



# HHS Public Access

Author manuscript

*Can J Behav Sci.* Author manuscript; available in PMC 2017 November 29.

Published in final edited form as:

*Can J Behav Sci.* 2017 October ; 49(4): 243–250. doi:10.1037/cbs0000086.

## Examination of the validity and reliability of the French version of the Brief Self-Control Scale

Damien Brevers<sup>1,2</sup>, Jennifer Foucart<sup>2</sup>, Paul Verbanck<sup>1,2</sup>, and Ofir Turel<sup>3</sup>

<sup>1</sup>Laboratory of Psychological Medicine and Addictology, Faculty of Medicine, Brugmann-campus, Université Libre de Bruxelles, Brussels, Belgium

<sup>2</sup>Research in Psychology Applied to Motor Learning, Faculty of Motor Sciences, Erasme Campus, Université Libre de Bruxelles, Brussels, Belgium

<sup>3</sup>College of Business and Economics, California State University, Fullerton, CA, USA

### Abstract

This study aims to develop and to validate a French version of the Brief Self-Control Scale (BSCS; Tangney et al., 2004). This instrument is usually applied as a unidimensional self-report measure for assessing trait self-control, which captures one's dispositional ability to resist short-term temptation in order to reach more valuable long-term goals. Data were collected from two independent samples of French-speaking individuals ( $n_1 = 287$ ;  $n_2 = 160$ ). Results indicated that the French version of the BSCS can be treated as unidimensional, like the original questionnaire. Data also showed consistent acceptable reliability and reasonable test-retest stability. Acceptable external validity of constructs was supported by relationships with self-reported measures of impulsivity (UPPS), including urgency, lack of premeditation, and lack of perseverance. Overall, the findings suggest that the average score of the French version of the BSCS is a viable option for assessing trait self-control in French speaking populations.

### Keywords

Brief Self-Control Scale; Validity; Reliability; Impulsivity; French Adaptation

## INTRODUCTION

Trait self-control refers to one's capacity to promote his or her abstract and distal goals when threatened by competing concrete and proximal goals (Tangney et al., 2004; Fujita, 2011). This dispositional ability is not only important for promoting behaviors that are consistent with desirable long-term goals, but also for avoiding and overcoming inappropriate behaviors that produce strong immediate rewards or expected rewards, and are hence difficult to overcome (Baumeister et al., 1998; de Ridder et al., 2012; Tangney et al., 2004).

---

*Address Correspondence To:* Brevers Damien, PhD, Chargé de Recherche, FNRS, Laboratory of Psychological Medicine and Addictology, CHU-Brugmann, Université Libre de Bruxelles, Place Van Gehuchten, 4, 1020, Brussels (Belgium), Phone : +322473130, dbrevers@ulb.ac.be.

Given the benefits of self-control dispositions, high trait self-control has been associated with healthy habits, such as sleep hygiene, physical exercise, healthy snacking, metabolic control in type 1 diabetes (Barber et al., 2013; Berg et al., 2014, Galla and Duckworth, 2015; Tsukayama, et al., 2012; Vinkers et al., 2013), professional discipline and academic achievement (Hershberger, 2010; Kappes et al., 2012; Tangney et al., 2004; Tsukayama, et al., 2012), wellbeing (Ghorbani et al. 2014; Smith et al. 2017, Tangney et al., 2004), emotional stability (Bolton et al., 2012; Daly et al., 2014), and cognitive and interpersonal skills (Roberts et al. 2014, Shepperd et al., 2015; Tangney et al., 2004). In contrast, individuals with low trait self-control are more prone to engage in problematic hedonic behaviors such as using drugs, smoking, consuming alcohol, unhealthy food habits, low sexual self-restraint, smartphone and video game addictions (Darbor et al., 2016; Churchill and Jessop, 2011; Grubbs et al., 2015; Kim et al., 2016; McIntyre et al., 2015; Latner et al., 2014; Skakoon-Sparling et al., 2016; Tsukayama, et al., 2012; Vinkers, 2013; Wang et al., 2014; Wahler and Otis, 2014), and present low emotional, cognitive and interpersonal skills (social anxiety, aggression, delinquent behaviors, low self-esteem, self-defeating behavior, and high perceived stress; Blackhart et al., 2015; DeWall et al., 2011; Galla and Wood, 2015; Kroese et al., 2010; Miller et al., 2009).

One shared characteristic of the aforementioned studies is that trait self-control was typically assessed with the average score of the Brief Self-Control Scale (BSCS; Tangney et al., 2004). This scale is a 13-item version of the 36-item Self-Control Scale (SCS; Tangney et al., 2004). The BSCS has good reliability and is strongly correlated ( $r = .93$ ) with the SCS (Tangney et al., 2004). Tangney et al. (2004) proposed using the BSCS as a unidimensional instrument, the aggregated score of which represents trait self-control. Nevertheless, multidimensional factorial structures of the BSCS have also been proposed for assessing distinct facets of self-control: “inhibition” (the ability to refrain from immediate impulses) and “initiation” (the ability to start goal-directed behavior) in De Ridder et al. (2011), “general self-discipline” and “impulse control” (the resistance to short-term rewards or temptations in order to achieve long-term goals) in Ferrari et al., (2009), and “restraint” (the tendency to be deliberative or disciplined and engage in effortful control) and “impulsivity” (being spontaneous and acting on intuition or heuristics) in Maloney et al. (2012).

In accordance with Maloney et al. (2012), Morean et al. (2014) reported a two-factor solution for the BSCS. Nevertheless, while one of those factors aligned with the “impulsivity” factor from Maloney et al. (2012), the other did not align with the “restraint” factor. In another study, Lindner and Retelsdorf (2015) compared the unidimensional BSCS (Tangney et al., 2004) with its three multidimensional conceptualizations (De Ridder et al., 2011; Ferrari et al., 2009; Maloney et al. 2012). Findings suggested that compared to the unidimensional model, only the “restraint vs. impulsivity” model (Maloney et al. 2012) showed a consistent improvement in model fit. Moreover, in comparison to the unidimensional measure, the two-dimensional measures did not substantially enhance the predictive power regarding outcome variables (e.g., achievement-related outcomes in school, university, and workplace). Lindner and Retelsdorf (2015) therefore concluded that the BSCS’ average score is a viable optimal option for assessing trait self-control and for studying its relationship with outcome variables.

