At the team and organisational levels, employees high in SPP may benefit from a positive feedback environment, which could help to strengthen their sense of personal control (Sparr & Sonnentag, 2008). Further, an overall effort of organisations to create workplaces with sufficient job resources as an antipode to the high job demands can support these employees in drawing on their potential.

Finally, I would like to close with the following note. The findings of this dissertation are not meant to blame perfectionists that already feel pressured to be perfect to be accepted by others (Hewitt & Flett, 1991). As well, they are not meant to encourage practitioners to pick only employees high in SOP as the "cherries" and reject employees high in SPP in

personal selection. Organisations should rather question their contribution towards creating highly demanding environments and socialising flawless career starters. It starts with applicants having to explain themselves for gaps or detours in their CVs and ends with employees who are dismissed after making mistakes or concluding too few contracts. In a survey, one in four German companies named dismissal as a strategy to deal with unmet performance expectations, whereas about equal indicated to use personnel development interventions to address this topic (Kampkötter et al., 2016). This spectrum of reactions emphasises that approaches to failure can differ, especially in the extent to which employees are seen as resources that can be replaced or developed. Organisations may also choose the option to display an open error culture and allow employees to grow from their mistakes (Frese & Keith, 2015).

## Conclusion

This dissertation provides support for the role of perfectionism in shaping various aspects of employees' working life and their well-being. Therefore, it is important to differ between the dimensions of perfectionism and to consider the distinct processes linking these dimensions to enhanced or impaired well-being. There are certainly jobs that require a perfect execution of tasks. For example, no one wants to get on a plane that is about 90% safe. But there are certainly some jobs in which done is better than perfect. Although the examples of Steve Jobs and Elon Musk mentioned in the introduction show that striving for perfection may bring progress and advantages over competitors, a difference exists between deciding for oneself to strive or being pressured to do so. Indeed, the latter may have severe consequences for well-being, as the findings from this dissertation emphasise.

Altogether, this dissertation comes to a similar conclusion as Stoeber et al. (2020) on the potential combined effect of this construct. The phenomenon of perfectionism may be a boon and bane. However, the bane outweighs the boon for individuals and organisations. Or

to put in the words of Gregory Maguire, “The eye is always caught by light, but shadows have more to say.”

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# Appendix A: Manuscript 1

## The Perfect Colleague? Multidimensional Perfectionism and Indicators of Social Disconnection in the Workplace

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# The Perfect Colleague? Multidimensional Perfectionism and Indicators of Social Disconnection in the Workplace

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**Abstract**

How are perfectionist employees seen by their colleagues, and to what extent do they experience integration or social disconnection at work? Combining two different quantitative approaches, we investigated the relationship between multidimensional perfectionism and indicators of social disconnection in two samples of employees from Germany. Study 1 ($N$ = 184) measured the participants' perfectionism and presented four vignettes describing a self-oriented, other-oriented, socially prescribed, and non-perfectionist colleague. Participants rated the social skills and work competence of the described colleagues, and indicated their own willingness to work with them (interpersonal attraction). Study 2 ($N$ = 279) measured the participants' perfectionism and the social support, social exclusion, and intergroup conflicts they experienced in their working teams. All perfectionists, especially the other-oriented perfectionist, received significantly lower ratings on social skills and attraction than the non-perfectionist colleague. However, the self-oriented and other-oriented perfectionist received the highest competence ratings. Ratings differed depending on the participants' own perfectionism. In Study 2, socially prescribed perfectionism was positively related to all indicators of social disconnection, whereas other-oriented perfectionism was related to conflicts only. Self-oriented perfectionism was unrelated to indicators of social disconnection. The results emphasize the importance of considering perfectionism in the context of teamwork and team climate.

*Keywords*: multidimensional perfectionism, workplace, social disconnection, conflicts, social exclusion, interpersonal attraction, vignettes

# The Perfect Colleague? Multidimensional Perfectionism and Indicators of Social Disconnection in the Workplace

## 1. Introduction

Modern organizations increasingly require strong initiative, continuous personal development, and commitment to high performance standards (Bakker & Schaufeli, 2008). Against this background, striving for perfection is seen as a desirable virtue (Baer & Shaw, 2017) as employees high in perfectionism tend to invest much effort in their work (Stoeber, Davis, & Townley, 2013). At the same time, work is often performed in teams (Devine, Clayton, Philips, Dunford, & Melner, 1999), which requires achieving not only personal but also common goals (Kozlowski & Ilgen, 2006).

Building on the perfectionism social disconnection model (PSDM, Hewitt, Flett, Sherry, & Caelian, 2006), a growing body of research has linked perfectionism to interpersonal difficulties and social disconnection (Gnilka & Broda, 2019; Sherry, Stoeber, & Ramasubbu, 2016; Stoeber, Noland, Mawenu, Henderson, & Kent, 2017). These findings raise the question of functionality in the workplace. Addressing this question, the present research aimed to investigate how perfectionists are perceived by potential work colleagues, and to what extent they experience either integration or social disconnection in their working teams. With this research, we contribute to the perfectionism literature and the PSDM in the workplace context, and help to explain social disconnection at work by focusing on the personality of team members.

### 1.1. Multidimensional Perfectionism

Hewitt and Flett's (1991) tripartite model of perfectionism considers intrapersonal and interpersonal dimensions that differ regarding the source and direction of the perfectionist demands. Self-oriented perfectionism describes holding exceedingly high standards for

oneself and evaluating one's own behaviour strictly. Socially prescribed perfectionism comprises the beliefs that others expect perfection and that acceptance by others is dependent on meeting these standards. The third dimension, other-oriented perfectionism, describes holding extremely high standards for others. Hewitt and Flett (1991) contend that social components inherent in perfectionism play a crucial role in adjustment difficulties. The later developed PSDM (Hewitt et al., 2006) builds on this idea.

### 1.2. The Perfectionism Social Disconnection Model

While the initial PSDM (Hewitt et al., 2006) referred only to socially prescribed perfectionism, recent extensions of the model (Hewitt, Flett, & Mikail, 2017; Sherry, Mackinnon, & Gautreau, 2016) consider all dimensions of perfectionism. According to the PSDM, perfectionism leads to distress, dysfunction, and disorder via two pathways. First, perfectionists are likely to experience objective social disconnection (i.e., conflicts and impaired relations) as a result of unpleasant interpersonal behaviour, such as hostility, mistrust and passive aggressiveness (Hewitt & Flett, 2004; Stoeber et al., 2017). Second, they are vulnerable to subjective social disconnection as they are highly sensitive to interpersonal cues that indicate rejection or evaluation (Flett, Hewitt, & De Rosa, 1996; Flett, Besser, & Hewitt, 2014). Hence, perfectionists unwittingly tend to cause the social withdrawal and alienation they are trying to avoid (Hewitt, Flett, Mikail, Kealy, & Zhang, 2018).

Several studies support the PSDM with regard to socially prescribed and other-oriented perfectionism. For example, socially prescribed perfectionism has been shown to be positively related to hostility, interpersonal conflict and feelings of social isolation (Magson, Oar, Fardouly, Johnco, & Rapee, 2019; Sherry et al., 2016; Stoeber et al., 2017). Moreover, individuals high in socially prescribed perfectionism tend to perceive low social support (Molnar, Sadava, Flett, & Colautti, 2012; Sherry, Law, Hewitt, Flett, & Besser, 2008). Other-

oriented perfectionism has been shown to be positively related to hostility, disagreeable attitudes in daily life situations, and interpersonal conflict (Haring, Hewitt, & Flett, 2003; Stoeber, 2014a; Stricker, Kritzler, & Buecker, 2019).

By contrast, self-oriented perfectionism usually does not show associations with indicators of social disconnection, and is generally unrelated to perceived social support and conflicts (Haring et al., 2003; Molnar et al., 2012; Sherry et al., 2008). In a recent series of studies (Stoeber, 2015; Stoeber et al., 2017), this dimension showed a pattern of associations that indicated social connection, such as a positive correlation with trust, empathy, and caring for others. Hence, the PSDM might not apply to the same extent to self-oriented perfectionists.

### 1.3. Implications for Social Relationships at Work

Research concerning the PSDM has been conducted mainly with undergraduate students and to date has not been transferred to the workplace context (e.g. Gnilka & Broda, 2019; Molnar et al., 2012; Sherry et al., 2008). However, the workplace is the domain that is most frequently affected by perfectionism (Slaney & Ashby, 1996; Stoeber & Stoeber, 2009), and interpersonal functioning in working teams as well as workplace relationships are crucial in today's working life. Teamwork, for instance, requires social interaction with colleagues (Kozlowski & Ilgen, 2006) and social support from colleagues is an important resource for employees (Halbesleben, 2006; Schaufeli & Taris, 2014). It is thus necessary to consider previous research concerning the PSDM regarding perfectionists' interactions and relationships with their colleagues.

It can be argued that socially prescribed perfectionist colleagues, who constantly fear making mistakes and being rejected by other team members, and other-oriented perfectionist colleagues, who constantly criticize others' mistakes, strain working relationships. Self-

oriented perfectionism, which is intrapersonal in its nature, might not affect working relationships to the same extent as the interpersonal dimensions of perfectionism. However, colleagues high in self-oriented perfectionism might give the impression of being highly motivated to perform in the best possible way, prioritising their personal ambitions rather than team goals.

### 1.4. The Present Research

The aim of the present research was to examine perfectionism and indicators of social disconnection in the context of the workplace, from two perspectives (i.e. using two methodological approaches). Study 1 was conducted as an experiment and Study 2 was a field study.

In Study 1, the participants' perfectionism was measured. They were then allocated to one of four vignettes, describing either a self-oriented perfectionist, other-oriented perfectionist, socially prescribed perfectionist, or non-perfectionist team member. The participants rated these colleagues regarding their social skills and work competence. They also rated their own willingness to work with the described colleague (interpersonal attraction). Building on the PSDM and respective research as well as the findings reported by Hoffmann, Stoeber and Musch (2015) in the context of mate selection, the following ratings were hypothesized: Compared to the non-perfectionist, all perfectionists would receive lower ratings of social skills and interpersonal attraction. The self-oriented perfectionist would receive the highest ratings among the perfectionists due to the intrapersonal nature of this dimension.

Concerning the competence ratings, the study was mostly explorative. However, we expected that self-oriented perfectionists would be rated most competent among the four conditions. Additionally, following Hoffmann et al. (2015), we investigated on an exploratory

basis whether the ratings of social skills, competence and interpersonal attraction would differ depending on the participants' own perfectionism.

In Study 2, the participants' perfectionism was measured, together with social support, social exclusion, and intergroup conflicts they experienced in their working teams. In this way, both subjective and objective indicators of social disconnection were included. In line with previous research supporting the PSDM with regard to the interpersonal dimensions of perfectionism, the following associations were hypothesized: Only socially prescribed and other-oriented perfectionism but not self-oriented perfectionism were expected to be negatively related to social support and positively related to social exclusion and intergroup conflicts. Other-oriented perfectionism was unrelated to social support in previous research (e.g. Zuroff, & Blankstein, 2006; Sherry et al., 2008). However, we assumed that this dimension interferes with mutual support and social connection in working teams. In the case of other-oriented perfectionists, primarily the targets of their demands experience distress (Hewitt & Flett, 2004; Hewitt, Flett, & Mikail, 1995). By constantly criticizing others personally and for their work, they put their team members under pressure and give the impression of being hostile and unsupportive. It is therefore likely that colleagues avoid other-oriented perfectionists and that they are less willing to support them.

## 2. Study 1: The Colleagues' Perspective

### 2.1. Participants

An initial sample of 189 employees, was recruited online via the platform SoSci Survey in Germany. Data collection was supported by an undergraduate student involved in the project. The study was advertised via social media and also distributed via mailing lists among the university staff members.

After five participants were excluded (see 2.4.), the final sample consisted of 184 employees, all involved in teamwork. Preliminary considerations on statistical power, taking previous findings by Hoffmann et al. (2015) as an example, were thus fulfilled. More than two-thirds of the participants in the final sample (72.3%) were female (1.1% classified themselves as diverse). Their mean age was 37.04 years (*SD* = 10.97). On average, the participants were working 34.40 hours a week (*SD* = 10.70) and had an organizational tenure of 8.49 years (*SD* = 8.24). They worked in different sectors of the economy, with the most frequent being health and social services (29.9%), education (13.0%), public administration (8.7%) and industry (8.2%).

## 2.2. Procedure

The study was approved by the relevant ethics boards of the [name deleted to maintain the integrity of the review process]. Participation was voluntary and no compensation was offered. Participants first provided informed consent. After completing the measure of perfectionism (see 2.3.1), participants were randomly allocated to one of the four vignettes (see 2.3.2.). They were instructed to imagine that the described person would be assigned to their working team and were then asked to rate the person's social skills, competence and attraction as a colleague.

## 2.3. Materials

### *2.3.1. Perfectionism*

To assess the participants' perfectionism, we used the 15-item short form of the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991; German translation: Altstötter-Gleich, 1998). Self-oriented perfectionism (5 items; e.g. "I strive to be as perfect as I can be"; α = .87) and socially prescribed perfectionism (5 items, e.g. "People expect nothing

less than perfection from me"; α = .92) were measured with the short version by Cox, Enns, and Clara (2002). Other-oriented perfectionism (5 items; e.g. "If I ask someone to do something, I expect it to be done flawlessly"; α = .75) was measured with items derived by Hewitt, Habke, Lee-Baggley, Sherry, and Flett (2008).

Items were presented with the MPS standard instruction and rated from 1 (*strongly disagree*) to 7 (*strongly agree*). The short scales perform well compared with the original version (Stoeber, 2018) and have been used in many studies (e.g. Mackinnon, Sherry, & Pratt, 2013; Smith, Saklofske, & Yan, 2015; Stoeber, Lalova, & Lumley, 2020).

#### *2.3.2. Vignettes*

Four vignettes created by Hoffmann et al. (2015) were presented, describing either a self-oriented perfectionist, socially prescribed perfectionist, other-oriented perfectionist, or a non-perfectionist. Hoffmann et al. (2015) based the three perfectionist vignettes on Hewitt and Flett's (2004, p. 6) description of prototypical self-oriented, socially prescribed, and other-oriented perfectionists, as well as items from the Cox et al. (2002) short form of the MPS. The non-perfectionist was described as a person who was not a self-oriented perfectionist, to present a realistic and accessible scenario for the participants (Hoffmann et al., 2015). The person was named "Ms. M." in all vignettes.

#### *2.3.3. Social Skills and Competence*

In accordance with previous studies (Rudman & Glick, 1999; Steffens & Mehl, 2003), two indices were created to measure the perceived social skills and work competence of the person who was described in each vignette ("Ms. M."). To form these indices, the respective items and compositions by Steffens and Mehl (2003) were used. Ratings of nine characteristics (e.g. supportive, kind) were combined with an overall assessment of Ms. M.'s social skills ("How likely is it that Ms. M. is willing to support others at work?") to form the social skills index (α = .94). To form the competence index (α= .79), ratings of nine

characteristics (e.g. ambitious, confident) were again combined with an overall assessment of Ms. M.'s professional skills ("How likely is it that Ms. M. has sufficient professional skills?"). For each index, the participants rated the extent to which the characteristics corresponded to their impression of Ms. M. Participants responded on a scale from 1 (*not at all*) to 7 (*extremely*).

#### *2.3.4. Attraction*

Two items, based on the Interpersonal Judgement Scale (Byrne, 1971), were used to measure interpersonal attraction. The first item referred to liking the described person ("How much do you think you will like this team member?"). The second item captured the degree to which the participant would enjoy working with the person ("How much would you want to work with this person?"). The items ($\alpha = .94$) were rated on a scale from 1 (*not at all*) to 7 (*extremely*).

### 2.4. Statistical Analyses

Before the analyses, four participants who were working fewer than eight hours per week were excluded. Another participant was excluded because the response time (< 2 sec) indicated a lack of attention in reading the vignette. To examine differences in the ratings of the described colleagues, we conducted a one-way ANOVA with perfectionist as between-participants factor, and social skills, competence and attraction as dependent variables. Tukey's HSD test was used to test pairwise comparisons between the four experimental conditions (see Table 2).

Moderated regression analyses were then conducted to examine whether the ratings differed depending on the participants' own perfectionism. The continuous predictors (participants' own perfectionism) were first standardized and then entered in the regression analyses to provide a meaningful zero point for the interpretations (Frazier, Tix, & Barron,

2004). In Step 1, gender was entered as a control variable, because women ($M$ = 3.45, $SD$ = 1.49) gave significantly lower attraction ratings than did men ($M$ = 4.07, $SD$ = 1.62), $t(180) = -2.43$, $p = .016$. Women ($M$ = 3.70, $SD$ = 1.29) also gave significantly lower ratings on social skills than did men ($M$ = 4.21, $SD$ = 1.28), $t(180) = -2.33$, $p = .021$. Gender was dummy coded (0 = male, 1 = female) which is why the two participants who classified themselves as diverse were not included in this analysis.

In Step 2, perfectionism and the four experimental conditions were entered. In Step 3, the interaction effects between the participants' perfectionism and the experimental conditions were included (see Table 3). For this purpose, four dummy variables were coded to display the conditions: the self-oriented perfectionist colleague (SOP colleague; 1= SOP vignette, 0 = all other vignettes); the socially prescribed perfectionist colleague (SPP colleague; 1= SPP vignette, 0 = all other vignettes); and the other-oriented colleague (OOP colleague; 1= OOP vignette, 0 = all other vignettes). Thus, the non-perfectionist colleague (NP colleague) was the reference condition.

### 2.5. Results and Discussion

Descriptive statistics and intercorrelations of the scales are shown in Table 1. Ratings of social skills but not ratings of competence showed a high positive correlation with the attraction ratings, indicating that perceived social skills might be decisive for the willingness to work with certain colleagues. The results from the ANOVA are depicted in Table 2. In line with the assumptions, all perfectionist colleagues received lower attraction ratings than did the non-perfectionist colleague. The other-oriented perfectionist was the least favored team member. However, there was no significant difference in attraction ratings between the self-oriented and the socially prescribed perfectionist colleague. All perfectionist colleagues were

rated equally less socially skilled than the non-perfectionist, and again the other-oriented perfectionist received the lowest ratings.

A different pattern was found concerning the competence ratings. The other-oriented and self-oriented perfectionists received the highest ratings of competence. These were followed by the socially prescribed and non-perfectionist colleagues, who were rated equally competent.

The regression analyses (see Table 3) revealed two significant interaction effects between the participants' perfectionism and the experimental condition, for the dimension of other-oriented perfectionism. Participants high in other-oriented perfectionists gave higher attraction ratings to other-oriented and self-oriented perfectionist colleagues than participants low in other-oriented perfectionism. This finding is congruent with those reported by Hoffmann et al. (2015) in the context of mate selection. Another significant interaction effect was found for the dimension of self-oriented perfectionism. Participants high in self-oriented perfectionism rated socially prescribed perfectionist colleagues more socially skilled than participants low in self-oriented perfectionism. This finding is partly congruent with Hoffmann et al. (2015), who found significant interactions of self-oriented perfectionism with all perfectionist vignettes, though in a different context. The interaction plots are depicted in Figure 1 and 2.

**Table 1**

*Descriptive Statistics and Bivariate Correlations Between Variables*

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|
| 1. Self-oriented perfectionism | - | | | | | | | 5.12 | 1.18 |
| 2. Socially prescribed perfectionism | .18* | - | | | | | | 3.07 | 1.47 |
| 3. Other-oriented perfectionism | .50*** | .33** | - | | | | | 4.04 | 1.10 |
| 4. Social skills | .15* | .06 | .18* | - | | | | 3.84 | 1.30 |
| 5. Competence | .07 | .11 | .01 | -.04 | - | | | 4.83 | 0.93 |
| 6. Attraction | .13 | .14 | .16* | .77*** | .14 | - | | 3.64 | 1.55 |
| 7. Gender | .14 | .10 | .03 | -.17* | .07 | -.18* | - | .73 | - |

*Note*. $N = 184$. Gender (female) was dummy-coded with 0 = male, 1 = female. All other scales were measured on a 7-point scale.
* $p < .05$. ** $p < .01$. *** $p < .001$.

**Table 2**

*One-way ANOVA for Social Skills, Competence and Attraction of the Rated Colleagues*

| | Self-oriented perfectionist (*n* = 48) | | Socially prescribed perfectionist (*n* = 44) | | Other-oriented perfectionist (*n* = 47) | | Non-perfectionist (*n* = 45) | | |
|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *F*(3, 180) |
| Social skills | $3.60^{b}$ | 1.02 | $3.80^{b}$ | 1.10 | $2.88^{c}$ | 1.10 | $5.13^{a}$ | 1.30 | 38.70*** |
| Competence | $5.15^{b}$ | 0.76 | $4.47^{a}$ | 0.84 | $5.38^{b}$ | 0.78 | $4.28^{a}$ | 0.87 | 19.43*** |
| Attraction | $3.61^{b}$ | 1.36 | $3.57^{b}$ | 1.30 | $2.78^{c}$ | 1.55 | $4.64^{a}$ | 1.42 | 13.61*** |

Note. $N = 184$. Social skills, competence and attraction were rated on a scale from 1 (not at all) to 7 (extremely).
*F* statistic from one-way ANOVA with perfectionist as between-participant factor. Means with different superscripts indicate significant mean differences between the four experimental conditions in pairwise comparisons, i.e. $^{a}$ differs siginificantly from $^{b}$ and $^{c}$, $^{b}$ differs significantly from $^{c}$, $p < .05$ (Tukeys's HSD test).
*** $p < .001$.

