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The Craving Typology Questionnaire: Polish adaptation and validation

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Summary

Aim. Alcohol craving, a core symptom of addiction, is experienced by most individuals with alcohol use disorder (AUD). Its significance in the course of addiction treatment has been widely investigated using various psychometric instruments. The Craving Typology Questionnaire (CTQ) developed by Martinotti et al. allows for the assessment of alcohol craving in accordance with the three-factor model proposed by Verheul et al. The aim of this study was to adapt and validate the CTQ for use in the Polish population.

Material and methods. A total of 510 individuals (396 men and 114 women) diagnosed with alcohol dependence and undergoing treatment in various therapeutic centers participated in the study. Alongside the CTQ, the following instruments were used: the Penn Alcohol Craving Scale (PACS), the Yale-Brown Obsessive Compulsive Drinking Scale (Y-BOCS-hd), and the Short Alcohol Dependence Data Questionnaire (SADD) to assess craving intensity and severity of dependence.

Results. The Polish version of the CTQ demonstrated acceptable psychometric properties. Factor analysis revealed three dimensions – reward craving, relief craving, and obsessive craving – accounting for approximately 47% of the total variance. Due to differences in factor structure from the original, the final version was reduced from 20 to 17 items. Cronbach's alpha was 0.85 for Obsessive craving, 0.73 for Relief craving, and 0.57 for Reward craving. All CTQ subscales showed moderate, significant correlations with PACS, Y-BOCS-hd, and alcohol dependence severity.

Conclusions. The method can therefore be recommended, albeit with some caution, for use in research and clinical practice, particularly in the selection of appropriate forms of therapy, including pharmacological interventions.

Key words: alcohol craving, Craving Typology Questionnaire (CTQ), Polish adaptation

Introduction

Alcohol craving – defined as an intense and difficult-to-control urge to consume alcohol and experience its effects – has long been recognized as a key factor in the development of alcohol use disorder (AUD), its clinical course, and patient functioning after treatment. Craving is associated with impaired control over drinking, constitutes a major source of psychological distress for individuals with AUD, and significantly contributes to relapse into maladaptive patterns of substance use [1–5]. Consequently, alcohol craving has been included as a diagnostic criterion for AUD in the ICD-10 and DSM-5 classifications and is also reflected in the most recent ICD-11 revision [4, 6].

Systematic reviews of the literature indicate that alcohol craving is a complex, multidimensional phenomenon [1, 7]. Research highlights the role of specific cognitive processes (e.g., attentional bias), beliefs, and expectancies about alcohol, conditioning mechanisms, motivational factors, as well as psychobiological responses and regulatory mechanisms [1, 7–9]. These components form the foundation for theoretical models of craving, which – although not mutually exclusive – emphasize different underlying mechanisms. In recent years, increasing attention has been devoted to the biological determinants of alcohol craving [3, 7, 9].

A noteworthy integrative framework for understanding the psychobiological underpinnings of craving was proposed by Verheul, Van den Brink, and Geerlings – the authors of the Three-Pathway Psychobiological Model of Craving [10]. This model posits the existence of three relatively distinct mechanisms underlying different types of craving.

The first pathway refers to reward craving, reinforced by the pleasurable effects of alcohol. This type of craving is more commonly observed in men and is associated with genetic predispositions, early onset of drinking, high impulsivity, dissocial traits, and an elevated need for stimulation – features that may reflect dopaminergic dysregulation or specific personality characteristics.

The second pathway involves relief-oriented craving, motivated by the need to reduce tension and experience relief. This type is linked to dysregulation of the GABAergic system, heightened stress reactivity, elevated anxiety levels, and avoidant personality traits. It is more frequently observed in women and typically emerges later in life.

The third pathway, referred to as obsessive craving, is characterized by a loss of control over intrusive, persistent thoughts about alcohol. This variant may stem from serotonergic deficiency or personality traits such as low self-directedness – or a combination of these factors.