The BSCS has already been translated and validated to German (Bertams and Dickäuser, 2009), Turkish (Nebioglu et al., 2012) and Chinese (Unger et al., 2016). In this study, we aimed to validate a French version of the BSCS, because such an adaptation might be useful for both research and clinical purposes in French-speaking populations, as well as for undertaking possible cross-cultural differences in self-control. To this end, we recruited two independent samples of individuals in order to assess the factor structure, internal consistency, test-retest stability, and convergence of the French-translated BSCS. First, due to limited agreement regarding the factor structure of the BSCS and because the BSCS is being examined in a new population (Byrne, 2012), it was analyzed through exploratory factor analyses. Second, Cronbach's alpha and Guttman split-half coefficients were employed for assessing internal consistency. Third, Pearson correlations were used to explore test-retest stability. Fourth, because trait self-control (as measured with the BSCS) has often been negatively associated with impulsivity (e.g., Johnson et al., 2013; Miller et al., 2009; Tsukayama, et al., 2012, 2013), initial support regarding external validity as developed via associations of the French-translated BSCS with the UPPS Impulsive Behavior Scale (UPPS; Van der Linden et al., 2006; see also Whiteside and Lynam, 2001) and its four dimensions: lack of premeditation, urgency, lack of perseverance, and sensation-seeking.

## METHOD AND MATERIALS

### Participants and procedure

We recruited two samples of French-speaking individuals for conducting independent factor analyses. The first sample included 287 self-reportedly healthy student participants (subject to item ratio = 22:1): 134 women, 152 men, and one respondent who did not report his or her sex. The majority were undergraduate students ( $n = 226$ , 78.7%) and the remaining part of the sample consisted of graduate students ( $n = 61$ , 21.3%). The average age of participants was 21.9 ( $SD = 3.6$ , ranging from 18 to 43 years old). The second sample included 160 self-reportedly healthy students (subject to item ratio = 12:1): 76 women, 79 men, and five respondents who did not report their sex. All participants were undergraduate students. The average age of participants was 20.1 ( $SD = 2.3$ ; ranging from 18 to 32 years old).

For sample 1, the survey session was undertaken in an auditorium at the Faculty of Motor Sciences of the Université Libre de Bruxelles (ULB). The survey included informed consent, sociodemographic data, the French version of the BSCS (Tangney et al., 2004), and a self-reported measure of impulsivity (French Version of the UPPS; Van der Linden et al., 2006). A sub-group of participants ( $n = 57$ ) from sample 1 completed the scale a second time, six months later, in order to allow examination of test-retest stability. The survey for sample 2 was undertaken in an auditorium at the Haute Ecole Libre de Bruxelles (HELB), and included informed consent, sociodemographic data, and the French version of the original English BSCS (Tangney et al., 2004). This study was approved by the local ethics committee of the Université Libre de Bruxelles. No compensation was given for participation in the study.

## Measures

The French version of the BSCS was developed following common scale translation practices: (a) the authors of this study translated the 13 items (5-points scale, ranging from “*pas du tout*” [not at all] to “*fortement*” [very much]) of the original English version of the BSCS (Tangney et al., 2004) into French; (b) an English–French bilingual translated the French version back into English; and (c) discrepancies between the original BSCS and the back-translation were discussed between the authors and the translator until a satisfactory solution was found (see Table 1. for a listing of the translated items).

In sample 1, we assessed self-reported impulsivity with the French Version of the 45-item UPPS (Van der Linden et al., 2006). Response options for each item ranged from 1 (Strongly Agree) to 4 (Strongly disagree). Importantly, because the items from the UPPS run in different directions (for the list of items, see Van der Linden et al., 2006), relevant items were reverse-scored so that high scores indicate high impulsivity. The UPPS contains four scales: “urgency” (12 items), defined as the tendency to experience strong reactions, frequently under the condition of intense negative affect (e.g., “*When I feel rejected, I will often say things that I later regret*”), “lack of premeditation” (11 items), defined as the tendency not to take into account the consequences of an act before engaging in that act (e.g., “*I am a cautious person*”), “lack of perseverance” (10 items), defined as the inability to remain focused on a task that may be boring and/or difficult (e.g., “*Once I get going on something I hate to stop*”), and “sensation seeking” (12 items), considered as a tendency to prefer and pursue activities that are stimulating or exciting coupled with openness to trying new and unconventional experiences (e.g., “*I would enjoy water skiing*”). Using the FACTOR 10.5.02 software (Lorenzo-Seva & Ferrando, 2013, 2006) to run parallel analysis with Polychoric correlations, indicated first that the data for each scale are appropriate for factor analysis (all Kaiser–Meyer–Olkin  $>0.85$ ). It next showed that each scale can be treated as unidimensional (advised number of dimensions was 1). Loadings were .49–.83 for the urgency scale, .47–.90 for the lack of premeditation scale, .47–.83 for the lack of perseverance scale, and .43–.77 for the sensation seeking scale. Reliability indices (Cronbach  $\alpha$  and Guttman Split-Half Coefficients [GSH]) were adequate:  $\alpha = .88$  (95% CI [.85, .91]) and GSH = .84 for the urgency scale,  $\alpha = .77$  (95% CI [.71, .83]) and GSH = .82 for the lack of premeditation scale,  $\alpha = .84$  (95% CI [.79, .88]) and GSH = .79 for the lack of perseverance scale, and  $\alpha = .80$  (95% CI [.74, .85]) and GSH = .80 for the sensation seeking scale. Average scores and standard deviations for each scale are given in Table 2. Given the support for acceptable reliability of the UPPS dimensions and for the unidimensionality of the scales, average scores for each UPPS scale were used in subsequent analyses.

