
Italian validation of the Approach-Avoidance Temperament Questionnaire

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✎ **ABSTRACT.** L'Approach-Avoidance Temperament Questionnaire (ATQ) è lo strumento per la misurazione dei temperamenti di approccio ed evitamento del modello teorico di Elliot e Thrash (2002, 2010). In questo lavoro ci siamo proposti di dare un contributo alla validazione italiana dell'ATQ. Dall'analisi fattoriale esplorativa (EFA) in un campione pilota di studenti universitari (n = 98) e dall'analisi fattoriale confermativa (CFA) in un gruppo più ampio (n = 360), è emersa una solida struttura a due fattori, una soddisfacente affidabilità interna, invarianza per genere e livello di istruzione e validità convergente con la scala BIS-BAS. Anche se i nostri risultati attendono di essere confermati in campioni più grandi e diversificati, l'ATQ sembra essere uno strumento valido e affidabile per misurare i temperamenti di approccio ed evitamento.

✎ **SUMMARY.** Our aim is to contribute to the Italian validation of the Approach-Avoidance Temperament Questionnaire (ATQ), an instrument devoted to evaluate approach and avoidance temperaments according to the Approach-Avoidance Temperament Model (Elliot & Thrash, 2002, 2010). We performed an exploratory factor analysis (EFA) in an university students' pilot sample (Sample 1, n = 98) and a confirmatory factor analysis (CFA) in an adults' convenience sample (Sample 2, n = 360). We evaluated the invariance across gender and education and we explored the convergent validity with the BIS-BAS scale. The ATQ reported an a-priori two-factor structure in the EFA, that was confirmed in the CFA, satisfactory internal reliability, invariance across gender and education and convergence with the BIS-BAS scale. Even though our results await to be confirmed in larger and diversified samples, the ATQ appears to be a valid, reliable and parsimonious instrument to measure approach-avoidance temperaments.

Keywords: Approach temperament, Avoidance temperament, Italian validation

INTRODUCTION

The motivated behavior is governed by two tendencies: the tendency to approach and the tendency to avoidance. Whereas researchers interested in approach and avoidance have analyzed these tendencies from specific angles (such as emotions, traits etc.), Elliot and Thrash (2002) have come to describe approach and avoidance in a broader perspective starting from the aim to identify the basic structures of personality.

Literature has identified three pairs of basic factors of personality: first, the Extraversion/Neuroticism, two traits which respectively concern optimism and sociability and insecurity and worry proneness (Elliot & Thrash, 2002); second, the positive/negative emotionality, two affective dispositions that induce the individual to experience positive (versus negative) emotions (Elliot & Thrash, 2002); third, the Behavioral activation system/Behavioral inhibition system (BAS/BIS), two motivational systems that facilitate (versus inhibit) behavior and generate positive (versus negative) affect (Gray, 1982).

Moving from the evidences of theoretical and empirical links between Extraversion, BAS and positive emotionality, and between Neuroticism, BIS and negative emotionality (Carver & White, 1994), Elliot and Thrash (2002) hypothesized that these two constructs' groups shared an underlying core rooted in the positive (versus negative) valence and in the neurobiological sensitivity to desirable (versus undesirable) stimuli. The authors confirmed their hypothesis in three empirical studies (1, 2, 6 studies: Elliot & Thrash, 2002) identifying two latent factors: the approach temperament from Extraversion, positive emotionality and BAS, and the avoidance temperament from Neuroticism, negative emotionality and BIS. Thus, Elliot and Thrash (2010) defined the temperaments as neurobiological sensitivities expressed by vigilance, emotional reactivity and behavioral inclination to valenced stimuli, specifically, inclination to reward stimuli for the approach temperament and to punishment stimuli for the avoidance temperament.