Although these mechanisms may co-occur within individuals with alcohol dependence, the authors emphasize that in many cases, one pathway can be identified as predominant. It is also worth noting that at least two of the three proposed pathways show considerable similarity to Robert Cloninger's typology of alcoholism.

Within this framework, two basic types of alcoholism are distinguished: Type I and Type II. Type I, more frequently observed in women, is characterized by a later onset of problematic drinking, a strong influence of environmental factors, and the co-occurrence of anxiety and a high level of harm avoidance. In contrast, Type II is characterized by an early onset of dependence, a stronger genetic predisposition, impulsivity, a high level of novelty seeking, and antisocial behaviors. The two types differ in their temperamental profiles and etiological mechanisms, which has important diagnostic and therapeutic implications [11, 12].

Building on theoretical model by Verheul et al., a team of Italian researchers developed the Craving Typology Questionnaire (CTQ) [12]. The construction of the instrument involved a literature review on drinking motives and alcohol-related situations, followed by the development of an initial pool of 45 items. This was subsequently reduced to 20 items grouped into three subscales: Reward craving (7 items), Relief craving (5 items), and Obsessive craving (8 items). Psychometric analyses – both exploratory and confirmatory – conducted on clinical ($n = 100$) and non-clinical ($n = 547$) samples supported the three-factor structure of the questionnaire and demonstrated good psychometric properties (Cronbach's alpha = 0.81–0.83). Significant gender differences were observed on the reward craving scale (with higher scores in men), as well as a negative correlation between scores on this scale and participant age [12]. More recently, a revised 15-item version of the questionnaire has also been developed [13].

Given the potential of the CTQ for assessing individual patterns of alcohol craving – and its practical relevance for both diagnostic and therapeutic purposes – a decision was made to adapt the questionnaire for use in the Polish context.

The aim of the present study was to conduct a validation process and evaluate the psychometric properties of the Polish version of the Craving Typology Questionnaire (CTQ) developed by Martinotti et al. [12].

Materials and methods

The study was conducted across five treatment centers for alcohol dependence in Poland, including both inpatient and outpatient facilities. A total of 550 patients diagnosed with alcohol dependence syndrome (ICD-10 code F10.2) were recruited.

To minimize the potential influence of acute withdrawal symptoms on alcohol craving assessments, all measurements were conducted during the third week of treatment. After excluding incomplete questionnaires, data from 510 individuals were included in the final analyses, comprising 396 men and 114 women.

The study was approved by the Research Ethics Committee for Scientific Studies at the University of Lodz (approval number: 5/KBBN-UŁ/I/2014).

Statistical analyses were conducted using Statistica 6.0 PL. Basic sociodemographic characteristics of the study sample are presented in Table 1.

Table 1. **Descriptive statistics of the study sample (*n* = 510)**

Variable	***N***	**%**	***M***	***SD***
Age			44.19	11.31
Gender				
Men	396	77.65		
Women	114	22.35		
Staying in a relationship				
Yes (marital or non-marital partnership)/	242	47.45		
No	268	52.55		
Education				
Basic / Vocational	279	54.72		
Secondary / Higher	231	45. 29		
Children				
Yes	378	74.12		
No	132	25.88		
Nicotine addiction				
Yes	387	75.88		
No	123	24.12		
Drug addiction				
Yes	47	9.22		
No	463	90.78		
Addiction in the family of origin				
Yes	306	60.0		
No	204	40.0		
The current therapy is				
First line	312	61.18		
Subsequent therapy	198	38.82		
Somatic illnesses				
Absent	404	79.22		
Present	106	20.78		
Mental disorders				
Absent	311	60.98		
Present	199	39.02		
History of suicide attempts				
Yes	58	11.37		

table continued on the next page

No	452	88.63		
Currently taking medication prescribed by a psychiatrist				
Yes	117	22.95		
No	393	77.06		
Age of addiction onset			29.44	11.25
Duration of treatment (in years)			3.56	6.06

