The influence of self-control on self-oriented perfectionistic strivings in students

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Abstract

The present experience sampling study examined the relationship between self-control and self-oriented perfectionistic strivings in students on a state and trait level. This investigation was motivated by the susceptibility of perfectionistic students for negative consequences of perfectionistic strivings and concerns, while these are considered to be minimizable by self-control. Participants were recruited through convenience- and snowball-sampling. The final sample comprises predominantly German and Dutch, as well as Lithuanian students (N=35) between 18 and 26 with a response rate of 50% or higher. Data collection was administered via the online platform *Ethica* over the course of fifteen days, in which participants completed daily state measurements, as well as the 'Personal Standards' dimension of the Frost Multidimensional Perfectionism Scale and the Brief Self-control Scale once per week. All used scales are determined as internally consistent. Results from the standardized linear mixed model show that perfectionistic strivings are moderately positive associated to trait and weakly positive associated to state self-control. The hypothesized ego-depleting effect of perfectionistic strivings on self-control was not observed, implicating that general and momentary self-control provide perfectionistic students an increased capacity for goal-directedness, which enables them to meet their perfectionistic strivings. Future research shall additionally assess perfectionistic concerns in relation to self-control, to investigate the possible ego-depleting effect thereof.

Perfectionism

While carrying out everyday activities like cleaning and sports, or academic activities like reading and learning, one aims to meet the own personal standards corresponding to the activity. Such standards are for example: “I have to run minimum ten kilometres to be satisfied with my performance today.” Or “I have to finish summarizing all study material one week prior to the exam, if I want to achieve a good grade.” The nature and the personal importance of such standards is different for everyone. So, for example while some people might be happy with achieving an average grade for an academic task, others might be unsatisfied with the same result, since they set themselves high standards. Setting very high standards for oneself and repeatedly aiming for their attainment, for example a perfect grade in an academic task, is a tendency commonly found in individuals with high levels of perfectionism. Perfectionistic individuals direct their behaviour towards flawlessness, while aiming to attain to high standards for their own performance. This is commonly accompanied by overly critical evaluations of their own performance (Stoeber and Rambow, 2007).

As hypothesized by Stoeber and Otto (2006), perfectionism appears to be a bidimensional framework, which mainly distinguished in two dimensions, namely perfectionistic concerns, and perfectionistic strivings. Firstly, perfectionistic concerns are defined as the tendency to overestimate the consequences of failing to meet one’s standards and to have doubts about the personal achievement potential and behaviour. This is further accompanied by a perceived discrepancy between high expectations and actual achievements (Stoeber & Otto, 2006). Stoeber and Otto (2006) further state, that perfectionistic concerns incorporate socially prescribed perfectionism, which means that a perfectionist is overly concerned with negative evaluation and disapproval by others regarding the own performance, because the standards imposed from others on oneself are perceived as extremely high. Secondly, perfectionistic strivings are defined as the tendency to form high standards regarding one’s performance and to aim for their achievement while being overly

concerned with organizational activities to meet the high standards (Stoeber & Otto, 2006). These perfectionistic strivings are strongly associated with self-oriented perfectionism, which describes the tendency of an individual to impose unrealistically high standards on oneself to avoid self-criticism (Hewitt, Flett, Turnbull-Donovan & Mikail, 1991). Concludingly, perfectionistic concerns are made up of doubts about one's achievement potential, caused by a discrepancy between actual and desired achievement, while perfectionistic strivings describe the setting and desired adherence of high standards.

Perfectionistic concerns and strivings hold the potential to both benefit and handicap the possessing individual. If individuals with high perfectionistic concerns engage in self-criticism because they cannot attain to their heightened standards, they run the risk of a multitude of negative consequences like decreased self-esteem, well-being, and academic performance, as well as increased risk for depression and procrastination behaviour. This may strongly inhibit their social and academic functioning (Flett, Hewitt & Dyck, 1989; Hewitt & Flett, 2002; Hewitt, Flett, & Ediger, 1996; Lo & Abbott, 2013; Stoeber & Otto,2006; Dunkley, Blankstein, Masheb, & Grilo, 2006). Nonetheless, individuals with high perfectionistic strivings are comparatively more motivated and show better academic performance if they are able to regulate and meet their heightened standards (Bieling, Israeli, Smith, & Antony, 2003; Lo & Abbott, 2013; Stoeber & Otto, 2006). Although, Flett, Hewitt and Dyck (1988) report that self-oriented perfectionistic strivings in interaction with high life stressors predicts trait anxiety and neuroticism, which subsequently may have significant impact on an individual's well-being. Furthermore, while Frost et al. (1993) state that perfectionistic strivings generally are related to positive characteristics, other studies on bidimensional perfectionism also conclude that perfectionistic strivings are related to both positive, as well as negative characteristics, which can benefit and handicap the possessing individual (Bieling, Israeli, & Antony, 2004; Bieling, Israeli, Smith, & Antony, 2003, Lo & Abbott, 2013; Stoeber & Otto, 2006). So, in the bidimensional conception of perfectionism,

perfectionistic concerns lead to mostly negative outcomes, while perfectionistic strivings can lead to both positive and negative outcomes for the possessing individual.

One social group which is extremely susceptible to these consequences of perfectionistic strivings and concerns are students. This is because students simultaneously have to adhere to both self-oriented perfectionistic strivings to avoid self-criticism and to socially prescribed perfectionistic concerns in the form of academic demands and expectations by teachers, parents, and friends. Curran and Hill (2019) conducted a meta-analysis with 164 samples consisting of 41.641 students who filled out the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991) from 1989 to 2016, and concluded that the magnitude of self-oriented and socially-prescribed perfectionism in students has linearly increased. While perfectionistic students are confronted with increased autonomy, academic demands, and high personal standards, Bennion, Olpin, and DeBeliso (2018) also state that the amount of encountering life stressors increases significantly when becoming a student. This puts especially students at risk for the negative consequences of perfectionistic concerns and strivings (Bieling, Israeli, Smith, & Antony, 2003; Bieling, Israeli, & Antony, 2004; Dunkley, Blankstein, Masheb, & Grilo, 2006; Flett, Hewitt and Dyck ,1988; Stoeber & Otto ,2006).