**Table 3**

*Moderated Regression Analyses Predicting Social Skills, Competence and Attraction*

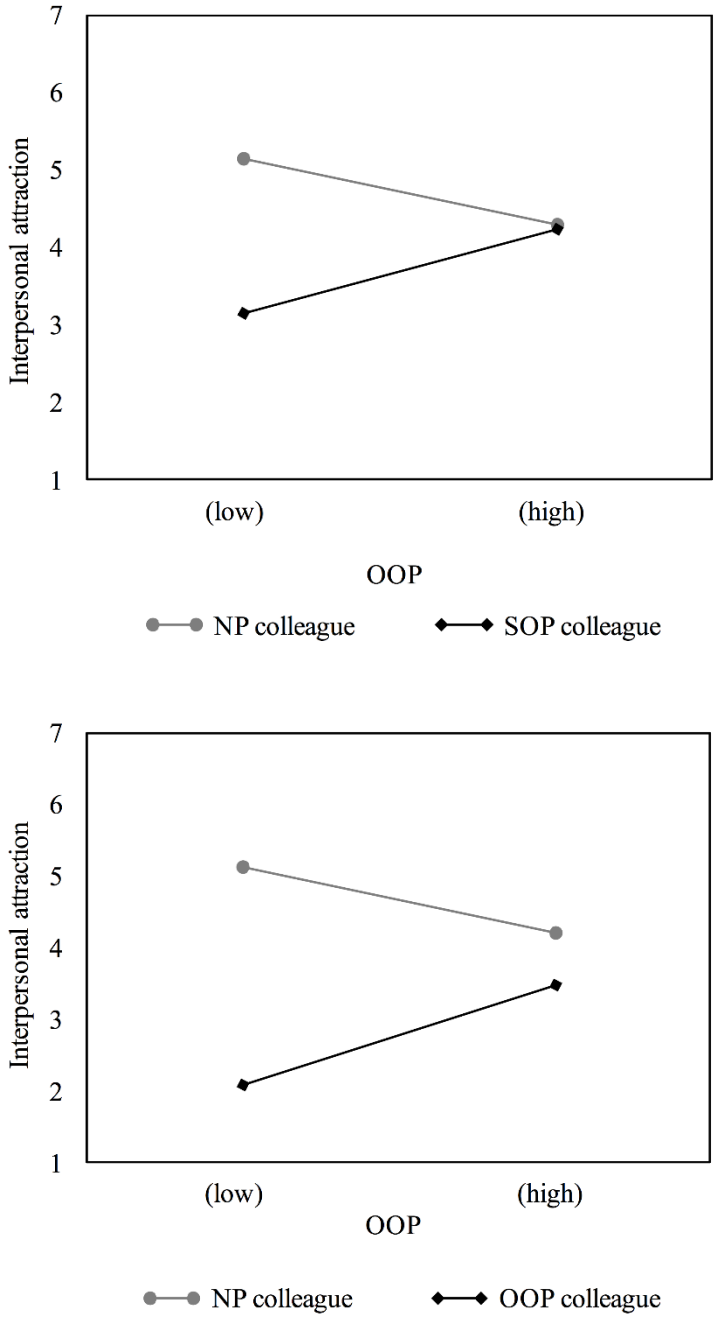
| Predictors | Social Skills β | Competence β | Attraction β |
|---|---|---|---|
| Step 1: Control variables | | | |
| Gender[1] | -.17* | .07 | -.18* |
| Δ $R^2$ | .03* | .01 | .03* |
| Step 2: Perfectionism and colleague | | | |
| Self-oriented perfectionism (SOP) | .14* | .07 | .14 |
| Socially prescribed perfectionism (SPP) | .09 | -.01 | .15* |
| Other-oriented perfectionism (OOP) | .06 | .04 | .04 |
| SOP colleague | -.49*** | .42*** | -.27** |
| SPP colleague | -.42*** | .10 | -.29*** |
| OOP colleague | -.76*** | .52*** | -.55*** |
| Δ $R^2$ | .42*** | .25*** | .24*** |
| Step 3: Perfectionism x colleague interactions | | | |
| SOP x SOP colleague | .19 | .09 | .05 |
| SOP x SPP colleague | .24* | -.04 | -.04 |
| SOP x OOP colleague | .16 | .01 | -.02 |
| SPP x SOP colleague | .00 | -.11 | .11 |
| SPP x SPP colleague | .01 | -.04 | .16 |
| SPP x OOP colleague | -.07 | -.10 | -.04 |
| OOP x SOP colleague | .07 | .21 | .28* |
| OOP x SPP colleague | -.10 | .19 | .10 |
| OOP x OOP colleague | .19 | .24 | .40** |
| Δ $R^2$ | .07** | .04 | .11** |

*Note*. $N$ = 184. Gender (female) was dummy-coded with 0 = male, 1 = female. SOP colleague was dummy-coded with 1 = SOP colleague, 0 = all other conditions; SPP colleague with 1 = SPP colleague, 0 = all other colleague; and OOP colleague with 1 = OOP colleague, 0 = all other conditions (The non-perfectionist colleague was the reference group). Depicted beta coefficients are based on the step in which the variables were entered.
* $p$ <.05. ** $p$ <.01. *** $p$ <.001.

[1] The regression coefficients remained significant when the multiple regression analyses were ran without gender included as the first step.

**Figure 1**

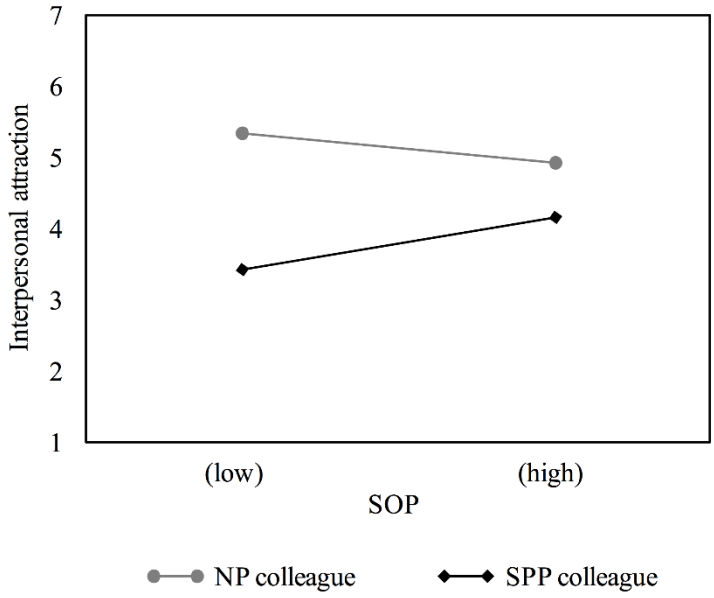
*Interactions of Other-Oriented Perfectionism (OOP) and Perfectionist Colleague Versus Non-Perfectionist Colleague (NP colleague) Predicting Attraction*




*Note.* Top: OOP × self-oriented perfectionist (SOP) colleague; bottom: OOP × other-oriented perfectionist (OOP) colleague. Interpersonal attraction was rated on a scale from 1 (not at all) to 7 (extremely).

**Figure 2**

*Interaction of Self-Oriented Perfectionism (SOP) and Socially Prescribed Perfectionist Colleague (SPP colleague) Versus Non-Perfectionist Colleague (NP colleague) Predicting Social Skills*




*Note.* Interpersonal attraction was rated on a scale from 1 (not at all) to 7 (extremely).

## 3. Study 2: The Perfectionists' Perspective

### 3.1. Participants

A sample of 294 employees was recruited online via SoSci Survey in Germany. Again, data collection was supported by an undergraduate student. The study was advertised via social media and distributed via mailing lists among the university staff members, but also among business contacts.

After 15 participants were excluded (see 3.4.), the final sample consisted of 297 employees, all involved in teamwork. More than two thirds (73.1%) of them were female and their mean age was 37.14 years (*SD* = 13.02). Their mean weekly working time was 35.03 hours (*SD* = 11.07) and they had a mean organizational tenure of 7.53 years (*SD* = 8.65). The

most frequent sectors of economy were health and social services (22.2%), education (10.8%), industry (9.7%) and public administration (9.0%).

### 3.2. Procedure

The study was approved by the relevant ethics boards of the [name deleted to maintain the integrity of the review process]. As in Study 1, participation was voluntary, and no compensation was offered. The participants provided informed consent before completing the measures of perfectionism, social support, social exclusion and conflicts at work.

### 3.3. Measures

#### *3.3.1. Perfectionism*

To assess multidimensional perfectionism, the same measure was used as in Study 1. The reliabilities for the subscales self-oriented perfectionism (SOP; α = .89), socially prescribed perfectionism (SPP; α = .90) and other-oriented perfectionism (OOP; α = .76) were satisfactory in the present sample.

#### *3.3.2. Social Support*

Frese's (1989) German adaption of the Social Support Scales by Caplan et al. (1975) was used to assess social support. The five items (e.g. "How much is each of the following people willing to listen to your work-related problems?"; α = .87) were answered with regard to colleagues at work. Participants rated the items on a scale from 1 (*not at all*) to 5 (*absolutely*).

#### *3.3.3. Social Exclusion*

Social exclusion was measured with seven items from Pereira, Meier, and Elfering (2013), which are based on Leary, Tambor, Terdal, and Downs (1995). The items (e.g. "At

work, I have the impression that others avoid me“) were rated on a scale from 1 (*does not apply*) to 5 (*fully applies*) and showed satisfactory reliability (α = .86).

#### *3.3.4. Conflicts*

The German version of Jehn's intragroup conflict scale (Lehmann-Willenbrock, Grohmann, & Kauffeld, 2011) was used to assess conflicts at work. The scale measures task conflict (e.g. "How much conflict about the work you do is there between you and your team?"; α = .78) and relationship conflict (e.g. "How much friction is there among you and your team members?; α = .74).

As in previous research (e.g. Meier, Gross, Spector, & Semmer, 2013), the items were slightly adapted to refer to conflicts between the participant and the team, rather than conflict between team members in general. The six items were rated from 1 (*never/none*) to 5 (*very often/very much*).

### 3.4. Statistical Analyses

Prior to the analyses, eight participants were excluded because they did not meet the requirements for teamwork. Another four participants were excluded from the analysis because they worked fewer than eight hours per week. Finally, three participants were excluded as they showed a Mahalanobis distance exceeding the critical value of $\chi^2$ (9) = 27.88, $p < .001$ (see Tabachnick & Fidell, 2007).

Bivariate correlations and multiple regression analyses (see Table 4) were calculated. The values were inspected to determine the unique contribution of each perfectionism dimension to social disconnection, once the substantial overlap was controlled for (e.g. Hewitt & Flett, 2004; Stoeber, 2014b).

### 3.5. Results and Discussion

As expected, the bivariate correlations showed that socially prescribed and other-oriented perfectionism were related to indicators of social disconnection. Regarding the multiple regression analyses, only socially prescribed perfectionism showed a pattern of unique relationships with all indicators of social disconnection. Other-oriented perfectionism was related to task and relationship conflict at work only. Interestingly, regressions also revealed that self-oriented perfectionism was negatively related to relationship conflict. This finding is in line with previous research that reported unique relationships between self-oriented perfectionism and social connection (Stoeber, 2015; Stoeber et al., 2017).

**Table 4**

*Bivariate Correlations and Multiple Regression Analyses: Multidimensional Perfectionism and Indicators of Social Disconnection*

| | Bivariate correlations | | | Partial correlations | | | | |
|---|---|---|---|---|---|---|---|---|
| Variables | SOP | SPP | OOP | SOP | SPP | OOP | *M* | *SD* |
| Social support | -.08 | -.32*** | -.14* | .04 | -.31*** | -.05 | 3.76 | 0.79 |
| Social exclusion | .08 | .40*** | .16** | -.06 | .40*** | .06 | 1.77 | 0.68 |
| Relationship conflict | .02 | .34*** | .20** | -.14* | .32*** | .15* | 1.97 | 0.62 |
| Task conflict | .07 | .33*** | .19** | -.09 | .33*** | .13* | 2.29 | 0.73 |

*Note*. $N = 279$. Social support, social exclusion, relationship conflict and task conflict were measured on a 5-point scale. Standardized regression weights from the multiple regression with SOP, SPP, and OOP as predictors are depicted.
* $p < .05$. ** $p < .01$. *** $p < .001$.

## 4. General Discussion

### 4.1. Current Findings

The present research investigated the construct of multidimensional perfectionism and indicators of social disconnection in the workplace context, from two perspectives. In

Study 1, we examined how perfectionists were perceived by potential work colleagues. In Study 2, we examined the extent to which, in real-life, perfectionists experienced integration or social disconnection in their working teams.

The results were largely consistent with the predictions. In Study 1, all perfectionist colleagues received lower attraction ratings and ratings of social skills than the non-perfectionist colleague, with the other-oriented perfectionist being the least favored team member. This finding is interesting, considering that other-oriented and self-oriented perfectionists received the highest ratings of competence. An explanation could be that other-oriented perfectionists are perceived as antisocial but also as assertive and confident.

In addition, employees high in other-oriented perfectionism gave high attraction ratings to other-oriented and self-oriented perfectionist colleagues. These patterns fit with the direction of their demands and are congruent with that of Hoffmann et al. (2015) in the context of mate selection. Further, employees high in self-oriented perfectionism rated socially prescribed perfectionist colleagues more socially skilled. This explorative finding is only partly congruent with the findings of Hoffmann et al. (2015), but also refers to assumed skills and not to a personal preference. The finding might indicate that self-oriented perfectionists understand the pressure that socially prescribed perfectionists perceive, which is reflected in more benevolent ratings. This explanation would be in line with previous findings showing positive relationships with empathy and caring for others (Stoeber 2015, Stoeber et al., 2017).

Although no perfectionists were preferred as team members, only socially prescribed perfectionism showed a pattern of unique relationships regarding all indicators of social disconnection in Study 2, including feelings of social exclusion. Other-oriented perfectionists, despite being least favored as a team member, did not experience social exclusion or low social support, according to the regression analyses. This finding confirms earlier studies in

which other-oriented perfectionism was unrelated to social support (e.g. Dunkley et al., 2006; Sherry et al., 2008). Consistent with the PSDM (Hewitt et al., 2006, 2017; Sherry et al., 2016) and the findings from Study 1, other-oriented perfectionism was positively related to task and relationship conflict. Self-oriented perfectionism did not display any relationships with indicators of social disconnection and was even negatively related to relationship conflict. These findings are in line with previous research indicating self-oriented perfectionism and social connection (e.g. Stoeber, 2015; Stoeber et al., 2017). They provide further support for the assumption that the PSDM might not apply to the same extent to self-oriented perfectionists. Although rated as rather undesirable, self-oriented perfectionism - given its intrapersonal nature - does not affect interpersonal relationships at work, according to the present results. However, self-oriented perfectionists might give the impression of focusing on their own goals rather than on team goals, and could thus be seen as poor team players. Another explanation for the divergent findings concerning self-oriented perfectionism could be the interdimensional overlap of the perfectionism dimensions still inherent in the vignettes[2] in Study 1, but not in the perfectionism scales in Study 2. As known from previous research, self-oriented perfectionism may show patterns of associations that indicate psychological adjustment, once this overlap is controlled for (Hill, Huelsman, & Araujo, 2010; Stoeber & Otto, 2006). Equally, the ratings concerning self-oriented perfectionists may have been less negative, without this overlap included in the vignettes. However, statistical control was not possible in this case due to the dummy coding involved.

Overall, the results suggest that social disconnection at work arises from an interplay between initial antipathy towards perfectionists and trait-dependent causes. The latter can lead to objective disconnection, in the form of interpersonal conflicts, and to subjective disconnection, as indicated by feelings of low social support and exclusion. Therefore,

[2] We are grateful to an anonymous reviewer for highlighting this issue concerning the use of vignettes when investigating multidimensional constructs.

interpersonal sensitivity (Flett et al., 2014) might play an essential role in the perception of social disconnection and explain the finding that socially prescribed perfectionists feel excluded at work whereas other-oriented perfectionists do not. From another point of view, it can be questioned if there are specific characteristics among other-oriented perfectionists that make them in a way immune to feelings of social exclusion despite not being liked by others. In recent studies, other-oriented perfectionism showed unique relationships with the Dark Triad of personality, uncaring und callous traits and an individualistic value orientation, which points towards high self-regard with simultaneous low concern for others (Stoeber 2014a, 2015). They might consequently attach little importance to social relationships and feel adequately included according to their own needs.

### 4.3. Strengths, Limitations and Future Research Directions

To the best of our knowledge, the present research is the first to focus on perfectionism and social disconnection in the workplace and thus to extend the PSDM to this specific context. Moreover, we combined two perspectives, applying two quantitative methodological approaches, to obtain a comprehensive view of how perfectionists are seen by potential team members and how they perceive working in their own teams. Additionally, all dimensions from Hewitt and Flett's model were regarded, including other-oriented perfectionism, which is often neglected as it is not considered a core facet of perfectionism (Stoeber & Otto, 2006).

Nevertheless, there are some shortcomings that future research should consider. First, Study 1 comprised only the initial ratings of potential colleagues. It would be interesting to compare these ratings to the actual experiences of team members who work with perfectionists for a long time. Second, the colleagues in the vignettes were described as team members in general terms. It is probable that a description of a specific working relationship

including a greater degree of co-worker exchange, e.g. collaborating in a project or under a perfectionist leader, could produce different, perhaps even stronger results. However, even with a broad description significant differences in the ratings were found. Third, as all perfectionists in the vignettes were presented as female colleagues, our findings from Study 1 are limited to female perfectionists. Future research would benefit from replications in which female and male colleague vignettes are randomly assigned.

Another limitation should be noted concerning the sampling of the studies. Although two separate studies were conducted by different project members, an overlap of the samples is possible. Even if the studies were advertised via different social media networks and channels, we cannot exclude the possibility that e.g. university staff members participated in both studies. The findings may therefore be slightly distorted given that some participants were more aware of the purpose of study 2. We therefore compared both samples concerning a combination of data on gender, age and sectors of economy. With 81% of the participants from sample 2 differing in sample characteristics to those in sample 1, a possible overlap cannot be completely ruled out but should not have a large impact. Also, study 2 differed from study 1 in the participants' perspective, in the measures used and in the specific research question.

Building on Study 2, it would be interesting to study social support, exclusion and interpersonal conflicts at the team level, with mutual ratings by colleagues, to compare the subjective experiences and external perceptions. Moreover, it remains unclear whether conflicts precede social exclusion or the other way round (DeWall, Twenge, Gitter, & Baumeister, 2009).

Interpersonal functioning and social relationships are relevant for health (Cohen, 2004; House, Landis, & Umberson, 1988) and may represent substantial resources or stressors at work (Schaufeli & Taris, 2014). Future studies could focus on how indicators of social

disconnection contribute to stress, reduced well-being and performance at work; and the extent to which those indicators differ across the dimensions of perfectionism. Finally, future research could compare perfectionism as it occurs in different sectors and professions. It seems possible that, for instance, self-oriented perfectionism is valued in certain occupations, such as surgery or in highly specialized teams.

### 4.4. Conclusion

The present results indicate that it is important to consider perfectionism in the context of teamwork and team climate. Although further research is needed to support the current findings, we conclude that perfectionist demands among team members may threaten a positive team climate. Socially prescribed and other-oriented perfectionism, especially, may represent a source of task and relationship conflict, and socially prescribed perfectionism might even evoke feelings of social exclusion. If employees could choose the “perfect” colleague, this person would probably not be a perfectionist but rather someone with realistic expectations for themselves and the team.

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# Appendix B: Manuscript 2

## Far from Perfect Sleep – A Diary Study on Multidimensional Perfectionism in the Context of the Stressor-Detachment Model´

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# Far from Perfect Sleep – A Diary Study on Multidimensional Perfectionism in the Context of the Stressor-Detachment Model

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**Abstract**

Socially prescribed perfectionists but not self-oriented perfectionists are vulnerable to impaired sleep quality. However, the mechanisms that link multidimensional perfectionism to varying sleep remain unclear, especially in applied settings, such as the workplace. Integrating the perfectionism literature and the stressor-detachment model, we proposed time pressure and detachment as relevant mechanisms. We expected socially prescribed perfectionism (SPP) to have a negative indirect effect on daily sleep quality through detachment and a serial mediation of time pressure and detachment. Further, we expected self-oriented perfectionism (SOP) to show ambivalent effects, displaying a negative indirect effect on daily sleep quality through detachment, but also a positive indirect effect through serial mediation. We tested our hypotheses with data from 70 employees that participated in a diary study over 5 consecutive days (day level $N = 233$). Results from multilevel path analyses provided support for the expected serial mediation linking SPP to impaired sleep quality. Further, a direct positive effect of SOP on sleep quality was found. Our findings highlight the conjoint role of time pressure and subsequent detachment for the association of SPP and sleep quality. We discuss theoretical implications for multidimensional perfectionism in the context of the stressor-detachment model and possible intervention approaches.

*Keywords*: multidimensional perfectionism, time pressure, detachment, sleep quality, diary study

# Far from Perfect Sleep – A Diary Study on Multidimensional Perfectionism in the Context of the Stressor-Detachment Model

The trait of perfectionism is increasing among individuals, especially in industrialised countries (Curran & Hill, 2019). People may not only demand increased perfectionism from themselves but also experience their environment as overly demanding. The workplace, in particular, is a context in which goal achievement, performance appraisal, and feedback are ubiquitous (Cleveland et al., 1989). Thus, it is not surprising that the workplace is the context most frequently affected by perfectionism (Slaney & Ashby, 1996; Stoeber & Stoeber, 2009). One might call this development a "blessing" because employees high in perfectionism put much effort into their work (Stoeber et al., 2013). On the other hand, a recent meta-analysis indicated that perfectionism is unrelated to workplace performance and may put employees at risk for stress and poor well-being (Harari et al., 2018). From a more detailed point of view that considers the multidimensionality of this personality disposition, perfectionism has been referred to as a "double-edged sword" (Molnar et al., 2006).

