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Innovations in Cross-Linguistic Self-Control Measurement:
Creating a Short and Language-Invariant Version of the Self-
Control Strategy Scale

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Abstract

Self-control is critical for achieving long-term goals and improving well-being across various domains, such as academics, health, and relationships. Traditionally, self-control has been understood in terms of inhibition, focusing on the suppression of immediate desires. However, recent research has expanded this concept to include proactive strategies. The Self-Control Strategy Scale (SCSS) measures these strategies but is lengthy, potentially causing respondent fatigue and data quality issues. Therefore, this study aimed to develop a short, language-invariant SCSS (SCSS-s) for German and English speakers, maintaining its psychometric robustness while enhancing research efficiency and cross-lingual comparability. Items were reduced using item-subscale-total correlations, factor loadings, and inter-item correlations. The resulting SCSS-s maintained a strong model fit and preserved the original eight-factor structure. Subscale reliability remained stable ($\alpha = .59$ to $.88$), and convergent validity with the Brief Self-Control Scale was supported by explaining 54% of the variance in English data and 47% in German data. The SCSS-s also demonstrated predictive validity, accounting for up to 30% of variance in self-control failure. Precommitment and Behavioral Inhibition consistently emerged as key predictors. The SCSS-s delivers a streamlined yet psychometrically robust tool for evaluating self-control strategies in German and English populations, enabling reliable cross-linguistic assessment.

Keywords: Self-Control, Self-Control Strategies, SCSS, Short Form, Scale Development, Language Invariance

Abstract

Selbstkontrolle ist essentiell, um langfristige Ziele zu erreichen und in zentralen Lebensbereichen wie Bildung, Gesundheit und zwischenmenschlichen Beziehungen erfolgreich zu sein. Lange wurde Selbstkontrolle vor allem als Unterdrückung unmittelbarer Impulse verstanden, die moderne Forschung betont aber immer mehr auch proaktive Selbstkontrollstrategien. Die Self-Control-Strategy-Scale (Selbstkontrollstrategie-Skala; SCSS) misst diese Strategien, führt aber durch ihre Länge potentiell zu Ermüdungseffekten, die die Datenqualität beeinträchtigen können. Ziel dieser Arbeit war es deshalb, eine sprachinvariante Kurzform der SCSS zu entwickeln, die äquivalent in Deutsch und Englisch misst. Dadurch sollen Effizienz, Anwendbarkeit und Vergleichbarkeit verbessert werden, ohne die psychometrische Robustheit zu kompromittieren. Zur Itemreduktion wurden Item-Subskala-Gesamt-Korrelationen, Inter-Item-Korrelationen und Faktorladungen verwendet. Die resultierende Kurzform (SCSS-s) zeigt einen ausgezeichneten Modellfit und behält die ursprüngliche Acht-Faktoren-Struktur bei. Die Reliabilität der Subskalen bleibt stabil ($\alpha = .59$ bis $.88$) und ist nur geringfügig niedriger als die der Langversionen. Konvergente Validität wird durch die Erklärung von etwa 50% der Varianz in der Brief Self-Control Scale durch die SCSS-s gestützt. Die SCSS-s demonstriert zudem prädiktive Validität, indem sie bis zu 30 % der Varianz von Selbstkontrollversagen erklärt. Precommitment (Vorabverpflichtung) und Behavioral Inhibition (Verhaltenshemmung) zeigen sich konsistent als stärkste Prädiktoren. Die SCSS-s bietet eine effiziente und psychometrisch robuste Möglichkeit, um Selbstkontrollstrategien auf Deutsch und Englisch äquivalent zu messen und zu vergleichen.

Schlagwörter: Selbstkontrolle, Selbstkontrollstrategien, SCSS, Kurzversion, Skalenentwicklung, Sprachinvarianz

Introduction

In today's complex and fast-paced world, self-control plays an increasingly important role. By resisting short-term temptations in favor of long-term goals, self-control enables individuals to manage endless online distractions or to prioritize sustainability and health over convenience. It ultimately leads to increased success and well-being across multiple domains, such as academics, personal and environmental health, and interpersonal relationships (Barnes et al., 2007; Duckworth & Seligman, 2005; Hofmann et al., 2008).

Traditionally, self-control research has focused primarily on inhibition, the ability to suppress immediate impulses. However, recent studies highlight the importance of more complex self-control behaviors, such as strategic planning and environmental structuring (Granberg et al., 2021; Hennecke & Bürgler, 2023; Theobald, 2021). These self-control strategies make exercising self-control more manageable by preparing and structuring individuals' environments and mindsets in advance, reducing reliance on momentary inhibition to resist temptations. By minimizing the need for constant exertion of self-control, these strategies increase the likelihood of achieving long-term goals. Therefore, it is crucial to understand their impact and scope.

The Self-Control Strategy Scale (SCSS; Katzir et al., 2021) serves as a tool in this regard, as it allows for the systematic measurement of these strategies. It captures eight self-control strategies, providing insight into how individuals manage their self-control efforts. To enhance efficiency and applicability, developing a short and comparable version of the scale becomes imperative, making it the aim of this thesis.

Theoretical Background

Expanding the Concept of Self-Control: Strategies Beyond Inhibition

Self-control has traditionally been defined as the ability to exert willpower to manage conflicts between immediate desires and long-term goals. This process typically requires prioritizing delayed gratification over immediate rewards, for which individuals often have to endure aversive or demanding tasks. Consequently, it necessitates the effortful inhibition of impulses, emotions, and behaviors that interfere with long-term goals (De Ridder et al., 2012; Milyavskaya & Inzlicht, 2017; Tangney et al., 2004).

However, this focus on mere inhibition has recently been questioned. Research suggests expanding the concept to include different self-control strategies (Duckworth, White, et al., 2016; Fujita, 2011; Gillebaart & De Ridder, 2015; Hofmann & Kotabe, 2012; Katzir et al., 2021). For instance, Milyavskaya et al. (2021) found that in 89% of self-control critical situations, individuals use at least one self-control strategy. These findings underscore that such strategies are not only prevalent but can also significantly enhance the likelihood of self-control success, as supported by various studies indicating their effectiveness (Fujita, 2011; Hennecke & Bürgler, 2020; Milyavskaya & Inzlicht, 2017; Williamson & Wilkowski, 2020).

Although inhibition is seen as a self-control strategy, other strategies focus on anticipatory actions that proactively manage the environment or modify cognitive frameworks to prevent the emergence of temptation. These anticipatory strategies may involve creating physical or social barriers to impulse triggers, pre-planning to avoid high-risk situations, or using mental visualization techniques to reinforce future benefits over immediate desires (Duckworth, Gendler, et al., 2016; Katzir et al., 2021).

Importantly, current research indicates that the effectiveness of these strategies is context-specific, suggesting that their impact varies across different situations and domains.

For example, strategies that are effective in managing dietary impulses may not necessarily translate to academic or financial decision-making scenarios (Ariely & Wertenbroch, 2002; Duckworth, White, et al., 2016). This specificity underscores the necessity of understanding a range of self-control strategies to select and apply the most effective methods for specific situations.

Self-Control Strategies

This thesis focuses on the self-control strategies outlined in the Self-Control Strategy Scale (SCSS; Katzir et al., 2021), which has been validated and adapted into German (Roth et al., 2024). Recognized for its comprehensive methodology, the SCSS is essential for standardized measurements. This thesis aims to develop a shortened, language-invariant version to enhance its practical applicability and cross-lingual comparability between English and German.

The SCSS includes eight distinct self-control strategies: situation selection, reward, punishment, precommitment, distraction, cognitive change, acceptance, and behavioral inhibition (Katzir et al., 2021).

Situation Selection

Situation selection is an anticipatory strategy that encompasses choosing environments or contexts that minimize the likelihood of encountering temptations or distractions. For example, a person aiming to eat healthier might choose to avoid walking through a snack aisle at the grocery store, or someone focused on studying may opt to work in a quiet library instead of a busy coffee shop. By identifying specific triggers, individuals can select settings that avoid these triggers, effectively regulating impulses and emotions. This proactive approach helps prevent impulsive reactions and thereby supports better

self-control (Isaacowitz et al., 2015; Livingstone & Isaacowitz, 2015; Lopez et al., 2021; Van Bockstaele et al., 2020; Webb et al., 2018).

Reward

Using rewards strategically means leveraging positive reinforcement to motivate and sustain behavior that aligns with long-term goals. By setting up rewards for achieving certain milestones or behaviors, individuals can enhance their motivation and commitment. These rewards bridge the gap between immediate actions and distant goals, facilitating adherence to goal-directed behaviors (Harari et al., 2021; Wang et al., 2021; Woolley & Fishbach, 2017).

However, relying on rewards can shift motivation from intrinsic to extrinsic, potentially undermining the intrinsic value of the behaviors themselves. This can be problematic, hence when the rewards are phased out upon reaching set goals, such as achieving a desired weight through healthy eating and exercise, the maintenance of these healthy behaviors often diminishes, potentially reversing progress (Kaiser et al., 2020; Malek et al., 2020; Ryan & Deci, 2000).

Punishment

The strategy of punishment functions by introducing negative consequences for behavior that does not align with long-term goals. This approach is based on the principle that the anticipation of negative outcomes can motivate individuals to avoid certain behaviors.

However, similar to reward-based strategies, punishment can also lead to a reliance on external motivations (Bear et al., 2017; Deci et al., 1981). If individuals associate certain behaviors exclusively with avoiding punishment, they may cease those behaviors once the threat is removed. Additionally, excessive use of punishment can induce negative emotional responses such as anxiety or resentment, which may counteract any long-term benefits in behavioral regulation. In line with these observations, researchers found correlations between

the use of punishment strategies and increased symptoms of depression and burnout, along with a decrease in life satisfaction (Hallard et al., 2021; Roth et al., 2024). However, causal relationships have not yet been determined.

Precommitment

Precommitment entails using self-imposed constraints that reduce the likelihood of deviating from planned actions. This usually implies setting explicit deadlines or commitments to create external accountability, which serves to reinforce commitment to individuals' goals. For instance, purchasing a year-long gym membership serves as a financial and psychological commitment to regular exercise, increasing the cost of non-attendance and enhancing engagement.

