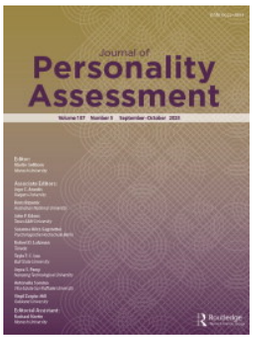

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Questionnaire of Approach and Avoidance Motivation (QAAM): Development and Validation

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ABSTRACT

This paper presents five studies conducted on 3,644 participants to examine a questionnaire assessing stable individual differences in approach and avoidance motivation. In Study 1, we developed a gender-invariant measure of a multidimensional model of approach and avoidance motivation. In Study 2, we confirmed the factor structure and gender-invariant solution of the instrument and established its relationship with the Big Five Inventory 2 (BFI-2). In Study 3, we provided evidence of the convergent and divergent validity of the new questionnaire by comparing it with several established measures of approach and avoidance motivation. In Study 4, we demonstrated the incremental validity of the QAAM Anxiety scale over BFI Neuroticism and the Behavioral Inhibition System scale from the BIS/BAS Scales in predicting stress-related psychophysiological responses. In Study 5, the questionnaire was shown to be useful in predicting behavioral outcomes in an overearning experimental paradigm. Overall, the new instrument possesses adequate psychometric properties. With its theoretical framework based on a multidimensional model of approach and avoidance motivation, it has the potential to facilitate more experimental studies on the underlying processes of personality traits.

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This paper presents the development and validation of a questionnaire on approach and avoidance motivation. Before introducing its construction, we describe the constructs that the new questionnaire aims to measure and review existing measures of approach and avoidance motivation.

Approach and avoidance motivation

Defining general tendencies in approach and avoidance motivation is challenging, as many authors have used different terminology for the same constructs—for instance, reward and punishment sensitivity (e.g., Torrubia et al., 2001), approach and avoidance temperament (Elliot & Thrash, 2010), and appetitive and defensive motivation (Lang & Bradley, 2013). All of these terminologies are consistent with the widely accepted definition of approach and avoidance motivation, where approach motivation is described as "the energization of behavior by, or the direction of behavior toward, positive stimuli (objects, events, possibilities)" whereas avoidance motivation as "the energization of behavior by, or the direction of behavior away from, negative stimuli" (Elliot, 2006, p. 112).

However, we argue that such broad definitions fail to reflect the complex, multidimensional nature of these key psychological constructs. For instance, Krupić et al. (2016) investigated the unidimensionality of approach motivation by comparing five different questionnaires within the most prominent theory in the approach-avoidance conceptual framework—the Reinforcement Sensitivity Theory (RST; Gray, 1982; Gray & McNaughton, 2000). Confirmatory factor analyses (CFA) revealed a four-dimensional model for the Behavioral Approach System (BAS) scales, which assess stable individual differences in approach motivation.

The first factor comprised scales primarily measuring motivation for rewards or resources, such as Sensitivity to Reward (SR) from the Sensitivity to Punishment Sensitivity to Reward Questionnaire (SPSRQ; Torrubia et al., 2001) and Impulsivity from the Reinforcement Sensitivity Theory–Personality Questionnaire (RST-PQ; Corr & Cooper, 2016). The second factor consisted of scales reflecting a tendency to explore opportunities for new rewards, including the BAS scales from the Jackson-5 questionnaire (Jackson, 2009), the Reinforcement Sensitivity Questionnaire (RSQ; Smederevac et al., 2014), and Reward Interest from the RST-PQ. The third factor included scales that capture the tendency to strive toward goal attainment, such as Drive from the BIS/BAS Scales (Carver & White, 1994) and the RST-PQ Goal-Drive Persistence scale. Finally, the fourth factor comprised scales reflecting the enjoyment associated with obtaining a reward, such as BIS/BAS Reward Responsiveness and RST-PQ Reward Reactivity.

These four factors of approach motivation can be explained by the scaffolding model proposed by Corr (2008), which was further elaborated in Corr and Krupić (2020) and Krupić and

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Corr (2017). The first component, known as *wanting*, encompasses very general desires (e.g., wealth) that determine the direction in which an individual seeks to act. The second component, *seeking*, is responsible for generating ideas about how to achieve these general desires, reflecting an individual's tendency to search for ways to fulfill them. Together, these two components (wanting and seeking) shape the content of motivation and guide behavior toward the desired goal.

The third phase, *getting*, involves implementing plans to realize goals driven by these desires. This component pertains to persistence in goal pursuit and indicates how strongly an individual is motivated to reach a specific objective. This phase of goal-directed behavior concludes with either abandoning the goal pursuit (i.e., quitting) or ultimately achieving it. Goal attainment leads to the fourth component, *liking,* which refers to the affective experience of success or accomplishment, revealing how important a given goal was to the individual.

Each of these four stages reflects a distinct aspect of approach motivation and appears to correspond to the specific roles of testosterone, dopamine, serotonin, and endogenous opioids, respectively (Krupić & Corr, 2017). This four-dimensional model of approach motivation synthesizes several models of goal-directed behavior (Austin & Vancouver, 1996; Baumeister, 2016; Corr, 2008; Corr & Krupić, 2017; Heckhausen & Gollwitzer, 1987; Little, 1983; Vohs & Baumeister, 2007). Notably, all these models describe the same constructs, but under different labels, which reduces the integration of findings and accumulation of knowledge of these processes across scientific disciplines. Therefore, the first aim of this study is to design approach motivation scales that correspond to the essence of these four stages in goal-directed behavior as defined by the aforementioned models.