A large body of research has linked especially the maladaptive dimensions of perfectionism summarised as perfectionistic concerns (e.g. concern over mistakes, doubts about actions, and socially prescribed perfectionism [SPP] which describes people's belief that others expect perfection and evaluate them) to increased stress and a variety of health issues (for a review and a meta-analysis, see Harari et al., 2018; Ocampo et al., 2020). These issues comprise even impaired sleep (Molnar et al., 2020), which is the focus of this study. Dimensions summarised as perfectionistic strivings (e.g. personal standards and self-oriented perfectionism [SOP] describing people's high expectations for themselves), on the contrary, are not necessarily linked to maladaptive health outcomes (Ocampo et al., 2020), which is why their adaptability is still debated. Reflecting this ambivalence, SOP has often been shown to be unrelated to sleep problems (e.g. Azevedo et al., 2010) or even displaying a positive

indirect association with healthy sleep (Molnar et al., 2020). Notably, healthy sleep is crucial for daily recovery and an important predictor of employees' health, performance, and occupational safety (Brossoit et al., 2019; Litwiller et al., 2017).

Based on the mediating hypothesis (Hewitt & Flett, 2002), which assumes that perfectionism is linked to impaired health via stress, and the stressor-detachment model (SDM; Sonnentag & Fritz, 2015), we attribute a key role to differences in the generation and experience of time pressure. According to the SDM, time pressure translates into sleep problems via a lack of detachment, the mental disconnection from work during nonwork time. Integrating perfectionism into the SDM, we assumed that socially prescribed perfectionists are prone to actively generate and experience daily time pressure, which triggers the cascade of low detachment resulting in impaired sleep quality. On the contrary, we expected self-oriented perfectionists to experience low daily time pressure and thus detach and sleep better.

The study contributes to the occupational health psychology literature in three ways. First, we contribute to strengthening the SDM or clarifying its boundaries at the day level by focusing on time pressure as a common challenge stressor at work (LePine et al., 2005). A recent longitudinal study suggest that detachment may mediate the relationship between time pressure and sleep quality as long-term consequence (Matick et al., 2021). However, longitudinal studies do not take into account that these constructs also fluctuate within shorter periods of time. Previous diary studies have shown that certain job stressors such as illegitimate tasks (Pereira et al., 2014) or unfinished tasks (Reis & Prestele, 2020), are associated with a lack of detachment, which in turn affect sleep quality but not others, such as role ambiguity (Reis & Prestele, 2020). Thus, testing time pressure as another stressor may advance knowledge on whether the SDM only applies to certain groups of stressors on the day level. To the best of our knowledge, no single study has examined whether detachment functions as a mediator of the effect of time pressure on sleep quality at the day level.

Therefore, we aimed to investigate the short-term effects of daily time pressure on sleep quality and the mediating role of detachment.

Second, we aim to broaden the knowledge on mechanisms that explain the different associations between perfectionism and sleep quality by examining time pressure and detachment as a potential serial mechanism. In doing so, we extend research on the SDM by introducing personality variables as antecedents of job stressors, such as time pressure. Knowing the underlying processes that are decisive for varying sleep quality allows scholars to think about potential boundary conditions that exacerbate or attenuate the effects of perfectionism and to derive timely interventions to prevent perfectionists from experiencing sleep problems. On a minor note, we examine these processes using a diary-study design and thus address calls for more diary studies in the research area of perfectionism where cross-sectional studies are predominant (Stoeber, 2018).

Third, we contribute to a better understanding of whether both dimensions of perfectionism are related to daily impaired sleep quality via a personality-dependent tendency to a lack of detachment independent of time pressure. The mediating hypothesis (Hewitt & Flett, 2002) and a recent meta-analysis mainly based on findings from student samples (Xie et al., 2019) suggest that both dimensions of perfectionism are linked to rumination. However, findings from research in the workplace context are mixed (Flaxman et al., 2018; Reis & Prestele, 2020). Therefore, we hope to gain new insights by analysing whether both kinds of perfectionists have a personality-dependent tendency towards low daily detachment, which in turn leads to reduced sleep quality independent of daily time pressure. The contrasting indirect effects of SOP on sleep quality via the serial mechanism of time pressure and detachment (positive indirect effect) and SOP on sleep quality via detachment (negative indirect effect) might explain the ambivalent findings regarding the role of SOP for sleep quality.

**The Stressor-Detachment Model as a Theoretical Framework**

The SDM is an established framework used to explain how impaired sleep develops from work experiences. It was therefore used as a guide in the present study to derive processes that mediate the association of perfectionism and sleep. According to the SDM, work-related stressors, such as time pressure and working overtime, can lead to a lack of detachment during nonwork time, which in turn leads to strain symptoms, such as impaired sleep and reduced well-being (Sonnentag & Fritz, 2015). Sonnentag and Fritz (2015) assumed that the effects in the SDM can appear within days or weeks (e.g. day- and week-level studies) but also over longer periods, such as years (e.g. longitudinal studies). Time pressure, a common phenomenon in today's working life (Smith et al., 2011), is typically suggested to be a challenge stressor (LePine et al., 2005). This means that time pressure can have short-term motivating potential (Baethge et al., 2018). While time pressure during the workday can be beneficial for employee thriving (Prem et al., 2017), it may be a source of strain after work (LePine et al., 2007) and inhibit daily detachment (Chawla et al., 2020). The high psychophysiological activation that arises from challenge stressors can make it difficult to switch off from work during nonwork time (Bennett et al., 2018). Thus, the beneficial effects may be limited to the workplace (Chawla et al., 2020). Providing evidence for the detrimental effect of time pressure for recovery and its relevance in the SDM framework, a recent longitudinal study has shown that detachment could explain the effect of time pressure on sleep quality as a long-term consequence (Matick et al., 2021).

Unexpectedly, at the day level, time pressure has not been reflected in sleep quality during the following night according to recent studies (Gerhardt et al., 2020; Haun & Oppenauer, 2019). We argue that detachment could be considered as a mediator that bridges daily time pressure and daily sleep quality. However, recent studies have not yet tested this suggested mediation and reported only the direct effects of time pressure on detachment

(Chawla et al., 2020; Gerhardt et al., 2020) and detachment on sleep quality (e.g., Clinton et al., 2017; Reis & Prestele, 2020). Thus, the mediating effect of detachment remains to be investigated on a daily basis. In conclusion, we expect that after days on which employees were pressed for time, they will recall experiences of the day or even think about tasks waiting for them the next day when they are in bed. These thoughts, in turn, will diminish their sleep quality.

*Hypothesis 1:* The effect of daily time pressure on sleep quality during the following night is mediated by detachment.

The roots of impaired sleep, according to the SDM, can be found in the presence of job stressors, which may be considered inevitable. However, we propose that individual differences, such as perfectionism, may also play a crucial role in sleep quality. We aimed to extend the comparatively small number of studies that have investigated the role of personality in the SDM (e.g. Reis & Prestele, 2020) and attribute an active role to perfectionists in contributing to the presence of job stressors.

**Multidimensional Perfectionism and Differences in Sleep Quality**

Differences in sleep quality can be attributed to the multidimensional nature of perfectionism. Considering the source and the direction of the perfectionistic demands, SOP and SPP can be distinguished (Hewitt & Flett, 1991). SOP is characterized by exceedingly high standards and strict evaluations directed towards oneself. In contrast, SPP follows the belief that others have high expectations and one will be highly criticised if they fail to meet these expectations.[1] Several models of perfectionism share the idea that different dimensions form two superordinate factors. Researchers typically refer to them as *perfectionistic strivings,* which includes setting high performance standards, and *perfectionistic concerns,* encompassing concern over mistakes and negative evaluation, and doubts about the qualities of one’s actions (see Stoeber & Otto, 2006, for a review). SOP and SPP are common

indicators of perfectionistic strivings and concerns, respectively (Stoeber & Damian, 2016; Stoeber & Gaudreau, 2017).

Perfectionistic concerns have consistently been related to a variety of sleep problems in previous research. Perfectionistic strivings, on the contrary, have been mostly unrelated to sleep quality (see Molnar et al., 2020; Schmidt et al., 2018, for reviews on perfectionism and sleep). So far, two studies have investigated and confirmed these findings in samples of employees (Flaxman et al., 2018; Reis & Prestele, 2020). Equally, SPP but not SOP was found to predict students' difficulties in falling asleep and nightly awakening over time (Azevedo et al., 2010). Recently, in a sample of adults, Molnar et al. (2020) even found SOP to show a positive indirect effect on sleep efficiency and quality via lower levels of perceived stress, whereas they found the opposite pattern for SPP. These findings point towards a need for gaining more knowledge on the different mechanisms.

**Why Perfectionism May Differently Shape Time Pressure**

The mediating hypothesis (Hewitt & Flett, 2002) posits that perfectionism is linked to poor health outcomes via the generation of pressure and anticipation of stressors, such as failure. This line of thinking is supported in the distinction of personality-dependent stressors as mediators and personality-independent stressors as moderators of the perfectionism-psychopathology link (Sherry et al., 2016). Perfectionists are assumed to contribute to personality-dependent stressors, for instance, by having concerns about not meeting others' demands. Personality-independent stressors, on the contrary, are understood to simply occur and to intensify stress (e.g. organisational restructuring).

A recent meta-analysis confirmed the mediating hypothesis for SPP but not for SOP, which was unrelated to stress (Smith et al., 2020). Testing both the mediating and moderating role of stress for the perfectionism-sleep link, Molnar et al. (2020) found further support for the mediating hypothesis and even revealed a negative relationship between SOP and

perceived stress. Taken together, these findings indicate that SOP and SPP show different, sometimes even opposing links, with stress. Drawing on these ideas and findings, we assume that socially prescribed but not self-oriented perfectionists are likely to actively generate and anticipate workplace stressors, such as time pressure.

In the present study, we conceptualised time pressure as a personality-dependent stressor that does not simply happen to perfectionists. One might intuitively expect that both perfectionists face time pressure due to their precise but inefficient way of working. However, based on transactional stress theory (Lazarus & Folkman, 1984) and findings on coping (Stoeber & Damian, 2016; Stoeber & Otto, 2006), it can be concluded that both perfectionists show different coping styles and therefore deal differently with daily tasks at work.

Striving towards their demands, self-oriented perfectionists use adaptive styles, such as problem-focused coping, which could reduce stressors (e.g. Dunkley et al., 2000). This style may help them to handle and accomplish tasks and prevent them from time pressure. Fearing to fall short of others' expectations, employees high in SPP engage in maladaptive coping behaviours, such as avoidant coping, which could fail to reduce or even increase stressors (e.g. Flett et al., 1992). Thus, they may generate time pressure and anticipate future failure in accomplishing tasks. This argument is supported by findings linking SOP to high self-efficacy and task mastery and SPP to low self-efficacy and task failure (Mills & Blankstein, 2000; Stoeber et al., 2015).

To conclude, we extend and combine previous findings on the mediating role of stress (Molnar et al., 2020) and the ideas of the SDM. We also draw on findings concerning perfectionism and detachment by Reis and Prestele (2020), which differed depending on whether job stressors were included in the analyses. In our theoretical model, we propose stressors as a relevant linkage between perfectionism and detachment. We assume that socially prescribed perfectionists are prone to actively generate and experience time pressure,

which triggers the cascade of low detachment resulting in impaired sleep quality. On the contrary, self-oriented perfectionists can reduce time pressure and thus detach and sleep better.

*Hypothesis 2:* SPP has a negative (*Hypothesis 2a*) and SOP has a positive (*Hypothesis 2b*) indirect effect on sleep quality through serial mediation of daily time pressure and detachment.

**Detachment as Another Mechanism**

Recently, Crain and Stevens (2018) theoretically underlined that, in addition to the work area, recovery experiences, such as detachment in the nonwork area, play an important role in employees' sleep. Regardless of daily time pressure, both dimensions of perfectionism could entail a personality-dependent tendency towards low daily detachment, which leads to impaired sleep quality. The contrasting indirect effects of SOP on sleep quality via the serial mechanisms of time pressure and detachment (positive indirect effect) and of SOP on sleep quality via detachment (negative indirect effect) might explain the ambivalent findings of SOP and sleep quality because the findings may depend on the specific mediator investigated.

The mediating hypothesis (Hewitt & Flett, 2002) further attributes a role to stress perpetuation; that is, a tendency of perfectionists to maintain stressful experiences by engaging in ruminative response styles. A recent meta-analysis indicated that both dimensions of perfectionism are linked to rumination (Xie et al., 2019). However, findings from research in the workplace context are mixed. For example, Flaxman et al. (2018) found positive associations of perfectionistic concerns and rumination about work as well as perfectionistic strivings and positive thinking about work. As pointed out by Reis and Prestele (2020), these cognitive processes mean that employees are not mentally detaching from work in the nonwork area. In their diary study, both perfectionistic strivings and concerns were negatively related to detachment in bivariate correlations. However, this effect did not hold when job

stressors and fatigue were included as additional predictors of detachment. Another study (Gluschkoff et al., 2017) investigated the mediating role of detachment for depressive symptoms among teachers. Using slightly adapted measurements, the authors found that negative reactions to imperfection, but not striving for perfection, were negatively related to detachment. Considering these findings, the associations of perfectionism and detachment need to be reinvestigated.

The SDM posits that employees fail to detach in the presence of job stressors. Beyond this indirect path, it can be argued that perfectionists continue to think of their work due to their general tendency towards a ruminative cognitive style, which in turn leads to reduced sleep quality. We therefore base our hypotheses on theory and meta-analytical findings and assume direct paths linking perfectionism and detachment:

*Hypothesis 3:* SPP (*Hypothesis 3a*) and SOP (*Hypothesis 3b*) have a negative indirect effect on sleep quality through daily detachment.

## Method

### Procedure

The relevant ethics committee of the [name deleted to maintain the integrity of the review process] approved the diary study, and three undergraduate students involved in the project supported the data collection. We recruited employees via personal contacts, social media, and a university staff mailing list. To be eligible for participation, employees should not work in shifts and suffer from any mental or physical illness that could affect sleep. As an incentive for study participation, a lottery with gift cards as prizes (one gift card for 100 Euro and two gift cards for 50 Euro) and feedback on the study results were offered.

Data collection took place via the online platform SoSci Survey. Employees first received information about the diary study and provided informed consent. After answering

the initial online survey, in which demographic information and perfectionism were assessed, employees were asked to enter their email address on a separate website and indicate the time they would like to receive daily surveys just before and just after work for 5 consecutive workdays. At the beginning of the following week, employees received the daily online surveys and were asked to answer them as soon as possible.

During the week, two data collections occurred each day. In the after-work survey, time pressure during that workday and the impact of the COVID-19 pandemic on the daily work routine were assessed and included as a control variable. Each morning before work, the employees rated their detachment during bedtime and the sleep quality of the last night. Employees provided a personal code for each survey to ensure collected data could be matched without compromising anonymity.

**Participants**

From our sample, 171 participants completed the initial survey; however, only 70 participants answered both the initial questionnaire and at least one complete daily questionnaire (time pressure after work, detachment, and sleep quality before work on the following day). This corresponds to a response rate of 41%. Dropout analyses were conducted to compare participants who participated in the initial survey and at least one complete daily questionnaire (completers) with participants who only participated at the initial survey (dropouts) in the study variables of the initial survey, as well as age, gender, and impact of the COVID-19 pandemic. Completers and dropouts of the employees did not significantly differ for any variable, with the exception that the completers were significantly older than the dropouts, 35 vs. 39 years old, $t(169) = -2.29$, $p < .05$. Detailed information on the dropout analyses can be found in the supporting information in Table S1.

On average, participants answered to questionnaires on 4.73 days (range from 4 to 5). Given that we were interested in the effect of daily time pressure (assessed after work, starting on Monday) on detachment and subsequent sleep (assessed in the before work questionnaire next morning until Friday), the cluster size ranged from 1 to 4 and was 3.84 on average. A total of 269 data points at the within-subject level were collected, including 217 diary entries with matching after and before work questionnaires.

The final total sample, which was used for the analyses, consisted of 70 participants (71.4% women), whose ages ranged from 21 to 63 years ($M$ = 38.79, $SD$ = 12.32). Overall, 75.7% of the participants were employed full-time (35 or more hours per week), 22.9% were employed part-time (15–34 hours weekly), and one person was employed on an hourly basis (less than 15 hours per week). Most participants were employed in the health and social work sector (24.3%) or the service sector (22.9%). On average, the employees had an organisational tenure of 7.77 years ($SD$ = 9.33).

## Measures

### *Initial Survey Measure*

**Perfectionism.** We assessed participants' perfectionism with 10 items from the short version (Cox et al., 2002) of the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991; German translation: Altstötter-Gleich, 1998). SOP (e.g. "I strive to be as perfect as I can be") and SPP (e.g. "People expect nothing less than perfection from me") were respectively measured with five items, and participants responded on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). The scale was reliable for both SOP (α = .84) and SPP (α = .84).

### *Daily After Work Survey Measure*

**Time Pressure.** Time pressure was assessed after the workday using three items from the time pressure subscale of the Instrument for Stress-Related Job Analysis (Semmer et al.,

1999). The items were adapted to the day level (e.g. “Today I had to work under time pressure”) and were rated on a 5-point scale ranging from *does not apply* (1) to *fully applies* (5). The scale was also reliable (α = .93).

***Daily Before Work Survey Measures***

**Detachment.** Detachment during bedtime was measured before the workday with four items from the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007). The instruction of this questionnaire includes the possibility to choose a time reference for detachment. In line with Van Laethem et al., (2016), we decided to assess detachment in the morning to avoid the emergence of work-related thoughts through answering the questionnaire before sleep and referred to detachment during bedtime. Pereira et al. (2014) suggest that the thoughts about work might come especially during bedtime, when people come to rest. Thus, assessing detachment in the evening survey may be too soon to capture it. Participants answered items such as, “When I was in bed yesterday, I forgot about work” on a 5-point scale ranging from *does not apply* (1) to *fully applies* (5). The scale was reliable (α = .96).

**Sleep Quality.** We used five items from the Pittsburgh Sleep Quality Index (Buysse et al., 1989; German translation: Riemann & Backhaus, 1996) to assess the last night’s sleep quality before the workday. For each participant and each night, a day-specific sleep quality score was calculated, which included four components: sleep latency, sleep duration, sleep efficiency, and subjective sleep quality.

Sleep latency was assessed in minutes by the item, “How long did it take you to fall asleep last night?” Participants’ sleep duration was measured in hours by the item, “How many hours did you actually sleep during the last night? (This does not have to be the same as the number of hours you spent in bed).” Sleep efficiency reflects the percentage ratio of sleep duration to the number of hours spent in bed. To calculate the number of hours spent in bed,

the participants were asked about the time they went to bed yesterday ("What time did you go to bed last night?") and the time they got up this morning ("What time did you get up this morning?"). Subjective sleep quality was measured by the single item, "How would you rate the quality of your sleep last night?" with the response alternatives ranging from *very bad* (1) to *very good* (4).

Following Buysse et al. (1989), values between *very good* (0) and *very bad* (3) were assigned to the four components. Afterwards, the four components were added to a day-specific sleep quality score, which could range from *very good* (0) to *very bad* (12). Since higher Pittsburgh Sleep Quality Index values imply lower sleep quality, we recoded the score so that higher values reflected higher day-specific sleep quality. The scale was reliable ($\alpha = .70$).

***Control Variables***

Since the current study took place during the COVID-19 pandemic, we assessed how strongly the current situation regarding the coronavirus affected the daily work routine of the employees. The impact of the COVID-19 pandemic as a control variable for time pressure, detachment, and sleep quality was measured with one item rated on a 6-point scale ranging from *not at all* (1) to *very strongly* (6). Finally, we controlled for age (in years) and gender (0 = female, 1 = male) because sleep problems increase with age (Ohayon, 2002) and are more common among women (Zhang & Wing, 2006).

**Data Analyses**

Due to the hierarchically structured data – daily measures (Level 1) nested within persons (Level 2) – we analysed the variance composition at the within- and between-person levels using intraclass correlations (ICCs (1)). The ICC (1) for time pressure was .49, for detachment .53, and sleep quality .32 (see Table 1), indicating that between 32% and 53% of

the total variance of the Level 1 variables was between-person variance. Thus, the ICCs (1) justified the adequacy of a multilevel approach for hypotheses testing.

We estimated a multilevel path model using Mplus Version 7.4 (Muthén & Muthén, 1998-2015) to test all hypotheses simultaneously. Since the hypothesised model assumes that the Level 2 predictor variables (perfectionism dimensions) have an impact on Level 1 outcomes (daily absolute scale levels of sleep quality) via a serial mediation of Level 1 mediators (daily absolute scale levels of time pressure and detachment during bedtime), a cross- and unique cluster-level mediation model with a 2-1-1-1 design (see Figure 1) was specified in line with Dietz et al. (2020) and Pituch and Stapleton (2012).

– Please insert Figure 1 about here –

In comparison to the approach of Preacher et al. (2010), which considers only the between-person indirect effects, this approach allows distinguishing between the within-person indirect effects (solid lines in Figure 1) and the between-person indirect effects (dashed lines in Figure 1) and has a greater power (Pituch & Stapleton, 2012). Even if the between-person indirect effects are not of interest for the hypotheses, they are reported for transparency in the supporting information in Table S2. Following Pituch and Stapleton (2012), the model assumes that the $a_{11}$ and $a_{21}$ paths and the $a_{12}$ and $a_{22}$ paths are equal, and therefore only one estimation is needed for the effect of each perfectionism dimension on the mediators time pressure and detachment. The model was tested using Bayesian estimation.