## Analytic Methods

To assess the factor structure of the BSCS–French Version, we used replication analysis (Osborne & Fitzpatrick, 2012), a method that relies on exploratory FAs and that addresses the replicability of factor loadings over different samples by comparing the squared differences between items in corresponding factor loadings. Polychoric correlations that account for the ordinal nature of the data (Muthén & Kaplan, 1985, 1992) were used in the FAs, performed with FACTOR 10.5.02 (Lorenzo-Seva & Ferrando, 2013, 2006). Cronbach’s

alpha and Guttman split-half coefficients were employed for assessing reliability (internal consistency), using cutoffs of .70. Pearson's correlation analyses were performed to investigate the relationship between the BSCS and the four scales of the UPPS (urgency, lack of premeditation, lack of perseverance, sensation seeking). Correlation magnitude of .30 was considered to be relevant (Cicchetti, 1994). Test-retest stability of the French BSCS was examined with Pearson correlation analyses (for assessing the stability of rank order variables) and Bayesian paired sample *t*-test (to assess the stability of the individual scores). The Bayesian approach was used in order to test for the likelihood of the data under both the null (i.e., no difference between test and retest scores) and the alternative hypotheses (i.e., difference between test and retest scores). Specifically, the Bayes factor is a ratio that contrasts the likelihood of the data fitting under the null hypothesis with the likelihood of fitting under the alternative hypothesis. Bayes factor values of less than 0.33 indicate substantial support for the null hypothesis and values greater than 3 indicate substantial support for the alternative (e.g., Dienes, 2011). In addition, the effect size for the paired sample *t*-test was calculated with Cohen's *d*.

## RESULTS

### Factor Structure

In the first sample ( $n = 287$ ), univariate normality was explored for the 13 items by calculating the skewness and kurtosis of each item. The results showed that skewness ranged from  $-0.1$  to  $0.8$  and kurtosis from  $-1.3$  to  $0.4$  (see also Table 1), indicating that it is reasonable to assume no strong deviation from normality (absolute values are considered to be extreme for skewness  $> 3$  and for kurtosis  $> 20$ ; Weston & Gore, 2006).

The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy indicated that the strength of the relationships between the 13 items was acceptable (KMO = .82) and that the data were, therefore, reasonably adequate for FA (Kaiser & Rice, 1974). Bartlett's test of sphericity, which tests the overall significance of all the correlations within the correlation matrix, was significant [Bartlett's  $X^2(287) = 750.3, p < .001$ ], and indicated that it was acceptable to proceed with the analysis (Bartlett, 1954). Overall, a KMO value between .50 and 1, and a significant Bartlett's test of sphericity are considered appropriate (Kline, 1994). With respect to the number of factors that should be retained in the FA, the parallel analysis (PA; a test based on minimum-rank FA; Timmerman and Lorenzo-Seva, 2011) suggested a one-dimensional solution.

As the data were ordinal (i.e., item rated on scales with five or fewer levels; e.g., Baglin, 2014), the polychoric correlation matrix, rather than the Pearson's correlation matrix (Muthén and Kaplan, 1985, 1992), was analyzed. It produced three factors. Factor 1 had an eigenvalue of 4.37 and accounted for 41% of the variance in the data. The eigenvalues of Factors 2 and 3 were 1.46 and 1.18, respectively. Factor 2 and 3 accounted for 13% and 9% of the variance in the data, respectively. Despite values exceeding 1, Factors 2 and 3 were not retained: a solution including these factors would have been difficult to interpret. In line with the PA test, a one-dimension solution was adopted. As can be seen in Table 1, Factor 1 had item-loadings ranging from .40 to .62, all of which were higher than the factor loading cutoff of .30 (Kline, 2005).

In the second sample ( $n = 160$ ), skewness ranged from  $-0.4$  to  $0.8$  and kurtosis from  $-0.8$  to  $0.5$  (see also Table 1), indicating that there is likely no strong deviation from normality. The KMO measure of sampling adequacy ( $KMO = .79$ ; Kaiser & Rice, 1974) as well as Bartlett's test of sphericity (Bartlett's  $X^2(378) = 528.2$ ,  $p < .001$ ; Bartlett, 1954) suggested that the data were likely suitable for FA. As for the first subset of data, the PA indicated that the use of a one-factor structure was optimal (Timmerman and Lorenzo-Seva, 2011). It produced four factors. Factor 1 had an eigenvalue of  $4.51$ , and accounted for  $42\%$  of the variance in the data. The eigenvalues of Factors 2 to 4 were  $1.49$ ,  $1.12$ , and  $1.04$ , respectively. Factor 2 to 4 accounted for  $13\%$ ,  $10\%$ , and  $8\%$  of the variance in the data, respectively. Despite values exceeding 1, Factors 2, 3 and 4 were not retained: a solution including these factors would have been difficult to interpret. In line with the PA test, a one-dimension solution was hence adopted. As can be seen in Table 1, Factor 1 had item-loadings ranging from  $.39$  to  $.67$ . BSCS descriptive statistics were:  $Average = 2.1$ ,  $SD = 0.6$ .

### Reliability, test-retest stability and convergence of constructs

In the first sample ( $n = 287$ ), the one factor solution was reasonably internally consistent with  $\alpha = .73$  (95% CI [.69, .78]), and Guttman split-half coefficient of  $.72$ ; deleting any of the items would only deteriorate  $\alpha$  and will not result in  $\alpha$  improvement. In the second sample ( $n = 160$ ), the one factor solution was reasonably internally consistent with acceptable reliability scores with  $\alpha = .81$  (95% CI [.77, .85]), and Guttman Split Half Coefficient =  $.83$ . Pearson correlation analyses revealed acceptable test-retest stability,  $r(57) = .66$ ,  $p < .001$ . The Bayes factor for the paired sample  $t$ -test (*prior value* =  $0.707$ ) was  $0.16$ , indicating substantial support for the null hypothesis, that is, that there is no differences in the individual scores between the first and second self-reports using the French translated BSCS scale. In addition, Cohen's  $d$  for the paired sample  $t$ -test was  $0.06$ , which is indicative of a very small effect size.