Perfectionism and Self-Control

In order to adhere to their high standards, perfectionistic students must engage in self-control processes. On the one hand Hewitt and Flett (1991) state that perfectionistic concerns are associated with motivational deficits and decreased intrinsic motivation. Also, socially prescribed perfectionism, as a main constitute of perfectionistic concerns, is negatively associated with perceived control regarding one's autonomy and future (Klibert et al., 2005). On the other hand, Mills and Blankstein (2000) state, that perfectionistic strivings are closely associated with goal striving, adaptive work habits, and positive academic performance, while

concluding that self-oriented perfectionistic strivings are strongly associated to the strategies with which perfectionists aim to attain to their strivings. Thereby self-oriented perfectionistic strivings do not solely depend on the setting of heightened standards, but also the ability for self-control to carry out actions, which aim at attaining to these standards.

Self-control is mainly constituted by inhibition and goal-directedness. Tangney, Baumeister, and Boone (2004) describe self-control as "the ability to override or change one's inner responses, as well as to interrupt undesired behavioural tendencies such as impulses and refrain from acting on them". More specifically, Milyavskaya and Inzlicht (2007) describe the inhibitory component of self-control as the ability to "restrain one's impulses in the service of greater goals and priorities". Secondly, goal-directed self-control is described as the ability to persist in activities which are difficult, disliked, or uninteresting, in order to reach a certain goal (Tornquist and Miles, 2019). Such self-control processes are inevitable prerequisites for goal attainment and require individual effort (Tangney, Baumeister, & Boone, 2004). Processes exemplary for this might be regulating one's thought processes towards increased concentration, controlling one's emotional affect, and resisting undesired impulses (Tangney, Baumeister, & Boone, 2004). Concludingly, the risks for depression, procrastination, decreased well-being, academic performance, and self-esteem in perfectionistic students as a consequence of failing to meet their high standards is hypothesized to be minimized through engagement in self-control processes to inhibit their perfectionistic concerns, and to continuously engage in goal-directed behaviour in order to attain to attain to perfectionistic strivings.

Firstly, there is evidence for self-control as being an inherent characteristic which is stable over time. (De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012). This is for example underpinned by findings of Mischel, Shoda, and Peake (1988), who state that the ability to refrain from acting on pleasurable stimuli like gratification in 4 and 5 year old children predicted positive academic success ten years later. Moreover, persisting in a

difficult motor task predicted a decrease in smoking cessation in the course over the next months (Brandon et al., 2003). The construct of trait self-control correlates positively with self-oriented perfectionistic strivings and negatively with other oriented perfectionistic concerns, as described by Tagney (2004). Mills and Blankstein (2000), and Flett et al. (1995) both verified this association by reporting that effort management and planning, which are exemplary for self-control behaviour, correlated positively with perfectionistic strivings in university students. Concludingly, constant adherence to above average personal standards, so an increase in self-oriented perfectionistic strivings, would be positively associated with general trait self-control. (Flett et al., 1995; Mills and Blankstein, 2000; Tagney, 2004). Thereby, the present research firstly aims to assess the association between self-control as a fixed measure and perfectionistic strivings. In this framework, self-control (independent variable) is thought of as having an effect on self-oriented perfectionistic strivings (dependent variable). The corresponding hypothesis is *Students with high general self-control display high self-oriented perfectionistic strivings.*

Secondly, self-control is also conceptualized as a construct which fluctuates in different situational context (Mischel, Cantor & Feldman, 1996; Tangney, Baumeister, & Boone, 2004). It is extensively reported, that fluctuating cognitive and mood states influence the tendency of being able to override a dominant response tendency, which is a main component of self-control (Govorun & Payne, 2006; Inzlicht, McKay, & Aronson, 2006; Ward & Mann, 2000). Furthermore, according to the strength model (Baumeister, Vohs & Tice, 2007), self-control is conceptualized as a limited resource. This implicates that the ability for consecutive self-control declines after repeated exhibition thereof, unaffected by which specific type of self-control effort which was exhibited in advance. This rationale is underpinned by the concept of ego depletion, which describes every self-control effort as causing short-term impairments that inhibit subsequent self-control efforts. It is stated that this effect is detectable in a variety of domains like interpersonal behaviour, decision-making,

intelligent thought, sexuality, eating and drinking (Baumeister, Vohs & Tice, 2007). After conducting a literature search it can be concluded that self-control as a state construct is well investigated by present research, while there seems to be a research gap regarding the relationship of self-control as a state construct and perfectionistic strivings. Thereby the main aim of the present research is to investigate the relationship between state self-control as a fluctuating construct and self-oriented perfectionistic strivings in students. Nonetheless, when conceptualizing self-control as a resource which gets depleted by repeated exhibition thereof (Baumeister, Vohs & Tice, 2007), constant monitoring and hypervigilance regarding the anticipation and adherence of high self-oriented perfectionistic strivings should exhaust an individual's capacity for state self-control in situations where perfectionistic strivings are experienced. The corresponding second hypothesis therefore is: *Students with low self-control at a specific moment display high self-oriented perfectionistic strivings at that same moment.*

Methods

Design

This research is part of a longitudinal collaborative study, in which self-control was investigated in relation to multiple constructs, namely fatigue, anxiety, and prosocial behaviour. Nonetheless, the scope of the present report solely concerns findings on the constructs self-control (SC) and perfectionistic strivings (PF). The associations between both constructs were investigated with trait and state questionnaires, while state measurements were provided to the participants by means of experience sampling (ESM). ESM is used to measure states by gathering data multiple times throughout the day (Larson & Csikszentmihalyi, 2014), thereby enabling the investigation of momentary, self-reported data on states (e.g., emotions, behaviour, feelings, thoughts). The presence, as well as the intensity of those states is measured during, or shortly after experiencing them. This short time-period

between experiencing and reporting on a state increases the accuracy of state measurements, since the potential for inaccurately recalling a state after a longer period of time is minimized.