We aggregated time pressure and detachment at the person level to separate the between-person and the within-person indirect effects. As mentioned, the ICCs (1) justified the mean aggregation at the person level. Perfectionism, the aggregated variables at the person level – time pressure and detachment – and the control variables age, gender, and the aggregated impact of the COVID-19 pandemic on the daily work routine (ICC (1) = .88) were specified as between-person variables (Level 2) and were grand-mean centred (Aiken et al.,

1991), except for gender. The control variable impact of COVID-19 on the daily work routine was specified as the within-person variable (Level 1) and was also grand-mean centred as well as the variables daily time pressure and detachment. This procedure is in line with recommendations for testing cross-level mediations (e.g. Enders & Tofighi, 2007; Ohly et al., 2010). To determine the unique contribution of SOP and SPP to time pressure, detachment, and sleep quality, we controlled for the overlap with the respective other dimension (Stoeber & Gaudreau, 2017).

## Results

Descriptive statistics and correlations between all study variables can be found in Table 1. At the person level, SOP was not related to time pressure ($r$ = .08, $p$ = .539) or detachment ($r$ = -.20, $p$ = .067), whereas SPP was positively related to time pressure ($r$ = .33, $p$ = .003) and negatively related to detachment ($r$ = -.32, $p$ = .008). At the day level, higher ratings of time pressure were related to less detachment ($r$ = -.27, $p$ = .001) and higher ratings of detachment were related to better sleep quality ($r$ = .60, $p$ < .001).

– Please insert Table 1 about here –

### Results of the Multilevel Path Model

The results of the multilevel path analysis are shown in Table 2.[2]

– Please insert Table 2 about here –

In line with Hypothesis 1, the results showed a significant negative indirect effect of daily time pressure on sleep quality during the following night via detachment, $b$ = −.26, 95% CI [-0.45, -0.11]. Higher ratings of daily time pressure were related to reduced ratings of detachment, β = -.27, 95% CI [-0.40, -0.14], which in turn led to reduced sleep quality, β = .58, 95% CI [0.42, 0.68]. Furthermore, the direct effect of daily time pressure on sleep

quality was not significant after controlling for the indirect effect, β = -.02, 95% CI [-0.24, 0.20], indicating that detachment mediated the effect of daily time pressure on sleep quality.

We also found a significant negative indirect effect of SPP on sleep quality through a serial mediation of daily time pressure and detachment, *b* = -.07, 95% CI [-0.17, -0.01], supporting Hypothesis 2a. By contrast, Hypothesis 2b was not supported, as the indirect effect of SOP on sleep quality through the serial mediation of daily time pressure and detachment was not significantly positive, *b* = .01, 95% CI [-0.05, 0.07].

Contrary to Hypotheses 3a and 3b, no significant negative indirect effect of SPP, *b* = -.19, 95% CI [-0.40, 0.02], nor SOP, *b* = -.14, 95% CI [-0.36, 0.08] on daily sleep quality via daily detachment was found, although we did note a descriptive tendency in favour of our hypotheses.[3]

## Discussion

### Current Findings

Drawing on the mediating hypothesis of stress (Hewitt & Flett, 2002) and the SDM (Sonnentag & Fritz, 2015), this study investigated the mediating roles of time pressure and detachment in the different relationships of perfectionism and employees' daily sleep quality. We expected that the effect of daily time pressure on sleep quality during the following night would be mediated by detachment (Hypothesis 1). Building upon this, we assumed SPP to have a negative indirect effect on daily sleep quality through serial mediation of increased time pressure and decreased detachment (Hypothesis 2a) as well as solely through decreased detachment (Hypothesis 3a). Further, we expected SOP to display a positive indirect effect through serial mediation of reduced time pressure and elevated detachment (Hypothesis 2b) but also a negative indirect effect on daily sleep quality through reduced detachment (Hypothesis 3b).

Overall, the results provided mixed support for our hypotheses. Above the proposed mediation of daily time pressure on sleep quality through detachment, we found that SPP puts employees at risk for high daily time pressure and consequently low daily detachment, which leads to impaired sleep quality. The results align with previous research explaining the association of SPP and impaired sleep by increased stress (Molnar et al., 2020). At the same time, SOP, however, was unrelated to time pressure, which is contrary to findings by Molnar et al. (2020) that supported a negative association of SOP and perceived stress in a sample of adults collected through MTurk. We like to speculate that although these perfectionists perform tasks precisely, they may also effectively cope with the arising stress. They might thus experience neither high nor especially low time pressure. Another explanation may be attributed to the operationalisation. We chose to operationalise perceived stress as time pressure, which is a specific stressor in the workplace context. Accordingly, effects from heterogeneous samples cannot necessarily be generalised to specific stressors in applied contexts. Knowing these specific stressors and mechanisms, however, is important to design precise interventions.

Further, our results indicate that SOP and SPP only show descriptive, though not significant, associations with detachment. These findings are contrary to meta-analytical evidence linking both perfectionism dimensions to rumination (Xie et al., 2019) but in line with Reis and Prestele (2020). An additional analysis indicated the association of SPP and sleep was mediated by detachment once time pressure was no longer included in the model. Thus, a key role can be attributed to stressors bridging the association of SPP and low detachment. Although employee high in SPP may have a general tendency towards a ruminative response style, they may primarily fail to detach after work because they continue to think about the stress (i.e. time pressure) they have experienced that day and how this stress may continue the following day.

Unexpectedly, SOP revealed a direct positive effect on sleep quality. This finding is in line with the adaptive tendency that SOP displayed in the findings by Molnar et al. (2020). For self-oriented perfectionists, further mechanisms may be more relevant than detachment, as will be discussed subsequently.

**Theoretical Implications**

Our findings strengthen the SDM and its applicability at the day level. Beyond job stressors, such as illegitimate or unfinished tasks (Reis & Prestele, 2020; Sonnentag & Lischetzke, 2018), time pressure in the work area may also affect employees' sleep quality via reduced daily detachment. Further, although challenge stressors may have a short-term beneficial effect regarding work engagement (Baethge et al., 2018), they may equally challenge daily recovery in the nonwork area.

This research also advances knowledge about perfectionism and sleep quality in employees and sheds light on time pressure and detachment as an underlying serial process from a within-person perspective. We extend previous research on the SDM by introducing personality dispositions (i.e. SPP) as individual risk factors that may contribute to experiencing workplace stressors. To the best of our knowledge, our study is the first to apply and test the mediating hypothesis in the workplace context. According to our findings, the assumption that the generation of pressure and anticipation of stressors explains the association of perfectionism and impaired sleep quality applies to SPP but not to SOP in this context. Although perfectionists may have a dispositional tendency towards rumination, they may primarily continue to think about work due to the stressors they have experienced throughout the day. Stressors such as high workload are also likely to evoke anticipatory stress and worries that the next workday will be equally stressful (Casper & Sonnentag, 2020). Thus, in the workplace context, the processes of stress generation and anticipation and the high psychophysiological activation arising from stressors may be more relevant for

recovery in the nonwork area than stress perpetuation in terms of general difficulties in detaching. In addition, our results point towards the necessity to simultaneously investigate mechanisms in work (i.e. stressors) and nonwork areas (i.e. recovery) to understand how personality dispositions may contribute to impaired health.

Concerning SOP and its ambivalent association with sleep, we found a positive direct effect after accounting for time pressure, detachment, and its overlap with SPP. This effect indicates the mechanisms that apply to SPP may not necessarily apply to SOP. Simply assuming different associations with the same mediators may fall short in considering the conceptual differences of perfectionism dimensions. Thus, a focus on each dimension and its unique motivational aspects may help us to uncover relevant mechanisms and understand health-promoting and health-impairing aspects of SOP that explain the often ambivalent findings.

**Strengths, Limitations, and Future Research Directions**

To our knowledge, this study is the first to investigate daily time pressure and detachment as underlying mechanisms of perfectionism and poor sleep quality. A major strength of our study is the diary design, which enables the assessment of processes in natural contexts, such as the workplace, and reduces the risk of retrospective biases (Ohly et al., 2010). However, the results must be interpreted in light of some limitations.

Although our sample consisted of several occupational groups to enable some generalisation of results, the dropout analysis indicated completers were significantly older than dropouts. Therefore, systematic differences between completers and dropouts cannot be completely ruled out. Further, a larger sample may have increased power to detect between-level effects. Although our sample size is well comparable to previous diary studies (Derks et al., 2014) and exceeds 30 between-level units that are recommended to avoid bias in multilevel designs, increasing the sample size at this level is considered especially relevant for

power (Scherbaum & Ferreter, 2009). Nevertheless, scholars recently recommended a minimum of 83 between-level units to ensure adequate statistical power in diary studies (Gabriel et al., 2019). Also, we collected data on 5 consecutive days only, which is a limited period.

In this study, we decided to assess detachment retrospectively and concurrently with sleep quality in the daily survey next morning. Advantages of this procedure are that we avoid to initiate work-related thoughts through filling out the survey directly before sleep (Van Laethem et al., 2016) and to miss thoughts that may only arise at bedtime in an evening survey (Pereira et al., 2014). However, disadvantages are the simultaneous measurement and intercorrelation of .60 between daily detachment and sleep quality in the present study which is higher than correlations of .26 in previous diary studies (Liu et al., 2021). Nevertheles, it is not uncommon that similar constructs such as rumination show high correlations with sleep quality (Syrek & Antoni, 2014).

Another limitation refers to the operationalisation of demands as time pressure. As pointed out by Reis and Prestele (2020), such narrow demands may be especially relevant for perfectionists. At the same time, we may have missed other relevant demands during a workday, such as performance expectations or role ambiguity. Further, the scale we used should be considered a subjective measure of time pressure. Thus, no conclusions about objective workload as a consequence of maladaptive coping can be drawn. Indeed, researchers found that SPP is associated with negative perceptions of employees' job characteristics (e.g. perceived autonomy and feedback) and low job satisfaction (Fairlie & Flett, 2003). Thus, they might experience higher time pressure as compared with employees low on SPP because they perceive their environment as particularly demanding.

Future research should focus on further relevant stressors in the perfectionism-sleep association. Socially prescribed perfectionists are highly sensitive for social stressors (i.e. co-

worker conflicts; Kleszewski & Otto, 2020), which are known to inhibit detachment in employees (Pereira & Elfering, 2014). Moreover, the direct positive effect of SOP on sleep quality indicates that different mediators should be considered for each dimension of perfectionism. For example, stressors and negative affective states may explain why SPP is related to impaired sleep whereas resources and positive affective states may explain the positive association of SOP and sleep quality. Previous research linking SOP to positive affect and perfectionistic strivings to positive thinking about work provide initial evidence for this idea (Flaxman et al., 2018; Molnar et al., 2006). Also, SOP has been linked to high self-efficacy and mastery of tasks (Mills & Blankstein, 2000; Stoeber et al., 2015). Self-oriented perfectionists might thus experience a spillover of positive affect from mastery experiences at work to the nonwork area (Sonnentag & Binnewies, 2013), which may facilitate healthy sleep. Finally, researchers may be interested in testing small interventions, such as mindfulness interventions (Querstret et al., 2017), that disrupt the cascade of the SDM and can be implemented daily.

**Practical Implications**

Our findings concerning SPP have practical implications. As a first step, we suggest that experts help socially prescribed perfectionists become aware of their cognitions and fears (e.g. not meeting others' expectations) and behaviours (e.g. avoidant coping) using psychoeducation. In this context, they should learn that these cognitions might increase time pressure, which in turn affects their recovery. However, this must not be understood by socially prescribed perfectionists as criticism, as they especially tend to be afraid of making mistakes and feel they must be perfect to be accepted by others (Hewitt & Flett, 1991). Instead of anticipating failure and doubting one's abilities, employees high in SPP could benefit from increased self-efficacy to reduce avoidance behaviour (Dunkley et al., 2003). Indeed, behavioural interventions aimed at strengthening their self-efficacy could be the next

building block to further protect their mental health. Finally, mindfulness interventions may be a promising approach for practitioners to reduce simultaneously SPP (Flett et al., 2020) and time pressure (Marais et al., 2020) and increase detachment (Karabinski et al., 2021) and sleep quality (Bartlett et al., 2019). Certainly, there are plenty of established interventions promoting boundary management and detachment (e.g. segmenting work and nonwork areas; Kinnunen et al., 2016). However, they should directly address the sources of stress and start early in the process linking SPP to impaired sleep.

## Conclusion

With this study we provide further evidence that employees' perfectionism can be linked to varying sleep on a day-to-day level. According to the results, socially prescribed perfectionists especially experience far from perfect sleep, which could be due to (perceived) time pressure and resulting difficulties in detachment. In contrast, self-oriented perfectionists did not face sleep impairment at all but seem to enjoy a perfect sleep. Mechanisms linking SOP with higher sleep quality remain to be uncovered. It seems important to consider how employees' personalities may contribute to stressors in the work area and how these workplace experiences may translate to nonwork areas when developing interventions. We hope that our findings encourage researchers to further investigate multidimensional perfectionism as a precursor of functional or dysfunctional sleep.

## Footnotes

[1] Hewitt and Flett (1991) proposed other-oriented perfectionism (OOP) as a third dimension. OOP describes having exceedingly high expectations for others. The targets of other-oriented perfectionists rather than the perfectionists themselves experience these externally directed demands and psychological consequences (Hewitt & Flett, 2004). Hence, as in previous studies (e.g., Childs & Stoeber, 2012), OOP was not considered in this study.

[2] We also analysed the hypotheses without the control variables gender, age, and impact of COVID-19. The regression coefficients remained significant and largely unchanged. The only exception was the path linking SPP to Level 2 detachment, which was significant without the control variables, β = -.24, 95% CI [-0.46, 0.03].

[3] In an additional analysis, we ran the path model without time pressure included. In this model, the negative indirect effect of SPP on sleep quality through detachment was significant, *b* = .24, 95% CI [0.05, 0.47], but the negative indirect effect of SOP on sleep quality via detachment was not, *b* = .14, 95% CI [-0.06, 0.36].

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## Tables

Table 1
*Descriptive Statistics, Reliabilities, and Correlations Between Study Variables*

| | | Response Scale | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Age | | 38.79 | 12.32 | - | .12 | .19 | -.25* | .23* | .26* | -.17 | .03 |
| 2 | Gender | 0-1 | 1.29 | | | - | -.15 | .07 | .13 | .22 | .00 | -.02 |
| 3 | Impact of the COVID-19 pandemic | 1-6 | 3.17 | 2.13 | | | (.88) | -.02 | -.08 | -.01 | .03 | .21 |
| 4 | SOP | 1-7 | 5.10 | 1.04 | | | | - | .13 | .08 | -.20 | .33* |
| 5 | SPP | 1-7 | 2.64 | 1.08 | | | | | - | .33** | -.32** | -.07 |
| 6 | Time Pressure | 1-5 | 2.44 | 1.15 | | | .02 | | | (.49) | -.30** | .03 |
| 7 | Detachment | 1-5 | 3.86 | 1.18 | | | .03 | | | -.28** | (.53) | -.27 |
| 8 | Sleep Quality | 1-12 | 10.19 | 2.11 | | | .08 | | | -.22* | .60*** | (.32) |

*Note.* For gender, 0 = *female*, 1 = *male*. SOP = self-oriented perfectionism. SPP = socially-prescribed perfectionism. Standardized correlations at the within-level ($N$ = 269 days) below the diagonal and at the between-level ($N$ = 70 employees) above the diagonal. ICCs (
1) are reported along the diagonal in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2

*Results of Multilevel Path Analysis - Within Effects*

| | Time Pressure | Detachment | Sleep Quality |
|---|---|---|---|
| | | β (SE) | |
| **Controls** | | | |
| IC (Person Level) | .04 [-0.21; 0.27] | -.01 [-0.25; 0.20] | |
| Age | | | .13 [-0.14; 0.47] |
| Gender[a] | | | -.07 [-0.35; 0.19] |
| IC (Day Level) | .01 [-0.10; 0.12] | .01 [-0.12; 0.14] | .11 [-0.04; 0.28] |
| **$a_{11}$-path[b]** | | | |
| SOP → Time Pressure | .04 [-0.23; 0.25] | | |
| SPP → Time Pressure | .33 [ 0.08; 0.54]* | | |
| **$a_{12}$-path[b]** | | | |
| SOP → Detachment | | -.16 [-0.38; 0.10] | |
| SPP → Detachment | | -.23 [-0.46; 0.02] | |
| **$b_{11}$-path** | | | |
| Time Pressure → Sleep Quality | | | -.02 [-0.24; 0.20] |
| **$b_{12}$-path** | | | |
| Detachment → Sleep Quality | | | .58 [ 0.42; 0.68]* |
| **$d_{11}$-path** | | | |
| Time Pressure → Detachment | | -.27 [-0.40;-0.14]* | |
| **Within-Indirect Effects** | | | |
| Time Pressure → Detachment → Sleep Quality | | | -.26 [-0.45;-0.11]* |
| SOP → Time Pressure → Detachment → Sleep Quality | | | .01 [-0.05; 0.07] |
| SPP → Time Pressure → Detachment → Sleep Quality | | | -.07 [-0.17;-0.01]* |
| SOP → Detachment → Sleep Quality | | | -.14 [-0.36; 0.08] |
| SPP → Detachment → Sleep Quality | | | -.19 [-0.40; 0.02] |
| **Direct Effects** | | | |
| SOP → Sleep Quality | | | .32 [ 0.01; 0.58]* |
| SPP → Sleep Quality | | | -.15 [-0.46; 0.17] |

*Note.* $N$ = 233 days nested in 70 employees; SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; IC = impact of the COVID-19 pandemic. [a] 0 = *female*, 1 = *male*. [b] The $a_{11}$ and $a_{21}$-path as well as $a_{12}$ and $a_{22}$-path from Figure 1 are assumed to be equal in this model. Standardized estimates, except for indirect effects; For reasons of parsimony, the correlations between the initial survey variables are not reported but were included in the model. * 95% confidence interval excluding zero.

## Figures

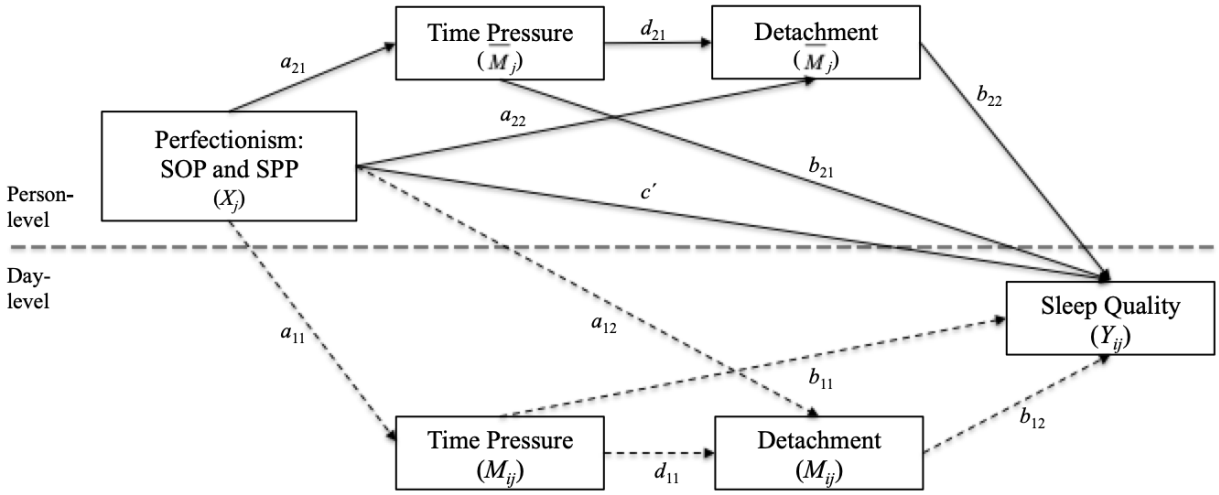


*Figure 1.* Cross- and unique cluster-level mediation models with a 2-1-1-1 design. $X_j$ represents self-oriented perfectionism (SOP) and socially prescribed perfectionism (SPP) for a particular employee $j$, $M_{ij}$ and $Y_{ij}$ represent time pressure, detachment and sleep quality, respectively for employee $i$ on day $j$ and $\bar{M}_j$ represents time pressure and detachment aggregated to the person-level for a particular employee $j$. Paths $a_{11}$ and $a_{21}$ as well as $a_{12}$ and $a_{22}$ are assumed to be equal.

## Supporting Information

Table S1

*Dropout Analyses*

| Variables at initial survey | | | | | Independent sample *t*-tests | | |
|---|---|---|---|---|---|---|---|
| | | *N* | *M* | *SD* | *t* | *df* | *p* |
| SOP | Dropouts | 101 | 5.27 | 0.98 | | | |
| | Completers | 70 | 5.08 | 1.04 | 1.22 | 169 | .225 |
| SPP | Dropouts | 101 | 2.91 | 1.29 | | | |
| | Completers | 70 | 2.64 | 1.08 | 1.50 | 163 | .136 |
| Time Pressure | Dropouts | 101 | 3.32 | 0.82 | | | |
| | Completers | 70 | 3.14 | 0.84 | 1.39 | 169 | .168 |
| Detachment | Dropouts | 101 | 3.14 | 1.11 | | | |
| | Completers | 70 | 3.38 | 1.10 | -1.42 | 169 | .159 |
| Sleep Quality | Dropouts | 101 | 8.82 | 2.55 | | | |
| | Completers | 70 | 9.10 | 2.48 | -.71 | 169 | .480 |
| Impact of the COVID-19 pandemic | Dropouts | 101 | .50 | 1.49 | | | |
| | Completers | 70 | .49 | 1.50 | .04 | 169 | .968 |
| Age | Dropouts | 101 | 34.61 | 11.26 | | | |
| | Completers | 70 | 38.79 | 12.32 | -2.29 | 169 | .023 |
| | | | | | 2x2-$\chi^2$-test | | |
| | | *N* | % *female* | | $\chi^2$ | | *p* |
| Gender | Dropouts | 101 | 72 | | | | |
| | Participants | 70 | 50 | | .015 | | .903 |

*Note.* SOP = self-oriented perfectionism. SPP = socially-prescribed perfectionism.