In contrast to approach motivation, avoidance motivation is less fragmented. Findings from neuroscience (Perusini & Fanselow, 2015) and ethological-experimental studies (Blanchard et al., 2001) indicate that there are two avoidance motivation systems: one that is activated prior to danger (related to *anxiety*), and another that operates during direct confrontation with the source of danger (related to *fear*). Within the framework of RST, the psychological mechanism responsible for reactions that precede aversive stimuli is called the Behavioral Inhibition System (BIS), while reactions that occur during confrontation are governed by the Fight-Flight-Freezing System (FFFS) (McNaughton & Corr, 2008). However, the distinction between anxiety and fear systems is not fully recognized in personality psychology. For example, lexical models such as the Big Five or HEXACO do not differentiate between these two avoidance mechanisms. Typically, they are combined into a single overarching factor, such as Negative Emotionality or Neuroticism. Therefore, the second aim of this new instrument is to develop scales that can capture these subtle distinctions between anxiety and fear.

Limitations of existing measures

Stable individual differences in distinct aspects of approach and avoidance motivation are typically assessed through self-report questionnaires. The most frequently used questionnaires have been inspired by RST, including the aforementioned RST-PQ (also available in a state-level version; see Wyman, 2022), the BIS/BAS Scales, the SPSRQ, and the RSQ (for an overview, see Corr, 2016; Corr & Krupić, 2020). Since RST represents the most advanced and influential theoretical framework for approach and avoidance motivation, we will establish the association of the new instrument with existing RST questionnaires in Study 3.

In addition to the questionnaires strictly developed within the RST framework, four new instruments have recently been created that capture constructs of approach and avoidance motivation, but as we will see, they do not cover all four aspects of approach motivation. Each of these questionnaires distinguishes between different components of approach and avoidance motivation. These instruments broadly reflect Scott et al. (2017) definition of general approach motivation as a reaction to potential gains (e.g., hoping for a potential reward) and non-gains (e.g., reacting to the possible failure to achieve a desired goal), while general avoidance motivation is described in terms of loss (e.g., fear of a potential negative outcome in the future) and non-loss (e.g., maintaining safety). Similarly, Moncel et al. (2023) identify components of Reward Approach and Reward Reactivity, which parallel the wanting/liking distinction in the multidimensional model of approach motivation presented above. Jonker et al. (2022) introduced a questionnaire that includes similar scales, referred to as Motivation to Approach Reward and Reward Responsivity, which also correspond to the *wanting* and *liking* components, respectively. Additionally, Motivation to Avoid Punishment and Punishment Responsivity reflect the definitions of *anxiety* and *fear*, respectively. Lastly, the Generalized Approach, Attainment, Maintenance, and Avoidance (GAMMA) scales (Lappi & Wilkowski, 2020) include an Approach Attainment scale, which assesses the tendency to achieve desired goals (similar to the *wanting* component), and Approach Maintenance, which reflects the tendency to maintain a satisfactory current state. While not equivalent to the liking component, the scale shares many similarities.

As we can see, there are many questionnaires that assess various aspects of approach and avoidance motivation. Currently, however, there is a lack of theoretical integration across the various sub-disciplines, as researchers from personality psychology, motivation, and neuroscience tend to use different labels for the same constructs. Thus, this new questionnaire will use RST as the main theoretical framework for defining distinct aspects of approach and avoidance motivation, but it will also incorporate labels from other theories that examine the same constructs under differing names. For the scales assessing approach motivation, we operationalized *wanting*, *seeking*, *getting*, and *liking* from Berridge's reward system (Berridge et al., 2009) and Baumeister's theory of motivation (Baumeister, 2016), instead of using scale labels developed within RST. In addition, the labels *anxiety* and *fear* will be used instead of BIS and FFFS, respectively, to align with the terminology commonly used in neuroscientific (e.g., Perusini & Fanselow, 2015) and ethoexperimental studies (e.g., Blanchard et al., 2001). We

believe that aligning labels across the various sub-disciplines will foster desirable theoretical and methodological integration of findings related to approach and avoidance motivation, which typically, are examined in relative isolation from one another.

The following sections describe the development of such an instrument, named the Questionnaire of Approach and Avoidance Motivation (QAAM) - a brief questionnaire that captures all distinct components of approach and avoidance motivation.

Construction of the QAAM questionnaire

Excessive questionnaire length can lead to survey fatigue among participants, which may, in turn, reduce sample representativeness and compromise data validity (Galesic & Bosnjak, 2009). Conversely, shorter questionnaires tend to be inherently less reliable (Sibley et al., 2024). To balance these concerns, we chose to retain between four to seven items per factor, following the example of the most widely used instrument cited in this paper—the BIS/BAS scales (Carver & White, 1994). In addition, we aim to develop an instrument that demonstrates strict gender invariance—a psychometric standard achieved by only about 10% of existing personality measures (see Dong & Dumas, 2020). This also represents a novelty in the design of instruments compared to the former questionnaires of approach and avoidance motivation. To achieve this aim, we began with an initial pool of 50 items (see Table S2 in the Online Supplemental Materials), from which we seek to identify the optimal combination of items to form four approach motivation scales (Wanting, Seeking, Getting, and Liking) and two avoidance motivation scales (Anxiety and Fear). We initially created eight items for each approach motivation scale and nine for Anxiety and Fear. The factor structure of the new questionnaire will be presented in Study 1.