To provide initial evidence regarding the external validity of the French version of the BSCS, Pearson correlations were computed between the average scores of the French BSCS and the four scales of the UPPS (see Table 2.). Moderate correlations were observed between the BSCS, urgency, lack of premeditation, and lack of perseverance scales (all Pearson coefficients  $> .34$ , all  $p < 0.001$ ). The correlation between BSCS and the UPPS sensation seeking scale was very small (Pearson coefficient =  $-.06$ ,  $p = .30$ ).

## DISCUSSION

This study presents the development and validation of a French adaptation of the Brief Self-Control Scale (BSCS), the English version of which was developed by Langney et al. (2004). We assessed factor structure and internal consistency in two independent samples of French-speaking participants. Initial evidence regarding test-retest stability was developed in the first sample of participants. Presumed factor structure (uni-dimensionality) replication was performed with sample 2; this sample was also used for developing initial evidence regarding external validity.

First, EFAs suggested that a one-factor solution for the 13-items of the BSCS is reasonable. Second, the internal consistency and test-retest stability of the single factor solution were

acceptable. Third, the French BSCS also seemed to have reasonable external validity, at least as related to self-reported measures of impulsivity. Overall, the results are in line with previous studies in showing that the single factor solution of the BSCS is an acceptable way for capturing self control and that consequently the French-translated BSCS average score can be used for reasonably encapsulating one's trait self-control (Bertams and Dickäuser, 2009; Linder et al., 2015; Tangney et al., 2004; Unger et al., 2016).

Interestingly, we observed that the French BSCS average score correlated with UPPS' urgency, lack of premeditation, and lack of perseverance dimensions (i.e., the higher trait self-control is, the lower the impulsivity is), but not with the sensation seeking scale of UPPS. This pattern of correlations appears to be highly consistent with both the theoretical approach of self-control and previous findings on the relationships between impulsivity and self-control. Specifically, we observed that trait self-control is associated with urgency, that is, the dispositional tendency to experience strong reaction in response to negative affect (Billieux et al., 2012; Chester et al., 2016; Whiteside and Lynam, 2001). This pattern might contribute to self-control failure, as suggested by the established association between urgency and the enactment of maladaptive hedonic behaviors, including substance abuse (excess alcohol intake, drug use, tobacco use, food consumption; e.g., Billieux et al., 2007; Roys et al., 2016; VanderBroek-Stice et al., 2017; Vest et al., 2016) and "behavioral" addictions (e.g., to gambling, mobile phone use, Internet use, video game play, buying; e.g., Albein-Urios et al., 2012; Billieux et al., 2011; Yau et al., 2015; Whiteside et al., 2005). The association between trait self-control and lack of perseverance is not surprising since the later concept refers to the tendency to have difficulties to remain concentrated on a task that may be boring and/or difficult (Whiteside and Lynam, 2001). Indeed, individuals who experience increased difficulties remaining on complex tasks requiring prolonged effort might also have increased difficulty to resist short-term temptation over long-term outcomes, that is, a failure of self-control. This assumption is in line with previous studies that highlighted a strong relationship between the average score of the BSCS and the successful completion of long-terms goals, such as professional achievements (e.g., Tangney et al., 2004; Tsukayama, et al., 2012).

Trait self-control as captured by the French BSCS was also associated with the "lack of premeditation" component of the UPPS, that is, the difficulty to reflect on the consequences of an act before its enactment (Whiteside and Lynam, 2001). Once again, this finding is in line with previous studies in showing that lack of premeditation is related to disadvantageous decision-making on tasks that require the pondering of both short-terms and long terms consequence of a subjective decision or action (e.g., Derefinko et al., 2011; Zermatten et al., 2005). Lastly, we reported a non-significant association between trait self-control, at least as captured by the French BSCS, and sensation seeking, which encapsulates the preference for exciting activities and the openness to new experiences (Whiteside and Lynam, 2001). One explanation for this result is that, by contrast to the other three dimensions of the UPPS, sensation seeking could be associated with both high and low trait self-control. For instance, mountain athletes (e.g., BASE jumpers, Everest climbers) are characterized by a strong sense of self-directness and mastery (e.g., Monasterio et al., 2016), but also by high level of sensation seeking (e.g., Koop et al., 2016). At the same time, sensation seeking has been repeatedly associated with maladaptive impulsive behaviors (e.g., Mobbs et al., 2010; Vest et

al., 2016). Hence, further research should examine whether the association between trait self-control and sensation seeking may be modulated by different types of habits (e.g., sport versus gambling or substance use; Myrseth et al., 2012). Another direction would be to assess novelty and uncertainty seeking using the behavioral inhibition system (BIS; Gray, 1976; Gray & McNaughton, 2003) lens of analysis. The BIS describes neurobiological foundations for behavioral inhibition, risk assessment, increased vigilance, and increased arousal (Gray, 1976; Gray & McNaughton, 2003). Importantly, the BIS model emphasizes that the unknown is initially perceived as aversive, activates the BIS, and facilitates fear; but when no aversive consequence is encountered, the appraisal becomes neutral and then appetitive (Carleton, 2016; Gray & McNaughton, 2003). In other words, the BIS encompasses both the aversive and the appetitive processes triggered by novelty. Moreover, Carleton (2016) has recently equated the BIS with dispositional difficulties with uncertainty and fearing the unknown. In this context, the examination of the association between self-control and the capacity to tolerate or seek novelty should be investigated in future studies.