Research demonstrates precommitment correlates with self-control success, but its utility may be contingent on individual self-control levels (Ariely & Wertenbroch, 2002; Sjøstad & Ekström, 2021). Those with strong self-control are more likely to utilize precommitment and benefit, as maintaining commitments inherently demands self-control (Noor, 2007). Moreover, the likelihood of committing decreases with rising commitment costs, leading to lower-than-ideal commitments, which paradoxically lowers goals and diminishes performance. Thus, effective precommitment requires understanding and managing self-control limits without additional stress (Ariely & Wertenbroch, 2002; Casari et al., 2009; John, 2020; Schwartz et al., 2014).

Distraction

Distraction as a self-control strategy means diverting one's focus from temptations to alternative activities or thoughts. It aims to decrease the immediate appeal of desires that conflict with long-term goals. This strategy is particularly helpful in situations where

avoiding temptation is not possible, allowing for effective management of impulses through alternative engagement.

Although initial findings confirm distraction's effectiveness as a self-control strategy (Williamson & Wilkowski, 2020), it is more commonly recognized for managing pain and negative emotions (In et al., 2023; Kohl et al., 2013; Strauss et al., 2016). Additionally, its impact may vary on whether it is used to avoid discomfort or to shift attention temporarily (Wolgast & Lundh, 2017).

Cognitive Change

Cognitive change involves altering one's perception of a temptation to reduce its appeal. This strategy is employed by reframing how an individual thinks about a temptation, focusing on its negative aspects or the benefits of resisting. For example, when tempted by unhealthy food, a person might remind themselves of the health consequences of poor eating habits or the positive outcomes of healthier choices. By mentally reevaluating the temptation, the desire becomes less attractive, making it easier to maintain self-control and adhere to long-term goals.

Cognitive change is particularly known as an emotion regulation strategy (Cutuli, 2014; Goldin et al., 2008; Troy et al., 2013). In the context of self-control, it seems to be especially beneficial for resisting positive temptations, such as unhealthy food cravings. This contrasts with the reappraisal of aversive activities, which is likely more challenging (Giuliani et al., 2013; Leroy et al., 2012; Siep et al., 2012; Williamson & Wilkowski, 2020).

Acceptance

The strategy of acceptance entails acknowledging and experiencing temptations without acting on them. Rather than trying to avoid or change the impulse, acceptance encourages individuals to observe their desires non-judgmentally. This approach helps to

diminish the power of temptations over time, as recognizing and allowing feelings and thoughts to exist without immediate reaction reduces their intensity. For instance, if someone feels an urge to eat a sweet treat while dieting, practicing acceptance would mean acknowledging the craving, understanding it's natural, yet choosing not to act on it.

Acceptance is a key component of mindfulness practices and is particularly emphasized in Acceptance and Commitment Therapy (ACT; Ruiz, 2010). Research demonstrates that ACT effectively changes responses to urges across various contexts, such as compulsive behaviors and nutrition management, thereby supporting better self-control (Bowen & Marlatt, 2009; Forman et al., 2016; Gregg et al., 2007; Ostafin & Marlatt, 2008; See et al., 2023; Twohig et al., 2006).

Inhibition

Behavioral inhibition focuses on the direct suppression of impulses and actions that are not aligned with long-term goals. This strategy involves consciously restraining oneself from engaging in immediate gratifications. For example, when someone feels tempted to skip a workout session, using behavioral inhibition means actively deciding not to give in to laziness and instead following through with the exercise plan. This act of willpower is critical in moments when temptations are strong, and other strategies like distraction or cognitive change might not be sufficient. By exercising behavioral inhibition, individuals maintain control over their actions, ensuring they stay on track toward their goals.

Though modern research emphasizes various aspects of self-control, inhibition remains a fundamental component (Adriaanse et al., 2014; De Ridder et al., 2011; Fujita, 2011; Katzir et al., 2021). It can be enhanced through repeated practice, which in turn fosters habit formation (Beames et al., 2017; Diamond, 2013). Eventually, inhibiting undesired behavior becomes automated, reducing the need for active suppression (Adriaanse et al.,

2014; Carden & Wood, 2018). This shift from effortful control to automatic behavior demonstrates inhibition's sustainability as a self-control strategy.

Effectiveness

The effectiveness of self-control strategies is context-specific, with their success depending on the situation and individual goals. Research shows that combining multiple strategies often yields better outcomes, as different methods may complement each other effectively (Bürgler et al., 2021; Milyavskaya et al., 2021). For example, situation selection can prevent temptations, while precommitment reinforces long-term goals, proven beneficial in domains like academics and health (Ariely & Wertenbroch, 2002; Duckworth et al., 2016).

However, not all strategies consistently lead to positive outcomes. While precommitment has been linked to increased life satisfaction and physical activity, punishment is often associated with negative emotional states, such as lower life satisfaction and higher depression rates (Roth et al., 2024). Reward and cognitive change show limited correlation with successful outcomes, suggesting their effectiveness might be restricted to specific contexts or less impactful overall (Katzir et al., 2021; Roth et al., 2024).

Measuring Self-Control and -Strategies

While several tools exist for measuring self-control, they often do not address self-control strategies comprehensively or are overly specific to particular contexts. The Brief Self-Control Scale (BSCS; (Tangney et al., 2004), which is currently one of the most popular tools for measuring self-control, primarily focuses on inhibition, offering a unidimensional perspective on self-control (Katzir et al., 2021). On the other hand, the Tempest Self-Regulation Questionnaire for Eating (TESQ-E; (De Vet et al., 2014) measures self-control strategies, but only within the specific context of eating behaviors.

Bridging Measurement Gaps: The SCSS

Recognizing these limitations, the Self-Control Strategy Scale (SCSS; Katzir et al., 2021) was developed to provide a more comprehensive assessment. It aims to cover a wide array of self-control strategies, making it applicable across diverse contexts. The initial collection of strategies for the SCSS was based on prior research. After refinement and validation across six samples ($N = 1946$), eight strategies were identified, forming the final scale.

The strategies, functioning as subscales, are operationalized through a set of 38 items (5 reverse coded), while one subscale comprises four to six items. Additionally, the scale includes three attention control items, resulting in a total of 41 items. The items follow a 1 (*not at all*) to 5 (*very much*) Likert scale. Each subscale is scored separately by calculating the average score of the associated items, allowing for an analysis of how frequently each strategy is used.

The reliability of the SCSS subscales is high, with Cronbach's alpha values ranging from .66 to .93, indicating strong internal consistency across the different strategies.

Convergent validity was determined by correlating the SCSS with the BSCS (Tangney et al., 2004). Combined, all strategies of the SCSS explained 66% of the variance in trait self-control. To determine predictive validity, the SCSS was correlated with measures for self-control failure and success in various domains such as savings or fitness. Results varied across different self-control strategies. However, researchers highlighted that the SCSS added predictive value beyond the BSCS. Strategies like precommitment and situation selection were identified as particularly effective in predicting positive self-control-related outcomes (Ariely & Wertenbroch, 2002; Duckworth, White, et al., 2016; Katzir et al., 2021; Roth et al., 2024).

German version of the SCSS

The SCSS was further translated and validated for German-speaking populations by Roth et al. (2024). Evaluated across four studies ($N = 3,359$), the eight-factor model showed good fit and was superior to alternative structures, confirming the general structure of the measure. The model was invariant across gender and age groups, indicating its broad applicability. Internal consistency for most subscales was satisfactory ($\omega > .70$), except for the precommitment subscale, which showed lower reliability due to translation challenges. However, the subscale still predicted relevant outcomes, suggesting inherent heterogeneity in the strategy. Test-retest reliability was generally satisfactory, though distraction and cognitive change showed lower stability (Roth et al., 2024).

The German SCSS demonstrated convergent validity by explaining approximately 70% of the variance in the closely related trait self-control. Predictive validity was confirmed by correlating strategies with self-control-related outcomes. Behavioral inhibition showed associations most frequently, followed by precommitment. Situation selection was positively correlated to physical activity, while precommitment showed positive effects on academic performance. These findings support the context specificity of self-control strategies. Importantly, the strategies accounted for roughly one-third of the variance in procrastination between participants, demonstrating discriminative validity. Finally, strategies were positively associated with overall life satisfaction (Roth et al., 2024).

Need for a language invariant short-scale

The SCSS was developed to comprehensively measure self-control strategies. It provides detailed insight into the use of those strategies. However, it presents limitations that necessitate a shorter form:

The length of the SCSS can lead to respondent fatigue. The full scale comprises 41 items, which may be burdensome for participants, especially in large-scale studies or repeated measures designs. This can result in decreased data quality, as participants may lose focus or become disengaged, potentially leading to incomplete or unreliable responses (Jeong et al., 2023; Kost & Correa Da Rosa, 2018; Rolstad et al., 2011).

A language invariant short form enables comparability between languages. This allows direct comparison of research outcomes from diverse populations, which is particularly relevant for international studies. It improves measurement accuracy and fairness, minimizing biases from inadequate translations or cultural misalignments, and facilitating a cultural sensitive approach (Fischer et al., 2019; Thielmann et al., 2020). Additionally, using a single adaptable scale across multiple contexts is cost-effective, streamlining research and conserving resources.

Therefore, this thesis aimed to develop a short language invariant version of the SCSS that maintains high reliability and validity, ensuring broad applicability, comparability, and efficiency in both German and English-speaking populations. To achieve this goal, the following hypotheses are proposed:

H1: The short SCSS retains the original SCSS's eight-factor structure.

H2: The short SCSS demonstrates reliability comparable to the full version.

H3: The short SCSS is configural, metric, and scalar invariant between the German and English versions.

H4: The short SCSS exhibits predictive validity by correlating with self-control failure measurements.

Methods

To develop the short SCSS (SCSS-s), key steps included language invariance testing, item reduction, and validation processes. These steps, outlined in Table 1, aimed to create the SCSS-s as an efficient cross-lingual tool for assessing self-control strategies. All statistical analyses were performed using R (R Core Team, 2016).