We operationalize the Wanting scale as the extrinsic type of motives, such as accumulating wealth, power, and other similar resources. The items' content resembles that of the Sensitivity to Reward scale from the SPSRQ—the most salient representation of the wanting component. The scale's focus on extrinsic motivation likely stems from its roots in animal neuroscience studies of the reward system, particularly those examining the wanting component across species (e.g., Berridge et al., 2009). The Seeking scale includes items reflecting proactivity and a general tendency to have a variety of interests, projects, and hobbies. The content shows similarities to the BAS scales from the RSQ, Jackson-5, and Reward Interest from the RST-PQ. The Getting scale encompasses items related to persistence and is most similar to the content of Goal-Drive Persistence from the RST-PQ and Drive from the BIS/BAS Scales. Finally, the Liking scale assesses experiences of joy and satisfaction, which is most aligned with the content of Reward Responsiveness from the BIS/BAS Scales and Reward Reactivity from the RST-PQ.

Distinguishing fear from anxiety using self-report methods is inherently complex and demands precise item construction. Most personality frameworks, such as the Big Five and HEXACO, include only a single avoidance-related dimension—Neuroticism or Emotionality, respectively. However, direct items like "*I am a fearful person*" do not adequately differentiate between fear and anxiety, as these terms are often used interchangeably in everyday language. Consequently, such items typically load onto the same factor (Franchina et al., 2024; Watson et al., 1988).

To better capture the subtle distinctions between these constructs, our questionnaire relies on indirect items that reflect the characteristic expressions of fear and anxiety. The following section details our strategy for developing separate scales for each.

Pappens et al. (2013) study provides guidance on this issue. Their findings indicate that items describing fear of dying, rapid breathing, and choking are more indicative of fear, whereas increased heart rate, sweating, and muscle tension are more representative of anxiety as stable traits. This differentiation aligns with the symptom definitions in the International Classification of Diseases, 11th Revision (Kogan et al., 2016). Building on these insights, our scales use indirect items that target the psychophysiological experiences unique to each construct. Specifically, the anxiety scale assesses reactions occurring before significant or potentially unpleasant events, while the fear scale focuses on sensations typical of panic attacks. This approach distinguishes our operationalization from existing questionnaires measuring avoidance motivation.

The need for this approach stems from the fact that laypeople rarely distinguish between anxiety and fear in everyday language, and may not notice when one state shifts into the other (Corr, 2013; Satchell et al., 2024). Therefore, we expect the Anxiety and Fear scales to correlate similarly with Negative Emotionality, a hypothesis to be examined in Study 2. Furthermore, while people may not always recognize mild states of anxiety or fear, they are generally aware of more intense experiences and can reflect on them. Individuals who experience stronger anxiety and fear reactions in daily life—as measured by our new scales—are also likely to respond more strongly to mildly threatening stimuli, which will be explored in Study 4. This method of operationalization aligns with recent recommendations by Watson et al. (2022) for the assessment of fear and anxiety.

To summarize, we have outlined the framework for our multidimensional instrument assessing approach-avoidance motivation, which consists of four approach-related scales (Wanting, Seeking, Getting, and Liking) and two avoidance-related scales (Anxiety and Fear). The following five studies assess the model's construct validity, as well as its convergent, divergent, predictive, and incremental validity.

Study 1—Construct validity

In our first study, we aimed to develop a six-dimensional questionnaire, the Questionnaire of Approach and Avoidance Motivation (QAAM), designed to measure: (a) four approach-related scales (Wanting, Seeking, Getting, and Liking); and (b) two avoidance-related scales (Anxiety and Fear). All items were originally written in Croatian; however,

we present the English translations in this paper. The questionnaire will have a six-point Likert response scale (see Appendix). Additionally, we will seek the gender invariant solution of the model and presented basic descriptive statistics in line with test development recommendations (Dong & Dumas, 2020; Flake et al., 2017).

To achieve this aim, we opted not to use exploratory factor analysis (EFA) to determine the factor structure. Instead, we relied on confirmatory factor analysis (CFA) to define a factor structure that demonstrates gender invariance, which cannot be achieved by EFA. In this way, we reduce the possibility that the questionnaire will later prove to be gender non-invariant in subsequent studies—a frequent issue with instruments developed solely on the basis of EFA results. Finally, we aimed to develop a short, easy-to-administer instrument with strong reliability coefficients and a clear factor structure, without resorting to modifications such as adding error covariances to improve fit indices.