Participants

The present study was conducted with English-proficient students between the age of 18 and 25, who are currently registered in a higher-level educational institution. Participants were recruited via convenience- and snowball-sampling by the researchers. Thereby, the researchers advertised the research themselves, while encouraging participants to recruit other students for the research. This was done to facilitate a larger sample size and reduced costs of participant recruitment. The English-proficiency was not investigated beforehand but was based on the participant's own assessment of their skills. Moreover, data was only included when a response rate of 50% or higher was given, as this is the common threshold for experience sampling studies (Connor & Lehman, 2012).

The study comprised a sample of 61 university and college students, out of which 26 participants were excluded due to insufficient response rate or missing demographic and educational information, leading to a final sample size of 35. 31 (89%) participants were German, three were Dutch (8%), and one indicated to be from Lithuania (3%). The age range of the participants was between 18 and 26 (M_{age} = 22). 23 (66%) participants identified as female, while 12 (34%) stated to be male. 28 (80%) indicated to have finished high school with VWO or Abitur, and 7 (20%) participants had achieved their bachelor's degree.

Materials and Procedure

The study was carried out via the online platform *Ethica*, which allows researchers to create, modify, and distribute surveys, and is accessible via app or web-browser (ethicadata.com). By this it was possible to administer trait questionnaires to gather fixed data, as well as ESM to gather momentary data. The trait measures that were administrated

include the Brief Self-Control Scale (BSCS) (Tangney, Baumeister, & Boone, 2004) (see Appendix B), and the 'Personal Standards' dimension of the Frost Multidimensional Perfectionism Scale (FMPS) (Frost, Marten, Lahart & Rosenblate, 1990) (see Appendix C) to assess perfectionistic strivings.

13-Item Brief Self-Control Scale

The 13-Item Brief Self-Control Scale (BSCS) measures "the ability to override or change one's inner responses, as well as to interrupt undesired behavioural tendencies such as impulses and refrain from acting on them" (Tangey, Baumeister & Boone, 2004). It covers multiple aspects of self-control, including task performance, impulse control, psychological adjustment & self-esteem, interpersonal relationships, personality features and moral emotions. The BSCS is a questionnaire that assess one's degree of trait self-control based on thirteen different items, like for example "*I am good at resisting temptations*", on a 5-point Likert-Scale scaling from 1 ("Not at all") to 5 ("Very much"). The brief version of the instrument is one of the most common and effective instruments for measuring self-control, wherefore the extended version has become increasingly outdated (Duckworth et al., 2007). This questionnaire furthermore was chosen due to its reduced length, which facilitates participant engagement (Cairns, 2013). As for the internal consistency of this survey, it was previously proven to be adequate ($\alpha = .83$) (Tangey, Baumeister & Boone, 2004) while it was also determined internally consistent in the present study ($\alpha = .88$). As for the test-retest reliability the 13-Item Brief Self-Control Scale scored high as well ($r = .87$) (Tangey, Baumeister & Boone, 2004).

'Personal Standards' – Frost Multidimensional Perfectionism Scale

Frost, Marten, Lahart and Rosenblate (1990) report the personal standards dimension of the Frost Multidimensional Perfectionism Scale (FMPS) as measuring self-oriented high

standards. Flett et al. (1995) suggests that the Personal Standards sub-scale of the FMPS is sufficient to investigate perfectionistic strivings because they are constituted by high self-oriented standards. The original FMPS originally consists of 6 dimensions, which incorporate the different facets of general perfectionism (Frost, Marten, Lahart & Rosenblate, 1990). The corresponding personal standards subscale comprises a 7 item scale with a 5-point likert scale from 1 ("Strongly disagree") to 5 ("Strongly agree"), with items like "*If I do not set the highest standards for myself, I am likely to end up a second-rate person*". The measurement shows good internal consistency (α = .83) (Frost, Marten, Lahart & Rosenblate, 1990) and was also determined internally consistent by the present study (α = .86). Its short length is expected to increase the participants willingness to engage in the study (Cairns, 2013).

Experience sampling in Ethica

In *Ethica* participants can complete surveys using any form of digital devices (e.g., smartphones and tablets with iOS or Android operating system, etc), thereby providing the opportunity to issue questionnaires on a daily basis in a more natural setting on the basis of ESM, which reduces participation effort since no additional study material or a designated place to take the daily measures is needed. As for the time of response, *Ethica* makes use of a variety of triggering logics. With these triggering logics, a fixed time or time period can be set, in which the participants are asked to answer the given surveys. Additionally, pop-up notifications can be used to give participants a reminder on when a specific activity (e.g., survey) should be completed. The experience sampling surveys measured ego-depletion, goal-directedness, and inhibition as the three facets constituting self-control, and perfectionistic strivings. The corresponding items are reported below (*see Table 1*).