The Approach-Avoidance Temperament Questionnaire

To directly measure approach-avoidance temperaments, Elliot and Thrash (2010) developed the Approach-Avoidance Temperament Questionnaire (ATQ). In a series of 6 studies the authors documented satisfactory internal reliability (Cronbach's alphas are approach temperament

= .80; avoidance temperament = .79) and a solid two-factor structure in an exploratory analysis (Study 1) and in a confirmatory factor analysis (CFI = .93, RMSEA = .063) (Study 2); they also confirmed the satisfactory internal reliability (Cronbach's alphas are approach temperament = .85; avoidance temperament = .86) and documented the test-retest stability (approach temperament $r = .70$, $p < .05$; avoidance temperament $r = .85$, $p < .05$) (Study 3). Moreover, they explored the convergent validity of the approach-avoidance temperaments with Extraversion-Neuroticism, positive and negative emotionality and BIS-BAS scales. After observing a medium-high correlation between temperaments and the like-valenced constructs in an eight-factors CFA model, the authors compared this result with a series of nested models, collapsing together the like-valenced constructs (e.g., approach temperament with BAS), and a full structural model in which approach and avoidance temperaments were the common roots of the like-valenced constructs. This final model showed better fit to the data confirming the theoretical assumptions that approach and avoidance temperaments should be considered as the underlying core of Extraversion/Neuroticism, positive negative emotionality and BIS BAS (Study 4). They also documented the discriminant (Study 5) and predictive validity of the ATQ (Study 6).

Walker and Jackson (2017) have recently noted that the approach-avoidance temperament model is an elegant and parsimonious theory that opened new possibilities to researchers since temperaments are considered as the basic foundation for personality's structure.

The ATQ has been used in literature to analyze approach-avoidance temperaments in relation to coping and sports performance (Yeatts & Lochbaum, 2013), dependency or autonomy-oriented help seeking (Komissarouk, Harpaz & Nadler, 2017), happiness, life satisfaction and well-being (Briki, 2018), showing satisfactory internal reliability in line with the original validation manuscript (Cronbach's alpha range: approach temperament = .75-.85, avoidance temperament = .73-.91) (Briki, 2018; Komissarouk et al., 2017; Yeatts & Lochbaum, 2013). Moreover, the ATQ has been translated into German and the authors confirmed adequate internal reliability (Cronbach's alpha range: approach temperament = .71-.80, avoidance temperament = .73-.81), a two-factor structure (CFI = .94, RMSEA = .060), as well as construct and predictive validity through a series of 4 studies that explored approach-avoidance temperaments in the work setting (Bipp, Kleingeld & Van Dam, 2015).

Approach-avoidance tendencies in the Italian context

Italian studies on approach-avoidance tendencies have been limited to the BIS-BAS scale (Carver & White, 1994) based on the Reinforcement sensitivity theory (Gray, 1982), since this has been the only available instrument validated in Italian (Leone, Pierro & Mannetti, 2002). Leone and colleagues found a satisfactory factorial structure, internal reliability and convergent validity of the BIS BAS factors with Extraversion, Impulsivity and Neuroticism, which although associated still represent different constructs. However, the BIS and BAS systems pertain to a constrained range of eliciting stimuli (i.e., reward and punishment) and processes, thus they are suited to analyze approach and avoidance only in relation to basic stimulus-response functioning (Elliot & Thrash, 2010).

The lack of a measure that assesses approach and avoidance through a broader perspective inspired this contribution. We aim to provide Italian researchers with a measure for the approach-avoidance assessment in a broader perspective, the ATQ (Elliot & Thrash, 2010). We hypothesize that the Italian version of the ATQ will have an adequate factorial structure and internal reliability similar to the original instrument. In accordance with the theoretical background, we expect that approach and avoidance temperament scales will show convergent validity with the BAS and BIS constructs, but still maintaining their own identity.

Moreover, even though it has not been tested yet, we expect the two-factor structure of the questionnaire to be invariant across gender and education.

METHOD

Participants and procedures

We validated the questionnaire in two independent samples. Sample 1 consisted of 98 university students of psychology at the University of Cagliari, 25 men and 73 women, ages 20-50 ($M = 22.41$, $SD = 4.83$). Sample 2 was composed of 374 individuals, 210 males, 164 females, ages 18-65 ($M = 34.91$, $SD = 13.41$), 136 university students, 238 workers (e.g., employees, lawyers, masons, housewives, etc.), 251 cities residents, 123 small towns residents, 7-26 years of

education ($M = 14.63$, $SD = 2.87$). The research was publicized through internet ads, leaflets and face-to-face recruitment in public places (universities, associations etc.).

