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Polish version of the *White Bear Suppression Inventory* (WBSI) by Wegner and Zanakos: factor analysis and reliability

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Summary

Aim. The main aim of this study was to adapt a Polish version of the White Bear Suppression Inventory (WBSI), originally created by Wegner and Zanakos (1994) to measure chronic suppression.

Method. The Polish version of the WBSI was prepared following the back-translation procedure. The scale was administered to 246 individuals from general population. Then, factor structure analysis of the WBSI was conducted. Finally, reliability analysis of the Polish version of the WBSI and its two sub-scales was done.

Results. The Polish version of the WBSI yielded satisfactory psychometric properties. The results from the explanatory factor analysis indicated a two-factor structure of the WBSI inventory including factors of 'suppression' and 'intrusions'. The psychological measures with both factors as well as measures based on the total WBSI scores show very high reliability.

Conclusions. The reliability of the Polish version of the WBSI is comparable to the original version. The analysis allowed us to identify a new subscale that may represent the experience of intrusions. The Polish version of the WBSI is characterized by good psychometric properties and may be used to assess intrusions and suppression.

Key words: suppression, intrusive thoughts, White Bear Suppression Inventory WBSI

Introduction

Recurrent, unwanted and uncontrollable thoughts, memories or emotions, termed as intrusions, have been identified as core symptoms underlying several mental disorders, such as anxiety disorders, depression or eating disorders [e.g., 1–5]. In case individual faces intrusions, his/her primary purpose of mental operations is to remove such unwanted contents by keeping them out of consciousness [6, 7]. This specific process,

called suppression, described by a Freudian theory of psychological defense mechanisms [8], and it has been postulated to be targeted at removing the unwanted intrusions [6].

In fact, several researchers have indicated that psychological defense mechanisms of control and elimination of intrusive thoughts are counterproductive, leading to sufferings of individual. For example, Wegner et al. [9] required half of participants to suppress thoughts about white bears in the first session and then verbally express these thoughts in a second phase; the second group expressed thoughts about a white bear only in the initial session. It was observed that suppressing resulted in an increased frequency of thoughts about the white bear. Therefore, individual's efforts to suppress intrusions may be dysfunctional control strategy that paradoxically results in a rebound effect [1, 10–12]. Wegner [13] proposed that such paradoxical effects of thought suppression be described as so-called ironic processes of mental control. According to this concept, it is assumed that attempts to control thoughts involve two substantial processes: (1) operating process directed at searching for mental contents that are consistent with the effective control and (2) monitoring process aimed at exploring mental contents that are inconsistent with achieving the desired effect by control. In addition, it is postulated that operating process requires cognitive resources to a greater extent than monitoring process; in situations in which these resources are reduced, there might be replacing of operating process with monitoring, which ironically enhances sensitivity to the mental contents that typically are avoided.

As opposed to the Wegner's theory, some researchers have contradicted the assumption of ironic processing by showing that suppression of unwanted thoughts may be effective by ensuring adaptive behavior [see 14–16]. For example, Anderson and Green [16] using a 'think/no-think' paradigm showed that suppression of unwanted thoughts may obstruct retrieval of such suppressed contents in later processing stages. During the 'think/no-think' procedure participants were required to learn associations between unrelated word pairs (the clue-stimulus association). Then, participants underwent a response stage procedure in which only clues were displayed prompting participants to either recall the associated response word (think) or suppress the response (no-think). In terms of measuring suppression, the most important phase of this experiment was recognition. It turned out that words that belonged to the 'think' condition were the best recollected. To the contrary, recognition of words which were accompanied by the 'no-think' message was decreasing when the exercise was performed with the increasing number of repetition. The authors' interpretation of such results was that intensification of thinking about the learned words enhanced their memory, while suppression in the 'no-think' condition inhibited a later retrieval of this material from the memory. Given these outcomes, Anderson and Green [16] have suggested that one of the targeting function of executive control processes is to prevent unwanted thoughts and memories from entering awareness and in consequence to inhibit retrieval of such undesired contents.