Table S2

*Results of Multilevel Path Analysis - Between Effects*

| | Sleep Quality |
|---|---|
| | β (SE) |
| SOP → Detachment → Sleep Quality | -.03 [-0.05; 0.19] |
| SPP → Detachment → Sleep Quality | .03 [-0.06; 0.21] |
| SOP → Time Pressure → Detachment → Sleep Quality | .00 [-0.02; 0.02] |
| SPP → Time Pressure → Detachment → Sleep Quality | .01 [-0.02; 0.07] |

*Note.* $N$ = 233 days nested in 70 employees; SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism. The $a_{11}$ and $a_{21}$-path as well as $a_{12}$ and $a_{22}$-path from Figure 1 are assumed to be equal in this model. Standardized estimates, except for indirect effects; For reasons of parsimony, the correlations between the initial survey variables are not reported but were included in the model.

# Appendix C: Manuscript 3

## A Matter of Needs – Basic Need Satisfaction as an Underlying Mechanism Between Perfectionism and Employee Well-being

**Authors:** Emily Kleszewski, Kathleen Otto

**Status:** Submitted to *Journal of Occupational and Organizational Psychology*

# A Matter of Needs – Basic Need Satisfaction as an Underlying Mechanism Between Perfectionism and Employee Well-Being

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**Abstract**

Why do dimensions of perfectionism have different effects on engagement, exhaustion, and satisfaction at work? We addressed this question and investigated autonomy, competence, and relatedness satisfaction as separate mechanisms that might mediate the relationship between perfectionism and well-being (operationalized as work engagement, job satisfaction, and exhaustion). Extending the perfectionism literature and self-determination theory (SDT), we expected the self-oriented and socially prescribed perfectionism to be differently related to employee well-being through the fulfilment or lack of need satisfaction. Further, we attributed a unique role to autonomy satisfaction in fostering work engagement. Data were collected at 2 time points, with a 3-month interval, in an online study. The results from path analyses including data from 328 (T1) and 138 (T2) employees were largely in line with our expectations. The dimensions of perfectionism were differently related to work engagement and job satisfaction through autonomy satisfaction. Differences in competence satisfaction accounted for the different relations of perfectionism with job satisfaction and differences in relatedness satisfaction explained its relations with exhaustion. Overall, our findings highlight the motivational differences inherent in perfectionism that translate into well-being via satisfaction of each of the three needs. We discuss implications for SDT and future research directions concerning relevant mechanisms.

*Keywords*: multidimensional perfectionism, self-determination theory, basic need satisfaction, employee well-being, job satisfaction, exhaustion, work engagement

# A Matter of Needs – Basic Need Satisfaction as an Underlying Mechanism Between Perfectionism and Employee Well-Being

## 1. Introduction

Perfectionism has been described as a "double-edged sword" that contains both adaptive and maladaptive aspects (Molnar et al., 2006). It affects all areas of life, with the workplace being the most frequently affected domain (Stoeber & Stoeber, 2009). Given this ambivalence and the increase of perfectionism in industrialized countries (Curran & Hill, 2019), research on perfectionism in the workplace has flourished in recent years (Ocampo et al., 2020). We now have wide knowledge about dimensional perfectionism and its positive and negative work-related outcomes, especially regarding well-being. According to recent reviews and a meta-analysis (Harari et al., 2018; Ocampo et al., 2020; Stoeber & Damian, 2016), perfectionism dimensions summarized as perfectionistic strivings (e.g. self-oriented perfectionism, personal standards, and high standards) may show a positive link to well-being, such as work engagement. By contrast, dimensions belonging to perfectionistic concerns (e.g. socially prescribed perfectionism, concern over mistakes, doubts about actions, and discrepancy) consistently show a maladaptive association with well-being, such as burnout. It is often debated whether perfectionistic strivings can be considered as adaptive (Stoeber & Otto, 2006). These dimensions have also been found to be linked to negative outcomes, such as negative affective and cognitive reactions after failure (Besser et al., 2004), and associations with positive outcomes often emerge when the overlap with perfectionistic concerns is controlled for (Hill et al., 2010).

However, knowledge of the mechanisms that drive these different effects is limited (Ocampo et al., 2020). Such knowledge is necessary to advance the theory and more clearly understand how the dimensions of perfectionism may contribute to high vitality and optimal functioning, or exhaustion and poor functioning. Furthermore, knowledge of the relevant

mechanisms would help to deal with perfectionism and can be used to improve interventions to promote employee well-being, given that perfectionism can be considered as a stable disposition (e.g. Sherry et al., 2013). Drawing on transactional stress theory (Lazarus & Folkman, 1984) and the initiation-termination model of worry (Berenbaum, 2010), previous research identified maladaptive coping and rumination about work as processes that mediate the relationship between perfectionistic concerns and negative indicators of well-being, such as burnout (Flaxman et al., 2018; Stoeber & Damian, 2016). These specific mechanisms may fall short in explaining why employees high in perfectionistic strivings tend to fully invest themselves in their work.

Thus, we aim to integrate dimensional perfectionism in a broader theoretical framework that considers its fundamental motivational differences and how these may translate into high or low functioning and well-being at work. We argue that self-determination theory (SDT) and specifically its concept of basic need satisfaction (Deci & Ryan, 2000) offers a promising approach. A core tenet of SDT is that satisfaction of the needs for autonomy, competence, and relatedness is essential for flourishing and well-being, including in the workplace (Van den Broeck et al., 2016). Moreover, SDT addresses individual differences in employees' orientations toward the initiation and regulation of their behaviour and aspirations as antecedents of need satisfaction (Deci et al., 2017). Dimensions of perfectionism differ concerning the initiation of behaviour and the motivational focus for pursuing goals. Therefore, we propose perfectionism as a form of dispositional motivation in the SDT framework. Against this background, we investigate the mediating role of need satisfaction in the relationship between dimensional perfectionism and employees' job satisfaction, exhaustion, and work engagement.

This study contributes to previous research in three ways. First, we extend existing knowledge about perfectionism and overall need satisfaction (e.g. Jowett et al., 2016) as we

consider the three needs as separate mechanisms that link perfectionism to well-being and address these motivational mechanisms in the workplace context. This enhances the understanding of whether the disposition of perfectionism applies to well-being across applied contexts as an empirical contribution. We further highlight the active role of individuals in shaping need satisfaction and contribute to a more detailed understanding of how each of the three needs links the dimensions of perfectionism to employee well-being. Second, we attribute a unique position to autonomy satisfaction in fostering optimal, active functioning. Thus, we specify the assumption of SDT that each need contributes uniquely to psychological growth and well-being (Deci & Ryan, 2000) by investigating which needs will predict which well-being indicators. Third, we investigate these associations using a two-wave design and address recent calls to go beyond cross-sectional designs in the area of perfectionism (Stoeber, 2018b) and SDT (Deci et al., 2017; Van den Broeck et al., 2016).

**1.1 Dimensional perfectionism and employee well-being**

Broadly, perfectionism is conceived of as a personality disposition. It is characterized by striving for flawlessness and having exceptionally high performance standards, in combination with the tendency to evaluate one's own behaviour overcritically (Flett & Hewitt, 2002; Frost et al., 1990). The double-edged nature of perfectionism in driving various effects on well-being can be traced back to the dimensionality of the construct. One way of distinguishing these dimensions is to consider the source and direction of the perfectionistic standards (Hewitt & Flett, 1991). Self-oriented perfectionism (SOP) is intrapersonal in nature and comprises holding exceedingly high standards for oneself, accompanied by strict evaluations of one's own behaviour. Socially prescribed perfectionism (SPP) is characterized by the belief that others impose high standards, and that those others will be strongly critical if one fails to meet their expectations. Lastly, other-oriented perfectionism (OOP) describes holding exceedingly high demands that are directed towards others.

In the course of growing research interest, various models with different conceptualizations of these dimensions have evolved (e.g. Frost et al., 1990; Hewitt & Flett, 1991). These models have in common that the proposed dimensions can be assigned to two superordinate factors. They are typically referred to as *perfectionistic strivings,* which refers to aspects such as setting high performance standards; and *perfectionistic concerns,* meaning aspects such as the fear of negative evaluation and concern over mistakes (see Stoeber & Otto, 2006, for a comprehensive review). SOP is seen as a key indicator of perfectionistic strivings, whereas SPP is seen as a key indicator of perfectionistic concerns (Stoeber & Damian, 2016; Stoeber & Gaudreau, 2017). OOP is considered as an 'other form' of perfectionism as findings challenge its assignment to these superordinate factors (Ocampo et al., 2020). Following recommendations concerning this third dimension (Stoeber & Otto, 2006), we refrained from including OOP in the present study[1]. Hence, we focus on SOP and SPP as key indicators of perfectionism by examining their associations with employee well-being.

Overall, we adopted the traditional definition of well-being in the workplace as a broad concept encompassing many constructs (Danna & Griffin, 1999). We build on the theoretical framework by Warr (1990, 2013) to capture employee well-being comprehensively, with positive and negative indicators. This framework of affective well-being entails four quadrants which differ on the dimensions of pleasure and activation. We focused on job satisfaction (low activation, high pleasure), exhaustion (low activation, low pleasure), and work engagement (high activation, high pleasure) because these indicators correspond to Warr's framework (Bakker & Oerlemans, 2011). They also represent frequently

[1] Given the externally directed demands, the targets of other-oriented perfectionists tend to experience distress rather than the perfectionists themselves (Hewitt & Flett, 2004). Thus, OOP is usually not included when investigating employee well-being (e.g. Childs & Stoeber, 2012). Rather, researchers separately focus on its impact for significant others via its unique associations with disagreeable behaviour (Stricker et al., 2019). For interested readers, we included OOP in an additional analysis. The results can be found in the supporting information.

studied and established indicators of employee well-being (e.g. Bhave et al., 2019; Mäkikangas et al., 2016) and indicate differences in functioning among perfectionistic employees. To date, SPP (but not SOP) has been related to poor job satisfaction (Fairlie & Flett, 2003; Hochwarter & Byrne, 2010) and high levels of exhaustion. By contrast, SOP is unrelated to exhaustion and may even display negative associations with exhaustion when the overlap between the dimensions of perfectionism is controlled for (see also Stoeber & Damian, 2016, for a review). Moreover, a negative association for SPP and a positive association for SOP and work engagement was found (Childs & Stoeber, 2010). Mirroring the pattern of the negative relationship of SOP and exhaustion, the negative relationship of SPP and work engagement emerges or becomes more evident when the overlap between the dimensions is statistically controlled for (see again Stoeber & Damian, 2016, also for the relevance of considering this overlap in the investigation of perfectionism).

### 1.2 Self-determination theory and basic need satisfaction as a theoretical framework

According to self-determination theory (SDT; Deci & Ryan, 2000), individuals are naturally active and strive towards psychological growth and well-being. Within SDT, basic psychological needs are described as universal "nutriments" and necessary conditions for the natural processes to function optimally (Deci & Ryan, 2000). SDT posits the needs for autonomy, competence, and relatedness. Building on previous work (e.g. deCharms, 1968), Deci and Ryan (2000) understand autonomy as a sense of freedom and ownership over one's behaviour and the feeling that behaviours are concordant with the self. In line with White (1959), they describe competence as the desire to experience mastery over one's environment and to attain valuable outcomes. Lastly, relatedness refers to the fundamental human need to feel connected with and cared for by others (Baumeister & Leary, 1995).

Given that individuals are embedded in and interact with their social environment, SDT has been applied to a variety of contexts encompassing education, sports, and work

(Deci & Ryan, 2000). One factor that may facilitate or hinder need satisfaction are conditions in these environments, such as supervisor support provided in the workplace (Deci et al., 2017). SDT further addresses individual differences in people's orientations toward the initiation and regulation of their behaviour as relevant for differing degrees of need satisfaction. A fundamental distinction relates to the motivation to engage in goal-directed behaviour, which is referred to as the process or the "why" of goal pursuit (Deci & Ryan, 2000). Based on the degree of self-determination, motivation can be classified as autonomous or controlled depending on the extent to which individuals initiate and regulate behaviour with a sense of freedom and volition or with a sense of external pressure and a lack of volition. Motivation can be regarded on the state (i.e. daily motivation), the domain (i.e. motivation at work), or on the personality level (Deci & Ryan, 2012). The personality level is typically referred to as causality orientations and describes an individual's general tendency in initiating and regulating behaviour (Deci & Ryan, 1985a). In the following, we will use the terms autonomous and controlled functioning to describe differences in this general tendency. Further, the content of goals or the "what" of goal pursuit is relevant for need satisfaction (Deci & Ryan, 2000; Ryan et al., 1996). In this regard, a tenet of SDT is that goals which are pursued for autonomous reasons ("why") and that are intrinsic rather than extrinsic (i. e. affiliation and growth as opposed to fame and image, "what") involve relatively high satisfaction of an individual's basic psychological needs (Deci & Ryan, 2000). Initiation of behaviour and contents of goals are central aspects that define and distinguish the perfectionism dimensions, underlining a salient motivational component in perfectionism. Thus, we propose perfectionism as another antecedent of need satisfaction and a dispositional form of motivation. In line with recent recommendations (Van den Broeck et al., 2016), we treated the three needs as related yet separate constructs and investigated their distinct relationships with perfectionism.

### 1.3 Perfectionism and basic need satisfaction

We argue that the double-edged nature of perfectionism also drives differences in need satisfaction. Motivational differences are rooted in SOP and SPP (Stoeber et al., 2018), and these affect the way employees orient toward their workplace environment and thus the degree to which they find opportunities to satisfy their needs within this context.

Whereas self-oriented perfectionists strive to fulfil their own and inherently valued standards, socially prescribed perfectionists experience external pressure to perform perfectly (Hewitt & Flett, 1991). Thus, the motivational functioning (the "why") characterizing the dimensions is autonomous for SOP and controlled for SPP. Further, SOP and SPP differ in the content of goal pursuit (the "what"). According to the dual process model of perfectionism (Slade & Owens, 1998), self-oriented perfectionists are generally driven by approach behaviour; hence, they pursue perfection, success, and approval as goals. By contrast, socially prescribed perfectionists are driven by avoidance behaviour; their goal is to avoid imperfection, failure and disapproval. It could be argued that approval is an extrinsic goal which is less likely to foster need satisfaction (Kasser & Ryan, 1996). However, we argue that the approach goals that self-oriented perfectionists pursue are overall growth-oriented and thus likely to channel behaviours favourable for need satisfaction. Guided by avoidance goals, socially prescribed perfectionists will, unfortunately without wanting to, engage in behaviours that hinder need satisfaction. The distinction between approach and avoidance is not directly included in SDT, but it has been suggested that autonomous and controlled motivation can be described in terms of approach and avoidance (Carver & Scheier, 1999). Deci and Ryan (2000) acknowledge a certain overlap between both distinctions as controlled behaviours are usually acquired under negative consequences or punishments. Overall, research supports the argumentation that SOP and SPP have different motivational qualities (see Stoeber et al., 2018, for a review): SOP shows unique positive relationships with autonomous motivation

and an approach-orientation and SPP shows unique positive relationships with controlled motivation and an avoidance orientation. In the following, we aim to provide a more detailed argumentation concerning perfectionism and its relationship with satisfaction of the three needs at work.

According to SDT (Deci & Ryan, 1985a), autonomous functioning makes individuals proactively engage in activities out of interest. Individuals with controlled functioning, on the contrary, feel pressurized and thus hesitate to proactively engage in activities. Thus, we assume that self-oriented perfectionists will feel self-determined as they approach their high demands and thus enjoy performing work tasks according to their goals and interests. They should experience autonomy satisfaction. Socially prescribed perfectionists, by contrast, would display a lack of interest as they feel that they are forced to perform perfectly at work to avoid failure and disapproval. Thus, they would not experience autonomy satisfaction.

H1: *SOP is positively related (a) and SPP is negatively related (b) to autonomy satisfaction.*

Further, we expect differences in competence satisfaction. Given their growth-orientation, employees high in SOP should challenge themselves to approach and achieve their goals at work, which facilitates competence satisfaction. By contrast, socially prescribed perfectionists are constantly confronted with the anxiety about not meeting the unrealistic high expectations of supervisors, colleagues, and clients and their own inadequacy to fulfil these expectations. They may thus have difficulties in deriving satisfaction, even from successful tasks, as they believe that the result will be not good enough. These issues are likely to undermine their competence satisfaction. Additionally, they might avoid certain work tasks and handicap themselves regarding the experience of competence. Supporting these arguments, research has linked SOP to task approach goals, task mastery, self-efficacy, and satisfaction and pride after high performance and SPP to fear of negative evaluations, task

failure, procrastination, low self-efficacy, and dissatisfaction after high performance (Flett et al., 1992; Hewitt & Flett, 1991; Mills & Blankstein, 2000; Stoeber et al., 2015; Stoeber & Yang, 2010).

H2: *SOP is positively related (a) and SPP is negatively related (b) to competence satisfaction.*

Furthermore, differences in relatedness satisfaction can be hypothesized. Concerning social interactions, autonomous functioning will facilitate relatedness satisfaction through natural social interactions, whereas controlled functioning may lead to defensive functioning (Hodgins et al., 1996). Considering also their approach- and growth-oriented goals, self-oriented perfectionists can be expected to show a natural tendency to nurture social relationships without feeling restricted. Socially-prescribed perfectionists, on the contrary, aim to avoid disapproval by the people around them which should result in defensive behaviours or a constant effort to maintain a perfect outward appearance. The latter aspect is captured in the concept of perfectionistic self-presentation which describes an interpersonal expression of perfectionism that is related to inauthentic expressions of the self, anxiety in social interactions, and social self-esteem deficits (Hewitt et al., 2003).

The idea of defensive functioning in social relationships is in line with the perfectionism social disconnection model (PSDM, Hewitt et al., 2006). The SDM posits that especially SPP, with its interpersonal character, is related to subjective and objective social disconnection (i.e., conflicts and impaired relations). This disconnection is the result of unpleasant interpersonal behaviour, such as hostility and mistrust, and high sensitivity to interpersonal cues that indicate evaluation or rejection (Flett et al., 2014; Hewitt & Flett, 1991). Evidence supports the notion that socially prescribed perfectionists, but not self-oriented perfectionists, experience low social support and feelings of social exclusion, including in the workplace (e.g. Kleszewski & Otto, 2020; Sherry et al., 2008). Thus, socially

prescribed perfectionists who perceive their environment as overly demanding and unsupportive are likely to experience a lack of relatedness satisfaction. SOP, by contrast, is intrapersonal, and does not include this perception of the environment. Supporting the assumption that SOP is related to functional social relationships, previous research indicated that self-oriented perfectionists may have social nurturance goals, show prosocial behaviours, and experience feelings of social connection (Stoeber, 2014; Stoeber et al., 2017)

H3: *SOP is positively related (a) and SPP is negatively related (b) to relatedness satisfaction.*

To our knowledge, no previous study has examined perfectionism and its association with satisfaction of the three needs in the workplace context. However, this association appears to be reflected in research that linked perfectionism and need satisfaction or frustration in specific contexts. In a clinical sample, perfectionistic concerns led to overall need frustration (Boone et al., 2014). In addition, perfectionistic concerns and perfectionistic strivings showed opposite relationships with overall need frustration and need satisfaction in a sample of junior athletes (Jowett et al., 2016). Finally, for a sample of junior sport participants, a negative association was found between perfectionistic strivings and competence frustration. By contrast, a positive association was found between perfectionistic concerns and the frustration of all three needs (Mallinson-Howard & Hill, 2011). Those findings provide initial support for the hypothesized relationships. However, they are either restricted to especially vulnerable (Boone et al., 2014), high performing samples (Jowett et al., 2016) and domain-specific perfectionism (Mallinson-Howard & Hill, 2011), or focused on overall need satisfaction (Boone et al., 2014, Jowett et al., 2016). We aimed to demonstrate that perfectionism and its consequences also apply to the workplace. We further aimed to investigate the association of perfectionism with the three separate needs because we propose them to show distinct associations with well-being over time.

### 1.4 Basic need satisfaction as an underlying mechanism between perfectionism and well-being

To complete the bridge, why exactly need satisfaction should explain various associations between perfectionism and well-being, we need to consider the consequences of need satisfaction. SDT maintains that need satisfaction contributes to optimal functioning and psychological well-being, whereas need frustration leads to diminished well-being, also in the workplace (Deci et al., 2017). Hence, each of the three needs is proposed to be significant (Deci & Ryan, 2000). Within SDT, well-being is understood as "a subjective experience of affect positivity but […] also an organismic function in which the person detects the presence or absence of vitality" (Deci & Ryan, 2000, p. 243). This understanding fits well our conceptualization of employee well-being encompassing job satisfaction (affect positivity), work engagement (presence of vitality), and exhaustion (absence of vitality).