The ATQ questionnaire was translated into Italian by three independent translators and the final version was back-translated into English by an expert.

The ATQ questionnaire was included within a battery of instruments and administered in two independent samples and two different sessions. Sample 1 completed the ATQ in classroom at the end of a lesson. Sample 2 completed the ATQ questionnaire and the BIS-BAS scale as a part of a larger study. All data were collected after obtaining informed consent and were anonymized through the assignment of a numerical code to each participant. The two studies were approved by the Ethics Committees of the Sapienza University of Rome and the University of Cagliari.

Instruments

The Approach-Avoidance Temperament Questionnaire (Elliot & Thrash, 2010) is composed of 12 items with a 7-point Likert scale response format (1 = Strongly disagree, 4 = Neither agree nor disagree, 7 = Strongly agree). The ATQ investigates with 6 items per scale, the approach temperament (e.g., "I am always on the lookout for positive opportunities and experiences") and the avoidance temperament (e.g., "When it looks like something bad could happen, I have a strong urge to escape").

The BIS-BAS scale (Carver & White, 1994; Italian version Leone et al., 2002) is composed of 20 items with a 5-point Likert scale response format (1 = It does not describe me at all, 5 = It completely describes me). The BIS explores anxious anticipation of negative events (7 items, e.g., "I worry about making mistakes"). The BAS investigates the reward sensitivity with three factors: BAS Drive that assesses proactive behaviors (4 items, BASd; e.g., "I go out of my way to get things I want"); BAS Reward Responsiveness that explores the tendency to be excited by reward opportunities (5 items, BASrr; e.g., "When I get something I want I feel excited and energized"); and BAS Fun Seeking that investigates the tendency to experiment new sensations (4 items, BASfs; e.g., "I crave excitement and new sensations"). The Italian version showed an adequate factorial structure (CFI = .95, RMSEA = .054) and acceptable internal reliability (Cronbach's alphas are BASd = .68, BASfs

= .75, BASrr = .74, BIS = .72) (Leone et al., 2002). In this study we confirmed its acceptable internal reliability (ω is BASd = .75, BASfs = .63, BASrr = .74, BIS = .78).

Analysis and models

Data analysis was conducted with structural equation modeling, the parameters were estimated with the full information maximum likelihood to manage the few missing cases (Sample 1 = 1 missing of item 5- 1.02%; Sample 2 = 1 missing of item 12- .27%). We excluded from the analyses 14 participants of the Sample 2 that abandoned the study. We tested the factorial structure through EFA in a university students' sample (Sample 1) and we confirmed the results with CFA in a larger adults' sample (Sample 2). To evaluate the model's adequacy, we referred to several fit indices, the chi-square value (χ^2), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA). Researchers commonly consider as sufficient or satisfactory fit values CFI and TLI above .90 or .95 and RMSEA below .08 or .06 (Hu & Bentler, 1999).

To support the factorial invariance over genders and level of education the difference of CFI and RMSEA between the most restrictive model and the previous one should not exceed a Δ CFI of .01 and a Δ RMSEA of .015 (Cheung & Rensvold, 2002).

We calculated the internal reliability of the ATQ through McDonald's ω index (McDonald, 1970): $\omega = (\sum|\lambda_i|)^2 / ((\sum|\lambda_i|)^2 + \sum\delta_{ii})$, where λ_i are the factor loadings and δ_{ii} the error variances.

Finally, we examined the convergent validity of the ATQ with the BIS-BAS scale (Carver & White, 1994; Italian validation Leone et al., 2002) within a latent framework based on item parcels. This was done to reduce the complexity of the model, in line with recommendations of Leone and colleagues for the BIS-BAS scale (2002) and after testing the satisfactory fit and adequate parameters at the item-level factor structure for the ATQ (Marsh, Lüdtke, Nagengast, Morin & Von Davier, 2013)¹.