Table 1

Methods Overview

Step	Description
Data	Consistent factor structure
Preparation	Standardize variable names and data types
Merging	Merge datasets with language indicator
Language Invariance Testing	
Configural	Assess if factor structure is consistent across languages
Metric	Test if factor loadings are equal
Scalar	Check if item intercepts are equal
Item Reduction (conditional)	Goal: two to three items per subscale
Item-subscale-total correlations	Remove items with weak correlations ($<.4$)
Factor loadings	Remove items with low factor loadings ($<.4$)
Discriminative Power	Corrected item-subscale score correlation, remove items with correlations $<.3$
Inter-item correlations	Remove redundant items with high inter-item correlation ($>.8$)
Reliability and Validity Testing	
Internal Consistency	Cronbach's alpha comparable to original scale
Convergent Validity	Multiple regression with the Brief Self-Control Scale (BSCS)
Predictive Validity	Multiple regression analyses using self-control failure measures

Data

To develop an invariant short form in German and English, datasets from the SCSS in both languages (English: Katzir et al., 2021; German: Roth et al., 2024) were combined. Both datasets were inspected for compatibility by checking structural consistency and data types, and standardizing the variable names. Data from participants who failed attention checks were excluded from the English dataset, and variables not required for scale development were removed. Subsequently, participants with missing age values were excluded (2.7% of the total sample), resulting in a final sample size of $N = 5,196$ ($N = 3,359$ German, $N = 1,837$ English). This ensured all participants were aged 18 or older and that data accuracy was maintained. A language indicator was added to differentiate between German and English responses. The combined dataset was reviewed to confirm successful merging and data integration.

For validity analyses, subsamples were used based on data availability: $N = 787$ (German) and $N = 1,837$ (English) for convergent validity, and $N = 1,165$ (German) and $N = 1,400$ (English) for predictive validity.

SCSS Language Invariance Testing

After preparing the data, language invariance testing (configural, metric, scalar) was performed, to verify that the SCSS measures equivalently in German and English (Table 2).

Achieving scalar invariance is essential as it allows for valid mean comparisons by confirming that differences in scores reflect actual differences in the underlying constructs. This ensures the SCSS is suitable for cross-lingual analysis (Cheung & Rensvold, 2002; Putnick & Bornstein, 2016).

Table 2*Language Invariance Testing*

Invariance Level	Objective	Statistical Constraints
Configural	Consistent factor structure	Multi-group CFA; $CFI \geq 0.95$, $RMSEA \leq 0.06$
Metric	Equal factor loadings → items have the same impact on latent factors	CFA with constraints on factor loadings; assess model fit: $CFI \geq 0.95$, $RMSEA \leq 0.06$
Scalar	Equal item intercepts → allowing comparison of latent variable means	CFA with constraints on intercepts; assess model fit: $CFI \geq 0.95$, $RMSEA \leq 0.06$

Configural invariance was assessed, to confirm that the eight factor structure of the SCSS is consistent in both language groups. A multi-group confirmatory factor analysis (CFA) was computed using language as the grouping variable. The eight-factor model was specified according to the theoretical structure of the SCSS, detailing how each item loads onto its respective factor. Model fit was assessed using two primary indices: Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA). Acceptable values are CFI close to or above 0.95 and RMSEA below 0.06 (Hu & Bentler, 1999). Good model fit indicates that the basic structure of the SCSS is equivalent across languages.

Metric invariance was tested to ensure that the factor loadings are equal across both language groups. This step verifies that the relationships between items and their underlying factors are consistent across languages. To test for metric invariance, the factor loadings were set to be equal, and model fit was reassessed using the same indices and cutoffs as for configural invariance. Good model fit after adding these constraints indicates that metric invariance holds.

Scalar invariance was assessed to ensure that the item intercepts are equal across language groups. This step confirms that participants with the same level of the underlying construct have the same expected item scores, regardless of language. To test for scalar invariance, both the factor loadings and item intercepts were constrained to be equal across groups. Model fit was reassessed with the same acceptable values as before. Good model fit with additional constraints indicates scalar invariance.

Confirming configural, metric, and scalar invariance ensures the SCSS operates equivalently in German and English, allowing valid scale comparisons (Davidov et al., 2014).

Item Reduction

The goal was to reduce each SCSS subscale to two to three items by identifying the most representative and distinct ones. Conditional steps were used for this selection (Clark & Watson, 2016; Richins, 2004; Tian et al., 2001; Worthington & Whittaker, 2006). After each item removal, the model was refitted. If the model fit remained acceptable and the number of items was still too high, the subsequent step was executed. If removing an item resulted in a deterioration of the model fit, that item cannot be removed, and the steps will continue with the item retained. This process proceeded until the desired number of items was reached.

Firstly, item-subscale-total Pearson correlations were calculated. Items with higher correlations are considered more representative of the respective subscale. Items with item-subscale-total correlations above .4 were retained.

Next, the item loadings were examined. Items with low loadings (below .4) that are consistently weak in both language groups were removed (Peterson, 2000).

Following, the discriminative power of each item was evaluated to assess its contribution to the overall subscale score. Corrected item-subscale-total correlations were calculated by correlating each item with its subscale score, excluding that item. Items with

correlations below .3 were identified for potential removal due to insufficient discriminative power (Kelava & Moosbrugger, 2012; Körner et al., 2008; Sappok et al., 2014).

Lastly, inter-item correlations were used to identify redundancy between items. Items with very high inter-item correlations (above .8) may be redundant and were considered for removal.

Since the number of items did not sufficiently decrease despite these steps, a final refinement phase was applied. In this phase, Items were ranked by factor loadings, with the lowest-performing items removed, reducing each subscale to two items. This was intended to ensure the best possible reduction even if some criteria were not fully met.

The result of these steps is the SCSS-s, consistently refitted to confirm its language invariance and adherence to the eight-factor structure.

Reliability and Validity Testing

To assess whether the scale is not only language invariant but also reliable, internal consistency was evaluated. Although McDonald's omega is generally considered more robust, Cronbach's alpha was used in this study because omega requires subscales longer than two items (Rammstedt & Beierlein, 2014). Cronbach's alpha was calculated for each subscale of the SCSS-s, and these reliability measures were then compared to those of the original scale (Katzir et al., 2021; Roth et al., 2024). The aim was to reach alpha values no more than .1 lower than the values of the original scales.

After assessing the reliability, convergent validity was assessed to determine whether the short SCSS correlates well with established measures of similar constructs. This involved multiple regression analyses with the subscales of the short SCSS as predictors of the Brief Self-Control Scale (BSCS; (Tangney et al., 2004). Significant regression coefficients ($p < .05$) and a substantial coefficient of determination demonstrate convergent validity.

To explore predictive validity, multiple regression analysis was performed with the SCSS-s subscales as predictors and self-control failure measurements as the outcome variable. The Pure Procrastination Scale (Steel, 2010) and Katzir's self-control failure score (2021) functioned as self-control failure measurements. Significant predictors were determined at the .05 p -value level. The regression coefficients (β) indicate the direction and strength of each subscale's relationship with self-control failure. Additionally, the R^2 value represents the proportion of variance in self-control failure measurements explained by the subscales, highlighting which self-control strategies are most effective in mitigating procrastination.

This analysis aimed to identify the unique contribution of each self-control strategy to procrastination tendencies. An inverse relationship between higher self-control and lower levels of self-control failure signals good predictive validity (Ferrari & Emmons, 1995; Geng et al., 2021; Uzun et al., 2020; Zhao et al., 2021).

Consistent with these expectations, the regression analysis of the German SCSS (Roth et al., 2024) revealed that self-control strategies collectively explained approximately 32.7% of the variance in procrastination. In both the German and English versions of the SCSS (Katzir et al., 2021) behavioral inhibition emerged as a particularly strong negative predictor of self-control failure ($\beta = -.49, p < .001$ in German and $\beta = -.17, p < .001$ in English). Pre-commitment negatively correlated with self-control failure in both studies ($\beta = -.15, p < .001$ in German and $\beta = -.04, p < .05$ in English). Punishment showed slight positive associations ($\beta = .07, p < .05$ in German and $\beta = .05, p < .001$ in English). These findings served as benchmarks for evaluating the predictive validity of the short SCSS.

Results

Language Invariance Testing

The fit indices for the German and English data were first calculated separately to assess potential discrepancies between the language groups. Both language groups showed a good model fit (German: CFI = 0.927, RMSEA = 0.044; English: CFI = 0.930, RMSEA = 0.050), indicating alignment with the proposed eight-factor structure of the SCSS.

Configural invariance testing demonstrated that the factor structure was largely equivalent across languages. With CFI = 0.928 and RMSEA = 0.046, the fit indices were within the acceptable limits of CFI close to or above 0.95 and RMSEA below 0.06. Metric invariance testing confirmed the comparability of factor loadings across languages (CFI = 0.923, RMSEA = 0.047). Scalar invariance testing showed slightly weaker results (CFI = 0.898, RMSEA = 0.053). While RMSEA remained within acceptable bounds, the CFI fell below the ideal threshold of 0.95, indicating some deviations in covariances. However, since the CFI was close to the criterion and RMSEA met criteria, scalar invariance was regarded as largely achieved.

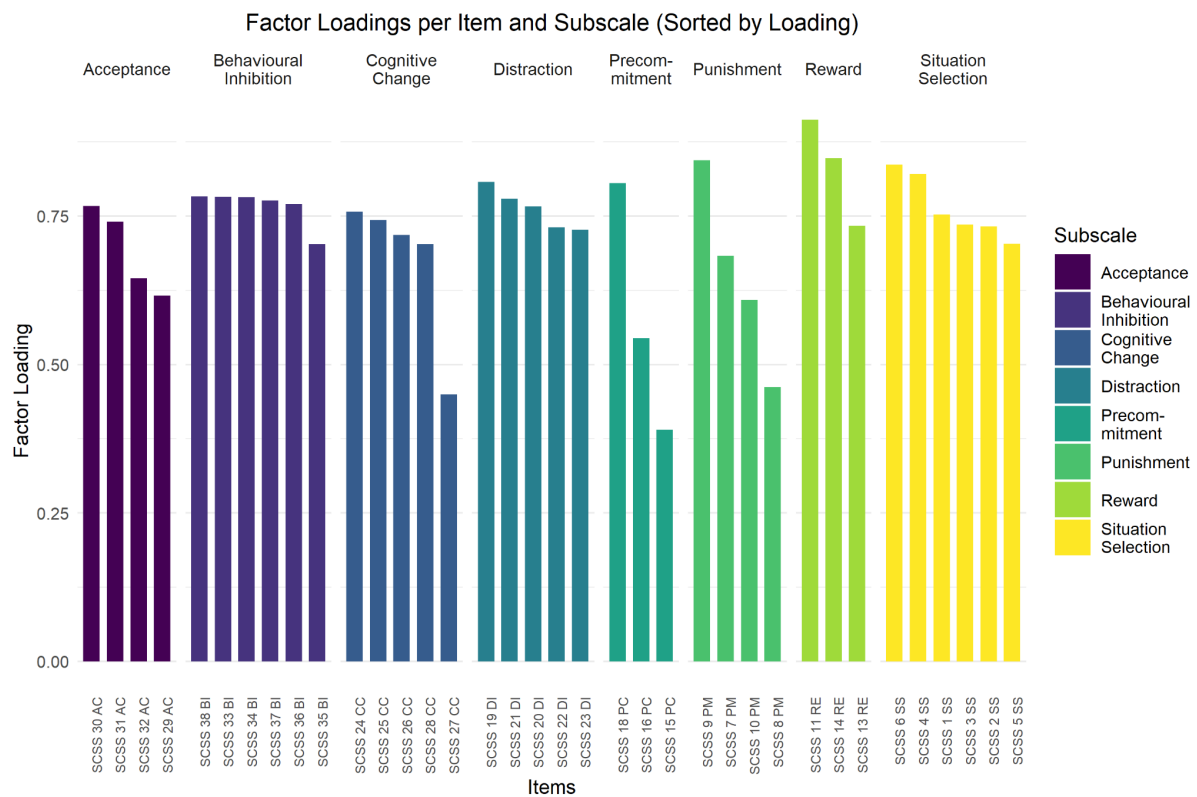
In conclusion, the eight factor structure of the SCSS demonstrated good fit across both German and English data. Despite minor deviations in intercepts, the SCSS is language invariant, indicating that differences in scores reflect actual differences in the underlying constructs. This cross-linguistic applicability allows for further development of the short scale using the merged German and English data.