In spite of these conceptual discrepancies in terms of suppression, a vast majority of researchers have claimed that disturbances in suppression of unwanted contents play an important role in the development of psychopathology [2, 12, 17]. Therefore, negative results of suppression in psychopathology may explain a variety of psychopathological symptoms associated with obsessive-compulsive disorder, depression, generalized anxiety disorder, posttraumatic stress disorder or phobia [2].

Yet, the most common measure of tendency to chronic suppression of unwanted intrusive thoughts is *the White Bear Suppression Inventory* (WBSI) developed by Wegner and Zanakos [1]. This scale consists of 15 items and a respondent is asked to assess how much she or he agrees with each of statements using a 5-point scale (from "Strongly disagree" to "Strongly agree"). The original version of the WBSI is used as a measure to identify individuals who chronically tend to suppress unwanted thoughts. In fact, a vast body of studies have indicated that the WBSI allows for the assessment of symptoms of psychopathological units such as obsessive-compulsive, depressive or anxiety symptoms [1, 18–20]. In addition, the results obtained on the WBSI scale also allow to diagnose a wide range of self-reported psychopathological symptoms, for instance, measured with the SCL-90 [19], or to diagnose personality traits such as neuroticism, trait-anxiety as well as a tendency to general worry [18].

Nevertheless, recent studies have suggested that the WBSI may be considered not only as a measure of tendency to chronic suppression, but it can also serve as a tool to assess the experience of intrusive thoughts [21]. Indeed, a factorial structure of the original WBSI seems to be controversial considering the fact that some studies have reported a single-factor [1], two-factor [22], or a three-factor solution [23]. Thus, there is growing evidence indicating that the WBSI measure refers to more than one psychological phenomenon that is not limited to the tendency for chronic suppression of unwanted contents. The unidimensional structure of the WBSI is called into question. In particular, Höping and de Jong-Meyer [22], using an exploratory factor analysis, identified two sub-factors of the WBSI – 'unwanted intrusive thoughts' (UIT) and 'thought suppression' (TS). Moreover, it was shown that UIT factor was predictive for psychopathological symptoms associated with anxiety, depression and obsessive-compulsive disorders. The thought suppression sub-scale was indicative solely for depression, however, it turned out that the relationship between *the Beck Depression Inventory* scores [24] and thought suppression was weak [22]. The similar results were also found by Rassin [21] whose study indicated a two-factor structure of the WBSI – linked with the Suppression and the Intrusion factors, combining in this fashion the measure of avoidant coping strategy and the frequency of experiencing the problems the respondent attempts to deal with. In addition, a confirmatory factor analysis (CFA) by Blumberg [23] has indicated that the WBSI addresses a three-factor structure.

Thus, the results of the confirmatory factor analysis of the WBSI show that distinction between experiencing unwanted intrusive thoughts and the process of thought

suppression seems to be adequate [22]. Given that intrusive thoughts are results of failures in thought suppression, it has been claimed that the WBSI is mainly a measure of dysfunctions in cognitive control and not only successful suppression [21, 25, 26]. Thus, contrary to the original work by Wegner and Zanakos [1], the hypothesis of at least two factors of the WBSI structure, which include suppression and intrusive thinking, seem to be more suitable.

Summing up – due to the fact that the WBSI enables measurement of failed suppression attempts and experiencing intrusions, the present research was aimed at providing the Polish version of the WBSI originally developed by Wegner and Zanakos [1], conducting a factor analysis of the translated WBSI, and finally an analysis of its psychometric properties such as reliability of the translated inventory in the Polish population.

Method and materials

246 participants (115 males and 131 females) aged between 18 and 57 ($M = 24.44$; $SD = 7.73$) who were undergraduate students from the University of Social Sciences and Humanities, Faculty in Wroclaw, participated in this study after filling in the informed consent forms. Students received credit points for participating in the study. Participants with history of psychiatric or neurological disorders were excluded from this study. The study was accepted by the local Ethics Committee.