Specifically, the three needs can be hypothesized to provide employees with the motivational fuel to flourish and dedicate themselves to their work (i.e. engagement; Deci et al., 2001) and experience pleasure (i.e. job satisfaction). Moreover, it can be assumed that a lack of this fuel makes employees vulnerable and depletes their energy resources (i.e. exhaustion; Van den Broeck et al., 2008). In line with these assumptions, the relevance of need satisfaction has been demonstrated for positive indicators of well-being, such as job satisfaction and work engagement, and negative indicators, such as exhaustion (e.g. Van den Broeck et al., 2008, 2010). However, the association between need satisfaction and well-being has mostly been demonstrated cross-sectionally. Studies that investigated how need satisfaction predicted daily well-being (Bakker & Oerlemans, 2016) or well-being over three or 12 months (Huyghebaert et al., 2018; Trépanier et al., 2014) were mostly conducted without considering the unique influence of the three needs (see Trépanier et al., 2016, for an exception). Even in cross-sectional studies, the three needs were found to be differently

related to well-being, with autonomy satisfaction appearing particularly important (Kovjanic et al., 2012; Trépanier et al., 2013). These findings align with the conclusion of a recent review in which autonomy was found to display the highest relative weights on engagement, job satisfaction, and burnout when controlling for its overlap with competence and relatedness. Competence, by contrast, showed no unique contribution to work engagement but relatively high weights on measures primarily characterized by positive affect (Van den Broeck et al., 2016). Longitudinal findings also provide support for investigating the impact of the three separate needs to gain a deeper understanding of which needs predict which indicators of well-being. They further show that need satisfaction does not equally predict well-being over time. For example, overall need satisfaction predicted work engagement but not burnout over a 12-month interval (Trépanier et al., 2014). In a study conducted over a 3-month interval, overall need satisfaction predicted work engagement and job satisfaction (Huyghebaert et al., 2018). Finally, a study that investigated the three needs and their satisfaction or frustration as separate predictors of psychosomatic complaints found significant effects of competence and relatedness satisfaction over a 12-month interval (Trépanier et al., 2016).

Coming back to SDT, it is clearly proposed that "autonomy occupies a unique position in the set of three needs: […] being able to satisfy the need for autonomy is essential […] for many of the optimal outcomes associated with self-determination" (Deci & Ryan, 2000, p. 242). Linking this unique position with Warr's model of well-being, we attribute a unique "booster" role to autonomy satisfaction in fostering well-being that indicates high activity. Work Engagement is characterized as high activation and high pleasure and can be considered as prototypical for these optimal outcomes and as closely related to individuals' natural active progression towards growth. Job satisfaction and exhaustion are indicators of well-being that are characterized by low activation and different affective valences. We propose that

competence and relatedness satisfaction may predict these indicators of well-being. Both competence and relatedness satisfaction are proposed to fuel positive experiences in terms of mastery and belongingness which are relevant for high or low pleasure. However, only autonomy satisfaction will simultaneously fuel positive affect and boost activity and thus uniquely predict work engagement in addition to job satisfaction and exhaustion.

Drawing on the theory and empirical evidence outlined above, we propose need satisfaction as a mediating mechanism between dimensional perfectionism and employee well-being. SDT posits that individuals show optimal functioning and well-being to the extent they experience opportunities to access or construct satisfaction of their needs as the necessary nutriment. Given that SOP facilitates satisfaction of the three needs, this dimension is expected to show positive associations with indicators of well-being. As opposed to this, SPP is assumed to hinder employees from experiencing autonomy, competence, and relatedness satisfaction. Thus, they are expected to have a lack of the fuel that is necessary to engage in work tasks, experience pleasure and that protects them from energy depletion. We propose a unique role to autonomy satisfaction in fostering work engagement and thus expect SOP and SPP to be differently related to all indicators of well-being via autonomy satisfaction only (H4 and H5). We further expect SOP and SPP to be differently related to job satisfaction and exhaustion via competence and relatedness satisfaction (H6 – H9). Figure 1 summarizes and illustrates the proposed model.

H4: *SOP is positively related to work engagement (a) and job satisfaction (b) and negatively related to exhaustion (c) via autonomy satisfaction.*

H5: *SPP is negatively related to work engagement (a) and job satisfaction (b) and positively related to exhaustion (c) via a lack of autonomy satisfaction.*

H6: *SOP is positively related to job satisfaction (a) and negatively related to exhaustion (b) via competence satisfaction.*

H7: *SPP is negatively related to job satisfaction (a) and positively related to exhaustion (b) via a lack of competence satisfaction.*

H8: *SOP is positively related to job satisfaction (a) and negatively related to exhaustion (b) via relatedness satisfaction.*

H9: *SPP is negatively related to job satisfaction (a) and positively related to exhaustion (b) via a lack of relatedness satisfaction.*

[Insert figure 1 about here]

## 2. Method

### 2.1. Procedure and sample

A two-wave online-study was conducted in a sample of full- and part-time employees in Germany. The online-questionnaires were hosted by the non-commercial platform SoSci Survey. Data were collected at two time points, separated by three months. Data collection for Time 1 started in January 2020 and finished in March, before any restrictions concerning the COVID-19 pandemic were implemented. Data collection for Time 2 started in April and finished in June when restrictions such as remote work and home schooling existed. The link to the study was distributed via mailing lists among university staff members and business contacts; it was also advertised via several social media channels. The study was approved by the relevant ethics committee. Participation was voluntary. A draw was offered as an incentive for participation. All participants provided their informed consent before completing the questionnaires.

At Time 1, 331 employees completed the questionnaire. Of these, three participants were excluded because their data showed a Mahalanobis distance exceeding the critical value of $\chi 2\ (14) = 36.12$, $p < .001$ (see Tabachnick & Fidell, 2007). Hence, the final sample comprised 328 employees. Among them, 230 were female (70%), 97 were male (30%), and 1 was non-binary. Their mean age was 38.21 years ($SD$ = 13.06). The sample was highly

educated, with about the half of the participants having a university degree (45%). On average, they worked 34.54 hours a week (*SD* = 13.15) and had an organizational tenure of 8.92 years (*SD* = 10.25). All branches of the economy were represented, with health and social services (25%), public administration (13%), industry (13%), and education (12%) being the most frequent ones.

The same participants were contacted again via e-mail and 195 of them completed the second questionnaire (59%). An anonymous self-generated identification code was used to match the data from the two waves. A total of 138 data sets was successfully matched and included in the analyses. For the remaining data, there were discrepancies in the codes between T1 and T2. The procedure of self-generated identification codes has many benefits including truly anonymous collection of data and increased appearance of confidentiality, but also the disadvantage of potential data loss if participants do not remember and precisely self-report the code (Audette et al., 2020). This loss leads to an average matching rate of 65% which reflects well the matching rate of 70% in the present study.

Thus, the final retention rate was 42% which is not uncommon for two-wave studies in organizational settings (e.g. Huyghebaert et al., 2018). Nevertheless, it can be assumed that some participants have dropped out at Time 2 because their private and working life was affected by the COVID-19 pandemic. We analysed whether differences in study and demographic variables could be found between participants who completed both questionnaires data and those who only participated at Time 1. The completers were older, $t(326) = 2.75$, $p = .006$, and had a higher organizational tenure, $t(326) = 2.36$, $p = .019$, than those who only participated at Time 1. However, there were no significant differences in perfectionism, need satisfaction and the indicators of well-being, indicating that attrition did not occur on the basis of study variables.

## 2.3. Measures

Participants' demographic information, perfectionism, need satisfaction, and well-being were measured at Time 1 (T1). Well-being was measured again at Time 2 (T2). In addition, the impact of COVID-19 on the participants' working life and negative life events were assessed at T2.

### *2.3.1. Perfectionism*

Perfectionism was assessed with a 15-item version of the Dimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991; German translation: Altstötter-Gleich, 1998). The short form by Cox et al. (2002) was used to measure SOP (5 items; e.g. "I strive to be as perfect as I can be."; α = .86) and SPP (5 items, e.g. "People expect nothing less than perfection from me."; α = .88). Items were presented with a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and the MPS standard instruction. The shortened scales are a reliable and valid measure of perfectionism (Stoeber, 2018a) and have been used by several researchers (e.g. Stoeber et al., 2020).

### *2.3.2. Basic psychological need satisfaction*

The Work-related Basic Need Satisfaction scale (W-BNS; Van den Broeck et al., 2010; German translation: Martinek, 2012) was used to measure need satisfaction at work. The three subscales comprise autonomy satisfaction (6 items, e.g. "I feel free to do my job the way I think it could best be done."; α = .84), competence satisfaction (6 items, e.g. "I feel competent at my job."; α = .86), and relatedness satisfaction (6 items, e.g. "At work, I feel part of a group."; α = .81). Items were rated on a scale from 1 (*totally disagree*) to 5 (*totally agree*).

### *2.3.3. Indicators of employee well-being*

Job satisfaction was assessed with the item "Overall, how satisfied are you with your job?" (Wanous et al., 1997) and rated on scale from 1 *(very dissatisfied)* to 7 *(very satisfied).*

Single items perform well for capturing overall job satisfaction (Fisher et al., 2016). The exhaustion subscale of the Oldenburg Burnout Inventory (OLBI; Demerouti et al., 2003) was used to measure exhaustion (8 items, e.g. “During my work, I often feel emotionally drained.”; α = .86/.86 for T1/T2 respectively). Participants rated their responses on a scale from 1 *(totally disagree)* to 5 *(totally agree)*. To capture work engagement, the 9-item version of the Utrecht Work Engagement Scale was used (UWES-9; Schaufeli et al., 2006). The nine items (e.g. “I am immersed in my work”; α = .94/.95 for T1/T2 respectively) were rated on a scale ranging from 1 *(never)* to 6 *(always)*.

### *2.3.4. Control variables*

We controlled for gender (0 = female, 1 = male), age, and organizational tenure (both in years). Previous research has shown these variables to be related to need satisfaction (e.g. Van den Broeck et al., 2016) and indicators of well-being, such as exhaustion and work engagement (e.g. Purvanova & Muros, 2010; Schaufeli et al., 2006). We also controlled T2 well-being for the impact of the COVID-19 pandemic on the participants’ working life and negative life events. The COVID-19 pandemic has affected all areas of life, including changes in work practices and private life, and has been related to reduced well-being (Trougakos et al., 2020). Private demands have been shown to spillover to the work domain and to affect an individual’s exhaustion and work engagement (e.g. Bakker et al., 2005). The impact of the pandemic was assessed with the question “To what extent does the COVID-19 pandemic affect your working life?”, which was rated from 1 *(not at all)* to 6 *(very much)*. Negative life events (0 = no, 1 = yes) were assessed with the question “Was there an incident within the last 6 weeks that had a negative effect on your well-being (e.g. divorce, serious illness, death of a close person, an accident…)?”.

**2.4 Statistical analyses**

We used path analysis including multiple mediators and outcomes to test all hypotheses simultaneously and applied a half-longitudinal design (Cole & Maxwell, 2003). In theory, perfectionism is conceptualized as a personality disposition. Consistent with this conceptualization, perfectionism has been shown to be relatively stable over months and years (e.g. Sherry et al., 2013). Hence, a natural causal chain can be assumed for the associations of perfectionism and need satisfaction. We thus investigated the contemporaneous relations between perfectionism and need satisfaction and used the time lag to examine the prospective relations between need satisfaction and well-being. For this purpose, we included the autoregressors of T2 well-being indicators at T1 in our path model. Configural and metric measurement invariance are important preconditions to ensure meaningful interpretations of the relation between variables over time (Finkel, 1995; Little et al., 2007). As recommended (Brown, 2006), we followed a step-up approach to test for these types of invariance across time points, before testing the proposed path model.

This model included paths from the perfectionism dimensions (T1) to the three needs (T1) and to the indicators of well-being (T2). It further included paths linking the three needs (T1) and the autoregressors of well-being (T1) to well-being (T2). The control variables were included as independent variables. In line with previous research (Laguna et al., 2017), missing data was handled by the full information maximum likelihood (FIML) procedure, which is a modern approach to handling missing data that allows using all available information without imputation and drawing conclusions about the entire sample (Little, 2013; Little et al., 2014). FIML is superior to other missing data strategies and estimates unbiased parameters and standard errors if the missing values on the variables are missing at random (Enders & Bandalos, 2001; Raykov, 2005). We inspected missing data using Little's (1988) Missing Completely at Random Test, which indicated that missingness was random (p

> .05). Thus, data from participants who responded only at Time 1 could be included. To test the significance of the mediating (i.e. indirect) effects,[2] we estimated 95% bias corrected confidence bootstrap intervals with 10,000 resamples (MacKinnon et al., 2004; Preacher & Hayes, 2008). Descriptive statistics and correlational analyses were calculated using IBM SPSS Version 27. Both measurement invariance analyses and path analysis were performed using Mplus Version 7.

## 3. Results

### 3.1. Correlational analyses

Descriptive statistics and intercorrelations of the variables are depicted in Table 1. As in previous studies (Flett et al., 2014; Stoeber et al., 2020), SOP and SPP were positively correlated ($r$ = .20, $p$ < .001). Partial correlations reflected the common differential associations. These included a positive correlation of SOP and job satisfaction ($r$ = .13, $p$ < .024, at T1) and work engagement ($r$ = .25, $p$ < .001, at T1 and $r$ = .24, $p$ = .004. at T2). They also revealed a negative correlation of SPP with job satisfaction ($r$ = -.12, $p$ = .029, at T1 and $r$ = -.20, $p$ = .021, at T2) and work engagement ($r$ = -.20, $p$ = .019, at T2), and a positive correlation between SPP and exhaustion ($r$ = .32, $p$ < .001, at T1 and $r$ = .35, $p$ < .001, at T2). Moreover, the control variables displayed significant correlations with need satisfaction and well-being. Among these, the smallest correlation was found for gender and exhaustion ($r$ = -.13, $p$ = .018, at T1) and the largest correlation for age and competence ($r$ = .24, $p$ < .001).

[Insert table 1 about here]

[2] We recognize that some authors (e.g. Mathieu & Taylor, 2006) distinguish between mediation and indirect effects. For the sake of simplicity, the terms are used interchangeably in this work.

### 3.2. Measurement invariance

To test for configural and metric invariance, we estimated longitudinal confirmatory factor analyses for all repeated measures. The invariance of factor loadings over time was assessed by comparing a model in which the factor loadings were constrained as equal over measurements with a model, in which factor loadings were unconstrained over time. We allowed the error variances of same items over time to correlate (Little et al., 2007). Conventional criteria (Hu & Bentler, 1999; Marsh et al., 2004) were used to assess a good ($\chi 2$/df ratio < 3.00, CFI ≥ .90, RMSEA ≤ .08, SRMR ≤ .10) or an excellent model fit to the data ($\chi 2$/df ratio < 2.00, CFI ≥ .95, RMSEA ≤ .06, SRMR ≤ .08). The results are shown in Table 2. Both configural and metric invariance could be demonstrated for all variables.

[Insert table 2 about here]

### 3.3. Path analysis and hypothesis testing

The path model had an excellent fit to the data ($\chi 2 = 12$, $df = 12$, $p = .51$, CFI = 1.00, RMSEA =.000, SRMR = .021). The model explained a significant proportion of variance for the mediators autonomy ($R^2 = .11$), competence ($R^2 = .17$), and relatedness satisfaction ($R^2 = .05$), and for the T2 outcomes work engagement ($R^2 = .75$), job satisfaction ($R^2 = .55$), and exhaustion ($R^2 = .72$). The indicators of well-being displayed significant stabilities over time ($\beta = .69$, $\beta = .40$, $\beta = .76$, $p < .001$, for work engagement, job satisfaction, and exhaustion, respectively). Concerning a potential common method bias, we used a unmeasured latent factor to assess the common variance among the variables in the path model (Podsakoff et al., 2003). This factor explained only 3% of the variance, which is well below the threshold of 25% (Williams et al., 1989). Thus, common method variance was unlikely to have distorted the participants' responses.

Standardized path coefficients from the path model are depicted in Figure 2. The hypothesized specific indirect effects are depicted in Table 3. Hypotheses 1-3 referred to the

association of perfectionism (T1) and need satisfaction (T1). All of them were supported: SOP displayed a significant positive relationship with satisfaction of the three needs (H1a, H2b, and H3a); SPP showed significant negative relationships to satisfaction of the three needs (H1b, H2b, and H3b).

Hypotheses 4-9 referred to the indirect effects of perfectionism (T1) with well-being (T2) via need satisfaction (T1). We describe the results concerning these hypotheses structured according to the three needs, beginning with autonomy (H4 and H5) and followed by competence (H6 and H7) and relatedness satisfaction (H8 and H9).

Hypotheses 4a and 4b were supported. Results from the bootstrapping analyses indicated significant indirect effect of SOP on T2 work engagement (H4a) and T2 job satisfaction (H4b) through autonomy. The results also provided support for Hypothesis 5a and 5b, showing significant negative indirect effects of SPP on T2 work engagement (H5a) and T2 job satisfaction (H5b) through T1 autonomy satisfaction. Hypotheses 4c and 5c had to be rejected as the indirect effects of SOP (H4c) and SPP (H5c) on T2 exhaustion through T1 autonomy were not significant.

Hypotheses 6a and 7a were supported. The results showed significant indirect effects of SOP (H6a) and SPP (H7a) on T2 job satisfaction through T1 competence satisfaction. Hypotheses 6b and 7b were not supported. The indirect effects of SOP (H6b) and SPP (H7b) on T2 exhaustion through T1 competence satisfaction were not significant. Nevertheless, these indirect effects were in the expected direction.

Hypotheses 8a and 9a could not be confirmed. For both SOP (H8a) and SPP (H9a), the indirect effects on T2 job satisfaction through T1 relatedness satisfaction failed to reach significance. Lastly, the results provided support for Hypotheses 8b and 9b, showing a significant negative indirect effect of SOP (H8b) as well as a positive indirect effect of SPP (H9b) on T2 exhaustion through T1 relatedness satisfaction.

The results remained largely unchanged when the analyses were conducted without the controls and included the three outliers.[3] The exceptions were the paths from SOP to autonomy (β = .09, *p* = .092) and relatedness satisfaction (β = .11, *p* = .054), which were not significant without control variables.

[Insert figure 2 and table 3 about here]

## 4. Discussion

### 4.1. Current findings

Grounded in SDT (Deci & Ryan, 2000), this study investigated the mediating role of basic need satisfaction in the different relationships of dimensional perfectionism and employee well-being. The results were largely consistent with our hypotheses. As predicted, SOP was positively and SPP negatively related to autonomy, competence, and relatedness satisfaction (H1-H3). Thus, it can be concluded that SOP facilitates and SPP hinders satisfaction of the three needs due to inherent motivational differences. These findings are congruent with previous research on perfectionism and need satisfaction in various contexts (e.g. Boone et al., 2014; Jowett et al., 2016; Mallinson-Howard & Hill, 2011).

In line with our expectations, the three needs mediated the associations of perfectionism with distinct indicators of well-being (H4-H9): SOP and SPP were differently related to work engagement (H4a and H5a) and job satisfaction (H4b and H5b) through autonomy satisfaction. Differences in competence satisfaction accounted for the different relations of SOP and SPP with job satisfaction (H6a and H7a) and differences in relatedness satisfaction explained the different relations of SOP and SPP with exhaustion (H8b and H9b). Therefore, it appears that the three needs represent separate mechanisms that explain the

[3] In additional analyses, we modelled autoregressive and cross-lagged paths between need satisfaction (T1/T2) and well-being (T1/T2). The significance of the results remained unchanged, which is why we decided to present the more parsimonious model in the manuscript. Results from the cross-lagged model and a test of the predictive impact of perfectionism on T2 need satisfaction can be found in the supporting information.

associations of perfectionism and well-being. As derived from SDT (Deci & Ryan, 2000) and Warr's framework (1990, 2013), autonomy satisfaction takes a unique role in fostering activity and explaining why self-oriented perfectionists are not only satisfied but also highly engaged at work, whereas socially-prescribed perfectionists are not. Competence and relatedness satisfaction may explain the different associations of perfectionism and indicators of well-being that are characterized by low activation but differ in high or low pleasure.

Contrary to our expectations, competence only accounted for the relationship of perfectionism and job satisfaction and relatedness only accounted for the relationship of perfectionism and exhaustion. Further, autonomy satisfaction did not predict exhaustion over time. An explanation for these findings may be that the experiences deriving from the three needs should be considered as relatively distinct concerning the quadrants of Warr's model. For example, a sense of belonging can be described as closely related to the perception of social support available at work which has been found to be a relevant resource for the avoidance of exhaustion (Halbesleben, 2006). Competence satisfaction and feelings of mastery may be most closely associated with pleasure. These unique experiences may become especially relevant when the needs are investigated simultaneously. Autonomy satisfaction with its boosting nature may particularly predict positive indicators that indicate the presence of activity and pleasure.

Overall, these findings align with cross-sectional studies (Kovjanic et al., 2012; Trépanier et al., 2013) and a recent meta-analysis (Van den Broeck et al., 2016) indicating that autonomy satisfaction is particularly important for well-being. They are also consistent with findings from longitudinal studies which demonstrated that need satisfaction may not equally predict all indicators of well-being over time (Trépanier et al., 2014).

Further, the positive associations of SOP with autonomy and relatedness satisfaction should be interpreted with caution. These associations were not evident when the analyses

were conducted without control variables; besides, the effect sizes were small (Cohen, 1992). An explanation for the small effect sizes may be the partly extrinsic goal content of SOP as captured in the goal of approval. We argued that an approach orientation is overall growth-oriented and thus favourable for need satisfaction. However, SDT states that external goals may even distract from need satisfaction (Deci & Ryan, 2000), which could be the case for self-oriented perfectionists.