One limitation of this study is that all participants were university students. Hence, additional studies are needed in order to generalize the present findings to other populations. Another is the limited predictive power demonstrated here; further research should examine whether the average score of the French-BSCS can predict long-term outcomes such as school and professional performance, and discriminate between samples that have been shown to report either high (e.g., professional athletes) or low (e.g., individuals with addictive disorders) levels of trait self-control. Finally, although the BSCS score represents a trait, the reasonable test-retest stability obtained here indicated that about 56% of the variance in BSCS scores (obtained at two time points) was non-shared. This suggests that the score of BSCS can be modulated over time and that perhaps further testing of trait stability is needed.

In sum, the present study shows that the average score of the French BSCS is an acceptable option for assessing trait self-control in French speaking populations. The French-BSCS should also be considered for undertaking cross-cultural research, which could further enhance fundamental knowledge on the mechanisms, similarities and differences related to self-control across countries.

## Acknowledgments

Funding for this study was provided by the National Center for Responsible Gaming (NCRG; Early Stage Investigator Grant) and the Belgian National Funds for Scientific Research (FNRS; Chargé de Recherche Grant).

## References

- Albein-Urios N, Verdejo-Román J, Asensio S, Soriano-Mas C, Martínez-González JM, Verdejo-García A. Re-appraisal of negative emotions in cocaine dependence: dysfunctional corticolimbic activation and connectivity. *Addiction Biology*. 2014; 19(3):415–426. [PubMed: 22978709]
- Baglin J. Improving your exploratory factor analysis for ordinal data: a demonstration using FACTOR. *Practical Assessment Research and Evaluation*. 2014; 19(5)
- Barber L, Grawitch MJ, Munz DC. Are better sleepers more engaged workers? A self-regulatory approach to sleep hygiene and work engagement. *Stress and Health*. 2013; 29(4):307–316. [PubMed: 23086901]
- Barber L, Rupperecht E, Munz D. Sleep Habits May Undermine Well-Being Through the Stressor Appraisal Process. *Journal of Happiness Studies*. 2014; 15(2):285–299.



- Baumeister RF, Bratslavsky E, Muraven M, Tice DM. Ego depletion: is the active self a limited resource? *Journal of Personality and Social Psychology*. 1998; 74(5):1252–1265. [PubMed: 9599441]
- Berg CA, Wiebe DJ, Suchy Y, Hughes AE, Anderson JH, White PC. Individual differences and day-to-day fluctuations in perceived self-regulation associated with daily adherence in late adolescents with type 1 diabetes. *Journal of Pediatric Psychology*. 2014; 39(9):1038–1048. [PubMed: 25064802]
- Bertrams A, Dickhauser O. Messung dispositioneller Selbstkontroll-Kapazität: Eine deutsche Adaptation der Kurzform der Self-Control Scale (SCS-K-D) [Measuring dispositional self-control capacity. A German adaptation of the short form of the Self-Control Scale (SCS-K-D)]. *Diagnostica*. 2009; 55:2–10. DOI: 10.1026/0012-1924.55.1.2
- Billieux J, Chanal J, Khazaal Y, Rochat L, Gay P, Zullino D, Van der Linden M. Psychological predictors of problematic involvement in massively multiplayer online role-playing games: illustration in a sample of male cybercafé players. *Psychopathology*. 2011; 44(3):165–171. [PubMed: 21372629]
- Billieux J, Rochat L, Ceschi G, Carré A, Offerlin-Meyer I, Defeldre A-C, Van der Linden M. Validation of a short French version of the UPPS-P Impulsive Behavior Scale. *Comprehensive Psychiatry*. 2012; 53(5):609–615. <https://doi.org/10.1016/j.comppsy.2011.09.001>. [PubMed: 22036009]
- Billieux J, Van der Linden M, Ceschi G. Which dimensions of impulsivity are related to cigarette craving? *Addictive Behaviors*. 2007; 32(6):1189–1199. <https://doi.org/10.1016/j.addbeh.2006.08.007>. [PubMed: 16997490]
- Blackhart GC, Williamson J, Nelson L. Social Anxiety in Relation to Self-Control Depletion Following Social Interactions. *Journal of Social & Clinical Psychology*. 2015; 34(9):747–773.
- Bolton LR, Harvey RD, Grawitch MJ, Barber LK. Counterproductive Work Behaviours in Response to Emotional Exhaustion: A Moderated Mediation Approach. *Stress & Health*. 2012; 28(3):222–233. <https://doi.org/10.1002/smi.1425>. [PubMed: 22281803]
- Carleton RN. Into the Unknown: A review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders*. 2016; 39:30–43. DOI: 10.1016/j.janxdis.2016.02.007 [PubMed: 26945765]
- Chester DS, Lynam DR, Milich R, DeWall CN. Craving versus control: Negative urgency and neural correlates of alcohol cue reactivity. *Drug and Alcohol Dependence*. 2016; 163(Suppl 1):S25–28. <https://doi.org/10.1016/j.drugalcdep.2015.10.036>. [PubMed: 27306727]
- Churchill S, Jessop DC. Reflective and non-reflective antecedents of health-related behaviour: Exploring the relative contributions of impulsivity and implicit self-control to the prediction of dietary behaviour. *British Journal of Health Psychology*. 2011; 16(2):257–272. [PubMed: 21489055]
- Cicchetti DV. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*. 1994; 6(4):284–290. doi:
- Daly M, Baumeister R, Delaney L, MacLachlan M. Self-control and its relation to emotions and psychobiology: evidence from a Day Reconstruction Method study. *Journal of Behavioral Medicine*. 2014; 37(1):81–93. <https://doi.org/10.1007/s10865-012-9470-9>. [PubMed: 23160950]
- Darbor KE, Lench HC, Carter-Sowell AR. Do People Eat the Pain Away? The Effects of Acute Physical Pain on Subsequent Consumption of Sweet-Tasting Food. *PLoS ONE*. 2016; 11(11):1–10.
- Derefinko K, DeWall CN, Metze AV, Walsh EC, Lynam DR. Do different facets of impulsivity predict different types of aggression? *Aggressive Behavior*. 2011; 37(3):223–233. [PubMed: 21259270]
- De Ridder DTD, De Boer BJ, Lugtig P, Bakker AB, Van Hoof EAJ. Not doing bad things is not equivalent to doing the right thing: Distinguishing between inhibitory and initiatory self-control. *Personality and Individual Differences*. 2011; 50:1006–1011. DOI: 10.1016/j.paid.2011.01.015
- De Ridder DTD, Lensvelt-Mulders G, Finkenauer C, Stok FM, Baumeister RF. 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: An Official Journal of the Society for Personality and Social Psychology, Inc.* 2012; 16(1):76–99. <https://doi.org/10.1177/1088868311418749>.