Item Reduction

The conditional item reduction process comprised item-subscale-total correlations, factor loadings, discriminative power, and inter-item correlations.

Item-subscale-total correlations did not lead to the removal of any items, as all correlations exceeded the .4 threshold. None of the correlations fell below .5, with only one item in the Precommitment subscale below .6. No items were eliminated based on this criterion. The examination of the factor loadings identified one item (SCSS_17_PC) loading below the threshold of .4, leading to its removal. The refitted model showed improved fit (CFI = 0.925, RMSEA = 0.046). The criterion of discriminative power, defined by corrected item-total correlations below .3, did not identify any items for exclusion, as all correlations were above this cutoff. Lastly, inter-item correlation analysis identified two highly correlated items: SCSS_12_RE and SCSS_11_RE. Given their similar factor loadings (.93 for SCSS_12_RE and .92 for SCSS_11_RE), the decision was based on wording. Item 11 ("I usually reward myself for accomplishing my long-term goals") was retained due to its broader phrasing, which aligns with the goal of developing a short scale that remains broadly applicable, while Item 12 ("I reward myself for the achievement of a long-term goal") was removed. The model was refitted, showing good fit (CFI = .925, RMSEA = .046).

The applied item reduction criteria removed only two items, insufficient to meet the target of two to three items per subscale. Consequently, the final refinement phase ranked items by factor loadings (illustrated in Figure 1). The lowest-ranked items were excluded to achieve the target of two items per subscale. The selected items for the short scale are: SCSS_6_SS, SCSS_4_SS (Situation Selection), SCSS_9_PM, SCSS_7_PM (Punishment), SCSS_11_RE, SCSS_14_RE (Reward), SCSS_18_PC, SCSS_16_PC (Precommitment), SCSS_19_DI, SCSS_21_DI (Distraction), SCSS_24_CC, SCSS_25_CC (Cognitive Change), SCSS_30_AC, SCSS_31_AC (Acceptance), and SCSS_33_BI, SCSS_38_BI (Inhibition). A full list of items, their wordings, and factor loadings can be found in the appendix.

Figure 1*Final refinement phase***The SCSS-s**

The final model, based on the reduced items, was redefined and refitted. The fit indices were excellent, with a CFI of 0.990 (threshold > 0.95) and an RMSEA of 0.026 (threshold < 0.06), indicating that the refined model fits the data better than the previous iterations. For the German version, the final model achieved a CFI of 0.993 and an RMSEA of 0.021, for the English version, the CFI was 0.988 and the RMSEA was 0.032. Compared to the baseline values (German: CFI = 0.927, RMSEA = 0.044; English: CFI = 0.930, RMSEA = 0.050), the refined model shows a marked improvement in fit across both languages.

Reliability

Internal consistency (Cronbach's Alpha) was calculated separately for the English and German SCSS-s versions and compared to the values of the SCSS (Table 2).

Table 2

Internal Consistency Data for SCSS and SCSSs Subscales

Cronbach's Alphas for	<i>SS</i>	<i>PU</i>	<i>RE</i>	<i>PC</i>	<i>DI</i>	<i>CC</i>	<i>AC</i>	<i>BI</i>
SCSS English	.93	.80	.90	.66	.90	.87	.82	.91
SCSS-s English	.87	.70	.88	.59	.84	.81	.77	.77
SCSS German	.88	.74	.93	.57	.85	.78	.78	.89
SCSS-s German	.81	.80	.87	.63	.74	.66	.68	.78

Note. Rounded to two decimal points. Values for German SCSS from Roth et al.

(2024), for the English SCSS from Katzir et al. (2021).

In both languages, the SCSS-s showed slightly lower reliability across most subscales. However, reliability increased for the German Punishment and Precommitment subscales (.74 to .80 and .57 to .63, respectively). Overall, the reduction in Cronbach's Alpha for the short version remained within the targeted .1 decrease from the original SCSS. This demonstrates that reducing the number of items did not significantly compromise the reliability of the scale. The SCSS-s retains enough of the original content to maintain internal consistency, making it a more efficient tool for practical use while still ensuring reliable measurement across both languages.

Validity

Convergent Validity with BSCS. Separate multiple regression analyses were undertaken for both the English and German samples to assess the convergent validity of the SCSS-s subscales in relation to the Brief Self-Control Scale (BSCS). The model explained 54 % of the variance in the English dataset ($F(8, 1828) = 273.1, p < .001$) and 47% of the variance in the German dataset ($F(8, 778) = 88.12, p < .001$). Although slightly lower than in the long versions, explained variance remains substantial.

Table 3

Convergent Validity: Predicting Trait Self-Control from Specific Self-Control Strategies

Version	SS	PU	RE	PC	DI	CC	AC	BI	R^2
SCSS English	.03	-.06***	.00	.16***	.00	.00	-.03*	.73***	.66
SCSS-s English	-.02	-.03*	-.04***	.23***	.04*	.02	-.08***	.48***	.54
SCSS German	.07**	-.01	-.01	.15***	.00	.03	-.03	.69***	.59
SCSS-s German	.04*	-.03	-.01	.13***	.02	.07**	-.07**	.40***	.47

Note. Standardized regression coefficients (β) for predicting trait self-control (Brief Self-Control Scale). Asterisks indicate significance levels: $p < .05$ (*), $p < .01$ (**), and $p < .001$ (***). R^2 values represent the proportion of explained variance in self-control. Values for German SCSS from Roth et al. (2024), for the English SCSS from Katzir et al. (2021).

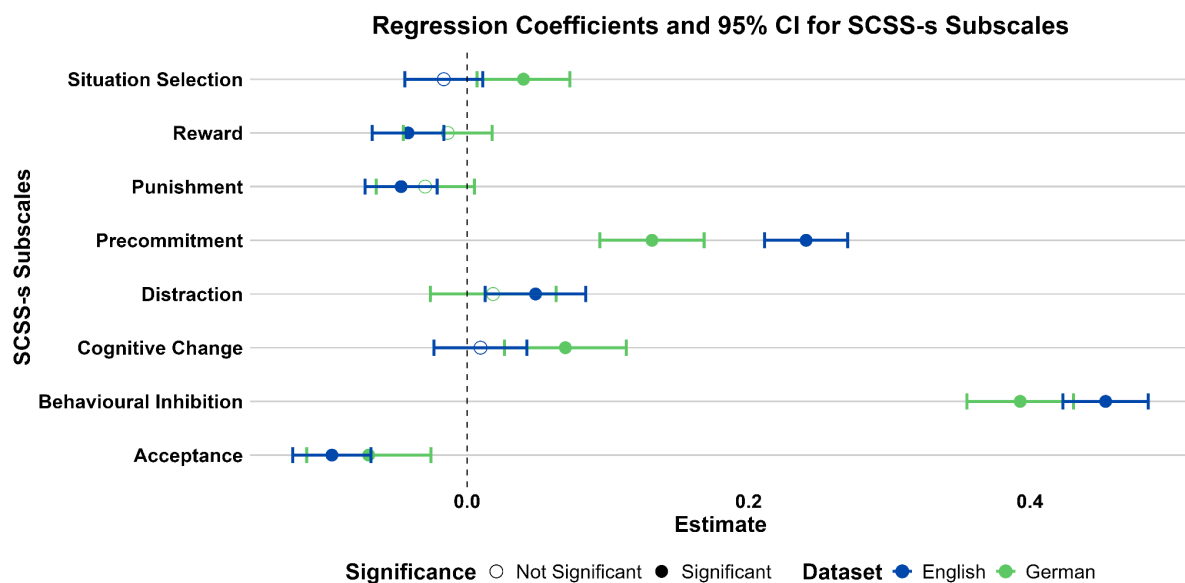
In the English sample, Precommitment, Distraction, and Behavioural Inhibition were significant positive predictors of self-control, whereas Punishment, Reward, and Acceptance showed significant negative associations. In the German sample, Precommitment, Cognitive Change, Behavioural Inhibition, and Situation Selection emerged as significant positive predictors, with Acceptance again showing a significant negative association (Table 3).

Comparing these results with the long version of the SCSS, the overall pattern of key predictors is largely consistent across both versions. Precommitment and Behavioural Inhibition consistently emerge as the strongest predictors, reaffirming their critical role in self-control. However, some nuances arise in the short versions, such as the additional significance of Distraction and Reward in the English sample, which were not significant in the long version. Additionally, Cognitive Change emerged as a significant positive predictor in the German SCSS-s, while showing no significance in the other versions.

This analysis, as summarized in the forest plot (Figure 2), demonstrates that despite the reduction in item numbers, the SCSS-s retains essential predictive power of trait self-control. Compared to the full SCSS, there is no substantial loss in convergent validity.

Figure 2

Convergent Validity: Multiple Regression of SCSS-s and BSCS



Note. Standardized regression coefficients (β) for predicting trait self-control (Brief Self-Control Scale) from SCSS-s subscales. Significance levels indicated as $p < .05$. Error bars represent 95% confidence intervals.