### 4.2. Theoretical implications

This research advances and integrates knowledge about perfectionism and need satisfaction in the workplace. Our results demonstrate that the three needs represent separate underlying mechanisms. We thus extend previous research that focused on perfectionism and overall need satisfaction (e.g. Jowett et al., 2016) and contribute to a more detailed understanding of how each of the three needs links dimensional perfectionism to employee well-being. This study provides an answer to the initial question of why the dimensions of perfectionism are differently related to employee well-being, by using SDT and the universal concept of need satisfaction as an explanation. Basic psychological needs represent a crossroad to either optimal or poor functioning (Ryan & Deci, 2000), making this mechanism a starting point for prevention and promotion of well-being among perfectionist employees. This extends previous knowledge concerning mechanisms. Rumination, for example, which is derived from the initiation-termination model of worry (Berenbaum, 2010) explains the association of perfectionistic concerns and poor functioning (e.g. Flaxman et al., 2018). Basic psychological needs, on the contrary, can be considered as mechanisms that also explain why perfectionistic strivings can be related to adaptive, high functioning. Confirming previous findings from clinical and high performing contexts (Boone et al., 2014; Jowett et al., 2016), our results indicate that this mechanism can be applied to various contexts to explain differences in well-being. Further, we highlight the active role of individuals in orienting

towards their environment and thus contributing to opportunities in which autonomy, competence, and relatedness satisfaction can be experienced. More specifically, we see perfectionism as a dispositional form of motivation. SOP can be seen as representing the autonomous, approach-oriented, and overall self-determined form that enables need satisfaction. SPP can be described as the controlled, avoidance-oriented form of this disposition indicating a lack of self-determination and hindering need satisfaction. Thus, our findings emphasize the close interrelation of personality and motivation.

Additionally, we specify SDT regarding the unique contributions of the needs in predicting well-being over time. Our results highlight the importance of investigating the three needs as distinct constructs as they may be considered to have unique associations with well-being as conceptualized by Warr's framework. Autonomy, competence, and relatedness satisfaction can be described to align with different quadrants of this model and thus to explain different associations of perfectionism and well-being. According to our results, autonomy satisfaction has a unique role for positive well-being and fosters both active functioning and pleasure (i.e. work engagement and job satisfaction). Competence and relatedness satisfaction may be more relevant in contributing to well-being that is characterized by low activation and differences in pleasure (i.e. job satisfaction and exhaustion). Only relatedness satisfaction may uniquely prevent employees from exhaustion when all needs and different indicators of well-being are investigated simultaneously.

### 4.3. Strengths, limitations, and future research directions

To our knowledge, this study is the first to focus on the three needs as separate mechanisms that explain the differential relationship of dimensional perfectionism and well-being. Further, the study is the first to investigate perfectionism and need satisfaction in the workplace. By examining the three needs as separate constructs, and by including positive and negative indicators of well-being, we address suggestions from previous research and

provide detail about the underlying mechanisms (Ocampo et al., 2020; Van den Broeck et al., 2016; Warr, 2013). Moreover, we tested all hypotheses simultaneously and used data from two waves to examine the prospective relations between need satisfaction and well-being which is highly encouraged by SDT researchers (Van den Broeck et al., 2016).

Our findings should be interpreted in the light of certain limitations. First, the present study solely relied on self-reported measures which can be influenced by common method bias (Podsakoff et al., 2003). However, common method bias was unlikely to distort the results of our study, and self-reported measures can be considered highly appropriate for assessing need satisfaction (Van den Broeck et al., 2016; see also Chan (2009), for a detailed discussion). Nevertheless, SDT researchers encourage future studies to include objective measures, especially concerning well-being outcomes (Deci et al., 2017; Van den Broeck et al., 2016).

Second, there are further conceptualizations of perfectionism that capture additional aspects of perfectionistic concerns, such as concern over mistakes and doubt about actions (Frost et al., 1990), or discrepancy (Slaney et al., 2001). Future studies could incorporate and combine different models of perfectionism to cover the full range of the construct. In addition and in line with previous studies (e.g. Dunkley et al., 2014; Flaxman et al., 2018), future research should include conscientiousness and neuroticism as control variables to determine the unique contribution of the perfectionism dimensions beyond broader personality traits. The incremental variance of perfectionism has been demonstrated for work-related outcomes (Clark et al., 2010). However, given the rather small effect sizes in the present study, it would be essential to investigate the robustness of these effects beyond conscientiousness and neuroticism.

Third, the interpretations of the associations of need satisfaction and well-being are limited to a time-lag of 3 months. Researchers have called for more of such “shortitudinal”

studies that investigate shorter time lags than the common interval of 1 year than (Dormann & Griffin, 2015). However, they also suggest to integrate short and long time lags to investigate whether findings differ depending on the time frame.

Moreover, the present research did not include a measure for the fourth quadrant in Warr's model. The construct of workaholism comprises high activation and low pleasure (Bakker & Oerlemans, 2011). SOP has been related to workaholism (Stoeber et al., 2013) which is why it would be interesting to investigate whether autonomy will also uniquely predict this indicator of high activation.

Finally, further mechanisms might be important in the association between perfectionism and employee well-being and contribute to the discussion of whether SOP is adaptive or not. Based on the mechanism of stress generation (Hewitt & Flett, 2002), perfectionists might tend to actively create stressors, such as time pressure and working overtime. Perfectionisms cognition theory (Flett et al., 2016) is another promising approach that focuses on cognitive perseveration and that links both SOP and SPP to rumination. In the case of SOP, rumination may be a risk for well-being that opposes the protective function of need satisfaction. Thus, future research should integrate various mechanisms to determine their relative importance and to provide a comprehensive view of possible intervention approaches. In addition, it would be interesting to identify moderator variables that enhance or diminish need satisfaction. SDT (Deci & Ryan, 2000) also attributes a crucial role in need satisfaction to the social context. It could be, for instance, that socially prescribed perfectionists do experience relatedness in a positive team climate; they might also experience autonomy and competence satisfaction when they work under a supportive leader. Transformational leadership has been related to need satisfaction (e.g. Kovjanic et al., 2012) and could be a valuable approach. As opposed to this, socially prescribed perfectionists might

experience even less need satisfaction having a perfectionistic leader constantly controlling them and being resentful in the case of mistakes (Otto et al., 2021).

### 4.3. Practical implications and conclusion

Overall, the findings of this study highlight the importance and nourishing function of need satisfaction for employee well-being. Need satisfaction might play a key role in explaining why the different dimensions of perfectionism have different effects on engagement, exhaustion, and satisfaction at work. Enhancing need satisfaction among employees high in SPP might be a promising intervention approach. It can be important to build awareness among such employees regarding their scope of action, successfully completed tasks, and available social support. On an individual level, guided self-help and counselling provide options to support perfectionists (Stoeber & Damian, 2016). At the team and organisational levels, a positive feedback environment could help to establish a sense of personal control (Sparr & Sonnentag, 2008). Team-based interventions focusing on employees' perspective taking, communication and collaboration have been demonstrated to foster each other's need satisfaction (Jungert et al., 2018). Similar interventions might be promising in teams with employees high in SPP. Nevertheless, harm reduction should not be the only approach. In the long run, overly demanding environments leading to the development of SPP should be questioned, given the wide-ranging consequences of this dimension – including in the workplace. We hope that our findings encourage researchers to further investigate the ways in which perfectionism affects work-related outcomes.

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## Tables

Table 1. Descriptive statistics and bivariate and partial correlations of the study variables

| | Bivariate correlations | | | | | | | | | | | | | | | | | | Partial correlations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | *M* | *SD* | 4 | 5 |
| Time 1 | | | | | | | | | | | | | | | | | | | | |
| 1. Gender | - | | | | | | | | | | | | | | | | 0.30 | 0.46 | -.10 | .01 |
| 2. Age | .22*** | - | | | | | | | | | | | | | | | 38.21 | 13.06 | -.08 | .05 |
| 3. Organizational tenure | .21*** | .70*** | - | | | | | | | | | | | | | | 8.92 | 10.25 | -.05 | .04 |
| 4. SOP | -.10 | -.07 | -.05 | (.86) | | | | | | | | | | | | | 5.26 | 1.01 | | |
| 5. SPP | .01 | .05 | .03 | .20*** | (.88) | | | | | | | | | | | | 3.03 | 1.33 | | |
| 6. Autonomy | .03 | .19** | .18** | .04 | -.22*** | (.84) | | | | | | | | | | | 3.32 | 0.85 | .09 | -.24*** |
| 7. Competence | .18** | .24*** | .17** | .19** | -.15** | .42*** | (.86) | | | | | | | | | | 3.99 | 0.74 | .22*** | -.20*** |
| 8. Relatedness | .02 | .13* | .16** | .08 | -.10 | .44*** | .28*** | (.81) | | | | | | | | | 3.69 | 0.85 | .10 | -.13* |
| 9. Work engagement | .01 | .15** | .10 | .24*** | -.02 | .62*** | .48*** | .45*** | (.94) | | | | | | | | 4.60 | 1.20 | .25*** | -.07 |
| 10. Job satisfaction | .08 | .17** | .16** | .11 | -.10 | .69*** | .48*** | .43*** | .75*** | - | | | | | | | 5.19 | 1.29 | .13* | -.12* |
| 11. Exhaustion | -.13* | -.09 | -.13* | .05 | .33*** | -.61*** | -.46*** | -.29*** | -.53*** | -.58*** | (.86) | | | | | | 2.83 | 0.80 | -.01 | .32*** |
| Time 2 | | | | | | | | | | | | | | | | | | | | |
| 12. Impact COVID | -.06 | .08 | .05 | -.09 | -.07 | .05 | .14 | .06 | .14 | -.05 | -.11 | - | | | | | 4.39 | 1.46 | -.07 | -.05 |
| 13. Negative life events | -.01 | .08 | .10 | .04 | .19* | -.12 | .02 | -.10 | -.10 | -.14 | .12 | .11 | - | | | | 0.12 | 0.33 | -.01 | .18* |
| 14. Work engagement | -.08 | .01 | -.02 | .19* | -.14 | .65*** | .40*** | .45*** | .85*** | .57*** | -.53*** | .22** | -.07 | (.95) | | | 4.76 | 1.19 | .24** | -.20* |
| 15. Job satisfaction | -.01 | .11 | .05 | .01 | -.19* | .65*** | .42*** | .34*** | .57*** | .65*** | -.44*** | .05 | -.12 | .65*** | - | | 5.29 | 1.31 | .07 | -.20* |
| 16. Exhaustion | -.06 | .03 | -.07 | .11 | .36*** | -.58*** | -.49*** | -.39*** | -.49*** | -.52*** | .82*** | .01 | .12 | -.49*** | -.49*** | (.86) | 2.59 | 0.78 | .01 | .35*** |

*Note.* $N$ = 328 for T1 and $N$ = 138 for T2. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism. Gender (0 = female, 1= male) and negative life events (0 = no, 1= yes) were dummy coded; perfectionism and job satisfaction were measured on a 7-point scale and exhaustion was measured on a 5-point scale. All other item responses were measured on a 6-point scale. Partial correlations account for the overlap between SOP and SPP.

*$p$ < .05. ** $p$ < .01. *** $p$ < .001

Table 2. Measurement invariance analyses of work engagement and exhaustion

| Variable | $\chi 2$ | df | *p* | CFI | RMSEA | SRMR |
|---|---|---|---|---|---|---|
| Work engagement | | | | | | |
| Free loadings | 261.18 | 107 | .00 | .962 | .066 | .043 |
| Loadings invariant | 276.06 | 115 | .00 | .960 | .065 | .060 |
| Model difference | 14.84 | 8 | .06 | .000 | -.001 | .017 |
| Exhaustion | | | | | | |
| Free loadings | 235.92 | 95 | .00 | .922 | .067 | .053 |
| Loadings invariant | 240.70 | 102 | .00 | .923 | .064 | .057 |
| Model difference | 4.78 | 7 | .69 | .001 | -.003 | .004 |

Table 3. Specific Indirect Effects and Bootstrapped Confidence Intervals

| | Indicator of well-being | | |
|---|---|---|---|
| Predictor | Job satisfaction | Exhaustion | Work engagement |
| SOP → Autonomy satisfaction | .046 [.004, .138] | .000 [-.016, .012] | .022 [ .001, .065] |
| SOP → Competence satisfaction | .051 [.002, .132] | -.021 [-.058, .007] | .013 [-.021, .058] |
| SOP → Relatedness satisfaction | .005 [-.017, .041] | -.014 [-.038, -.002] | .010 [-.001, .039] |
| Sum of indirect effects (SOP) | .102 [.027, .230] | -.035 [-.078, -.003] | .045 [.002, .112] |
| SPP → Autonomy satisfaction | -.081 [-.180, -.024] | .001 [-.022, .023] | -.038 [-.087, -.007] |
| SPP → Competence satisfaction | -.032 [-.090, -.001] | .013 [-.004, .038] | -.008 [-.039, .013] |
| SPP → Relatedness satisfaction | -.004 [-.036, .015] | .012 [.002, .034] | -.009 [-.030, .001] |
| Sum of indirect effects (SPP) | -.117 [-.230, -.048] | .026 [.000, .060] | -.055 [-.112, -.018] |

*Note.* Unstandardized effects are depicted, with 95% bias-corrected bootstrapped confidence intervals presented in brackets. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism

## Figures

Figure 1.

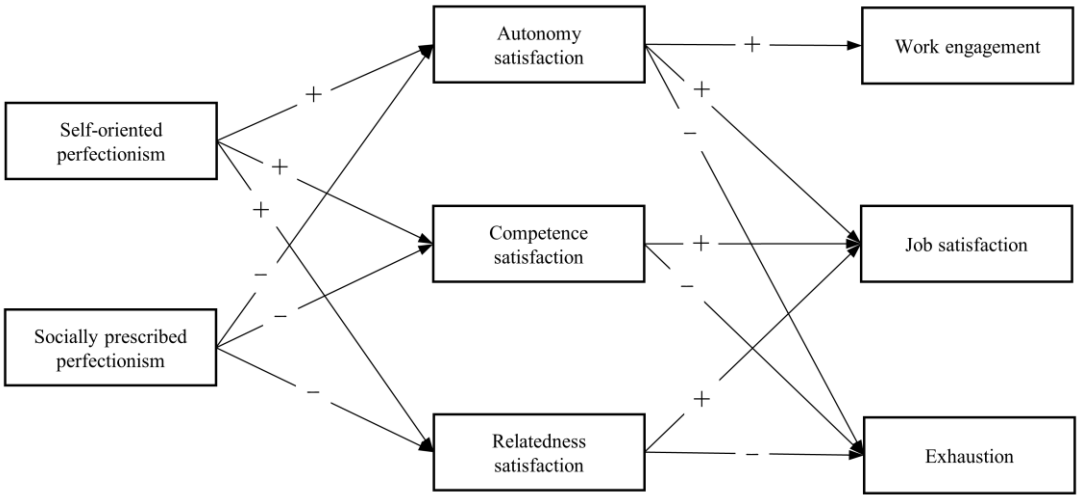
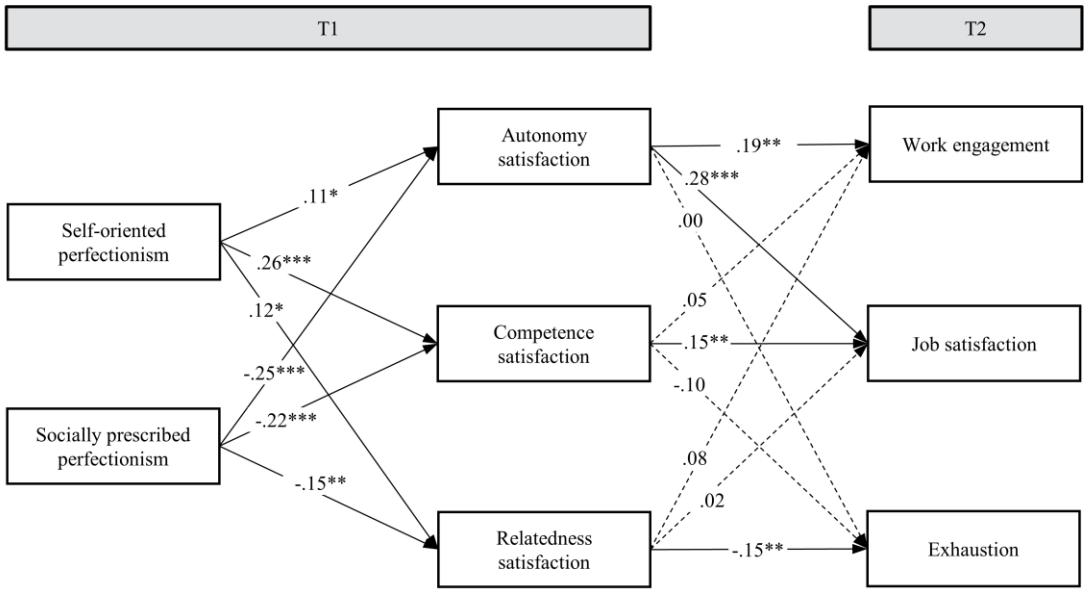



Figure 2.




Note. Control variables, autoregressors of T2 well-being, and covariances are not depicted for reasons of clarity.

*$p < .05$. **$p < .01$. ***$p < .001$.

## Figure captions

Figure 1. Proposed model

Figure 2. Simplified path model showing standardized path coefficients

## Supporting Information

### A. Cross-lagged path analysis of need satisfaction and well-being

In an additional analysis, we modelled the cross-lagged effects between mediators and outcomes in our path model to exclude a threat of causal inference through reverse causality. For example, it could be argued that employees' current well-being can affect their perceptions of need satisfaction or their ability to engage in work tasks or experiences that foster need satisfaction. Moreover, we attributed a unique role to autonomy satisfaction within SDT. Thus, we aimed to test the associations of need satisfaction over time to detect possible reciprocal effects of need satisfaction over time.

The model included paths from the perfectionism dimensions (T1) to the three needs (T1) and to the indicators of well-being (T2). It further included autoregressive and cross-lagged paths between the three needs (T1/T2) and well-being (T1/T2). The control variables were included as independent variables. We allowed synchronous correlations between measures that were obtained at the same time. We also tested need satisfaction for measurement invariance across time points. Configural and metric invariance could be demonstrated for all three needs. The results of the measurement invariance analysis are shown in Table 1. Results from the path model are depicted in Figure 1. Table 3 comprises also the correlations of T2 need satisfaction with the study variables.

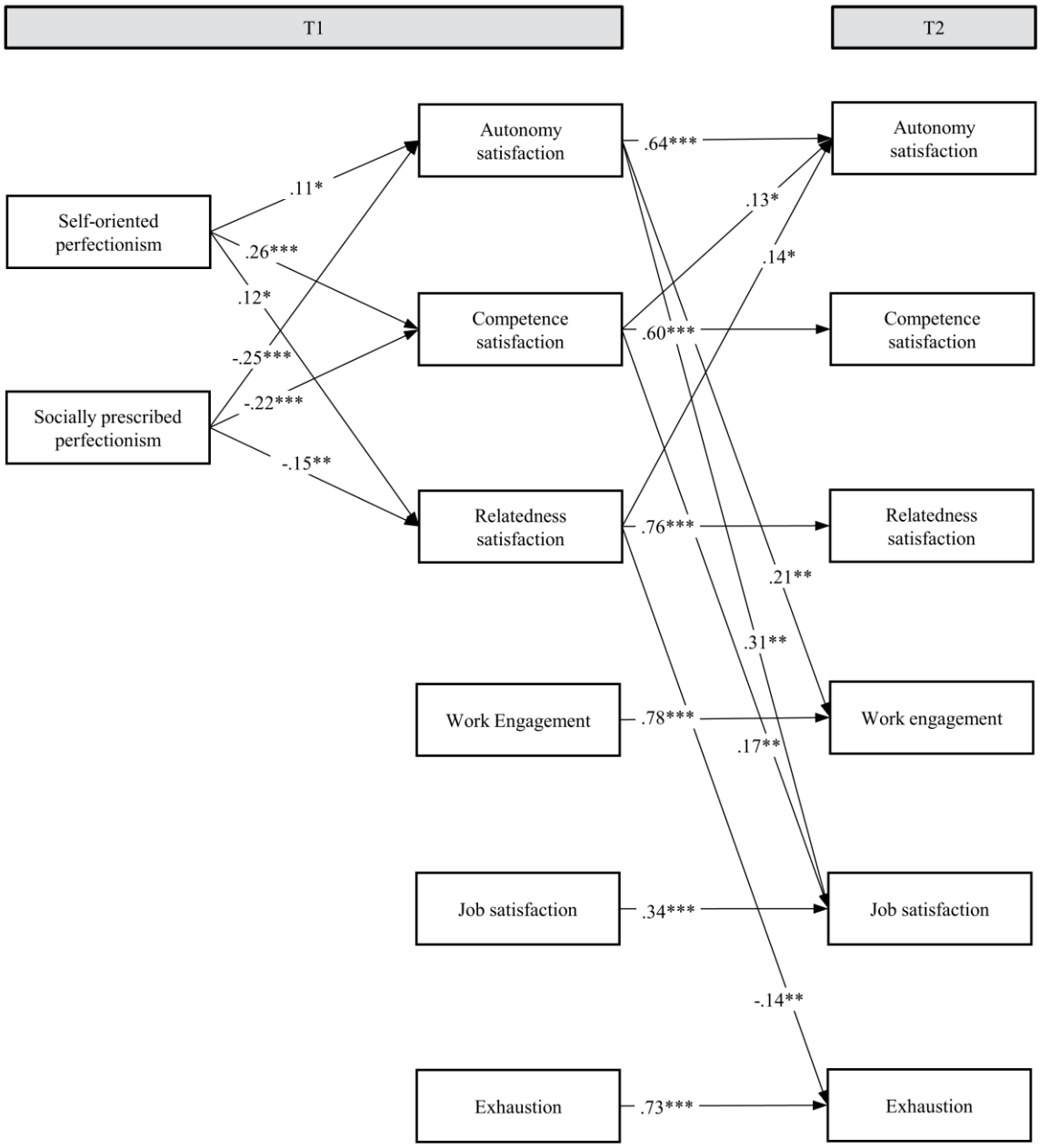
The cross-lagged path model had an excellent fit to the data ($\chi 2 = 14.$, $df = 12$, $p = .29$, CFI = .998, RMSEA =.024, SRMR = .021). The model explained a significant proportion of variance for the mediators autonomy ($R^2 = .11$), competence ($R^2 = .17$), and relatedness satisfaction ($R^2 = .05$), and for the outcomes job satisfaction ($R^2 = .56$), exhaustion ($R^2 = .72$), and work engagement ($R^2 = .76$). Findings from the cross-lagged path model did not differ from our main analysis in the manuscript. All cross-lagged paths from well-being to needs satisfaction were not significant. Thus, no support for effects indicating reversed causation

between need satisfaction and well-being was found. However, results showed significant associations of need satisfaction over time. Competence (β = .13, $p$ = .031) and relatedness satisfaction at T1 (β = .18, $p$ < .001) significantly predicted autonomy satisfaction at T2.