In addition to the demographic questionnaire and the adapted CTQ, the following psychometric instruments were used in the study:

– Penn Alcohol Craving Scale (PACS) [14], in the Polish adaptation by Chodkiewicz et al. [15]. The PACS consists of five items: three assess the frequency, intensity, and duration of alcohol craving, while the remaining two evaluate the individual's perceived ability to resist drinking when alcohol is available, and the average craving intensity over the past week. Responses are given on a seven-point Likert scale (0–6), with the total score being the sum of all items. The Polish version demonstrates good psychometric properties, with a Cronbach's alpha of 0.89. In the current study, Cronbach's alpha was 0.88.

– Yale–Brown Obsessive Compulsive Scale Modified to Reflect Obsessions and Compulsions Related to Heavy Drinking (Y-BOCS-hd) [16], in the Polish adaptation by Nowakowska-Domagała et al. [17]. This scale comprises 10 items designed to assess the severity of obsessive thoughts and compulsive behaviors related to alcohol craving in individuals with alcohol use disorders. The first five items address alcohol-related obsessions, while the remaining five assess compulsive behaviors. Each item is rated on a five-point scale (0–4), where 0 indicates no symptoms and 4 indicates severe symptoms. The Polish version of the scale has demonstrated good internal consistency, with a Cronbach's alpha of 0.84 for the full scale, 0.75 for the obsession subscale, and 0.79 for the compulsion subscale. In the present study, the Cronbach's alpha for the full scale was 0.85.

– Short Alcohol Dependence Data Questionnaire (SADD) [18], in the Polish adaptation by Ziółkowski [19]. The SADD is a 15-item self-report instrument used to assess the severity of alcohol dependence. Each item is rated on a four-point scale (0–3). The total score classifies the level of dependence as follows: 0 = no dependence; 1–9 = mild dependence; 10–19 = moderate dependence; 20–45 = severe dependence. In the current sample, the Cronbach's alpha for the total scale was 0.78.

Results

Preliminary adaptation studies

In the initial phase of the adaptation process, procedures recommended for the translation and cultural adaptation of psychometric instruments were followed. The original English version of the questionnaire was independently translated into Polish by two translators, including one psychologist with a background in philology. A back-translation was then performed by two different translators, one of whom held certified sworn translator credentials. A comparison of the original and back-translated versions enabled the development of a semantically accurate and linguistically refined Polish version.

To assess the clarity and comprehensibility of the questionnaire items, a pilot study was conducted. The participants were 20 individuals with alcohol dependence, all members of the Alcoholics Anonymous community. Inclusion criteria for the pilot sample were age over 55 years and completion of only primary education. After completing the questionnaire, participants were asked to identify any items they found unclear or difficult to understand. None of the items were rated as unclear by more than 5% of respondents, indicating an acceptable level of linguistic clarity and comprehensibility.

Factor structure of the scale

Prior to conducting factor analysis, the adequacy of the sample was assessed. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy reached a value of 0.900, indicating a strong foundation for factor analysis. Additionally, Bartlett's test of sphericity was statistically significant ($\chi^2 = 2227.11$; $p < 0.0001$), confirming that the correlation matrix was not an identity matrix and that the application of factor analysis was appropriate.

Exploratory and confirmatory factor analyses

An initial exploratory factor analysis (EFA) with oblimin rotation revealed the presence of three factors, which together accounted for approximately 47% of the variance in scores. However, some items showed comparable factor loadings on two different factors, and several items loaded onto factors different from those in the original version of the instrument.

Given these inconsistencies, a confirmatory factor analysis (CFA) was performed, assigning items to factors based on the original structure proposed by the questionnaire's authors. The resulting model did not reach satisfactory fit indices: $\chi^2 = 1160.46$; $df = 170$; $p < 0.0001$; RMSEA = 0.108; GFI = 0.862; AGFI = 0.830; CFI = 0.814; SRMR = 0.120.