Predictive Validity with Self Control Failure Measurements. To assess predictive validity of the SCSS-s, multiple regression analysis was conducted using its subscales as predictors and the Pure Procrastination Scale (Steel, 2010) and Katzir’s composite self-control failure score (2021) as outcome measures. Although the SCSS-s explains slightly less variance ($R^2 = .11$ and $.30$ for the English and German versions, respectively) compared to the full SCSS ($R^2 = .23$ and $.33$), this reduction aligns with expectations due to item reduction. The proportionate decrease in R^2 is relatively minor, indicating that the SCSS-s retains substantial predictive power. For context, a linear regression using the established Brief Self-Control Scale (BSCS) to predict self-control failure yielded an R^2 of approximately $.21$, highlighting that the SCSS-s performs similarly to this benchmark measure.

Table 4

Predictive Validity: Predicting Self-Control Failure from Specific Self-Control Strategies

Version	SS	PU	RE	PC	DI	CC	AC	BI	R^2
SCSS English	.04	.14***	-.04	-.10**	-.04	.08**	.02	-.44***	.23
SCSS-s English	.06**	.07***	.01	-.15***	-.07**	.05*	.04*	-.18***	.11
SCSS German	-.00	.07*	-.00	-.15**	-.05	-.02	-.03	-.49***	.33
SCSS-s German	-.001	.11***	.01	-.14***	-.05	-.05	-.03	-.38***	.30

Note. Standardized regression coefficients (β) for predicting self-control failure (Pure Procrastination Scale (for German data) and Self-Control Failure Score (for English data). Asterisks indicate significance levels: $p < .05$ (*), $p < .01$ (**), and $p < .001$ (***). R^2 values represent the proportion of explained variance in self-control. Values for German SCSS from Roth et al. (2024), for the English SCSS from Katzir et al. (2021).

Examining the regression coefficients (Table 4) reveals a consistent pattern, with Precommitment and Behavioral Inhibition as the leading negative predictors across all

versions, reinforcing their inverse relationship with self-control lapses. Punishment, conversely, remains the most prominent positive predictor. However, specific deviations are observed: In the English SCSS-s, Acceptance shows a significant positive effect, while in the German versions, its effect is negative but not significant. This contrast indicates potential contextual differences in the relationship between acceptance strategies and self-control failure. Additionally, Situation Selection (SS) in the English SCSS-s exhibits an unexpected significant positive association with self-control failure, contradicting the anticipated inverse relationship based on theoretical considerations.

Hypotheses Evaluation

Overall, the results provide support for the hypotheses proposed: the SCSS-s retains the original eight-factor structure (H1), demonstrates comparable reliability (H2), and holds configural, metric, and scalar invariance across languages (H3). Moreover, the SCSS-s demonstrated convergent validity through its association with the BSCS and predictive validity in accounting for self-control failures (H4), substantiating its utility in assessing self-control strategies.

Discussion

Summary

This thesis aimed to develop a short version of the SCSS (Katzir et al., 2021), while maintaining its psychometric robustness and enhancing research efficiency and cross-lingual comparability. The development process involved item reduction based on inter-item correlations and factor loadings, followed by confirmatory factor analyses to assess model fit in both languages. Additionally, reliability and convergent and predictive validity were evaluated separately for the German and English versions. The analyses indicated that the

resulting short SCSS (SCSS-s) maintains strong psychometric properties, demonstrating robust model fit, reliability, and validity across both the German and English versions.

Quality Assessment of the SCSS-s

The SCSS-s retained the core eight-factor structure and demonstrated satisfactory model fit across both languages, suggesting that the reduction in item numbers did not compromise the integrity of the underlying constructs. Language invariance testing established evidence for configural and metric invariance, confirming that the factor structure and item loadings were consistent between German and English speakers. Although scalar invariance revealed minor deviations in intercepts, these differences were within acceptable limits, indicating that the scale remains broadly comparable across languages. However, these subtle deviations underscore the need for caution when interpreting mean score differences between language groups.

The initial item reduction criteria—based on item-subscale-total correlations, factor loadings, discriminative power, and inter-item correlations—were less effective than expected, resulting in the removal of only two items. Most items exhibited consistently strong psychometric properties, with high correlations and loadings above the established cutoffs. This homogeneity likely limited the criteria's ability to distinguish between stronger and weaker items. Moreover, the relatively low inter-item correlations indicate that the items were not redundant but instead captured distinct nuances of their respective subscale strategies. As a result, the criteria did not provide sufficient differentiation to achieve the target of reducing each subscale to two or three items.

Due to this limitation, the final item selection relied heavily on ranking items by factor loadings. This shift allowed for the retention of items that contributed most strongly to the subscale's structural integrity. While this approach optimized model fit and preserved key

constructs, it narrowed the focus to core dimensions, potentially reducing the conceptual breadth and subtlety of the measured strategies. However, this outcome is expected, as fewer items inherently limit the breadth and nuance that can be measured. Short scales are designed for efficiency, focusing on core dimensions rather than capturing the full complexity of the construct.

In capturing these core dimensions, the SCSS-s enhances clarity and precision, as evidenced by its improved fit indices. With CFI values consistently above 0.95 and RMSEA values well below 0.06, the refined model aligns more closely with the observed data, indicating a reduction in statistical noise and secondary influences. These improvements suggest that the item reduction effectively concentrated the scale on its most robust indicators, enhancing the model's internal coherence.

The internal coherence of the SCSS-s is further reflected in its reliability metrics, which remained stable across both language versions, despite the reduction in items. While internal consistency showed minor decreases in most subscales, these reductions were modest and well within acceptable limits, indicating the scale's coherence and conciseness in measuring self-control strategies.

The consistently lower reliability of the Precommitment subscale across versions likely stems from the inherent heterogeneity of commitment tactics it captures, ranging from internal constraints to external accountability. This diversity introduces variability in responses, reflecting its nature as a multi-dimensional construct in self-control research. Conversely, the increased reliability of the German Punishment subscale suggests that refining items helped sharpen focus on core behaviors, enhancing clarity and consistency.

Overall, the SCSS-s demonstrates reliable measurement of the self-control strategies with fewer items. By retaining the most informative items, the SCSS-s achieves a balance

between comprehensive measurement and practical usability, allowing researchers to efficiently assess self-control strategies without sacrificing measurement precision.

The convergent validity analysis supports the adequacy of the SCSS-s in measuring self-control strategies effectively. Although the SCSS-s explained slightly less variance in trait self-control compared to the long versions, these reductions were modest and aligned with expectations due to the fewer items retained. This efficiency comes without a substantial loss in predictive capacity, underscoring the streamlined version's utility.

Notably, Precommitment and Behavioral Inhibition consistently emerged as strong predictors, reaffirming their central role in managing self-control. Their prominence aligns with theoretical perspectives that emphasize proactive and inhibitory strategies as critical components of effective self-control. Nuances in the findings—such as the emergence of Cognitive Change in the German SCSS-s and the increased significance of Reward and Distraction in the English SCSS-s—suggest that refining the scale has enhanced the clarity of certain strategies' contributions. These shifts indicate that the item reduction process not only preserved essential constructs but also refined the representation of specific self-control tactics, thereby improving interpretability and cross-linguistic applicability.

Cumulatively, the SCSS-s shows solid convergent validity by aligning well with a broader self-control measure (BSCS), despite measuring specific strategies rather than general traits. This alignment confirms the scale's precision in targeting essential self-regulatory behaviors while maintaining its theoretical distinctiveness from broader constructs of self-control.

The SCSS-s demonstrated strong predictive validity in assessing self-control failure, with only minimal reductions in explanatory power aligning with expectations due to item reduction. The scale's predictive capacity remained comparable to that of the established BSCS, underscoring its robustness. Precommitment and Behavioral Inhibition consistently

emerged as key predictors, reaffirming their theoretical importance in self-control. The nuanced role of Punishment, which showed a positive association with failure, suggests potential maladaptive effects when punitive strategies dominate self-control efforts. Moreover, divergent patterns between language versions, such as contrasting effects of Acceptance, point to contextual influences and cultural variability in strategy efficacy. These findings reinforce the SCSS-s's capacity to capture targeted strategies while highlighting the importance of contextual factors in interpreting results.

Comprehensively, the SCSS-s effectively balances psychometric robustness with practical efficiency, preserving essential self-control constructs while demonstrating strong reliability, cross-linguistic consistency, and both convergent and predictive validity. This streamlined version offers researchers a concise, reliable tool for assessing self-control strategies across diverse contexts.

Limitations and Future Research

Several methodological and conceptual limitations should be acknowledged. First, the item reduction criteria were proved insufficient to effectively narrow the item pool. These criteria might not have been sensitive enough to distinguish items with nuanced contributions to the scale. Relying predominantly on statistical fit indices could have emphasized structural coherence at the expense of substantive psychological relevance. Future research could explore more sophisticated methodologies, such as item response theory (IRT), to better capture interdependencies between items and refine the scale's measurement properties. Developing a weighted aggregate score that accounts for the adaptive or maladaptive contributions of each subscale could offer a more comprehensive perspective on overall self-control success.

The findings also indicate potential cultural variability in the predictive role of certain strategies, such as Acceptance and Situation Selection. Differences in these strategies' effects on self-control outcomes across language versions suggest that the SCSS-s may not fully capture all strategic nuances in cross-linguistic contexts. According to Roth et al. (2023), different cultures may emphasize unique strategies, which suggests that further validation work is necessary to explore whether the SCSS-s holds intercultural generalizability or whether additional, culture-specific strategies should be considered.

A further conceptual limitation is the context-independent measurement of self-control strategies in the SCSS-s, despite evidence suggesting that strategies may be highly context-specific (Ariely & Wertenbroch, 2002; Bürgler et al., 2021; Duckworth, Gendler, et al., 2016; Milyavskaya et al., 2021; Roth, 2023). This raises concerns about the validity of assessing general tendencies across situations, as strategy use may vary depending on the specific context. Future research should focus on evaluating self-control strategies within distinct domains to enhance the precision and contextual relevance of the scale.

Lastly, although procrastination was employed as an indicator of self-control failure to establish the SCSS-s's predictive validity, it is essential to acknowledge that self-control lapses may extend beyond procrastination alone. Procrastination captures a specific manifestation of impulsivity and delayed gratification, yet self-control failures could encompass a broader range of behaviors, including challenges in emotional regulation, dietary restraint, and health maintenance (Pietrzak & Tokarz, 2016; Pychyl & Sirois, 2016; Rebetz et al., 2018). This conceptual distinction requires further examination, as over-reliance on procrastination as a proxy may limit the SCSS-s's applicability to contexts where self-control failures manifest differently. Although procrastination is a well-established measure of self-regulatory difficulties, incorporating additional measures related to

impulsivity or emotion regulation, may provide a more comprehensive assessment of the SCSS's predictive validity.