Method

Participants and procedure

A total of 1,311 participants (31.4% male) from Croatia completed the initial item pool, which consisted of 50 items (the final version of the questionnaire and the corresponding instructions can be found in the Appendix, and the initial item pool, translated into English, in the Online Supplemental Materials). The average age of participants was 23.67 years (SD = 6.16). The sample was drawn from the general population and recruited *via* social networks, with assistance from psychology students who participated with data collection in exchange for course credits. All participants completed the initial item pool using an online survey system. The ethical committee of the Faculty of Humanities and Social Sciences, University of Osijek, Croatia approved all studies presented in this paper.

Results and discussion

As a pre-analysis, we conducted an exploratory factor analysis (which will not be fully reported here) to rule out the possibility that the initial item pool might better reflect an alternative factor solution (i.e., other than the six-factor solution). As shown in Table S2 (see Online Supplemental Materials), parallel analysis indicated that the initial item pool is best suited to a six-factor solution. Since we created a separate set of items for each scale, we tested how many items from the initial item pool loaded onto their corresponding factors. The pattern matrix indicates that 47 out of the 50 items from the initial item pool loaded onto their corresponding factors. This provides evidence that the initial item pool was carefully designed according to the definitions of all six distinct components of approach and avoidance motivation. With the desired number of extracted factors confirmed, the next step is to establish a six-dimensional model with goodness-of-fit indices—CFI and TLI above .90, and RMSEA and SRMR below .08 (Hu & Bentler, 1999)—while ensuring gender invariance using the maximum likelihood (ML) estimation method. All analyses were conducted by IBM SPSS and Amos.

The final factor structure of the six-dimensional model (Figure 1) was determined through a series of CFAs. Each scale contained four items, except for the Anxiety scale, which included seven items. Items were removed if they displayed cross-loadings, had overly similar content to other items within the same scale, or did not contribute to a gender-invariant solution. The goodness-of-fit indices (χ^2 = 1642.32, df = 317, p < .01, CFI = .925, TLI = .911, RMSEA = .057, SRMR = .051) indicate the adequacy of the final version of the questionnaire according to Hu and Bentler (1999) cutoff criteria.

Figure 1 illustrates that the four approach-related scales were moderately correlated with each other, while the Anxiety scale showed a moderate correlation with the Fear scale. The approach-related scales did not have significant correlations with the Anxiety and Fear scales, and these associations were omitted for clarity in the graphical representation.

Descriptive statistics, presented in Table 1, demonstrate that all scales achieved McDonald's omega and Cronbach's alpha reliability coefficients above .80. The distribution of the Liking scale was slightly negatively skewed and peaked, indicating that more participants scored highly on this scale, while the Fear scale exhibited a positive skewed distribution.

Strict gender invariance was achieved, as shown in Table 2. Configural invariance indicated that the same latent variables were extracted from the same set of items in both the male and female subsamples. The goodness of fit indices for metric invariance, which measures the equality of factor loadings across subsamples, did not differ significantly. Specifically, ΔCFI, ΔRMSEA, and ΔSRMR remained below the threshold of .010 (Cheung & Rensvold, 2002). Metric invariance allows for meaningful comparisons of correlations between the QAAM and other variables across the male and female subsamples. The same was found for the scalar and strict invariance. Scalar invariance, which reflects equality in intercepts, enables meaningful comparisons of arithmetic means between the two groups. Strict invariance indicated that the error variances did not significantly differ between male and female participants, suggesting comparable levels of measurement precision and approximately equal reliability coefficients across sexes.

In summary, the first version of the questionnaire demonstrates good psychometric properties, including adequate goodness-of-fit indices, strict gender invariance, and strong reliability coefficients for all scales.

Study 2—Construct validity and relationship with big five traits

The aim of this study is to confirm the factor structure and gender invariance of the final version of the questionnaire presented in Study 1 and to establish its relationship with Big Five personality traits. These two questionnaires originate from different research paradigms, and the relationship