Table 1

Daily state measurements

Self-Control: Ego-Depletion	Self-Control: Goal-Directedness	Self-Control: Inhibition	Perfectionistic strivings
1. In the past couple of hours, have you felt that it is hard to make up your mind about even simple things?	4. In the past couple of hours, how easy was it for you to do something "good" that you did not really want to do (e.g.: eating healthy food)?	6. In the past hour, how easy was it for you to refrain from doing something "bad" you really wanted to do? (e.g.: snacking)?	8. At the moment, I perceive my goals and standards as high
2. In the past couple of hours, have you felt that things are bothering you more than they usually would?	5. In the past couple of hours, I was able to stick to my goals.	7. In the past few hours, were you able to resist temptations.	9. At the moment, I feel the need to be competent in what I do
3. In the past couple of hours, have you felt that you have less mental and emotional energy than you normally have?			

Self-Control. The final state self-control scale (see Appendix A) measured self-control as a three-dimensional construct, incorporating ego-depletion, goal-oriented self-control, and inhibitory self-control.

Ego depletion. Baumeister, Wright and Carreon (2019) formulated an ego-depletion scale, consisting of three items, which was entirely adapted for the present state-self-control survey. The questions were answered on a 5-point Likert-Scale, ranging from 0 (*Not at all*) to 4 (*Very much*). The authors further support the items by stating that regarding the first item (*"In the past couple of hours, have you felt that it is hard to make up your mind about even simple things? "*) decision-making requires self-control, wherefore ego-depletion is hypothesized to lead to difficulty in making simple decisions (Baumeister, Wright, & Carreon ,2019; Vohs et al., 2008). Regarding the second item (*"In the past couple of hours, have you felt that things are bothering you more than they usually would? "*), Baumeister, Wright and Carreon (2019) report, that "ego depletion alters people's intensity of negative feelings such that they are more bothered by frustrating events (Baumeister & Tierney, 2011, p. 30)". In regard to the third item (*"In the past couple of hours, have you felt that you have less mental and emotional energy than you normally have? "*), Baumeister, Wright and Carreon (2019) state, that "People's subjective experience of ego-depletion can be a diffuse sense of fatigue or exhaustion (Hagger, Wood, Stiff, & Chatzisarantis, 2010)". Concludingly, the ego depletion scale by Baumeister, Wright and Carreon (2019) is incorporated in the present study due to its suitability and because it is substantiated by different research.

Goal-directed and inhibitory self-control. The items 4 and 5 measure goal-directed self-control, while item 6 and 7 measure inhibitory self-control. Tornquist and Miles (2019) describe goal-directed self-control as the ability to persist in difficult, disliked, or uninteresting activities to attain to a goal. Based on this rationale, the fourth ("*In the past couple of hours, how easy was it for you to do something "good" that you did not really want to do (e.g.: eating healthy food)?"*) and the fifth item ("*In the past couple of hours, I was able*

to stick to my goals.") were composed, to measure goal-directed self-control. In regard to goal-oriented self-control, De Ridder, de Boer, Lugtig, Bakker, and van Hooft (2011) proposed the 6-item-inhibitory self-control scale, which entails six items that measure inhibitory self-control on a 5-point likert-scale. Two items from this questionnaire *("I am good at resisting temptations "*, and *"Sometimes I can't stop myself from doing something, even if I know it is wrong. "*) were adapted and broadly revised to provide a state measurement for inhibitory self-control. The revision also comprised reversing the secondly adapted item and adding 'in the past (few) hour(s)', so it measures a momentary experience rather than a trait. This led to the sixth (*In the past hour, how easy was it for you to refrain from doing something "bad" you really wanted to do? (e.g.: snacking)?)* and the seventh (*In the past few hours, were you able to resist temptations*) item being constructed. All questions were answered on a 7-point Likert-Scale, ranging from 0 (*Not at all*) to 7 (*Extremely*).

Perfectionistic Strivings. In order to measure self-oriented perfectionistic strivings, two items from the FMPS *("It is important to me that I be thoroughly competent in what I do*" and "*I have extremely high goals*") (Frost, Marten, Lahart & Rosenblate, 1990) were slightly revised and subsequently adopted to measure self-oriented perfectionistic strivings (see Appendix A). The revision mainly encompassed adding 'at the moment' prior to the adapted statement, to make the item suitable as a state measurement. The final eight and ninth items to measure self-oriented perfectionistic strivings were: *"At the moment, I perceive my goals and standards as high."* and *"At the moment, I feel the need to be competent in what I do."* Both items were answered on a 5-point Likert scale, ranging from 0 (*Strongly disagree*) to 5 (*Strongly agree*).

Procedure

The Ethics committee of the University of Twente approved the present research with the request number 210672, and data collection took place in April and May 2021, from April 27th to May 12h. The study interface on *Ethica* and all incorporated functions like clarity of user interface, notifications, functionality of surveys and response functionality were repeatedly tested and adapted by the researchers before the studies deployment. Participants were asked to download the *Ethica* application on their smartphone using their email address and a study code which was provided by the researchers in advance. Before the start of the study, an activity overview which incorporated expectations towards the participants was provided via *Ethica*. Subsequently, participants were provided with the informed consent (see Appendix D). They were also asked to give *Ethica* the permission to use the notification function on their smartphone. This was done to increase functionality of the study and encouragement to fill out the provided surveys, while participants do not have to remind themselves to fill out a survey (Consolvo & Walker 2003). Additionally, the subjects were informed to contact the researchers regarding any problems with the *Ethica* application or the study itself.

Data collection started on April 27th, 2021. An overview of the 15 days study is provided in Table 2. Firstly, participants were asked to indicate their demographic information (age, gender, nationality). Subsequently, participants filled in the trait measurements of self-control (BSSC), and perfectionism (FMPS, PS) for the first time. This procedure was repeated at Day 1, 8, and 15 between 12:00 and 13:00. From Day 1 to Day 15 participants did fill in the state questionnaires on self-control and perfectionistic strivings. The state questionnaires were randomly assigned via notifications in fixed time-slots of three hours (9:00 - 12:00, 13:00 - 16:00, 20:00 - 23:00) (see *Table 2*). Corresponding notifications were provided to the participant every half hour, to ensure a heightened response rate. In order to prevent response habituation or bias caused by repeated ordering of item blocks, the

sequence of blocks was randomized. Participants were only able to answer the questionnaire during the corresponding timeslot, after which the questionnaire expired. This prevented participants from filling out all surveys at the end of the day. Thereby, it is ensured that all data reflects participants' experience at that moment of data collection rather than participants' (potentially biased) memory of events. Additionally, the data collection was followed by a positive message in which the participants were thanked for their participation. This aimed at increasing and maintaining high response rates and a positive attitude towards the study generally.