Overall, the correlational basis of the findings limits the ability to draw causal conclusions. Future research could explore the development of aggregate scoring approaches, investigate interactions between self-control strategies, and examine the cultural adaptability. These efforts could provide more nuanced insights into the dynamics and contextual relevance of self-control strategies.

Conclusion

This thesis developed a short version of the SCSS (SCSS-s), achieving a balance between psychometric robustness and research efficiency. The SCSS-s retained the core eight-factor structure and demonstrated good model fit. Despite slight deviations in scalar invariance, the scale remains broadly comparable between languages.

The item reduction process, primarily based on factor loadings to retain key items, led to improved model fit and enhanced coherence. The SCSS-s showed stable reliability and strong convergent validity with the BSCS. It demonstrated predictive validity by retaining substantial explanatory power in predicting self-control failure. Precommitment and Behavioral Inhibition emerged as the strongest predictors of self-control, reaffirming their central role in self-control.

However, limitations remain. The reduction criteria were not fully effective in differentiating weaker items, and the absence of an aggregate score limits comparisons with broader self-control measures. Additionally, strategies may be context-specific, raising questions about the validity of general assessments.

Overall, the SCSS-s provides an efficient and reliable tool for assessing self-control strategies across diverse contexts, while ongoing refinement could further enhance its precision and applicability.

References

- Adriaanse, M. A., Kroese, F. M., Gillebaart, M., & De Ridder, D. T. D. (2014). Effortless inhibition: Habit mediates the relation between self-control and unhealthy snack consumption. *Frontiers in Psychology, 5*.
<https://doi.org/10.3389/fpsyg.2014.00444><https://doi.org/10.1007/s12144-019-00442-3>
- Ariely, D., & Wertenbroch, K. (2002). Procrastination, Deadlines, and Performance: Self-Control by Precommitment. *Psychological Science, 13*(3), 219–224.
<https://doi.org/10.1111/1467-9280.00441>
- Barnes, S., Brown, K. W., Krusemark, E., Campbell, W. K., & Rogge, R. D. (2007). The Role of Mindfulness in Romantic Relationship Satisfaction and Responses to Relationship Stress. *Journal of Marital and Family Therapy, 33*(4), 482–500.
<https://doi.org/10.1111/j.1752-0606.2007.00033.x>
- Beames, J. R., Schofield, T. P., & Denson, T. F. (2017). A meta-analysis of improving self-control with practice. In *Routledge international handbook of self-control in health and well-being* (S. 405–417). Routledge.
<https://www.taylorfrancis.com/chapters/edit/10.4324/9781315648576-32/meta-analysis-improving-self-control-practice-joanne-beames-timothy-schofield-thomas-denson>
- Bear, G. G., Slaughter, J. C., Mantz, L. S., & Farley-Ripple, E. (2017). Rewards, praise, and punitive consequences: Relations with intrinsic and extrinsic motivation. *Teaching and Teacher Education, 65*, 10–20. <https://doi.org/10.1016/j.tate.2017.03.001>
- Bowen, S., & Marlatt, A. (2009). Surfing the urge: Brief mindfulness-based intervention for college student smokers. *Psychology of Addictive Behaviors, 23*(4), 666–671.
<https://doi.org/10.1037/a0017127>
- Bürgler, S., Hoyle, R. H., & Hennecke, M. (2021). Flexibility in using self-regulatory strategies to manage self-control conflicts: The role of metacognitive knowledge, strategy repertoire, and feedback monitoring. *European Journal of Personality, 35*(6), 861–880.
<https://doi.org/10.1177/0890207021992907>

- Carden, L., & Wood, W. (2018). Habit formation and change. *Current Opinion in Behavioral Sciences*, 20, 117–122. <https://doi.org/10.1016/j.cobeha.2017.12.009>
- Casari, M., Bisin, A., Brandts, J., Camera, G., Camerer, C., Charness, G., Courtois, P., Frechette, G., Laibson, D., Levin, D., Nicolini, R., Plott, C., Riedl, A., & Viscusi, K. (2009). Pre-commitment and flexibility in a time decision experiment. *J Risk Uncertain*, 38, 117–141.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5
- Clark, L. A., & Watson, D. (2016). *Constructing validity: Basic issues in objective scale development*. <https://psycnet.apa.org/record/2015-32022-012>
- Cutuli, D. (2014). Cognitive reappraisal and expressive suppression strategies role in the emotion regulation: An overview on their modulatory effects and neural correlates. *Frontiers in Systems Neuroscience*, 8. <https://doi.org/10.3389/fnsys.2014.00175>
- Davidov, E., Meuleman, B., Cieciuch, J., Schmidt, P., & Billiet, J. (2014). Measurement Equivalence in Cross-National Research. *Annual Review of Sociology*, 40(Volume 40, 2014), 55–75. <https://doi.org/10.1146/annurev-soc-071913-043137>
- De Ridder, D. T. D., De Boer, B. J., Lugtig, P., Bakker, A. B., & Van Hooft, E. A. J. (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. <https://doi.org/10.1016/j.paid.2011.01.015>
- De Ridder, D. T. D., 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. <https://doi.org/10.1177/1088868311418749>
- De Vet, E., De Ridder, D., Stok, M., Brunso, K., Baban, A., & Gaspar, T. (2014). Assessing self-regulation strategies: Development and validation of the tempest self-regulation questionnaire for eating (TESQ-E) in adolescents. *International Journal of Behavioral Nutrition and Physical Activity*, 11(1), 106. <https://doi.org/10.1186/s12966-014-0106-z>

- Deci, E., Nezlek, J., & Sheinman, L. (1981). Characteristics of the Rewarder and Intrinsic Motivation of the Rewarder. *Journal of Personality and Social Psychology*, 40, 1975) cognitive evaluation theory, which distinguishes between the controlling and informational aspects of rewards. <https://doi.org/10.1037/0022-3514.40.1.1>
- Diamond, A. (2013). Executive Functions. *Annual Review of Psychology*, 64(Volume 64, 2013), 135–168. <https://doi.org/10.1146/annurev-psych-113011-143750>
- Duckworth, A. L., Gendler, T. S., & Gross, J. J. (2016). Situational Strategies for Self-Control. *Perspectives on psychological science : a journal of the Association for Psychological Science*, 11(1), 35–55. <https://doi.org/10.1177/1745691615623247>
- Duckworth, A. L., & Seligman, M. E. P. (2005). Self-Discipline Outdoes IQ in Predicting Academic Performance of Adolescents. *Psychological Science*, 16(12), 939–944. <https://doi.org/10.1111/j.1467-9280.2005.01641.x>
- Duckworth, A. L., White, R. E., Matteucci, A. J., Shearer, A., & Gross, J. J. (2016). A stitch in time: Strategic self-control in high school and college students. *Journal of Educational Psychology*, 108(3), 329–341. <https://doi.org/10.1037/edu0000062>
- Ferrari, J., & Emmons, R. (1995). Methods of Procrastination and their Relation to Self-Control and Self-Reinforcement: An Exploratory Study. *Journal of social behavior and personality*, 10, 135–142.
- Fischer, J., Praetorius, A.-K., & Klieme, E. (2019). The impact of linguistic similarity on cross-cultural comparability of students' perceptions of teaching quality. *Educational Assessment, Evaluation and Accountability*, 31(2), 201–220. <https://doi.org/10.1007/s11092-019-09295-7>
- Forman, E. M., Butryn, M. L., Manasse, S. M., Crosby, R. D., Goldstein, S. P., Wyckoff, E. P., & Thomas, J. G. (2016). Acceptance-based versus standard behavioral treatment for obesity: Results from the mind your health randomized controlled trial. *Obesity*, 24(10), 2050–2056. <https://doi.org/10.1002/oby.21601>
- Fujita, K. (2011). On Conceptualizing Self-Control as More Than the Effortful Inhibition of Impulses. *Personality and Social Psychology Review*, 15(4), 352–366.

<https://doi.org/10.1177/1088868311411165>

- Geng, Y., Gu, J., Wang, J., & Zhang, R. (2021). Smartphone addiction and depression, anxiety: The role of bedtime procrastination and self-control. *Journal of Affective Disorders*, 293, 415–421. <https://doi.org/10.1016/j.jad.2021.06.062>
- Gillebaart, M., & De Ridder, D. T. D. (2015). Effortless Self-Control: A Novel Perspective on Response Conflict Strategies in Trait Self-Control. *Social and Personality Psychology Compass*, 9(2), 88–99. <https://doi.org/10.1111/spc3.12160>
- Giuliani, N. R., Calcott, R. D., & Berkman, E. T. (2013). Piece of cake. Cognitive reappraisal of food craving. *Appetite*, 64, 56–61. <https://doi.org/10.1016/j.appet.2012.12.020>
- Goldin, P. R., McRae, K., Ramel, W., & Gross, J. J. (2008). The Neural Bases of Emotion Regulation: Reappraisal and Suppression of Negative Emotion. *Biological psychiatry*, 63(6), 577–586. <https://doi.org/10.1016/j.biopsych.2007.05.031>
- Granberg, C., Palm, T., & Palmberg, B. (2021). A case study of a formative assessment practice and the effects on students' self-regulated learning. *Studies in Educational Evaluation*, 68, 100955. <https://doi.org/10.1016/j.stueduc.2020.100955>
- Gregg, J. A., Callaghan, G. M., Hayes, S. C., & Glenn-Lawson, J. L. (2007). Improving diabetes self-management through acceptance, mindfulness, and values: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 75(2), 336–343. <https://doi.org/10.1037/0022-006X.75.2.336>
- Hallard, R. I., Wells, A., Aadahl, V., Emsley, R., & Pratt, D. (2021). Metacognition, rumination and suicidal ideation: An experience sampling test of the self-regulatory executive function model. *Psychiatry Research*, 303, 114083. <https://doi.org/10.1016/j.psychres.2021.114083>
- Harari, M., Williams, E., Castro, S., & Brant, K. (2021). Self-leadership: A meta-analysis of over two decades of research. *Journal of Occupational and Organizational Psychology*, 94. <https://doi.org/10.1111/joop.12365>
- Hennecke, M., & Bürgler, S. (2020). Many roads lead to Rome: Self-regulatory strategies and their effects on self-control. *Social and Personality Psychology Compass*, 14(6), e12530. <https://doi.org/10.1111/spc3.12530>