RESULTS

Exploratory factor analysis on Sample 1.

We tested the a-priori two-factor structure with exploratory procedures (EFA). Results showed adequate fit indices (CFI = .95, RMSEA = .051; see Table 1). All items showed satisfactory factor loadings on the corresponding factors (>.380), except for item 5 (see Table 2). This item is expressed in a negative form therefore some of the participants might have misunderstood the question; this might have affected the results, considering the small sample. In line with theoretical expectations and with results of the original instrument, no correlation between the two temperaments was found ($r = -.026, p > .05$). Satisfactory internal reliability was found for both scales (ω : ATQap = .75, ATQav = .75).

Confirmatory factor analysis and invariance over gender and education on Sample 2.

The two-factor structure was cross-validated using confirmatory procedures (CFA) in Sample 2. We found solid fit indices (CFI = .96, RMSEA = .043) (see Table 1) and satisfactory factor loadings for all items, including item 5 (see Table 3). We also confirmed a lack of correlation between approach and avoidance temperaments ($r = .038, p > .05$) and satisfying internal reliability (ω : ATQap = .74, ATQav = .82). These results are in line with the original and subsequent studies on the ATQ (Bipp et al., 2015; Elliot & Thrash, 2010). To explore the invariance of the factorial structure in addition to the gender groups we divided the sample in "low level education" group (up to 13 years of education) and "high level education" group (over from 13 years of education). The invariance models showed that the factorial structure of the ATQ is invariant across gender and education (Δ CFI < .01; Δ RMSEA < .015) from the less restrictive model (M1) to the more restrictive model (M6) (see Table 4 and Table 5).

Convergent validity with BIS-BAS scale.

To explore the convergent validity between approach-avoidance temperaments and BIS BAS constructs, we tested a latent model with six correlated latent factors: four factors for the BIS-BAS scale (BIS, BASd, BASfs, BASrr) and two factors for the ATQ (ATQap, ATQav). The model showed an acceptable fit to the data [$\chi^2(75) = 172.965, p < .05, CFI = .95, TLI = .93, RMSEA = .060$] and satisfactory factor loadings (>.500).

The correlation matrix between BIS BAS and approach-avoidance temperaments can be observed in Table 6. Positive and high correlations were found between approach

¹ BIS-BAS scale: $\chi^2(21) = 52.954, p < .05$ Scaling Correction Factor = 1.1996, CFI = .95, TLI = .92, RMSEA = .065 with satisfactory factor loadings (>.500). ATQ: $\chi^2(8) = 8.640, p > .05$, Scaling Correction Factor = 1.1359, CFI = .99, TLI = .99, RMSEA = .015 with robust factor loadings (>.650).

Table 1 – Fit indices of EFA in Sample 1 and CFA in Sample 2

	χ^2	df	SCF	CFI	TLI	RMSEA	R. 90% C.I.	R. prob.
EFA Sample 1	54.128	43	.976	.95	.92	.051	.000-.090	.452
CFA Sample 2	85.172*	51	1.197	.96	.95	.043	.027-.059	.737

Legenda. df = degree of freedom; SCF = Scaling Correction Factor; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; R. 90% C.I. = 90% RMSEA Confidence interval; R. prob. = Probability RMSEA (* $p < .05$).

Table 2 – Exploratory factor analysis of the ATQ on Sample 1

Item		Factors		
		ATQap	ATQav	Residual variance
ZATQ2	Pensare alle cose che desidero mi dà proprio una forte carica.	.662*	.006	.562
ZATQ4	Mi entusiasmo subito, quando intravedo un'opportunità per qualcosa che mi piace.	.612*	.044	.624
ZATQ5	Non ci vuole tanto per entusiasarmi e motivarmi.	.212	-.040	.953
ZATQ8	Sono sempre alla ricerca di opportunità ed esperienze positive.	.709*	-.182	.457
ZATQ10	Le cose belle che mi capitano mi influenzano molto intensamente.	.592*	.204	.614
ZATQ11	Quando voglio qualcosa, sento un forte desiderio di impegnarmi per ottenerla.	.616*	-.106	.606
ZATQ1	Per natura, sono una persona molto nervosa.	-.130	.395*	.824
ZATQ3	Non ci vuole molto a farmi preoccupare.	.043	.546*	.701
ZATQ6	Provo ansia e paura in modo molto intenso.	-.007	.830*	.310
ZATQ7	Le brutte esperienze mi colpiscono molto intensamente.	.079	.661*	.559
ZATQ9	Quando avverto che potrebbe accadere qualcosa di brutto, sento la necessità di scappare.	.070	.383*	.850
ZATQ12	È facile per me immaginare cose brutte che potrebbero accadermi.	-.171	.568*	.643