Table 2

Study activity overview

	Day 0	Day 1	Day 2-7, 9-14	Day 8 & 15
Morning **9:00 – 12:00**	Installation Ethica Registration Ethica	Demographics	State self-control (7 items) Perfectionistic strivings (2 items)	State self-control (7 items) Perfectionistic strivings (2 items)
Afternoon **13:00-16:00**	Welcome message and study description	Trait self-control (BSCS) Trait perfectionistic strivings (FMPS, PS)	State self-control (7 items) Perfectionistic strivings (2 items)	State self-control (7 items) Perfectionistic strivings (2 items) Trait self-control (BSCS) Trait perfectionistic strivings (FMPS, PS)
Evening **20:00 – 23:00**	Informed consent		State self-control (7 items) Perfectionistic strivings (2 items)	State self-control (7 items) Perfectionistic strivings (2 items)

Data Analysis

The results of the trait, as well as state measurements were transferred from *Ethica* and analysed and visualized by means of the software program *IBM SPSS Statistics* (Version 26). The data collection procedure of the present study resulted in numerous state and trait measurements from each participant. To investigate the internal consistency of the trait scales, Cronbach's alpha was calculated. Pearson correlations were computed to examine the validity between trait and state scales. The average mean per person of individual state measurements was calculated. From this, the person mean variable (PM), so the mean scores of the perfectionistic strivings scale and the mean scores of the self-control scale were computed per participant. The PM reflects a single value which is the average of all conducted state measurements regarding one construct. This enables to compare the PM for one state construct with the scores from the trait scales. This score was used to investigate between-person effects (Curran and Bauer, 2011). Additionally, the person mean centred variable (PMC) was computed by subtracting individual scores on the state scales from the PM. The PMC reflects the momentary deviation of individual state scores from the PM of all state scores regarding one construct. Thereby, individual differences between state measurements were made visible and subsequently used to investigate within-person effects between state measurements (Curran and Bauer, 2011).

In order to investigate the two hypotheses: *Students with high general self-control display high self-oriented perfectionistic strivings* and *Students with high self-oriented perfectionistic strivings at a specific moment display low self-control at that same moment,* a standardized linear mixed model (LMM) was conducted. The used LMM made use of an autoregressive structure. This is done to take into account that timely proximal state measurements may be more strongly associated than timely distant measures. Additionally, the autoregressive structure assumes the existence of such type of relation but does not provide implications on how strong the specific relation is. Since both hypotheses incorporate

the distinct scales for self-control and perfectionistic strivings, the PM and PMC of obtained state scores on SSC and SPF had to be standardized in the form of z-scores, so they could be compared.

Results

Descriptive statistics

The present analyses are based on four distinct measurements, in the following referred to as TPF (trait perfectionistic strivings), TSC (trait self-control), SPF (state perfectionistic strivings), and SSC (state self-control). The corresponding scales are displayed in Table 3, with an overview of the minimum score, maximum score, mean, and standard deviation of the measured constructs. In the analysed sample the response rate was 88,9% for TPF and TSC, and 72,3% for SPF and SSC. All measurement scales were determined as internally consistent (see Methods). Additionally, the TSC and SSC scales show a strong positive correlation (r=.658, p=.000), while the TPF and SPF scales are not significantly correlated with each other. (r=.307, p=.078).

Table 3

Sample size, Minimum and maximum scores, Mean, Standard deviation of TPF, TSC, SPF, SSC scales

	n	min	max	mean	std. Deviation
Trait perfectionism	35	1.52	4.00	2.53	0.72
Trait self-control	35	0.18	3.64	1.82	0.76
State perfectionism	35	1.03	3.90	2.65	0.64
State self-control	35	1.53	3.56	2.45	0.55

Perfectionistic strivings and self-control

The standardized LMM incorporated the standardized state perfectionism score (SPF(Z)) as the dependent variable and standardized person mean state self-control score (SSC(Z_PM)) as well as the standardized person-mean centred state self-control score (SSC(Z_PMC)) as the independent

variables. Thereby, the SPF(Z) - SSC(Z_PM) association measured the between-person effect of self-control and perfectionistic strivings, while the SPF(Z) - SSC(Z_PMC) association measured the within-person effect. Firstly, results of the standardized LMM show a moderate positive significant association between SPF(Z) and SSC(Z_PM) with B=.406, p=.000, 95% CI [.317, .495]. This implicates that an increase in perfectionistic strivings is positively related to an increase in general self-control. Secondly, the standardized LMM shows a weak positive significant association between SPF(Z) and SSC(Z_PMC) with B=.175, p=.000, 95% CI [.132, .218]. This implicates that increased perfectionistic striving is also positively related to self-control at a specific moment. Nonetheless, the association between perfectionistic strivings and general self-control is stronger than between perfectionistic strivings and momentary self-control.

Discussion

The rationale of the present study was, that students are very susceptible to the negative effects of perfectionism, since they abruptly have to adhere to personal, academic and autonomy standards simultaneously, which requires perfectionistic students to engage in goal-directed behaviour and corresponding behavioural inhibition to attain to their high standards. Thereby, the present study investigated the effect of general and momentary self-control on self-oriented perfectionistic strivings in students. In this framework, self-oriented perfectionistic strivings were hypothesized as being positively associated to trait self-control, and negatively associated to state self-control, because perfectionistic strivings were thought of as having an ego-depleting effect on the state-level.