- Hennecke, M., & Bürgler, S. (2023). Metacognition and self-control: An integrative framework. *Psychological Review*, 130(5), 1262–1288. <https://doi.org/10.1037/rev0000406>
- Hofmann, W., Friese, M., & Wiers, R. W. (2008). Impulsive Versus Reflective Influences on Health Behavior: A Theoretical Framework and Empirical Review. *Health Psychology Review*, 2(2), 111–137. <https://doi.org/10.1080/17437190802617668>
- Hofmann, W., & Kotabe, H. (2012). A General Model of Preventive and Interventive Self-Control. *Social and Personality Psychology Compass*, 6(10), 707–722. <https://doi.org/10.1111/j.1751-9004.2012.00461.x>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- In, S., Hur, J.-W., Kim, G., & Lee, J.-H. (2023). Effects of distraction, cognitive reappraisal, and acceptance on the urge to self-harm and negative affect in nonsuicidal self-injury. *Current Psychology*, 42(11), 9063–9070. <https://doi.org/10.1007/s12144-021-02151-2>
- Isaacowitz, D. M., Livingstone, K. M., Harris, J. A., & Marcotte, S. L. (2015). Mobile Eye Tracking Reveals Little Evidence for Age Differences in Attentional Selection for Mood Regulation. *Emotion (Washington, D.C.)*, 15(2), 151–161. <https://doi.org/10.1037/emo0000037>
- Jeong, D., Aggarwal, S., Robinson, J., Kumar, N., Spearot, A., & Park, D. S. (2023). Exhaustive or exhausting? Evidence on respondent fatigue in long surveys. *Journal of Development Economics*, 161, 102992. <https://doi.org/10.1016/j.jdeveco.2022.102992>
- John, A. (2020). When Commitment Fails: Evidence from a Field Experiment. *Management Science*, 66(2), 503–529. <https://doi.org/10.1287/mnsc.2018.3236>
- Kaiser, F. G., Henn, L., & Marschke, B. (2020). Financial rewards for long-term environmental protection. *Journal of Environmental Psychology*, 68, 101411. <https://doi.org/10.1016/j.jenvp.2020.101411>
- Katzir, M., Baldwin, M., Werner, K. M., & Hofmann, W. (2021). Moving beyond Inhibition: Capturing a Broader Scope of the Self-Control Construct with the Self-Control Strategy Scale (SCSS). *Journal of Personality Assessment*, 103(6), 762–776.

<https://doi.org/10.1080/00223891.2021.1883627>

Kelava, A., & Moosbrugger, H. (2012). Deskriptivstatistische Evaluation von Items (Itemanalyse) und Testwertverteilungen. In H. Moosbrugger & A. Kelava (Hrsg.), *Testtheorie und Fragebogenkonstruktion* (S. 75–102). Springer Berlin Heidelberg.

https://doi.org/10.1007/978-3-642-20072-4_4

Kohl, A., Rief, W., & Glombiewski, J. A. (2013). Acceptance, Cognitive Restructuring, and Distraction as Coping Strategies for Acute Pain. *The Journal of Pain*, 14(3), 305–315.

<https://doi.org/10.1016/j.jpain.2012.12.005>

Körner, A., Geyer, M., Roth, M., Drapeau, M., Schmutzer, G., Albani, C., Schumann, S., & Brähler, E. (2008). Persönlichkeitsdiagnostik mit dem NEO-Fünf-Faktoren-Inventar: Die 30-Item-Kurzversion (NEO-FFI-30). *PPmP - Psychotherapie · Psychosomatik · Medizinische Psychologie*, 58(6), 238–245. <https://doi.org/10.1055/s-2007-986199>

Kost, R. G., & Correa Da Rosa, J. (2018). Impact of survey length and compensation on validity, reliability, and sample characteristics for Ultrashort-, Short-, and Long-Research Participant Perception Surveys. *Journal of Clinical and Translational Science*, 2(1), 31–37.

<https://doi.org/10.1017/cts.2018.18>

Leroy, V., Grégoire, J., Magen, E., Gross, J. J., & Mikolajczak, M. (2012). Lead Me Not into Temptation: Using Cognitive Reappraisal to Reduce Goal Inconsistent Behavior. *PLOS ONE*, 7(7), e39493. <https://doi.org/10.1371/journal.pone.0039493>

Livingstone, K. M., & Isaacowitz, D. M. (2015). Situation Selection and Modification for Emotion Regulation in Younger and Older Adults. *Social psychological and personality science*, 6(8), 904–910. <https://doi.org/10.1177/1948550615593148>

Lopez, R. B., Cosme, D., Werner, K. M., Saunders, B., & Hofmann, W. (2021). Associations between use of self-regulatory strategies and daily eating patterns: An experience sampling study in college-aged women. *Motivation and Emotion*, 45(6), 747–758.

<https://doi.org/10.1007/s11031-021-09903-4>

Malek, S. L., Sarin, S., & Haon, C. (2020). Extrinsic Rewards, Intrinsic Motivation, and New Product Development Performance. *Journal of Product Innovation Management*, 37(6), 528–551.

<https://doi.org/10.1111/jpim.12554>

Milyavskaya, M., & Inzlicht, M. (2017). Attentional and motivational mechanisms of self-control. In *Routledge international handbook of self-control in health and well-being* (S. 11–23).

Routledge.

<https://www.taylorfrancis.com/chapters/edit/10.4324/9781315648576-2/attentional-motivatio-nal-mechanisms-self-control-marina-milyavskaya-michael-inzlicht>

Milyavskaya, M., Saunders, B., & Inzlicht, M. (2021). Self-control in daily life: Prevalence and effectiveness of diverse self-control strategies. *Journal of Personality*, 89(4), 634–651.

<https://doi.org/10.1111/jopy.12604>

Noor, J. (2007). Commitment and self-control. *Journal of Economic Theory*, 135(1), 1–34.

<https://doi.org/10.1016/j.jet.2006.03.017>

Ostafin, B. D., & Marlatt, G. A. (2008). Surfing the Urge: Experiential Acceptance Moderates the Relation Between Automatic Alcohol Motivation and Hazardous Drinking. *Journal of Social and Clinical Psychology*, 27(4), 404–418. <https://doi.org/10.1521/jscp.2008.27.4.404>

Peterson, R. A. (2000). A Meta-Analysis of Variance Accounted for and Factor Loadings in Exploratory Factor Analysis. *Marketing Letters*, 11(3), 261–275.

<https://doi.org/10.1023/A:1008191211004>

Pietrzak, A., & Tokarz, A. (2016). Procrastination as a Form of Misregulation in the Context of Affect and Self-Regulation. *Studia Humana*, 5(3), 70–82. <https://doi.org/10.1515/sh-2016-0016>

Putnick, D. L., & Bornstein, M. H. (2016). Measurement Invariance Conventions and Reporting: The State of the Art and Future Directions for Psychological Research. *Developmental review* : DR, 41, 71–90. <https://doi.org/10.1016/j.dr.2016.06.004>

Pychyl, T. A., & Sirois, F. M. (2016). Procrastination, Emotion Regulation, and Well-Being. In *Procrastination, Health, and Well-Being* (S. 163–188). Elsevier.

<https://doi.org/10.1016/B978-0-12-802862-9.00008-6>

R Core Team. (2016). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>

Rammstedt, B., & Beierlein, C. (2014). Can't We Make It Any Shorter?: The Limits of Personality

- Assessment and Ways to Overcome Them. *Journal of Individual Differences*, 35(4), 212–220.
<https://doi.org/10.1027/1614-0001/a000141>
- Rebetez, M. M. L., Rochat, L., Barsics, C., & Van Der Linden, M. (2018). Procrastination as a Self-Regulation Failure: The Role of Impulsivity and Intrusive Thoughts. *Psychological Reports*, 121(1), 26–41. <https://doi.org/10.1177/0033294117720695>
- Richins, M. L. (2004). The Material Values Scale: Measurement Properties and Development of a Short Form. *Journal of Consumer Research*, 31(1), 209–219. <https://doi.org/10.1086/383436>
- Rolstad, S., Adler, J., & Rydén, A. (2011). Response Burden and Questionnaire Length: Is Shorter Better? A Review and Meta-analysis. *Value in Health*, 14(8), 1101–1108.
<https://doi.org/10.1016/j.jval.2011.06.003>
- Roth, L. (2023). Strategies for self control: German translation and evaluation of the Self Control Strategy Scale. *Peer Community in Registered Reports*, 100498.
<https://doi.org/10.24072/pci.rr.100498>
- Roth, L., Jankowski, J., Meindl, D., Clay, G., Mlynski, C., Freiman, O., Nordmann, A., Stenzel, L.-C., & Wagner, V. (2024). *Registered Report: Self-Control Beyond Inhibition. German Translation and Quality Assessment of the Self-Control Strategy Scale (SCSS)*.
<https://doi.org/10.31234/osf.io/gpmnv>
- Ruiz, F. J. (2010). A Review of Acceptance and Commitment Therapy (ACT) Empirical Evidence: Correlational, Experimental Psychopathology, Component and Outcome Studies. *International Journal of Psychology*.
- Ryan, R. M., & Deci, E. L. (2000). When rewards compete with nature: The undermining of intrinsic motivation and self-regulation. In *Intrinsic and extrinsic motivation* (S. 13–54). Elsevier.
<https://www.sciencedirect.com/science/article/pii/B9780126190700500246>
- Sappok, T., Gaul, I., Bergmann, T., Dziobek, I., Bölte, S., Diefenbacher, A., & Heinrich, M. (2014). The Diagnostic Behavioral Assessment for autism spectrum disorder—Revised: A screening instrument for adults with intellectual disability suspected of autism spectrum disorders. *Research in Autism Spectrum Disorders*, 8(4), 362–375.
<https://doi.org/10.1016/j.rasd.2013.12.016>