Table 1. Measurement invariance analyses of T1 and T2 need satisfaction

| Variable | $\chi 2$ | df | $p$ | CFI | RMSEA | SRMR |
|---|---|---|---|---|---|---|
| Autonomy satisfaction | | | | | | |
| Free loadings | 81.08 | 47 | .00 | .972 | .047 | .044 |
| Loadings invariant | 84.49 | 52 | .00 | .973 | .044 | .051 |
| Model difference | 3.41 | 5 | .64 | .001 | -.003 | .007 |
| Competence satisfaction | | | | | | |
| Free loadings | 118.92 | 47 | .00 | .951 | .068 | .049 |
| Loadings invariant | 125.24 | 52 | .00 | .951 | .066 | .070 |
| Model difference | 6.32 | 5 | .28 | .000 | -.002 | .021 |
| Relatedness satisfaction | | | | | | |
| Free loadings | 94.20 | 47 | .00 | .955 | .056 | .053 |
| Loadings invariant | 97.22 | 52 | .00 | .957 | .052 | .059 |
| Model difference | 3.02 | 5 | .70 | .002 | -.004 | .006 |

**Figure 1.** Simplified path model showing standardized path coefficients




Note. Control variables, covariances, and non-significant paths are not depicted for reasons of clarity.

*$p < .05$. ** $p < .01$. *** $p < .001$.

**B. Perfectionism predicting T2 need satisfaction**

In an additional analysis, as suggested by an anonymous reviewer, we investigated the predictive impact of SOP and SPP and on T2 need satisfaction, while controlling for T1 need satisfaction. The COVID-19 pandemic can be considered as a major event that happened between T1 (data collection from January to March 2020) and T2 (data collection from April to June 2020) and that may lead to changes in need satisfaction. In the path model, we included paths from SOP, SPP, and T1 need satisfaction, and the control variables to T2 need satisfaction.

The results from the path analysis are shown in Table 2. Interestingly, SPP negatively predicted T2 competence satisfaction ($\beta = -.13$, $p = .041$). This effect remained significant when analyses were conducted without negative life events and the impact of COVID-19 at work as control variables. Thus, the predictive impact of SPP on T2 competence satisfaction can be considered as independent of these specific variables. An alternative explanation may be the general uncertainty and rapid changes that were present in this early pandemic situation. Employees high in SPP may have felt strained by these circumstances, fearing not to adequately handle new situations and making mistakes. This strain may have distracted them and led to feelings of even less competence satisfaction at work. SOP, on the contrary, depicted a positive but not significant tendency towards enhanced competence satisfaction ($\beta = .12$, $p = .083$). This indicated that employees high in SOP experienced competence satisfaction at work despite the changing circumstances, which may be due to their self-efficacy.

Table 2. Results from path analysis modelling the predictive impact of perfectionism on T2 need satisfaction

| Predictors | Autonomy T2 β | Competence T2 β | Relatedness T2 β |
|---|---|---|---|
| Autoregressor | .85*** | .61*** | .81*** |
| Gender | -.05 | -.01 | -.03 |
| Age | .07 | .05 | .05 |
| Tenure | -.05 | .12 | .01 |
| Negative life events | .03 | -.02 | -.01 |
| Impact of COVID-19 | -.04 | .04 | .02 |
| SOP | .00 | .12 | -.05 |
| SPP | .03 | -.13* | .01 |
| $R^2$ | .71*** | .55*** | .65*** |

Note. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism. Gender (0 = female, 1= male) and negative life events (0 = no, 1= yes) were dummy coded. *$p < .05$. ** $p < .01$. *** $p < .001$.

**C. Results for other-oriented perfectionism**

The data collection was planned as a part of a larger project comprising also a student thesis dealing with other-oriented perfectionism (OOP). Although this dimension was not the focus of the present study, we conducted additional analyses to possibly uncover a relevance of OOP in the context of need satisfaction and well-being. The shortened version by Hewitt et al. (2008) was used to measure OOP (5 items; e.g. "If I ask someone to do something, I expect it to be done flawlessly."; $\alpha = .79$).

Table 3 comprises the bivariate correlations of OOP with the study variables. Partial correlations controlling for the overlap of OOP with SOP and SPP indicated that OOP was positively related to T1 competence satisfaction ($r = .12$, $p = .029$) and T2 competence satisfaction ($r = .18$, $p = .033$). Contrary to the bivariate correlations, OOP was unrelated to T1 work engagement ($r = .09$, $p = .12$). Further, OOP was positively related to T2 work engagement ($r = .22$, $p = .009$).

We included OOP as an additional independent variable in our path model from the main analysis and modelled pathways linking OOP with each of the three needs (T1). OOP displayed a significant relation with competence satisfaction ($\beta = .11$, $p = .046$) and an indirect effect between OOP and job satisfaction through competence satisfaction was found, $b = .022$, CI [.001, .077]. Concerning SOP and SPP, the significance of the results remained largely unchanged with OOP included, apart from the path from SOP to autonomy satisfaction ($\beta = .08$, $p = .137$)

## D. Supplemental correlations

Table 3. Decriptive statistics and correlations of all variables included in the supporting information.

| | Bivariate correlations | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | *M* | *SD* |
| Time 1 | | | | | | | | | | | | | | | | | | | | | |
| 1. Gender | - | | | | | | | | | | | | | | | | | | | 0.30 | 0.46 |
| 2. Age | .22*** | - | | | | | | | | | | | | | | | | | | 38.21 | 13.06 |
| 3. Organizational tenure | .21*** | .70*** | - | | | | | | | | | | | | | | | | | 8.92 | 10.25 |
| 4. SOP | -.10 | -.07 | -.05 | (.86) | | | | | | | | | | | | | | | | 5.26 | 1.01 |
| 5. SPP | .01 | .05 | .03 | .20*** | (.88) | | | | | | | | | | | | | | | 3.03 | 1.33 |
| 6. OOP | .00 | .08 | .03 | .35*** | .34*** | (.79) | | | | | | | | | | | | | | 4.04 | 1.13 |
| 7. Autonomy | .03 | .19** | .18** | .04 | -.22*** | .03 | (.84) | | | | | | | | | | | | | 3.32 | 0.85 |
| 8. Competence | .18** | .24*** | .17** | .19** | -.15** | .12* | .42*** | (.86) | | | | | | | | | | | | 3.99 | 0.74 |
| 9. Relatedness | .02 | .13* | .16** | .08 | -.10 | -.01 | .44*** | .28*** | (.81) | | | | | | | | | | | 3.69 | 0.85 |
| 10. Work engagement | .01 | .15** | .10 | .24*** | -.02 | .15** | .62*** | .48*** | .45*** | (.94) | | | | | | | | | | 4.60 | 1.20 |
| 11. Job satisfaction | .08 | .17** | .16** | .11 | -.10 | .04 | .69*** | .48*** | .43*** | .75*** | - | | | | | | | | | 5.19 | 1.29 |
| 12. Exhaustion | -.13* | -.09 | -.13* | .05 | .33*** | .02 | -.61*** | -.46*** | -.29*** | -.53*** | -.58*** | (.86) | | | | | | | | 2.83 | 0.80 |
| Time 2 | | | | | | | | | | | | | | | | | | | | | |
| 13. Impact COVID | -.06 | .08 | .05 | -.09 | -.07 | .06 | .05 | .14 | .06 | .14 | -.05 | -.11 | - | | | | | | | 4.39 | 1.46 |
| 14. Negative life events | -.01 | .08 | .10 | .04 | .19* | .11 | -.12 | .02 | -.10 | -.10 | -.14 | .12 | .11 | - | | | | | | 0.12 | 0.33 |
| 15. Autonomy | -.04 | .14 | .15 | .03 | -.23** | .08 | .84*** | .51*** | .48*** | .60*** | .66*** | -.58*** | .01 | -.07 | (.84) | | | | | 3.33 | 0.76 |
| 16. Competence | .07 | .29*** | .28*** | .10 | -.30*** | .11 | .43*** | .72*** | .36*** | .40*** | .43*** | -.45*** | .13 | .00 | .44*** | (.86) | | | | 4.00 | 0.65 |
| 17. Relatedness | -.02 | .09 | .09 | .03 | -.20* | -.07 | .41*** | .30** | .80*** | .41*** | .35*** | -.29** | .08 | -.05 | .45*** | .29** | (.84) | | | 3.62 | 0.86 |
| 18. Work engagement | -.08 | .01 | -.02 | .19* | -.14 | .21* | .65*** | .40*** | .45*** | .85*** | .57*** | -.53*** | .22** | -.07 | .67*** | .42*** | .43*** | (.95) | | 4.76 | 1.19 |
| 19. Job satisfaction | -.01 | .11 | .05 | .01 | -.19* | .03 | .65*** | .42*** | .34*** | .57*** | .65*** | -.44*** | .05 | -.12 | .67*** | .46*** | .36*** | .65*** | - | 5.29 | 1.31 |
| 20. Exhaustion | -.06 | .03 | -.07 | .11 | .36*** | .09 | -.58*** | -.49*** | -.39*** | -.49*** | -.52*** | .82*** | .01 | .12 | -.61*** | -.51*** | -.32*** | -.49*** | -.49*** | 2.59 | 0.78 |

*Note.* $N$ = 328 for T1 and $N$ = 138 for T2. SOP = self-oriented perfectionism, SPP = socially prescribed perfectionism, OOP = other-oriented perfectionism. Gender (0 = female, 1= male) and negative life events (0 = no, 1= yes) were dummy coded; perfectionism and job satisfaction were measured on a 7-point scale and exhaustion was measured on a 5-point scale. All other item responses were measured on a 6-point scale. *$p$ < .05. ** $p$ < .01. *** $p$ < .001

# Appendix D: Manuscript 4

## Effects of an App-Based Mindfulness Training on Employees' Perfectionism and Recovery: A Brief Report on a Randomised Wait-list Control Trial

**Authors:** Emily Kleszewski*, Eva Matick*, Kathleen Otto (*authors contributed equally)

**Status:** Submitted to *Current Psychology*

# Effects of an App-Based Mindfulness Intervention on Employees' Perfectionism and Recovery: A Brief Report on a Randomised Wait-List Control Trial

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**Abstract**

Perfectionism may place employees at risk for impaired recovery and well-being. Considering mindfulness as a personal resource that may reduce perfectionistic cognitions as dynamic aspects of this construct and recovery deficits, the present research aimed to contribute to research on mindfulness and perfectionism by (1) investigating the effects of an app-based mindfulness intervention on perfectionistic cognitions and by (2) testing whether a short and easily accessible app-based mindfulness intervention may have effects on detachment and sleep quality. Compared with participants in the wait-list control group ($n$ = 45), participants in the intervention group ($n$ = 38) reported significantly higher levels of mindfulness and lower levels of perfectionistic concerns cognitions after completing the app-based course comprising 10 short units. However, these effects disappeared at the short-term follow-up after 2 weeks and indicate the need for continued mindfulness practice. Our findings point towards the benefits and boundaries of app-based mindfulness interventions.

*Keywords*: multidimensional perfectionism, perfectionistic cognitions, recovery, app-based mindfulness intervention

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# Effects of an App-Based Mindfulness Intervention on Employees' Perfectionism and Recovery: A Brief Report on a Randomised Wait-List Control Trial

Mindfulness, a form of attention that is intentionally and non-judgmentally directed to experiences in the present moment (Kabat-Zinn, 2003), is increasingly present in peoples' everyday life and research and has been described as a "hype" (Van Dam et al., 2018). A recent meta-analysis supported the effectiveness of mindfulness-based interventions in enhancing employees' health and well-being (Vonderlin et al., 2020). Recently, the COVID-19 pandemic has highlighted the necessity of flexible interventions that do not rely on face-to-face delivery. In this regard, online and app-based mindfulness interventions can be a promising alternative to promote employees' well-being, including recovery after work (e.g., Möltner et al., 2018; Querstret et al., 2017). This study aimed to contribute to research on mindfulness and perfectionism by (1) introducing and testing perfectionism with its dynamic concept of perfectionistic cognitions as another target for mindfulness interventions and by (2) investigating the effects of a low-threshold app-based mindfulness intervention on detachment and sleep quality as indicators of recovery that perfectionism may impede (Molnar et al., 2020; Reis & Prestele, 2020).

## Perfectionism as a Dimensional Construct

Commonly, perfectionism is understood as a multidimensional personality disposition comprising maladaptive dimensions (i.e., socially prescribed perfectionism [SPP]) and dimensions (i.e., self-oriented perfectionism [SOP]) that may be adaptive (see Stoeber & Otto, 2006, for a review). Scholars have begun to investigate perfectionistic cognitions as "state-like manifestations" of this construct (Hill & Appleton, 2011, p. 697). These cognitions may relate to personal standards (perfectionistic strivings cognitions [PSC]) or the concern to make mistakes (perfectionistic concerns cognitions [PCC]; Prestele et al., 2020). Both

dispositional perfectionism and perfectionistic cognitions may unfavourably shape employees' recovery. For example, recent research indicates that SPP relates to impaired sleep quality (Molnar et al., 2020) and PCC evoke worry and tension (Prestele et al., 2020).

### Perfectionism is Antithetical to Mindfulness

Researchers have suggested that especially people high in SPP would benefit from increased mindfulness (Flett et al., 2020), as their mindset is directed towards social evaluation, approval, and avoiding criticism. Accordingly, we considered mindfulness as a personal resource (Grover et al., 2016) that may reduce PCC and recovery deficits associated with perfectionism. Given the stability of dispositional perfectionism, a reduction of SPP is beyond the expected effects of a short app-based mindfulness course. Specifically, we assumed that increased mindfulness leads to significantly lower levels of PCC (Hypothesis 1) and significantly higher levels of detachment (Hypothesis 2) and sleep quality (Hypothesis 3).

## Method

### Procedure and Participants

The study was approved by the relevant ethics committee, and three undergraduate students supported the data collection. A total of 164 participants were screened for eligibility, of which 120 met the inclusion criteria (employment, smartphone, no regular mindfulness practice, no acute physical or mental illness) and were randomised to the intervention (INT) or wait-list control group (WLC). Participants in the INT group were instructed to complete a prescribed mindfulness course in the app 7mind within 2 weeks. They received an example weekly schedule of the 10 units (9–15 minutes each), which were mainly based on breathing exercises and body scans, but they were allowed to flexibly adapt this schedule. They filled out questionnaires before the intervention (T1) and directly after the intervention (T2, after 2 weeks) and responded to a short-term follow-up after 2 more weeks

(T3). Participants in the WLC group received access to the app after responding to the T3 questionnaire. After excluding those who only responded at T1, were on vacation, or indicated to complete less than five units, the final sample consisted of 87 employees. The majority of the sample (79%) was female, with a mean age of 37.22 (*SD* = 12.64) and organisational tenure of 10.08 years (*SD* = 9.86).

**Measures**

Established measures were used to assess mindfulness (23 items; Burzler et al., 2019, German translation: Tran et al., 2013), dispositional perfectionism (10 items; Cox et al., 2002, German translation: Altstötter-Gleich, 1998), perfectionistic cognitions (13 items; Prestele et al., 2020), detachment (4 items, Sonnentag & Fritz, 2007), and sleep quality (10 items; Buysse et al., 1989; German translation: Riemann & Backhaus, 1996). All scales displayed high reliability ($\alpha > .85$).

**Data Analyses**

In line with Querstret et al. (2017), ANCOVAs were conducted for the T2 and T3 outcomes including the respective T1 scores and gender and age as covariates. To inspect effect sizes, partial eta squared ($\eta_p^2$) values were calculated.

## Results

First, we tested whether the two groups differed in the study variables at T1. No significant differences were found, except for detachment, which was significantly higher in the INT group, $t(85) = 2.49$, $p = .015$. Results from the ANCOVAs are depicted in Tables 1 and 2.

– Please insert Tables 1 and 2 about here –

As shown in Table 1, participants in the INT group reported significantly higher levels of mindfulness at T2, thus confirming the manipulation of mindfulness. Providing support for

Hypothesis 1 and a short-term effect of the intervention, participants in the INT group reported significantly lower levels of PCC at T2 but no longer at T3.[1] The effect sizes were medium (Cohen, 1988). The other hypotheses were not confirmed.

## Discussion

According to our findings, low-threshold app-based mindfulness interventions may reduce PCC and thus intervene early in the process between perfectionism and impaired recovery. However, the effect was only of short duration. Although small descriptive changes on the recovery measures were found in the INT group, our findings are inconsistent with previous research on online and app-based mindfulness interventions (Möltner et al., 2018; Querstret et al., 2017). Future research may consider a higher dose of treatment and standardisation when the participants complete the mindfulness units, monitoring the participation, and controlling for placebo effects (Van Dam et al., 2018) to address the shortcomings of this work. Additionally, larger samples are needed to detect small to medium effects of app-based mindfulness interventions (Linardon, 2020). To conclude, our findings point towards the boundaries of the "hype."

[1] Findings did not differ without gender and age included as covariates. Results for dispositional perfectionism and PSC are included to comprehensively present the construct of perfectionism.

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## Tables

### Table 1

*ANCOVA results and between group effect sizes for outcome variables at T2 (after intervention)*

| Measure | INT group ($n$ = 38) | | WLC group ($n$ = 45) | | $F$ (1, 78) | $\eta_p^2$ |
|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | | |
| Mindfulness | 3.60 | 0.43 | 3.36 | 0.37 | 4.00* | .05 |
| Perfectionism | | | | | | |
| SOP | 4.70 | 1.60 | 4.79 | 1.18 | 0.00 | .00 |
| SPP | 2.38 | 1.34 | 2.77 | 1.25 | 2.47 | .03 |
| PSC | 3.99 | 1.10 | 3.78 | 1.37 | 0.98 | .02 |
| PCC | 2.20 | 0.90 | 2.70 | 1.02 | 4.41* | .05 |
| Detachment | 3.47 | 1.10 | 3.04 | 0.93 | 0.40 | .01 |
| Sleep quality | 16.16 | 3.18 | 15.10 | 3.10 | 3.29 | .04 |

*Note.* INT = intervention; WLC = waitlist control; SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; PSC = perfectionistic strivings cognitions; PCC = perfectionistic concerns cognitions. For all concepts, higher values represent a stronger endorsement to the concept. The respective T1 scores and gender and age are included as covariates.

* $p < .05$, two tailed.

**Table 2**

*ANCOVA results and between group effect sizes for outcome variables at T3 (follow-up)*

| Measure | INT group ($n$ = 31) | | WLC group ($n$ = 40) | | $F$ (1, 66) | $\eta_p^2$ |
|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | | |
| Mindfulness | 3.54 | 0.43 | 3.42 | 0.46 | 0.25 | .00 |
| Perfectionism | | | | | | |
| SOP | 4.67 | 1.53 | 4.72 | 1.16 | 0.92 | .01 |
| SPP | 2.46 | 1.49 | 2.78 | 1.26 | 0.38 | .01 |
| PSC | 4.02 | 1.20 | 3.88 | 0.98 | 1.00 | .02 |
| PCC | 2.33 | 0.95 | 2.57 | 0.98 | 0.23 | .00 |
| Detachment | 3.63 | 1.11 | 3.00 | 0.94 | 2.44 | .04 |
| Sleep quality | 15.40 | 3.45 | 14.83 | 3.43 | 0.78 | .01 |

*Note*. INT = intervention; WLC = waitlist control; SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; PSC = perfectionistic strivings cognitions; PCC = perfectionistic concerns cognitions. For all concepts, higher values represent a stronger endorsement to the concept. The respective T1 scores and gender and age are included as covariates.

# Appendix E

## Lebenslauf inkl. Publikationen und Konferenzbeiträgen

*Der Lebenslauf ist nicht Teil der Veröffentlichung.*

# Appendix F

## Eidesstattliche Erklärung der Verfasserin

Ich versichere hiermit, dass ich meine Dissertation „Boon and Bane: How Perfectionism Shapes Employee Well-Being Through Health-Impairing and Motivational Processes" selbstständig, ohne unerlaubte Hilfe angefertigt, und mich keiner anderen als der von mir ausdrücklich bezeichneten Quellen und Hilfsmittel bedient habe. Alle vollständig oder sinngemäß übernommenen Zitate sind als solche gekennzeichnet. Die Dissertation wurde in der jetzigen oder ähnlichen Form noch bei keiner anderen Hochschule eingereicht und hat noch keinen sonstigen Prüfungszwecken gedient.

Marburg, November 2021

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Emily Kleszewski