Legenda. ATQap = ATQ approach temperament; ATQav = ATQ avoidance temperament (* $p < .05$).

Table 3 – Confirmatory factor analysis of the ATQ on Sample 2

Items		Factors		
		ATQap	ATQav	Residual variance
ZATQ2	Pensare alle cose che desidero mi dà proprio una forte carica.	.726**		.472
ZATQ4	Mi entusiasmo subito, quando intravedo un'opportunità per qualcosa che mi piace.	.629**		.604
ZATQ5	Non ci vuole tanto per entusiasmarmi e motivarmi.	.335**		.888
ZATQ8	Sono sempre alla ricerca di opportunità ed esperienze positive.	.541**		.708
ZATQ10	Le cose belle che mi capitano mi influenzano molto intensamente.	.593**		.649
ZATQ11	Quando voglio qualcosa, sento un forte desiderio di impegnarmi per ottenerla.	.564**		.682
ZATQ1	Per natura, sono una persona molto nervosa.		.542**	.706
ZATQ3	Non ci vuole molto a farmi preoccupare.		.618**	.618
ZATQ6	Provo ansia e paura in modo molto intenso.		.869**	.244
ZATQ7	Le brutte esperienze mi colpiscono molto intensamente.		.670**	.551
ZATQ9	Quando avverto che potrebbe accadere qualcosa di brutto, sento la necessità di scappare.		.464**	.785
ZATQ12	È facile per me immaginare cose brutte che potrebbero accadermi.		.716**	.488

Legenda. ATQap = ATQ approach temperament, ATQav = ATQ avoidance temperament (* $p < .05$, ** $p < .001$).

Table 4 – Invariance over gender of ATQ on Sample 2

	χ^2	df	CFI	TLI	RMSEA
CFA	85.712*	51	.960	.949	.043
M0-CFA gender groups	167.322*	122	.947	.942	.045
CFA female	79.466*	51	.927	.905	.059
CFA male	57.374	51	.986	.982	.025
M1-Configural	136.369*	102	.959	.948	.043
M2-Metric	153.247*	112	.951	.943	.045
M3-Scalar	167.322*	122	.947	.942	.045
M4-Residual variance	174.646*	134	.952	.953	.041
M5-Variance Covariance	177.866*	137	.952	.954	.041
M6-Mean	185.102*	139	.946	.948	.043

Legenda. df = degree of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation.

Note. Male N = 202; Female N = 158; comparing M0 to M6 models the factorial structure of the ATQ is invariant across genders ($\Delta CFI < .01$; $\Delta RMSEA < .015$) (* $p < .05$).

Table 5 – Invariance over education level of ATQ on Sample 2

	χ^2	df	CFI	TLI	RMSEA
CFA	85.712*	51	.960	.949	.043
CFA education groups	1670.575*	122	.958	.955	.042
CFA low level edu.	72.183*	51	.958	.946	.043
CFA high level edu.	66.068	51	.963	.952	.046
M1-Configural	138.527*	102	.960	.949	.045
M2-Metric	152.203*	112	.956	.949	.045
M3-Scalar	160.575*	122	.958	.955	.042
M4-Residual variance	170.636*	134	.960	.961	.039
M5-Variance Covariance	171.613*	137	.962	.964	.037
M6-Mean	172.497*	139	.964	.965	.037

Legenda. df = degree of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation.