In regard to the first hypothesis *Students with high general self-control display high self-oriented perfectionistic strivings,* a significant moderate, positive association between trait self-control and self-oriented perfectionistic strivings was found. This means that students with higher levels of trait self-control also show higher self-oriented perfectionistic strivings. Therefore, the hypothesis is accepted. The findings are in line with research

conducted by Tagney (2004), who stated that trait self-control positively correlates with perfectionistic strivings. Also, the positive association of effort management and planning with perfectionistic strivings postulated by Mills and Blankstein (2000), and Flett et al. (1995) proves similar to the findings of the established results, since effort management and planning are exemplary processes for self-control. So, if students possess many perfectionistic strivings and corresponding high standards, they also show a general increase in goal-directed behaviour, like organizational activities and behavioural inhibition, to attain to their high standards.

In regard to the second hypothesis *Students with high self-oriented perfectionistic strivings at a specific moment display low self-control at that same moment*, a significant weakly positive association was established. This means, that in the moments in which students possessed high perfectionistic strivings, they also displayed heightened state self-control. Since the hypothesis postulated a negative association between state self-control and self-oriented perfectionistic strivings, the hypothesis is rejected. The assumption that constant monitoring and hypervigilance of personal standards, as present in perfectionistic strivings, leads to ego depletion and thereby reduces students ability to self-control (Baumeister, Vohs & Tice, 2007), is therefore not supported by the present findings. Nonetheless, since the exhibition of a self-control effort is thought of as inhibiting the subsequent self-control capability, it cannot be stated with absolute certainty, that the self-control effort related to perfectionistic strivings did or did not lead to an ego-depletion effect, because both perfectionistic strivings and self-control were always measured at the same time. Additionally, another possible explanation for the positive association between perfectionistic strivings and momentary self-control is, that perfectionists may not experience their strivings as resource draining or exhausting when they are able to attain to them by means of increased self-control.

Concludingly, as implicated by the established positive associations between general and momentary self-control and self-oriented perfectionistic strivings, high standards are accompanied by comparatively high general and momentary self-control. Although, the relationship between general self-control and perfectionistic strivings was stronger than with momentary self-control. Students who consider themselves generally high on trait self-control may be more used to engage in self-control efforts to attain to their higher standards, while students with momentarily occurring high personal standards, may not always be instantly able to mobilize their self-control capability in such situations.

On the one hand, trait and state self-control were significantly correlated. This means that the ability to exhibit self-control in a specific situation strongly depends on the general level of self-control. On the other hand, even though the 2-item state perfectionistic strivings measurement was constructed on the basis of the FMPS, PS, the correlation between trait and state perfectionistic strivings was slightly insignificant. This implicates either that the revised items for state perfectionistic strivings did not properly represent the measured trait construct, or that perfectionistic strivings were perceived and reported significantly different by participants on a trait and on a state level. Nonetheless, the analysis to answer both research questions did not incorporate trait scores from the FMPS PS. For the analysis only the person mean, and person mean centred of the state perfectionistic strivings scale was used to account for within- and between-person effects.

Overall, self-control was conceptualized as providing perfectionistic students an increased capacity for goal-directed behaviour, which subsequently enables them to meet their perfectionistic strivings. This is based on the implication that constructive handling of strivings is associated with goal striving, adaptive work habits, and positive academic performance (Mills and Blankstein ,2000). Mills and Blankstein (2000) further stated that perfectionistic strivings are closely associated to the strategies with which perfectionists aim to adhere to their high standards. This rationale was supported by the present report as trait

and state self-control, which incorporate strategies to adhere to high standards, were both positively associated with perfectionistic strivings.

Concludingly, while it was stated that perfectionistic strivings are related to both positive, as well as negative characteristics in existing research (Bieling, Israeli, & Antony, 2004; Bieling, Israeli, Smith, & Antony, 2003), the present study highlighted the positive consequences of self-oriented perfectionistic strivings as momentary and generally heightened goal-directedness and motivation in the context of self-control, which is related to increased academic performance and motivation. So, the present study determines self-control as a tool with which perfectionistic students are not only better able to cope with their high standards, but also to benefit from them by being more productive and organized.

Limitations and implications

Two main limitations were observed while conducting the present research. Firstly, because the trait and state measurements for perfectionism did not significantly correlate with each other, it is uncertain if the 2-item self-oriented perfectionistic strivings measurement was feasible to assess perfectionistic strivings as related to trait perfectionistic strivings, or if participants did experience and report their perfectionistic strivings differently in a state context due to situational differences. Therefore, future research on state and trait perfectionism should aim at adapting and developing more feasible scales regarding state perfectionistic strivings, which will better allow future research to draw comparisons between state and trait perfectionistic strivings.

Secondly, the scope of the present study did solely concern perfectionistic strivings as a sub-dimension of general perfectionism. Thereby, only the high standards dimension of the perfectionism construct was used in the present report. In order to assess perfectionism as a state construct more extensively, future research is advised to also investigate perfectionistic concerns in relation to state self-control. Additionally, Tagney (2004) states that other-

oriented perfectionistic concerns are negatively associated to trait self-control. Thereby, it can be assumed that this association might as well be negative when assessing self-control and perfectionistic concerns on a state level, because both constructs were established as strongly correlated in the present study. Concludingly, an ego-depleting effect caused by perfectionistic strivings was not found in the present study but could possibly be observed when assessing the relationship between self-control and perfectionistic concerns on a state level. Moreover, in regards to the established positive association between perfectionistic strivings and state self-control, it might be interesting for future research, to assess state self-control and perfectionistic strivings with a temporal distance. Thereby, a possible ego-depleting effect of perfectionistic strivings could be more thoroughly investigated, since it is only observable in the reduced capability for subsequent self-control efforts and not at the same moment (Baumeister, Vohs & Tice, 2007).