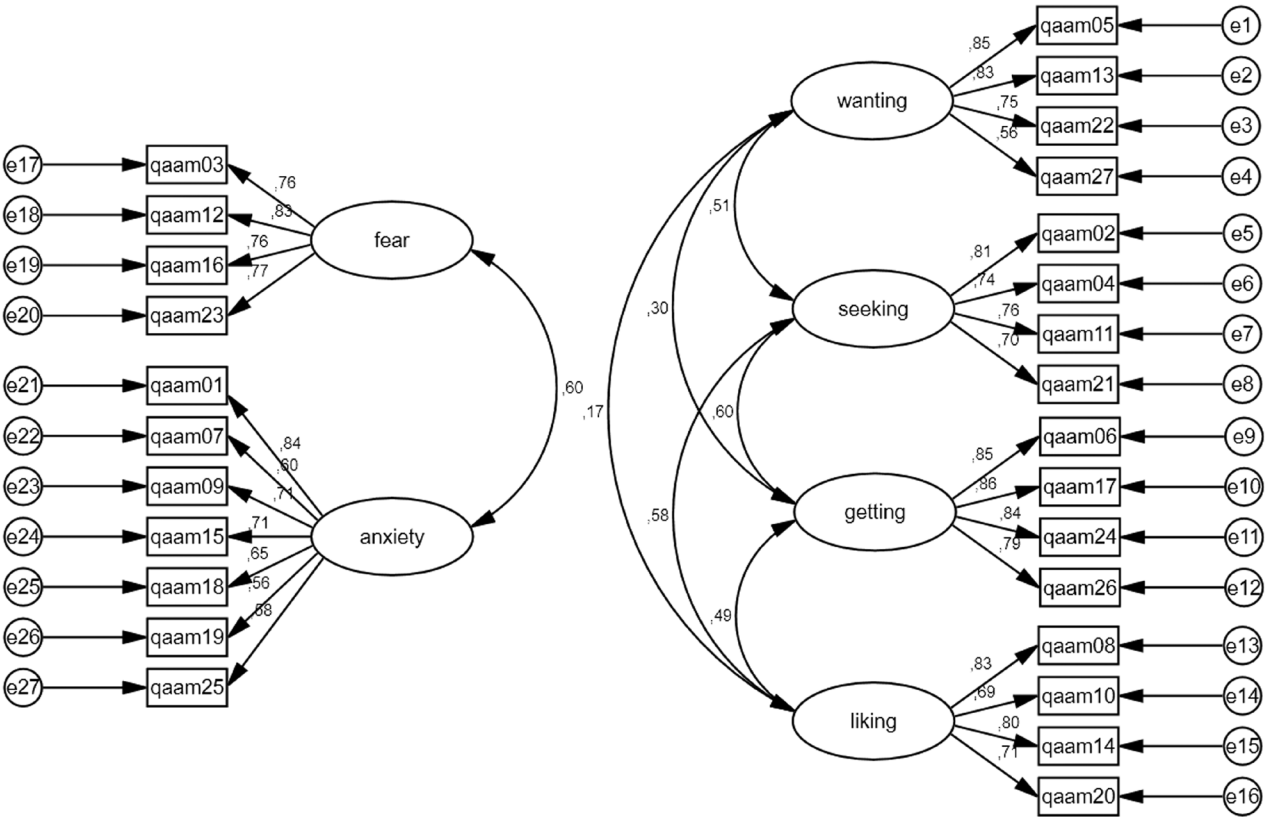

Figure 1. Six-dimensional model of the Questionnaire of Approach and Avoidance Motivation (QAAM).

Table 1. Descriptive statistics of the QAAM scales.

	α	*ω*	Mean	*SD*	Skewness	Kurtosis
Wanting	.84	.84	3.81	1.21	−0.14	−0.63
Seeking	.84	.84	4.49	1.08	−0.68	0.11
Getting	.90	.90	4.30	1.11	−0.57	0.07
Liking	.84	.84	4.82	0.97	−1.24	1.99
Anxiety	.84	.85	3.56	1.14	−0.04	−0.56
Fear	.86	.86	2.05	1.23	1.28	0.80

Note. As the rule of thumb, values within the range from -1 to +1 of skewness and kurtosis indicate fairly normal distributions.

between them has not been fully explained on theoretical grounds. The only established link between these two models is extraversion, which is assumed to be related to the workings of the BAS (Depue & Collins, 1999), the representative of approach motivation within RST. Since we advocate for the multidimensional nature of approach motivation, we expect that the four approach motivation scales within QAAM will have distinct relationships with the Big Five traits. Specifically, they should not all be most strongly related to Extraversion.

We hypothesize that Wanting will be most strongly associated with Extraversion, as it assesses the desire to attain social status, while Extraversion reflects sociability and assertiveness—traits typically linked to individuals with higher social rank. Seeking is expected to align most closely with Open-mindedness, as both constructs are important in exploring possibilities for achieving desired goals. The content of the Getting scale is conceptually similar to Conscientiousness, as both reflect productivity and the determination to complete tasks. Liking assesses the tendency to experience positive emotional states after achieving significant goals, suggesting a correlation with prolonged well-being. Thus, we expect Liking to correlate negatively with Negative Emotionality (particularly the Depression facet) and positively with traits typically associated with positive affect, such as Extraversion and Agreeableness.

Conversely, Anxiety and Fear should exhibit the opposite pattern of relationships to Liking with the Big Five traits, as they measure the experience of negative emotional states. Finally, as mentioned earlier in the introduction, we anticipate that both Anxiety and Fear will correlate most strongly with Negative Emotionality. Given that the BFI-2 measure of Negative Emotionality is a broad trait encompassing various negative emotional experiences, we expect similar correlations for Anxiety and Fear with this domain.

Method

Sample and procedure

Psychology students collected the community sample *via* social networks and personal email contacts. We included three control questions to assess whether participants carefully read the items. The example of such item was "*If you are reading this question, please select number four.*" The results of 36 participants were excluded from the analysis, as they did not answer two of these questions correctly.

Table 2. Gender invariance of the QAAM.

Model	χ^2	*df*	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA	ΔSRMR
Configural	1990.49**	618	.923	.913	.058	.052	–	–	–	–	–	–
Metric	2036.40**	639	.922	.914	.058	.054	45.91**	21	−.001	.001	.000	.002
Scalar	2116.20**	660	.918	.913	.058	.055	79.80**	21	−.004	−.001	.000	.001
Strict	2193.07**	687	.916	.914	.058	.055	76.87**	27	−.002	.001	.000	.000

**p <.01.

Table 3. Replication of gender invariance of QAAM.