We used the Polish version of *the White Bear Suppression Inventory* (WBSI), which was adapted on the basis of the work by Wegner and Zanakos [1]. The consent of the authors of the original version for the Polish adaptation of the tool was obtained. The inventory consists of 15 items concerning thinking and thought content. Each item is rated on a 5-point Likert-type scale from 1 ("Strongly disagree") to 5 ("Strongly agree"). We adapted a Polish version of the WBSI following a back-translation procedure. First, a team of two translators with psychological background (including one who lived in English-speaking country in the past), fluent in English and Polish (native language), was involved in translating the original version of the tool into Polish. Then, three psychologists, including one with deep expertise in cognitive psychology and psychometry, and a specialist in English language being familiar with British and American culture evaluated all aspects of the translation and approved the final version of the translation. Then, representatives of the target population were asked to fill in the translated questionnaire and evaluate whether the translation was prepared in a clear and understandable way. After the positive evaluation, two bilingual translators made two back-translations. Finally, the team involved in preparing the Polish version of the instrument (two psychologists along with the specialist in English language) evaluated its compatibility with the original. The content of the back-translations did not depart from the original version. The Polish adaptation has been given a graphic layout similar to the original version.

The authors make the Polish version of the WBSI available for public use free of charge (see the Appendix 1).

In order to identify specific factors of the WBSI, a principal component analysis (PCA) with a Promax rotation method was conducted. The analysis established three WBSI factors with eigenvalues > 1.0 (5.48, 1.68 and 1.13, respectively). However, an analysis of the scree plot indicated a two-factor structure. In the next step, we used the PCA combined with a Promax rotation method along with Kaiser normalization to identify a three – and two-factor solution of the scale.

Results

The mean total WBSI score was 50.53 (SD = 10.93; range 20–75). Some previous studies [1, 21] have indicated that there are gender differences in the total WBSI scores and women scored higher in thought suppression. Likewise, in our study, the student's t-test indicated that there is a significant difference was between females (M = 52.01; SD = 11.62) and males (M = 48.84; SD = 9.87), t (244) = 2.28, $p < 0.05$.

The factor loadings for the three-factor solution are presented in Table 1.

Table 1. **The results of principal component analysis and factor loadings of the 15 WBSI items (N = 246) for three-factor solution**

Item	FACTOR 1	FACTOR 2	FACTOR 3
9. There are thoughts that keep jumping into my head.	0.856	-0.094	-0.062
5. My thoughts frequently return to one idea.	0.854	-0.149	-0.015
4. There are images that come to mind that I cannot erase.	0.804	-0.017	-0.095
3. I have thoughts that I cannot stop.	0.692	0.143	-0.066
6. I wish I could stop thinking of certain things.	0.658	0.238	-0.022
7. Sometimes my mind races so fast I wish I could stop it.	0.639	-0.167	0.145
11. Sometimes I really wish I could stop thinking.	0.379	0.216	0.228
14. There are many thoughts that I have that I don't tell anyone.	0.236	0.226	0.235
1. There are things I prefer not to think about.	-0.095	0.894	-0.140
10. There are things that I try not to think about.	0.028	0.792	-0.008
2. Sometimes I wonder why I have the thoughts I do.	0.076	0.630	-0.094
13. I have thoughts that I try to avoid.	0.110	0.602	0.215
8. I always try to put problems out of mind.	-0.216	0.589	0.066
12. I often do things to distract myself from my thoughts.	0.050	-0.138	0.923
15. Sometimes I stay busy just to keep thoughts from intruding my mind.	-0.123	0.086	0.857

The items included to particular sub-scales are presented in bold. The values above 0.3 were established as inclusion criteria.