Conclusion

The present longitudinal research examined the association between self-control and self-oriented perfectionistic strivings as a sub-dimension of general perfectionism in 35 students as a fixed characteristic and as a momentary experience over the course of fifteen days. The study found that self-oriented perfectionistic strivings in students are positively associated with both fixed and momentary self-control. Overall, results of the present study implicate self-control as providing perfectionistic students with a capacity for goal-directedness and increased motivation, which potentially enables them to attain to their high standards. Future research can extend these findings by assessing also perfectionistic concerns in relation to momentary self-control, to grasp the relationship between perfectionism and self-control more extensively. Also, future research is advised to investigate the relationship of perfectionistic strivings and concerns with state self-control with temporal distance, to see whether the momentary experience of perfectionistic tendencies leads to subsequent ego-depletion.

References

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current directions in psychological science*, *16*(6), 351-355.

Baumeister, R. F., Wright, B. R., & Carreon, D. (2019). Self-control "in the wild": Experience sampling study of trait and state self-regulation. *Self and Identity*, *18*(5), 494-528.

Bennion, E., Olpin, M. N., & DeBeliso, M. (2018). A comparison of four stress reduction modalities on measures of stress among university students. *International Journal of Workplace Health Management*.

Bieling, P. J., Israeli, A. L., & Antony, M. M. (2004). Is perfectionism good, bad, or both? Examining models of the perfectionism construct. *Personality and individual differences*, *36*(6), 1373-1385.

Bieling, P. J., Israeli, A., Smith, J., & Antony, M. M. (2003). Making the grade: The behavioural consequences of perfectionism in the classroom. *Personality and Individual Differences*, *35*(1), 163-178.

Brandon, T. H., Herzog, T. A., Juliano, L. M., Irvin, J. E., Lazev, A. B., & Simmons, V. N. (2003). Pretreatment task persistence predicts smoking cessation outcome. *Journal of abnormal psychology*, *112*(3), 448.

Consolvo, S., & Walker, M. (2003). Using the experience sampling method to evaluate ubicomp applications. *IEEE pervasive computing*, *2*(2), 24-31.

Curran, P. J., & Bauer, D. J. (2011). The disaggregation of within-person and between-person effects in longitudinal models of change. *Annual review of psychology*, *62*, 583-619.

Curran, T., & Hill, A. P. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin*, *145*(4), 410.

de Ridder, D. T., de Boer, B. J., Lugtig, P., Bakker, A. B., & van Hooft, E. A. (2011). Not doing bad things is not equivalent to doing the right thing: Distinguishing between inhibitory and initiatory self-control. *Personality and Individual Differences*, *50*(7), 1006-1011.

De Ridder, D. T., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviors. *Personality and Social Psychology Review*, *16*(1), 76-99.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of personality and social psychology*, *92*(6), 1087.

Dunkley, D. M., Blankstein, K. R., Masheb, R. M., & Grilo, C. M. (2006). Personal standards and evaluative concerns dimensions of "clinical" perfectionism: A reply to Shafran et al.(2002, 2003) and Hewitt et al.(2003). *Behaviour research and therapy*, *44*(1), 63-84.

Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issues.

Flett, G. L., Hewitt, P. L., & Dyck, D. G. (1989). Self-oriented perfectionism, neuroticism and anxiety. *Personality and Individual Differences*, *10*(7), 731-735.

Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of two measures of perfectionism. *Personality and individual differences*, *14*(1), 119-126.

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). *The dimensions of perfectionism. Cognitive Therapy and Research, 14(5), 449–468.* doi:10.1007/bf01172967

Govorun, O., & Payne, B. K. (2006). Ego—depletion and prejudice: Separating automatic and controlled components. *Social Cognition*, *24*(2), 111-136.

Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. (2010). Ego depletion and the strength model of self-control: a meta-analysis. *Psychological bulletin*, *136*(4), 495.

Hewitt, P. L., Flett, G. L., & Ediger, E. (1996). Perfectionism and depression: longitudinal assessment of a specific vulnerability hypothesis. *Journal of Abnormal Psychology*, *105*(2), 276.

Hewitt, P. L., Flett, G. L., Turnbull-Donovan, W., & Mikail, S. F. (1991). The Multidimensional Perfectionism Scale: Reliability, validity, and psychometric properties in psychiatric samples. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, *3*(3), 464.

Hofmann, W., Baumeister, R. F., Förster, G., & Vohs, K. D. (2012). Everyday temptations: an experience sampling study of desire, conflict, and self-control. *Journal of personality and social psychology*, *102*(6), 1318.

Hofmann, W., & Van Dillen, L. (2012). Desire: The new hot spot in self-control research. *Current directions in psychological science*, *21*(5), 317-322.

Inzlicht, M., McKay, L., & Aronson, J. (2006). Stigma as ego depletion: How being the target of prejudice affects self-control. *Psychological Science*, *17*(3), 262-269.

Klibert, J. J., Langhinrichsen-Rohling, J., & Saito, M. (2005). Adaptive and maladaptive aspects of self-oriented versus socially prescribed perfectionism. *Journal of College Student Development*, *46*(2), 141-156.

Larson, R., & Csikszentmihalyi, M. (2014). The experience sampling method. In *Flow and the foundations of positive psychology* (pp. 21-34). Springer, Dordrecht.

Lo, A., & Abbott, M. J. (2013). Review of the theoretical, empirical, and clinical status of adaptive and maladaptive perfectionism. *Behaviour Change*, *30*(2), 96.