Model	χ^2	*df*	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA	ΔSRMR
Configural	1551.67**	618	.932	.923	.054	.052	–	–	–	–	–	–
Metric	1587.70**	639	.931	.924	.054	.054	36.03**	21	−.001	.001	.000	.002
Scalar	1667.70**	660	.927	.922	.054	.055	80.00**	21	−.004	−.002	.000	.001
Strict	1799.77**	687	.919	.917	.056	.057	132.07**	27	−.008	−.005	.002	.002

**p <.01.

Additionally, since we assessed gender invariance, we excluded a further four participants who identified as non-binary. The final sample consists of $N = 1{,}036$ participants, with 438 males and 598 females. The socioeconomic status (SES) of the participants is distributed as follows: 70 individuals are below average, 136 are above average, and the majority, 830 participants, are at an average SES level. Regarding employment status, 52 participants are unemployed, 559 are students, 6 are retired, 43 are high school students, and 376 are employed. The average age of the participants was $M = 26.67$ ($SD = 9.11$) years.

Instruments

The BFI-2 (Soto & John, 2017) is a 60-item personality questionnaire that measures 15 facets, each associated with one of the five domains: Extraversion, Agreeableness, Conscientiousness, Negative Emotionality, and Open-mindedness. The questionnaire has been translated into Croatian and validated (Krupić et al., 2025), demonstrating psychometric properties similar to the original version. While all domains exhibit high reliability, some facets show reliability below .70 due to the limited number of items per facet (see Table S3 for full information on description statistics). In addition, we used the final 27-item version of the QAAM, as described in Study 1. All QAAM scales demonstrated good reliability, ranging from ω = .78 (α = .79) for the Liking scale to ω = .89 (α = .89) for the Getting scale.

Results and discussion

First, we aimed to replicate the factor structure and assess the gender invariance of the questionnaire. We achieved a good fit (χ^2 = 1200.77, $df = 309$, CFI = .938, TLI = .929, RMSEA = .053, SRMR = .047). As shown in Table 3, strict gender invariance for the QAAM was confirmed, as none of the goodness-of-fit indices worsened by more than .010. No error covariances were introduced to improve the model.

The correlation analysis revealed that there is no significant overlap between the QAAM and the BFI-2 personality traits, although the correlations were generally in the expected directions (see Table 4). The Wanting scale showed the strongest correlation with Extraversion facets, particularly Assertiveness. The Seeking scale correlated most strongly with Open-mindedness, sharing common content that reflects broad interests, especially with the Creative Imagination and Intellectual Curiosity facets, where correlations reached approximately r = .50. The Getting scale correlated most strongly with the Productiveness facet of Conscientiousness, which was expected, as conscientious individuals are typically more committed to achieving long-term goals. The Liking scale correlated positively with the Energy Level facet of Extraversion and with Agreeableness, while correlating negatively with Depression. However, all these correlations were below r = .40.

Table 4. Correlations between QAAM and BFI 2 scales.

	Wanting	Seeking	Getting	Liking	Anxiety	Fear
Extraversion	.31	.38	.39	.29	−.38	−.24
Sociability	.24	.22	.19	.23	−.29	−.19
Assertiveness	.34	.33	.35	.10	−.35	−.19
Energy Level	.17	.38	.44	.38	−.27	−.21
Agreeableness	−.13	.04	.18	.35	−.01	−.06
Compassion	−.11	.07	.19	.31	.08	.02
Respectfulness	−.10	.04	.16	.26	.00	−.05
Trust	−.12	.00	.10	.30	−.10	−.11
Conscientiousness	−.06	.16	.50	.18	−.17	−.18
Organization	−.09	.06	.33	.13	−.08	−.15
Productiveness	−.03	.21	.56	.16	−.24	−.19
Responsibility	−.02	.16	.45	.19	−.14	−.14
Negative emotionality	.02	−.08	−.19	−.24	.58	.51
Anxiety	−.02	−.07	−.07	−.10	.60	.47
Depression	−.02	−.11	−.27	−.34	.47	.47
Emotional Volatility	.08	−.02	−.14	−.17	.40	.37
Open-mindedness	.25	.51	.25	.15	.00	.11
Intellectual Curiosity	.32	.47	.24	.07	−.07	.03
Creative Imagination	.24	.52	.33	.19	−.11	−.03
Esthetic Sensitivity	.08	.28	.08	.10	.14	.22

Note. Correlations above r = .06 are statistically significant at p <.05.

These results indicate that the four approach motivation scales, despite being moderately intercorrelated, relate with different personality traits. Anxiety and Fear were most strongly linked to Negative Emotionality traits. The two anxiety scales had a correlation of .60 with each other, and their correlations with other Negative Emotionality traits ranged from .37 to .47. In addition, the Anxiety and Fear scales were negatively correlated with Extraversion facets and, to a lesser degree, with the Productiveness facet of Conscientiousness. This indicates that individuals high in

Table 5. Correlational coefficient between QAAM and RST-PQ, SPSRQ-SV, BIS/BAS scales, GRFM, and RFQ.