However, this solution indicated that the first factor included 7 items, the second one –6 items, and the third factor – only 2 items. We included the items with factor loadings above the value of 0.3 [27]. None of these items met the inclusion criteria for both factors. One of the items (14) did not meet the inclusion criteria for any of the selected factors. The total variance of the three-factor solution was 55.22%, including: 36.50% for the first factor, 11.18% for the second factor and 7.54% for the third factor.

Because the third factor included only two items and the scree plot suggested the two-factor solution, in the next step we used the PCA combined with a Promax rotation method along with the Kaiser normalization to identify a two-factor solution of the scale. The factor loadings for the two-factor solution are presented in Table 2. There were seven items loading the factor 1 – 'intrusive thoughts' (e.g., "There are thoughts that keep jumping into my head"), and eight items loading the factor 2 – 'suppression' (e.g., "There are things that I try not to think about"). One of these items met the inclusion criteria for both factors (11). This item was moved into the factor 1. All of the items met the inclusion criteria for one of the selected factors. The total variance of the two-factor solution was 47.68%, including: 36.50% for the first factor and 11.18% for the second factor. Finally, the two-factor solution was chosen due to consistent content of items in two factors.

Table 2. **The results of principal component analysis and factor loadings of the 15 WBSI items (N = 246) for two factor solution**

Item	FACTOR 1	FACTOR 2
9. There are thoughts that keep jumping into my head.	0.840	-0.136
4. There are images that come to mind that I cannot erase.	0.817	-0.110
5. My thoughts frequently return to one idea.	0.813	-0.133
3. I have thoughts that I cannot stop.	0.742	0.035
6. I wish I could stop thinking of certain things.	0.724	0.147
7. Sometimes my mind races so fast I wish I could stop it.	0.558	0.006
11. Sometimes I really wish I could stop thinking.	0.383	0.368
15. Sometimes I stay busy just to keep thoughts from intruding my mind.	-0.294	0.868
12. I often do things to distract myself from my thoughts.	-0.197	0.762
13. I have thoughts that I try to avoid.	0.222	0.643
10. There are things that I try not to think about.	0.242	0.574
1. There are things I prefer not to think about.	0.177	0.527
8. I always try to put problems out of mind.	-0.071	0.497
14. There are many thoughts that I have that I don't tell anyone.	0.242	0.384
2. Sometimes I wonder why I have the thoughts I do.	0.266	0.374

The items included to particular sub-scales are presented in bold. The values above 0.3 were established as inclusion criteria.

In the next step, we assessed reliability of the WBSI by calculating Cronbach's alpha reliability coefficients for both factors. For the factor 1 we obtained $\alpha = 0.84$, and for the factor 2 it was $\alpha = 0.78$. The Cronbach's alpha coefficient calculated for the total WBSI reached the value of 0.87. The reliability of both the individual scales and the total WBSI was very high, indicating the homogeneous structure of the particular sub-scales.

Discussion

This article presents psychometric properties of the Polish version of *the White Bear Suppression Inventory* [1]. The results of the exploratory principal components analysis indicated the two-factor structure explaining 47.68% of variance. The reliability of the total WBSI was very high ($\alpha = 0.87$). The reliability of the Polish version of the WBSI was comparable to the original version of the WBSI, which ranges from 0.87 to 0.88 [1]. Our PCAs of the Polish version of the WBSI indicated a two-factor solution. We labeled these factors such as: factor 1 – 'intrusive thoughts' and factor 2 – 'suppression', with satisfactory reliability values: $\alpha = 0.84$ for the 'intrusive thoughts' factor and $\alpha = 0.78$ for 'suppression' factor.