Mischel, W., Cantor, N., & Feldman, S. (1996). Principles of self-regulation: the nature of willpower and self-control.

Mischel, W., Shoda, Y., & Peake, P. K. (1988). The nature of adolescent competencies predicted by preschool delay of gratification. *Journal of personality and social psychology*, *54*(4), 687.

Milyavskaya, M., & Inzlicht, M. (2017). What's so great about self-control? Examining the importance of effortful self-control and temptation in predicting real-life depletion and goal attainment. *Social Psychological and Personality Science*, *8*(6), 603-611.

Mills, J. S., & Blankstein, K. R. (2000). Perfectionism, intrinsic vs extrinsic motivation, and motivated strategies for learning: A multidimensional analysis of university students. *Personality and individual differences*, *29*(6), 1191-1204.

Rice, K. G., Ashby, J. S., & Slaney, R. B. (1998). Self-esteem as a mediator between perfectionism and depression: A structural equations analysis. *Journal of counseling psychology*, *45*(3), 304.

Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and social psychology review*, *10*(4), 295-319.

Stoeber, J., & Rambow, A. (2007). Perfectionism in adolescent school students: Relations with motivation, achievement, and well-being. *Personality and individual differences*, *42*(7), 1379-1389.

Stumpf, H., & Parker, W. D. (2000). A hierarchical structural analysis of perfectionism and its relation to other personality characteristics. *Personality and individual differences*, *28*(5), 837-852.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of personality*, *72*(2), 271-324.

Tornquist, M., & Miles, E. (2019). Trait self-control and beliefs about the utility of emotions for initiatory and inhibitory self-control. *European Journal of Social Psychology*, *49*(6), 1298-1312.

vanDellen, M. R., Hoy, M. B., & Hoyle, R. H. (2009). Contingent self-worth and social information processing: Cognitive associations between domain performance and social relations. *Social Cognition*, *27*(6), 847-866.

Ward, A., & Mann, T. (2000). Don't mind if I do: disinhibited eating under cognitive load. *Journal of personality and social psychology*, *78*(4), 753.

Appendix

Appendix A: State measurements: self-control and perfectionistic strivings

State self-control measurement (Baumeister, Wright & Carreon, 2019):

Ego Depletion

1. "In the past couple of hours, have you felt that it's hard to make up your mind about even simple things?"
2. "In the past couple of hours, have you felt that things are bothering you more than they usually would?"
3. "In the past couple of hours, have you felt that you have less mental and emotional energy than you normally have?"

Goal-directed self-control

4. "In the past couple of hours, how easy was it for you to do something "good" that you did not really want to do?" *For example, eating healthy food; studying for an exam; telling someone they hurt you; waking up early; going to the gym)*
5. "In the past couple of hours, I was able to stick to my goals."

Inhibitory self-control

6. "In the past hour, how easy was it for you to refrain from doing something "bad" you really wanted to do? *For example, snacking; procrastinating; take out your an ger on someone; take a nap during the day; sit on the couch)."*
7. "In the past few hours, I was able to resist temptations."

State Perfectionistic strivings

1. "At the moment I perceive my goals and standards as high."
2. "At the moment I feel the need to be competent in what I do."

Appendix B: Trait self-control scale

13-item Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004):

1. "I am good at resisting temptation "
2. "I have a hard time breaking bad habits "
3. "I am lazy "
4. "I say inappropriate things "
5. "I do certain things that are bad for me, if they are fun "
6. "I refuse things that are bad for me "

7. “I wish I had more self-discipline “
8. “People would say that I have iron self- discipline “
9. “Pleasure and fun sometimes keep me from getting work done “
10. “I have trouble concentrating “
11. “I am able to work effectively toward long-term goals “
12. “Sometimes I can’t stop myself from doing something, even if I know it is wrong “
13. “I often act without thinking through all the alternatives “

Appendix C: Trait perfectionistic strivings scale

Frost Multidimensional Perfectionism Scale (FMPS); Dimension: Personal Standards (Frost, Marten, Lahart & Rosenblate, 1990)

1. ” If I do not set the highest standards for myself, I am likely to end up a second-rate person. ”
2. ” It is important to me that I be thoroughly competent in what I do. ”
3. ” I set higher goals than most people. ”
4. ” I am very good at focusing my efforts on attaining a goal.”
5. ” I have extremely high goals. ”
6. ” Other people seem to accept lower standards from themselves than I do. ”
7. ” I expect higher performance in my daily tasks than most people. ”

Appendix D: Informed Consent

Dear Participant,

Thank you so much for signing up for our study! Before you start, a short introduction will follow. Information about the procedure and duration will be provided.

Overall, the purpose of this study is to measure self-control in daily life and how it affects certain aspects of our behaviour. By using monitoring tools that help us to identify the daily fluctuations of constructs from mental health, we can obtain an insight into their dynamic interactions!

Procedure & Duration

The study will run 15 days. On the first day, we will start with a so-called baseline questionnaire. This kind of questionnaire needs to be filled out at the beginning of the study, after one week and at the end of the study (don't worry you will be automatically provided with these questionnaires and remembered to fill them out). From the next day onward (day 2 of the study), you will receive notifications via Ethica which will remind you when it is time to fill out the next questionnaire (Please note: is necessarily to allow Ethica to send you notifications on your mobile device)! That will happen three times per day (in the morning, in the afternoon and in the evening). The questionnaires are very shortly and can be completed within approximately 2-3 minutes (Please note: it is important to fill out the questions as soon as possible (latest 1 hour after notification), as otherwise we will not be able to use your data).

Questions?

If you need more information about the study now or in the future, feel free to send an email to [redacted] (if you prefer an English or German answer) or to [redacted] (if you prefer the Dutch language).

Thank you very much for your support!

Fabienne, Jonathan, Donyell and Sarah