Note. Low level education N = 221; High level education N = 139; comparing M1 to M5 models the factorial structure of the ATQ is invariant across level of education ($\Delta CFI < .01$; $\Delta RMSEA < .015$) (* $p < .05$).

Table 6 – Correlation matrix ATQ and BIS-BAS scale

	ATQap	S.E.	B&K Formula	ATQav	S.E.	B&K Formula
BASd	.610**	.055	.72	-.165*	.065	.29
BASfs	.583**	.080	.74	.242**	.067	.37
BASrr	.835**	.036	.91	.238**	.066	.37
BIS	.064	.069	.20	.895**	.030	.95

Legenda. ATQap = ATQ approach temperament; ATQav = ATQ avoidance temperament; BASd = BAS drive; BASfs = BAS fun seeking; BASrr = BAS reward responsiveness; S.E. = Standard Error; B&K Formula = Bagozzi and Kimmel Formula (1995) (** $p < .001$, * $p < .05$).

temperament and all BAS scales, as well as between avoidance temperament and BIS. Also, negative correlations between avoidance temperament and BAS drive and BAS reward responsiveness and a positive correlation with BAS fun seeking were found. These results confirm the pattern of correlations showed in the validation paper of Elliot and Thrash (2010), even though the authors considered the general BAS scale and not the BAS subscales, but are generally higher (e.g., approach temperament with BAS reward responsiveness $r = .835$, $p < .001$; avoidance temperament and BIS $r = .895$, $p < .001$). Therefore, in order to be sure that the examined constructs are not isomorphic, we applied the Bagozzi and Kimmel formula (1995)². None of the results has exceeded the criterion of 1 (.20-.95; see Table 6), thus it resulted that approach-avoidance temperaments and BIS BAS, although associated, remain distinct constructs.

² To demonstrate the factor independence researchers should add to the correlation value 1.96 times the standard error of the correlation value to identify the upper limit of the 95% confidence interval for correlation (correlation + standard error of correlation + [(standard error of correlation/100) * 96]). It is commonly considered as evidence of discriminating validity between the two factors when the value is below 1.

CONCLUSION

Starting from the aim to identify the basic structures of personality, Elliot and Thrash (2010) identified two constructs, the approach and avoidance temperaments, that represent the common root of traits adjective (Extraversion/Neuroticism), emotional predispositions (positive/negative emotionality) and motivational systems (BIS/BAS) and they developed the Approach-Avoidance Temperament Questionnaire (Elliot & Thrash, 2010). “The availability of direct measures of approach and avoidance temperament opens the door for efficient and flexible research on these personality dimensions ... [which] ... represent the core dispositions on which other dispositions rest” (Elliot & Thrash, 2010, p. 894).

This study was aimed to provide an Italian validation of the Approach-Avoidance Temperament Questionnaire (Elliot & Thrash, 2010), we documented the two-factors structure and adequate factor loadings in an exploratory factor analysis conducted in a university students’ pilot sample and we confirmed a solid factorial structure and satisfactory internal validity in a confirmatory factor analysis conducted in a larger adults’ sample. We demonstrated the invariance of the ATQ factorial structure

over gender and education and in the convergent validity analysis we observed that BAS-BIS scales and approach-avoidance temperaments, even though related, are still distinct constructs.

Although the results described are encouraging, this study presents some limits that should be considered. Future researchers should evaluate the psychometric properties of the ATQ in larger and more diversified samples and they should examine convergent-discriminant validity with Extraversion and Neuroticism as well as positive/negative emotionality in an Italian sample. Nonetheless, so far, the Italian version of the ATQ

showed good psychometric properties comparable to the original instrument. In relation to the study of approach and avoidance tendencies, the only currently available measure in Italian is the BIS-BAS scale; however, BIS and BAS sensitivities seems to be constrained to a more limited set of eliciting stimuli, neurophysiological processes, and neuroanatomical structures (Elliot & Thrash 2010). Therefore, the ATQ can be employed in studies aimed to analyze approach and avoidance as broader concepts.

In conclusion, the ATQ is a brief and easy to administer instrument (12 items) and it could be considered a valuable and reliable instrument in approach-avoidance assessment.

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