- DeWalt CN, Deckman T, Gailliot MT, Bushman BJ. Sweetened blood cools hot tempers: physiological self-control and aggression. *Aggressive Behavior*. 2011; 37(1):73–80. [PubMed: 21064166]
- Dienes Z. Bayesian versus orthodox statistics: Which side are you on? *Perspectives on Psychological Science*. 2011; 6(3):274–290. <http://dx.doi.org/10.1177/1745691611406920>. [PubMed: 26168518]
- Ferrari JR, Stevens EB, Jason LA. The Relationship of Self-Control and Abstinence Maintenance: An Exploratory Analysis of Self-Regulation. *Journal of Groups in Addiction & Recovery*. 2009; 4(1/2):32–41. <https://doi.org/10.1080/15560350802712371>. [PubMed: 20689650]
- Fujita K. On conceptualizing self-control as more than the effortful inhibition of impulses. *Personality and Social Psychology Review: An Official Journal of the Society for Personality and Social Psychology, Inc.* 2011; 15(4):352–366. <https://doi.org/10.1177/1088868311411165>.
- Galla BM, Duckworth AL. More than resisting temptation: Beneficial habits mediate the relationship between self-control and positive life outcomes. *Journal of Personality and Social Psychology*. 2015; 109(3):508–525. <https://doi.org/10.1037/pspp0000026>. [PubMed: 25643222]
- Gray, JA. The behavioural inhibition system: a possible substrate for anxiety. In: Feldman, MP., Broadhurst, AM., editors. *Theoretical and experimental bases of behaviour modification*. London: Wiley; 1976. p. 3–41.
- Gray, JA., McNaughton, N. *The Neuropsychology of Anxiety: An Enquiry into the Functions of the Septo-Hippocampal System*. Second. New York, NY: Oxford University Press; 2003.
- Grubbs JB, Volk F, Exline JJ, Pargament KI. Internet Pornography Use: Perceived Addiction, Psychological Distress, and the Validation of a Brief Measure. *Journal of Sex & Marital Therapy*. 2015; 41(1):83–106. <https://doi.org/10.1080/0092623X.2013.842192>. [PubMed: 24341869]
- Hershberger PJ, Zryd TW, Rodes MB, Stolfi A. Professionalism: Self-control matters. *Medical Teacher*. 2010; 32(1):e36–e41. <https://doi.org/10.3109/01421590903199676>. [PubMed: 20095765]
- Hu LT, Bentler PM. Cut off criteria of fit indices in co-variance structure analysis; Conventional criteria versus new alternatives. *Structural Equation Modeling*. 1999; 6(1):1–55.
- Johnson SL, Carver CS, Mulé S, Joormann J. Impulsivity and risk for mania: Towards greater specificity. *Psychology & Psychotherapy: Theory, Research & Practice*. 2013; 86(4):401–412.
- Kappes HB, Oettingen G, Mayer D. Positive fantasies predict low academic achievement in disadvantaged students. *European Journal of Social Psychology*. 2012; 42(1):53–64.
- Kim Y, Jeong J-E, Cho H, Jung D-J, Kwak M, Rho MJ, Choi IY. Personality Factors Predicting Smartphone Addiction Predisposition: Behavioral Inhibition and Activation Systems, Impulsivity, and Self-Control. *PLoS ONE*. 2016; 11(8):1–15.
- Kopp M, Wolf M, Ruedl G, Burtscher M. Differences in Sensation Seeking Between Alpine Skiers, Snowboarders and Ski Tourers. *Journal of Sports Science & Medicine*. 2016; 15(1):11–16. [PubMed: 26957921]
- Kroese FM, Evers C, De Ridder DTD. Tricky treats: Paradoxical effects of temptation strength on self-regulation processes. *European Journal of Social Psychology*. 2011; 41(3):281–288.
- Latner JD, Mond JM, Kelly MC, Haynes SN, Hay PJ. The loss of control over eating scale: Development and psychometric evaluation. *International Journal of Eating Disorders*. 2014; 47(6): 647–659. <https://doi.org/10.1002/eat.22296>. [PubMed: 24862351]
- Wang, Lili. Body Mass Index, Obesity, and Self-Control: A Comparison of Chronotypes. *Social Behavior & Personality: An International Journal*. 2014; 42(2):313–320.
- Lindner C, Nagy G, Retelsdorf J. The dimensionality of the Brief Self-Control Scale—An evaluation of unidimensional and multidimensional applications. *Personality & Individual Differences*. 2015; 86:465–473. <https://doi.org/10.1016/j.paid.2015.07.006>.
- Lorenzo-Seva U, Ferrando PJ. FACTOR: A computer program to fit the exploratory factor analysis model. *Behavior Research Methods*. 2006; 38:88–91. <http://dx.doi.org/10.3758/BF03192753>. [PubMed: 16817517]
- Lorenzo-Seva U, Ferrando PJ. FACTOR 9.2: A comprehensive program for fitting exploratory and semiconfirmatory factor analysis and IRT Models. *Applied Psychological Measurement*. 2013; 37:497–498. <http://dx.doi.org/10.1177/0146621613487794>.
- Maloney PM, Grawitch MJ, Barber LK. The multi-factor structure of the brief self-control scale: discriminant validity of restraint and impulsivity. *Journal of Research in Personality*. 2012; 46:111–115. DOI: 10.1016/j.jrp.2011.10.001