Due to the unsatisfactory fit of the initial confirmatory model, items with statistically non-significant factor loadings (path significance >0.05) were removed. After eliminating three such items, model fit was reassessed. The revised model demon-

strated an acceptable level of fit: $\chi^2 = 336.04$; $df = 116$; $p < 0.001$; RMSEA = 0.060; GFI = 0.948; AGFI = 0.932; CFI = 0.942; SRMR = 0.070.

In subsequent steps, additional item reduction was attempted by removing items with the lowest standardized loadings, even if statistically significant. However, this did not improve model fit, and the decision was made to retain the current structure.

The final version of the instrument includes 17 items (compared to 20 in the original version), organized into three factors:

- Reward craving (5 items);
- Relief craving (4 items);
- Obsessive thoughts about alcohol (7 items).

Three items (items 5, 7, and 10) that were removed during the confirmatory factor analysis were retained in the questionnaire as buffer items, excluded from the total score calculation. The results of the exploratory factor analysis with oblimin rotation for the final version of the instrument are presented in Table 2. The three extracted factors explain over 47% of the total variance.

Table 2. **Factor loadings for CTQ items in the tested model (*n* = 510)**

Item	Reward craving	Relief craving	Obsessive craving
I drink because I like it	0.50		
I drink to get high and lose control	0.57		
I drink to relieve tension and stress		0.74	
I think about alcohol constantly			0.70
6. I stop thinking about alcohol only while I drink			0.63
8. I started drinking very early in life	0.50		
9. I drink because I need to and not because I like it			0.56
11. If I can't drink I get anxious			0.55
12. Because of the thought of alcohol I miss out on other important things			0.52
13. Sometimes I take other drugs with alcohol	0.61		
14. I drink when I feel sad		0.73	
15. I often use alcohol as a tranquilizer or sleep-inducer		0.72	
16. I can hardly ever put off the thought of drinking			0.79
17. Sometimes I can't get my mind off drinking			0.69
18. When I drink I calm myself down		0.58	
19. When I drink a lot I sometimes become aggressive and/or irritable	0.64		

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20.I fight with all my strength to overcome the thought of drinking but it is stronger than my will			0.68
Own value	1.96	2.56	3.78
% of variance	11.51	15.10	22.28

Reliability

The Cronbach's alpha coefficients for the individual scales in the modified version of the questionnaire were as follows: 0.85 for the Obsessive craving scale, 0.73 for the Relief craving scale, and 0.57 for the Reward craving scale. The first two values can be considered fully satisfactory, whereas the coefficient for the third scale indicates low internal consistency. Correlation analysis between the three factors revealed statistically significant associations of moderate strength; Pearson's *r* coefficients ranged from 0.42 to 0.58 ($p < 0.01$). In addition, item-total correlations were calculated for each scale. For all items – with the exception of item 13 – these coefficients ranged from 0.58 to 0.73 ($p < 0.01$), indicating good alignment of the items with the underlying constructs. Detailed results are presented in Table 3.

Table 3. **Correlations between items and subscales of the CTQ**

	Reward craving		Relief craving		Obsessive craving
1	0.58**	4	0.68**	5	0.72**
2	0.66**	14	0.79**	6	0.64**
8	0.67**	15	0.79**	9	0.63**
13	0.24**	18	0.73**	11	0.73**
19	0.68**			12	0.68**
				16	0.73**
				17	0.73**
				20	0.72**

** $p < 0.01$

Construct validity of the Polish version

Convergent validity of the method was assessed by analyzing its associations with scores from instruments measuring the intensity of alcohol craving and the severity of addiction, as shown in Table 4.