	Wanting	Seeking	Getting	Liking	Anxiety	Fear
Reinforcement Sensitivity Theory – Personality Questionnaire (RST-PQ; Corr & Cooper, 2016)						
Reward interest	.27**	.64**	.48**	.34**	−.14*	−.12*
Goal-drive persistence	.33**	.51**	.72**	.29**	.02	−.08
Reward reactivity	.30**	.39**	.38**	.45**	.13*	.00
Impulsivity	.29**	.38**	.29**	.34**	.23**	.19**
Flight-freeze	−.04	−.12*	.06	.07	.48**	.37**
Behavioral inhibition system	.08	.06	.01	.06	.65**	.36**
Defensive fight	.33**	.27**	.23**	.15**	.14*	.13*
Sensitivity to Punishment Sensitivity to Reward Questionnaire – Short version (SPSRQ-20; Aluja & Blanch, 2011)						
SR20	.55**	.29**	.13*	.01	−.00	−.09
SP20	−.14*	−.29**	−.32**	−.17**	.50**	.28**
BIS/BAS scales (Carver & White, 1994)						
Drive	.44**	.32**	.69**	.11	−.10	−.04
Fun seeking	.24**	.27**	.08	.14*	−.02	.07
Reward responsiveness	.35**	.23**	.44**	.37**	.06	−.10
Behavioral inhibition system	−.05	−.18**	−.14*	−.00	.63**	.38**
General Regulatory Focus Measure (GRFM; Lockwood et al., 2002)						
Promotion	.42**	.41**	.48**	.34**	.24**	.05
Prevention	.28**	.11**	.14**	.10	.48**	.31**
Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001)						
Promotion	.20**	.45**	.43**	.30**	−.27**	−.31**
Prevention	−.05	.11*	−.01	−.02	−.02	−.15**

**p <.01. *p <.05.

Anxiety and Fear have a slightly lower tendency to approach the social environment (referring to Extraversion) and to engage in goal-directed behaviors (referring to the Productiveness facet). The only counterintuitive finding is the positive correlation between Anxiety and Fear and the Esthetic Sensitivity facet of Open-mindedness, which is similar to the finding obtained by Soto and John (2017), where that facet had a small positive factor saturation on Negative Emotionality.

Study 3—Convergent and divergent validity

The purpose of the third study was to establish the convergent and divergent validity of the QAAM using several well-known questionnaires designed to assess similar constructs. This is particularly important for the new instrument, as this type of validation provides insights into how the QAAM relates to established constructs with well-known psychometric properties. Such information allows for the integration of the current results with those from previous studies, models, and theories. Of particular relevance for this questionnaire is the determination of whether this brief instrument can adequately capture the same construct domains as other, lengthier questionnaires. In general, we expect to find higher correlations (at least r = .50) between the Wanting, Seeking, Getting, and Liking scales with other approach motivation scales, while simultaneously showing the lowest possible correlations with avoidance motivation scales. Conversely, we expect the Anxiety and Fear scales to correlate more strongly with avoidance motivation measures and minimally with approach motivation scales.

Method

Participants and instruments

This was a multi-sample study, in which different samples of participant fulfilled various instruments alongside the QAAM. The first sample consisted of 296 participants (117 males and 179 females; mean age = 23.29, SD = 3.52), who completed the BIS/BAS Scales (Carver & White, 1994), a 24-item questionnaire measuring three BAS subscales: Drive, Fun Seeking, and Reward Responsiveness, as well as the BIS scale. The second sample comprised 314 participants (40.8% male, mean age = 28.29, SD = 9.99) who completed: (a) the Reinforcement Sensitivity Theory - Personality Questionnaire (RST-PQ; Corr & Cooper, 2016); and (b) the Sensitivity to Punishment and Sensitivity to Reward Questionnaire—Short Version (SPSRQ-SV; Aluja & Blanch, 2011). The RST-PQ is a 73-item questionnaire that includes four BAS scales (Reward Interest, Goal/Drive Persistence, Reward Reactivity, Impulsivity), BIS, and the Flight-Freeze System (FFS) scales, along with a Defensive Fight scale. The SPSRQ-SV contains two 10-item scales: Sensitivity to Punishment (SP) and Sensitivity to Reward (SR). The final sample consisted of 456 participants (200 male and 256 females, mean age = 26.36, SD = 8.06) who completed the General Regulatory Focus Measure (GRFM; Lockwood et al., 2002) and the Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001). The reliability coefficients for all questionnaires are presented in Table S3 and S4 in the Online Supplemental Materials.

Results and discussion

Correlations exceeding r = .50 are often regarded as a conventional benchmark for establishing adequate convergent validity (Carlson & Herdman, 2012). According to Table 5, the Wanting scale was associated with the SR scale, which aligns closely with impulsivity and reflects reward sensitivity, according to Gray's original Reinforcement Sensitivity Theory (Torrubia et al., 2001). The Seeking scale correlated with the RST-PQ Reward Interest scale, reflecting the tendency to explore new potential reward opportunities in the environment. The Getting scale was related to scales that reflect determination in goal pursuit, particularly the BAS Drive and RST-PQ Goal/Drive Persistence scales. The Liking scale

was associated with RST-PQ Reward Reactivity and, to a lesser extent, with BAS Reward Responsiveness, which assesses emotional reactions to receiving rewards.