In fact, our results are consistent with works by Rassin [21] as well as Höping and de Jong-Meyer [22] whose factor analyses of the original WBSI have indicated two-factor solutions. It is worth mentioning here that past analyses of the factor structure of the original WBSI, carried out by Muris and Merckelbach [28] and Wegner and Zanakos [1], indicated only one factor that described a general tendency of individuals to use suppression as a mental control strategy. Yet, as compared to the past analyses, recent studies aiming at exploring the structure of the WBSI have indicated more than one factor [21, 22]. These researchers confirmed that the first factor can identify tendency to experience unwanted intrusive thoughts, while the second factor is more likely related to thought suppression operationalized as chronic tendency to remove unpleasant thoughts from consciousness. Rassin [21] has argued that the WBSI may be in fact a measure of failures in suppression and this tool does not tackle successful suppression. In particular, this researcher has proposed a modified questionnaire by adding items for the third factor into the original WBSI. Yet, taking into account the fact that the WBSI includes items referring to intrusive thoughts, Rassin [21] has suggested that previous reports indicating a positive correlation between the WBSI and psychopathology measures [e.g., 1, 16] may be artificially high. Indeed, multiple regression analyses indicated that actually the factor of intrusion predicted the severity of symptoms measured using by the scales such as: the State-Trait Anxiety Inventory (STAI), *Maudsley Obsessional–Compulsive Inventory* (MOCI) and *Symptoms Checklist* (SCL-90) among non-clinical sample,

while the suppression factor predicted only the severity of symptoms on *the Beck Depression Inventory* (BDI) [21]. In fact, in a clinical sample, the factor of intrusion was related to MOCI scores, whereas the factor of suppression predicted the severity of symptoms measured using the SCL-90 [21].

Conclusions

The Polish adaptation of the WBSI has very good psychometric properties. In our opinion, future research with its use should include both subscales, referring to failed suppression attempts and the severity of intrusion. It should also be noted that the research sample consisted mainly of women. Future studies should be carried out to explore the relation of suppression and intrusion factors with psychopathological symptoms. It should also be noted that the present results fit well with the current discussion raising the issue that the WBSI is not only a measure of suppression, but it also tackles a measure of intrusions. It seems that the WBSI mainly allows to measure failed suppression attempts (i.e., the combination of suppression attempts and the experience of intrusions). It is worth noting that until now Polish psychological literature lacked tools to measure the mechanism of suppression of thoughts and intrusions in the non-clinical population (see *the Unwanted Thoughts Questionnaire* [29]). Therefore, in our opinion this study is an important contribution to the field of psychometric research in terms of measuring suppression and intrusion phenomenon in the general population.

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Appendix 1

WBSI

Daniel Merton Wegner &SophiaZanakos

This survey is about thoughts. There are no right or wrong answers, so please respond honestly to each of the items below. Be sure to answer every item by circling the appropriate letter beside each.

A	**B**	**C**	**D**	**E**					
Strongly Disagree	*Disagree*	*Neutral or Don't Know*	*Agree*	*Strongly Agree*					
1.	There are things I prefer not to think about.				A	B	C	D	E
2.	Sometimes I wonder why I have the thoughts I do.				A	B	C	D	E
3.	I have thoughts that I cannot stop.				A	B	C	D	E
4.	There are images that come to mind that I cannot erase.				A	B	C	D	E
5.	My thoughts frequently return to one idea.				A	B	C	D	E
6.	I wish I could stop thinking of certain things.				A	B	C	D	E
7.	Sometimes my mind races so fast I wish I could stop it.				A	B	C	D	E
8.	I always try to put problems out of mind.				A	B	C	D	E
9.	There are thoughts that keep jumping into my head.				A	B	C	D	E
10.	There are things that I try not to think about.				A	B	C	D	E
11.	Sometimes I really wish I could stop thinking.				A	B	C	D	E
12.	I often do things to distract myself from my thoughts.				A	B	C	D	E
13.	I have thoughts that I try to avoid.				A	B	C	D	E
14.	There are many thoughts that I have that I don't tell anyone.				A	B	C	D	E
15.	Sometimes I stay busy just to keep thoughts from intruding my mind.				A	B	C	D	E