Table 4. **Assessment of the theoretical validity of the CTQ – associations with the PACS, Y-BOCS-hd and SADD**

	PACS	Yale-Brown – obsessions	Yale – Brown – Compulsions	Yale-Brown Total	SADD
Reward craving	0.31**	0.30**	0.33**	0.36**	0.39**
Relief craving	0.20**	0.26**	0.26**	0.30**	0.38**
Obsessive craving	0.38**	0.42**	0.32**	0.40**	0.44**

**p <0.01

The results of the external validity analysis for the adapted version of the scale were consistent with the theoretical assumptions. All three CTQ subscales correlated significantly with both scales assessing the intensity of alcohol craving. The directions of the relationships were in line with expectations: higher levels of drinking motivated by the need for reward, the desire for relief, or obsessive thoughts were significantly associated with higher scores on both the general alcohol craving scale and the scale measuring obsessive-compulsive drinking patterns.

The strongest association was found between the CTQ – Obsessive craving subscale and the Obsessions subscale of the Yale-Brown questionnaire, supporting the theoretical validity of this construct. Similarly, statistically significant associations were observed for the Short Alcohol Dependence Data Questionnaire (SADD): higher levels of addiction severity were associated with higher scores across all three CTQ subscales.

Additionally, relationships between participants' age and duration of addiction and the CTQ subscale scores were analyzed. Statistically significant negative correlations were found only for the Reward craving subscale:

- age: $r = –0.24$; $p <0.01$;
- duration of addiction: $r = –0.36$; $p <0.01$.

These results indicate that younger age and shorter duration of addiction were significantly associated with greater intensity of reward-driven alcohol craving. A similar age-related pattern for this form of craving was also reported by the authors of the original version of the instrument.

Between-group differences analysis

To examine gender differences in CTQ subscale scores, independent samples t-tests were conducted. A statistically significant difference was found only in the Reward craving subscale, where men scored significantly higher ($M = 12.88$; $SD = 3.71$) than women ($M = 11.44$; $SD = 3.81$), $t(508) = 3.53$; $p <0.01$; $d = 0.38$, indicating a medium effect size. This result is consistent with findings reported by the authors of the original version of the instrument.

Differences in Reward craving scores were also observed when comparing individuals with a family history of alcohol dependence to those without such a history.

Participants with a family history scored higher (M = 13.10; SD = 3.80) than those without (M = 11.78; SD = 3.71), $t(508) = 3.86$; $p < 0.01$; $d = 0.35$ (medium effect size).

A similar pattern was observed in the context of nicotine dependence. Individuals diagnosed with nicotine dependence obtained significantly higher scores on the Reward craving subscale (M = 12.78; SD = 3.79) compared to non-dependent individuals (M = 11.56; SD = 3.87), $t(508) = 2.91$; $p < 0.01$; $d = 0.32$ (medium effect size). No statistically significant group differences were found in the other CTQ subscales. Additionally, CTQ scores were compared between individuals who reported no comorbid psychiatric disorders (Group 1; n = 311) and those who reported such disorders (Group 2; n = 199). Among participants reporting the presence of mental disorders, the majority were individuals with depressive disorders (n = 104, 50.7%) and anxiety disorders (n = 58, 29.14%). The analysis revealed statistically significant differences across all three subscales:

- Reward craving: Group 1 – M = 12.01; SD = 3.85; Group 2 – M = 13.46; SD = 3.65; $t(508) = –4.18$; $p < 0.01$; $d = 0.38$;
- Relief craving: Group 1 – M = 14.66; SD = 3.74; Group 2 – M = 16.35; SD = 3.38; $t(508) = –5.09$; $p < 0.01$; $d = 0.47$;
- Obsessive craving: Group 1 – M = 22.83; SD = 7.66; Group 2 – M = 25.60; SD = 7.49; $t(508) = –3.94$; $p < 0.01$; $d = 0.36$.

The strongest effect was observed in the Relief craving subscale, which may suggest that individuals with comorbid psychiatric disorders are more likely to use alcohol to alleviate emotional distress.