- McIntyre JC, Barlow FK, Hayward LE. Stronger sexual desires only predict bold romantic intentions and reported infidelity when self-control is low. *Australian Journal of Psychology*. 2015; 67(3): 178–186. <https://doi.org/10.1111/ajpy.12073>.
- Miller JD, Campbell WK, Young DL, Lakey CE, Reidy DE, Zeichner A, Goodie AS. Examining the Relations Among Narcissism, Impulsivity, and Self-Defeating Behaviors. *Journal of Personality*. 2009; 77(3):761–794. <https://doi.org/10.1111/j.1467-6494.2009.00564.x>. [PubMed: 20078737]
- Miller J, Flory K, Lynam D, Leukefeld C. A test of the four-factor model of impulsivity-related traits. *Personality and Individual Differences*. 2003; 34(8):1403–1418. doi:
- Mobbs O, Crépin C, Thiéry C, Golay A, Van der Linden M. Obesity and the four facets of impulsivity. *Patient Education and Counseling*. 2010; 79(3):372–377. [PubMed: 20399590]
- Monasterio E, Mei-Dan O, Hackney AC, Lane AR, Zwir I, Rozsa S, Cloninger CR. Stress reactivity and personality in extreme sport athletes: The psychobiology of BASE jumpers. *Physiology & Behavior*. 2016; 167:289–297. <https://doi.org/10.1016/j.physbeh.2016.09.025>. [PubMed: 27693575]
- Muthén B, Kaplan D. A comparison of some methodologies for the factor analysis of non-normal Likert variables. *British Journal of Mathematical and Statistical Psychology*. 1985; 38:171–189.
- Muthén B, Kaplan D. A comparison of some methodologies for the factor analysis of non-normal Likert variables: A note on the size of the model. *British Journal of Mathematical and Statistical Psychology*. 1992; 45:19–30. <http://dx.doi.org/10.1111/j.2044-8317.1992.tb00975.x>.
- Myrseth H, Tverå R, Hagatun S, Lindgren C. A comparison of impulsivity and sensation seeking in pathological gamblers and skydivers. *Scandinavian Journal of Psychology*. 2012; 53(4):340–346. [PubMed: 22783975]
- Nebioglu M, Konuk N, Akbaba S, Eroglu Y. The Investigation of Validity and Reliability of the Turkish Version of the Brief Self-Control Scale. *Kısa Öz-Kontrol Ölçeğinin Türkçe Versiyonunun Geçerlik ve Güvenirliğinin İncelenmesi*. 2012; 22(4):340–351.
- Osborne JW, Fitzpatrick DC. Replication analysis in exploratory factor analysis: What it is and why it makes your analysis better. *Practical Assessment, Research & Evaluation*. 2012; 17:1–8.
- Roberts ME, Gibbons FX, Gerrard M, Klein WMP. Individual Differences in Situation Awareness: Validation of the Situationism Scale. *Journal of Social Psychology*. 2015; 155(2):143–162. <https://doi.org/10.1080/00224545.2014.977762>. [PubMed: 25329242]
- Roys M, Weed K, Carrigan M, MacKillop J. Associations between nicotine dependence, anhedonia, urgency and smoking motives. *Addictive Behaviors*. 2016; 62:145–151. [PubMed: 27376882]
- Shepperd JA, Miller WA, Smith CT. Religiousness and aggression in adolescents: The mediating roles of self-control and compassion. *Aggressive Behavior*. 2015; 41(6):608–621. [PubMed: 26205757]
- Skakoon-Sparling S, Cramer KM. The impact of sexual arousal on elements of sexual decision making: Sexual self-restraint, motivational state, and self-control. *Canadian Journal of Human Sexuality*. 2016; 25(2):119–125. <https://doi.org/10.3138/cjhs.252-A1>.
- Smith ORF, Alves DE, Knapstad M, Haug E, Aarø LE. Measuring mental well-being in Norway: validation of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). *BMC Psychiatry*. 2017; 17:1–9. <https://doi.org/10.1186/s12888-017-1343-x>. [PubMed: 28049496]
- Tangney JP, Baumeister RF, Boone AL. High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*. 2004; 72(2):271–324. [PubMed: 15016066]
- Timmerman ME, Lorenzo-Seva U. Dimensionality assessment of ordered polytomous items with parallel analysis. *Psychological Methods*. 2011; 16:209–220. <http://dx.doi.org/10.1037/a0023353>. [PubMed: 21500916]
- Tsukayama E, Duckworth AL, Kim B. Resisting Everything Except Temptation: Evidence and an Explanation for Domain-specific Impulsivity. *European Journal of Personality*. 2012; 26(3):318–334. <https://doi.org/10.1002/per.841>.
- Tsukayama E, Duckworth AL, Kim B. Domain-specific impulsivity in school-age children. *Developmental Science*. 2013a; 16(6):879–893. <https://doi.org/10.1111/desc.12067>. [PubMed: 24118714]