- Schwartz, J., Mochon, D., Wyper, L., Maroba, J., & Patel, D. (2014). Healthier by Precommitment. *Psychological science*, 25. <https://doi.org/10.1177/0956797613510950>
- See, C. C. H., Tan, V. S. Y., Tan, J. M., & Sündermann, O. (2023). The effects of brief emotional acceptance instructions on emotional distress and compulsive urges of various obsessive-compulsive symptoms dimensions. *Journal of Experimental Psychopathology*, 14(3), 20438087231190121. <https://doi.org/10.1177/20438087231190121>
- Siep, N., Roefs, A., Roebroek, A., Havermans, R., Bonte, M., & Jansen, A. (2012). Fighting food temptations: The modulating effects of short-term cognitive reappraisal, suppression and up-regulation on mesocorticolimbic activity related to appetitive motivation. *NeuroImage*, 60(1), 213–220. <https://doi.org/10.1016/j.neuroimage.2011.12.067>
- Sjåstad, H., & Ekström, M. (2021). *Ulyssean Self-Control: Pre-commitment is effective, but choosing it freely requires good self-control*. <https://doi.org/10.31234/osf.io/w24eb>
- Steel, P. (2010). Arousal, avoidant and decisional procrastinators: Do they exist? *Personality and Individual Differences*, 48(8), 926–934. <https://doi.org/10.1016/j.paid.2010.02.025>
- Strauss, G. P., Ossenfort, K. L., & Whearty, K. M. (2016). Reappraisal and Distraction Emotion Regulation Strategies Are Associated with Distinct Patterns of Visual Attention and Differing Levels of Cognitive Demand. *PLOS ONE*, 11(11), e0162290. <https://doi.org/10.1371/journal.pone.0162290>
- 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. <https://doi.org/10.1111/j.0022-3506.2004.00263.x>
- Theobald, M. (2021). Self-regulated learning training programs enhance university students' academic performance, self-regulated learning strategies, and motivation: A meta-analysis. *Contemporary Educational Psychology*, 66, 101976. <https://doi.org/10.1016/j.cedpsych.2021.101976>
- Thielmann, I., Akrami, N., Babarović, T., Belloch, A., Bergh, R., Chirumbolo, A., Čolović, P., De Vries, R. E., Dostál, D., Egorova, M., Gnisci, A., Heydasch, T., Hilbig, B. E., Hsu, K.-Y., Izdebski, P., Leone, L., Marcus, B., Međedović, J., Nagy, J., ... Lee, K. (2020). The

- HEXACO–100 Across 16 Languages: A Large-Scale Test of Measurement Invariance. *Journal of Personality Assessment*, 102(5), 714–726.
<https://doi.org/10.1080/00223891.2019.1614011>
- Tian, K. T., Bearden, W. O., & Hunter, G. L. (2001). Consumers' need for uniqueness: Scale development and validation. *Journal of consumer research*, 28(1), 50–66.
- Troy, A. S., Shallcross, A. J., & Mauss, I. B. (2013). A Person-by-Situation Approach to Emotion Regulation: Cognitive Reappraisal Can Either Help or Hurt, Depending on the Context. *Psychological Science*, 24(12), 2505–2514. <https://doi.org/10.1177/0956797613496434>
- Twohig, M. P., Hayes, S. C., & Masuda, A. (2006). A preliminary investigation of acceptance and commitment therapy as a treatment for chronic skin picking. *Behaviour Research and Therapy*, 44(10), 1513–1522. <https://doi.org/10.1016/j.brat.2005.10.002>
- Uzun, B., LeBlanc, S., & Ferrari, J. R. (2020). Relationship between Academic Procrastination and Self-Control: The Mediation Role of Self-Esteem. *College Student Journal*, 54(3), 309–316.
- Van Bockstaele, B., Atticciati, L., Hiekkaranta, A. P., Larsen, H., & Verschuere, B. (2020). Choose change: Situation modification, distraction, and reappraisal in mild versus intense negative situations. *Motivation and Emotion*, 44(4), 583–596.
<https://doi.org/10.1007/s11031-019-09811-8>
- Wang, Y., Gao, H., Sun, chang, Liu, J., & Fan, X. (2021). Academic procrastination in college students: The role of self-leadership. *Personality and Individual Differences*, 178, 110866.
<https://doi.org/10.1016/j.paid.2021.110866>
- Webb, T. L., Lindquist, K. A., Jones, K., Avishai, A., & Sheeran, P. (2018). Situation selection is a particularly effective emotion regulation strategy for people who need help regulating their emotions. *Cognition and Emotion*, 32(2), 231–248.
<https://doi.org/10.1080/02699931.2017.1295922>
- Williamson, L. Z., & Wilkowski, B. M. (2020). Nipping Temptation in the Bud: Examining Strategic Self-Control in Daily Life. *Personality and Social Psychology Bulletin*, 46(6), 961–975.
<https://doi.org/10.1177/0146167219883606>
- Wolgast, M., & Lundh, L.-G. (2017). Is Distraction an Adaptive or Maladaptive Strategy for Emotion

- Regulation? A Person-Oriented Approach. *Journal of Psychopathology and Behavioral Assessment*, 39(1), 117–127. <https://doi.org/10.1007/s10862-016-9570-x>
- Woolley, K., & Fishbach, A. (2017). Immediate Rewards Predict Adherence to Long-Term Goals. *Personality and Social Psychology Bulletin*, 43(2), 151–162.
<https://doi.org/10.1177/0146167216676480>
- Worthington, R. L., & Whittaker, T. A. (2006). Scale Development Research: A Content Analysis and Recommendations for Best Practices. *The Counseling Psychologist*, 34(6), 806–838.
<https://doi.org/10.1177/0011000006288127>
- Zhao, J., Meng, G., Sun, Y., Xu, Y., Geng, J., & Han, L. (2021). The relationship between self-control and procrastination based on the self-regulation theory perspective: The moderated mediation model. *Current Psychology*, 40(10), 5076–5086. <https://doi.org/10.1007/s12144-019-00442-3>

Appendix

Table 5

Final Refinement Phase: Factor Loadings of Remaining Items

Item	Loading
SCSS_1_SS	.7524003
SCSS_2_SS	.7322855
SCSS_3_SS	.7355754
SCSS_4_SS	.8208392
SCSS_5_SS	.7033266
SCSS_6_SS	.8364327
SCSS_7_PM	.6829946
SCSS_8_PM	.4618210
SCSS_9_PM	.8442401
SCSS_10_PM	.6086685
SCSS_11_RE	.9119751
SCSS_13_RE	.7337470
SCSS_14_RE	.8473062
SCSS_15_PC	.3903670
SCSS_16_PC	.5441095
SCSS_18_PC	.8052475
SCSS_19_DI	.8071618
SCSS_20_DI	.7659158
SCSS_21_DI	.7788490
SCSS_22_DI	.7309306
SCSS_23_DI	.7268942
SCSS_24_CC	.7573763
SCSS_25_CC	.7432160
SCSS_26_CC	.7181009
SCSS_27_CC	.4499655
SCSS_28_CC	.7027702
SCSS_29_AC	.6162233
SCSS_30_AC	.7665610
SCSS_31_AC	.7407131
SCSS_32_AC	.6450983
SCSS_33_BI	.7826406
SCSS_34_BI	.7817205
SCSS_35_BI	.7028774
SCSS_36_BI	.7705303
SCSS_37_BI	.7763994
SCSS_38_BI	.7831835

Note. Factor loadings of items after the final refinement phase. Higher loadings indicate stronger contributions to the subscales. Abbreviations: SS = Situation Selection, PM = Punishment, RE = Reward, PC = Precommitment, DI = Distraction, CC = Cognitive Change, AC = Acceptance, BI = Behavioral Inhibition.

Table 6*Item List SCSS-s*

Item	German Wording (Roth et al., 2024)	English Wording (Katzir et al., 2021)
SCSS_4_SS	Ich passe meine Umgebung an, um keine Versuchungen zu erleben.	I alter my environment so that I will not face temptations.
SCSS_6_SS	Ich organisiere mein Umfeld so, dass ich keine Versuchungen erlebe.	I organize my environment so that I will not face temptations
SCSS_7_PM	Normalerweise bestrafe ich mich nicht dafür, wenn ich einer Versuchung nachgegeben habe. [R]	I usually don't create punishments for myself in case I fall into temptation. [R]
SCSS_9_PM	Ich bestrafe mich dafür, wenn ich „Verträge mit mir selbst“ breche.	I penalize myself for breaking my own “personal contracts”.
SCSS_11_RE	Ich belohne mich normalerweise für das Erreichen langfristiger Ziele.	I usually reward myself for accomplishing my long-term goals.
SCSS_14_RE	Wenn ich mir ein längerfristiges Ziel setze, plane ich mich zu belohnen, wenn ich dieses erreiche.	When I set an important long-term goal I decide to reward myself if I achieve it.
SCSS_16_PC	Ich setze mir selten Deadlines. [R]	I rarely commit myself to deadlines. [R]
SCSS_18_PC	Ich verschreibe mich frühzeitig Zielen, die ich erreichen möchte (z.B. setzen von Deadlines, im Vorhinein Aktivitäten bezahlen, an denen ich teilnehmen möchte).	I commit myself in advance to goals I want to achieve (e.g., by committing to deadlines, by paying money in advance to activities I want to participate in).
SCSS_19_DI	Wenn ich mit einer Versuchung konfrontiert bin, konzentriere ich mich auf etwas anderes.	When I encounter a temptation, I shift my focus away from it.
SCSS_21_DI	Wenn ich mit einer Versuchung konfrontiert bin, denke ich an etwas anderes.	When I face a temptation, I redirect my thoughts away from it.
SCSS_24_CC	Wenn ich ein ungewolltes Verlangen erlebe, kontrolliere ich mich selbst, indem ich anders darüber nachdenke.	When I face an unwanted desire I control myself by changing the way I think about it.
SCSS_25_CC	Wenn ich eine Versuchung weniger stark spüren möchte, ändere ich die Art und Weise, wie ich über die Versuchung nachdenke.	When I want to feel less craving for a temptation, I change the way I think about the temptation.
SCSS_30_AC	Wenn ich eine Versuchung spüre, akzeptiere ich mein Verlangen danach.	When I face a temptation I accept the craving for it.
SCSS_31_AC	Immer wenn ich den Drang spüre, etwas Unerlaubtes zu tun, akzeptiere ich, dass ich dieses Gefühl habe.	Whenever I have an urge for something forbidden, I accept having this desire.
SCSS_33_BI	Es fällt mir leicht, mich davon abzuhalten, unerwünschten Drängen nachzugeben.	I find it easy to keep myself from acting on unwanted desires.
SCSS_38_BI	Ich kann mich normalerweise davon abhalten, einem unerwünschten Drang nachzugeben, auch wenn dieser verlockend ist.	I usually manage to control myself from acting on unwanted desires even if they are tempting.

Note. Overview of selected items for the SCSS-s scale, with parallel German and English wordings for each item. Items marked with [R] are reverse-coded.