Discussion of results and conclusions

The aim of the present study was to adapt and validate the Polish version of the Craving Typology Questionnaire (CTQ), which enables the assessment of alcohol craving based on a three-factor model developed by Verheul et al. [10]. This model posits that craving may have distinct origins and manifestations – it may stem from the need for reward (*reward craving*), the desire for relief (*relief craving*), or be associated with intrusive alcohol-related thoughts (*obsessive craving*). Despite the popularity of this conceptualization in the literature, no empirical adaptation of the model had previously been undertaken in the Polish context. The findings presented here thus represent an important step toward filling this gap.

Factor analysis of the Polish version of the CTQ confirmed the general three-factor structure, though three items had to be removed, resulting in some differences in subscale composition compared to the original version. A lower reliability was observed for the Reward craving subscale, which may be attributable to differences in sample characteristics. Unlike the Italian validation study, which analyzed a combined sample of individuals with (n = 100) and without alcohol dependence (n = 547), our study focused exclusively on individuals meeting the criteria for alcohol dependence (n = 510). Moreover, our sample was more representative of the population of individu-

als with alcohol dependence (77.65% men, 22.35% women) compared to the Italian study, in which women constituted 69% of individuals with alcohol dependence, and the Turkish study, which included only male participants with alcohol dependence (n = 157) [12, 20].

It is worth noting that similar difficulties in replicating the original factor structure were reported by the authors of the Turkish adaptation [20]. In that study, three items – including two (items 7 and 10) that were also eliminated in our version – were reassigned to different subscales, and the internal consistency of the Reward craving subscale was even lower (Cronbach's alpha = 0.42). These findings suggest that both the severity of dependence and demographic characteristics of the sample may influence the factorial structure and internal coherence of the instrument.

Despite these differences, the results of the construct validity analyses were consistent with the assumptions of the model. Statistically significant correlations were found between CTQ scores and established measures of alcohol craving (PACS, Y-BOCS-hd) as well as alcohol dependence severity (SADD). In line with previous research, demographic variables – specifically gender and age – were shown to influence the intensity of different types of craving, supporting the instrument's cross-cultural relevance and its diagnostic potential.

The findings support the usefulness of Verheul's model for differentiating types of alcohol craving not only in research contexts but also in clinical practice. Previous studies have suggested that the predominant type of craving may have prognostic value and inform the selection of appropriate therapeutic strategies, including pharmacological interventions [10, 12, 21, 22]. For instance, individuals experiencing craving driven by the desire for relief may respond more favorably to medications that reduce anxiety and tension, whereas those exhibiting reward-driven craving may benefit more from treatments targeting the dopaminergic system. The CTQ may thus serve as a valuable tool for supporting the individualization of treatment, aligning with the growing emphasis on personalized approaches in addiction therapy [12, 13].

The instrument also holds substantial research potential. Measuring distinct types of craving enables more precise exploration of their associations with temperament traits, cognitive mechanisms, and the neurobiological foundations of addiction. Within the framework of contemporary addiction models, future research on the relationships between craving components and phenomena such as addiction memory, attentional bias, and cue reactivity appears especially important. These mechanisms play a critical role in the maintenance of addiction and are key predictors of relapse [e.g., 23–26].

Despite these promising results, the study has several limitations. These include the lack of data on test–retest reliability and limited generalizability of the findings to non-dependent populations. Future research should also investigate the tool's utility in longitudinal designs, particularly in tracking changes in craving profiles during treatment and sustained abstinence.

A limitation of the study is the reliance on self-reported information regarding comorbid mental disorders, which may not accurately reflect professionally established diagnoses. Incorporating such clinical diagnoses in future research would be valuable.

In conclusion, the Polish version of the CTQ appears to be a promising instrument with acceptable psychometric properties, suitable for use in both research and clinical settings. Further investigations into its applications and into the factors influencing the manifestation of various types of alcohol craving may meaningfully enhance our understanding of addiction mechanisms and contribute to more effective treatment outcomes.

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