- Tsukayama E, Duckworth AL, Kim B. Domain-specific impulsivity in school-age children. *Developmental Science*. 2013b; 16(6):879–893. <https://doi.org/10.1111/desc.12067>. [PubMed: 24118714]
- Unger A, Bi C, Xiao Y-Y, Ybarra O. The revising of the Tangney Self-Control Scale for Chinese students. *PsyCh Journal*. 2016; 5(2):101–116. <https://doi.org/10.1002/pchj.128>. [PubMed: 27144924]
- Van der Linden M, d'Acremont M, Zermatten A, Jermann F, Larøi F, Willems S, Juillerat AC, Bechara A. A French Adaptation of the UPPS Impulsive Behavior Scale: Confirmatory Factor Analysis in a Sample of Undergraduate Students. *European Journal of Psychological Assessment*. 2006; 22:38–42. DOI: 10.1027/1015-5759.22.1.38
- VanderBroek-Stice L, Stojek MK, Beach SRH, vanDellen MR, MacKillop J. Multidimensional assessment of impulsivity in relation to obesity and food addiction. *Appetite*. 2017; 112:59–68. <https://doi.org/10.1016/j.appet.2017.01.009>. [PubMed: 28087369]
- Vest N, Reynolds CJ, Tragesser SL. Impulsivity and risk for prescription opioid misuse in a chronic pain patient sample. *Addictive Behaviors*. 2016; 60:184–190. [PubMed: 27156219]
- Vinkers C, Adriaanse M, Ridder D. In it for the long haul: characteristics of early and late drop out in a self-management intervention for weight control. *Journal of Behavioral Medicine*. 2013; 36(5): 520–530. <https://doi.org/10.1007/s10865-012-9446-9>. [PubMed: 22890616]
- Wahler EA, Otis MD. Social Stress, Economic Hardship, and Psychological Distress as Predictors of Sustained Abstinence from Substance Use After Treatment. *Substance Use & Misuse*. 2014; 49(13):1820–1832. <https://doi.org/10.3109/10826084.2014.935789>. [PubMed: 25050587]
- Whiteside SP, Lynam DR. The five factor model and impulsivity : Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*. 2001; 30:669–689. DOI: 10.1016/S0191-8869(00)00064-7
- Whiteside SP, Lynam DR, Miller JD, Reynolds SK. Validation of the UPPS impulsive behaviour scale: a four-factor model of impulsivity. *European Journal of Personality*. 2005; 19(7):559–574. <https://doi.org/10.1002/per.556>.
- Yau YHC, Potenza MN, Mayes LC, Crowley MJ. Blunted feedback processing during risk-taking in adolescents with features of problematic Internet use. *Addictive Behaviors*. 2015; 45:156–163. <https://doi.org/10.1016/j.addbeh.2015.01.008>. [PubMed: 25679363]
- Zermatten A, Van der Linden M, d'Acremont M, Jermann F, Bechara A. Impulsivity and decision making. *The Journal of Nervous and Mental Disease*. 2005; 193(10):647–650. [PubMed: 16208159]

### Public Significance Statements

The present study shows that the French translation of the Brief Self-Control Scale can be used in French speaking populations for capturing dispositional abilities to resist short-term temptation in order to reach more valuable long-term goals; this could further enhance our understanding of the mechanisms involved in self-control across nationalities, cultures and populations.

**Table 1** Items score averages, standard deviations (SD), Skewness, Kurtosis, and loading from exploratory factor analyses.

#	Item	Sample 1					Sample 2				
		Average	SD	Skew	Kurtosis	Loading	Average	SD	Skew	Kurtosis	Loading
1	Je résiste facilement à la tentation.	2.9	0.9	0.2	-0.0	0.4	2.9	1.0	-0.0	-0.1	0.5
2	J'ai du mal à me débarrasser des mauvaises habitudes.	3.3	1.0	-0.1	-0.6	0.4	3.3	1.0	-0.4	-0.3	0.4
3	Je suis paresseux.	2.8	1.1	0.2	-0.6	0.5	2.9	1.1	0.4	-0.6	0.6
4	Je dis des choses inappropriées.	2.3	1.1	0.8	0.4	0.4	2.4	0.9	0.8	0.5	0.4
5	Je fais certaines choses mauvaises pour moi, si elles sont amusantes.	2.5	1.2	0.5	-0.7	0.6	2.7	1.1	0.2	-0.8	0.6
6	Je refuse de faire des choses qui sont mauvaises pour moi.	2.5	1.2	0.4	-0.9	0.5	2.5	1.1	0.4	-0.6	0.5
7	J'aimerais avoir plus d'auto discipline.	3.0	1.3	0.0	-1.3	0.5	3.2	1.3	-0.2	-1.2	0.5
8	On dit de moi que j'ai une bonne auto discipline.	2.4	1.0	0.7	0.2	0.5	2.5	1.1	0.6	0.4	0.7
9	Le plaisir et l'amusement m'empêchent parfois de finir mon travail.	3.0	1.2	0.1	-1.0	0.5	3.2	1.2	-0.3	-0.8	0.7
10	J'éprouve des difficultés à me concentrer.	2.9	1.2	0.1	-0.9	0.5	3.1	1.1	-0.0	-0.7	0.7
11	Je suis capable de mener à bien mes objectifs à long terme.	2.2	0.9	0.6	-0.0	0.4	2.4	0.9	0.5	0.2	0.6
12	Parfois je ne peux pas m'empêcher de faire quelque chose, même si je sais que c'est mal.	2.7	1.2	0.5	-0.8	0.6	3.1	1.1	-0.1	-0.7	0.7
13	J'agis souvent sans avoir réfléchi à toutes les alternatives.	2.4	1.1	0.5	-0.4	0.5	2.6	1.2	0.4	-0.7	0.5

Averages, standard deviations and correlations between the French Brief Self Control Scale and the four subscales of the UPPS in Sample 1 ( $n = 287$ ).

**Table 2**

	Averages	SD	1	2	3	4
1. BSCS	2.3	0.6	-			
2. UPPS Urgency	2.4	0.6	-.42*** CI [-.50, -.34]			
3. UPPS Lack of Premeditation	2.0	0.4	-.34*** CI [-.44, -.23]	.24*** CI [.13, .35]		
4. UPPS Lack of perseverance	2.1	0.5	-.55*** CI [-.63, -.46]	.31*** CI [.20, .41]	.35*** CI [.24, .45]	
5. UPPS Sensation Seeking	2.7	0.6	-.06 CI [-.21, .09]	-.05 CI [-.17, .07]	.19** CI [.08, .30]	-.02 CI [-.17, .13]

Notes. BSCS = Brief Self-Control Scale; CI = 95% Confidence Interval.

\*\*\*  $p < .001$ ,

\*\*  $p < .01$