The lower correlation between Liking and the BAS Reward Responsiveness scale can be explained by the fact that the BAS Reward Responsiveness scale measures both the anticipation of reward (e.g., "*When I see an opportunity for something I like, I get excited right away*") and the emotional response to receiving a reward (e.g., "*When good things happen to me, it affects me strongly*"). This combination of item content within the BAS Reward Responsiveness scale may explain a higher correlation with the Getting scale than with the Liking scale. In contrast, the RST-PQ Reward Reactivity scale specifically measures the emotional and motivational impact of receiving a reward (e.g., "*I get very excited when I get what I want*"), resulting in a clearer association with the Liking scale.

The Anxiety scale showed strong correlations with the BIS scales from the RST-PQ, the BIS/BAS scales, and the SP scale from the SPSRQ-SV. The Fear scale, often considered a challenging construct to measure within RST, demonstrated moderate correlations with the RST-PQ Flight-Freeze scale. Importantly, it showed correlations of less than .40 with BIS-related scales, supporting its divergent validity.

Finally, the two regulatory focus questionnaires were compared to the QAAM. As noted by Summerville and Roese (2008), scales with the same names—prevention and promotion—do not correlate strongly. This was reflected in mixed correlations between the QAAM and the preventive regulatory focus scales. The Wanting, Seeking, and Getting scales correlated with the GFRM Promotion scale and, to a lesser extent, with the RFQ Promotion scale. Differences in correlations are evident with the Prevention scales from both questionnaires, making the correlations between QAAM and preventive focus scales inconclusive.

Overall, the QAAM scales were statistically significant and theoretically meaningful correlated with other established approach and avoidance motivation scales. This brief questionnaire is capable of covering a broad domain of constructs typically assessed by longer, well-established measures of approach and avoidance motivation. The only exceptions were the Liking and Fear scales, which showed correlations below r = .50 with their counterpart scales in existing questionnaires. The incremental validity of these scales, beyond what is accounted for by existing measures, should be examined in future studies.

However, this pattern of correlations merely suggests the potential for integrating new findings obtained using the QAAM in future studies with existing knowledge on approach-avoidance motivation. To ensure that the new questionnaire is not statistically redundant, we need to provide evidence of its predictive and incremental validity, which we address in the next study.

Study 4—Prediction of aversive physiological responses in VR settings

The QAAM scales of Anxiety and Fear are operationalized as a self-report instrument containing items that focus on the occurrence of psychophysiological reactions to potential or immediate stress situations, respectively. As such, the new questionnaire should be able to predict actual physiological responses to stress, and to a greater extent than other personality traits representing avoidance measures, such as Neuroticism and the BIS. Since the Anxiety scale assesses physiological reactions to the presence of potential threats, we expect that Anxiety, but not Fear, will correlate with heart rate in a laboratory-induced stress condition.

Method

Participants

The community sample consisted of 119 participants (38% males) aged M = 23.65 years (SD = 4.82) who were invited to participate in the study by advertising on social networks.

Instruments

Three interactive 360-degree videos were displayed using an HTC Vive Headset, each containing stress-provoking content. In the first video, participants were placed in a cage in the deep blue ocean, where, after approximately 30 s, a shark swam nearby. The second video showed a person preparing to jump off a high canyon on a long swing. The final video simulated a roller-coaster ride. Each video, filmed with a 360-degree camera, lasted for three minutes.

Heart rate (pulse) was measured using the Beurer Pulse Oximeter PO80, which was placed on the participant's index finger of their non-dominant hand. The outcome variable was the arithmetic mean of heart rate activity during baseline and at each of the three measurement points during the experiment with the videos.

Subjective ratings of negative affect were assessed using two items, asking participants to rate how 'frightened' and 'scared' they felt prior to (i.e., at baseline) and during the video phase on a 5-point Likert scale (1—Not at all to 5—Extremely). Only two items were chosen to avoid the deeper reflection required by a longer scale, which could interfere with participants' current mood.

To assess the incremental validity of the QAAM, we used the original BFI (John & Srivastava, 1999), a 44-item questionnaire measuring Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness, along with the BIS/BAS Scales, previously described in Study 3. Descriptive statistics can be found in the (Online Supplemental Materials Table S3).

Procedure

Participants were informed that they would be taking part in a study involving three VR videos, though the content of these videos was not revealed prior to the experiment. After providing consent, participants completed the QAAM, BFI, and BIS/BAS Scales. Next, a baseline for negative affect and heart rate was recorded for two minutes using the pulse oximeter on the index finger of their non-dominant hand. Heart rate was then measured in the same manner during the Shark interactive video. Immediately following the video, participants rated how frightened and scared they felt. This

Table 6. Pearson's correlational coefficients between the avoidance-related scales from the BIS/BAS, Scales, BFI and QAAM, and negative affect and heart rate in virtual stress provoking settings.

	Negative affect				Heart rate			
	Baseline	Shark	Canyon	Roller coaster	Baseline	Shark	Canyon	Roller coaster
QAAM Anxiety	.37**	.19	.11	.19	.20*	.30**	.25*	.22*
QAAM Fear	.34**	.10	.13	.05	.16	.22*	.25*	.11
BIS/BAS - BIS	.32**	.09	.13	.26**	.08	.03	.04	.07
BFI - Neuroticism	.42**	.09	.14	.16	.11	.05	.12	.05
M	3.57	3.85	5.89	5.62	89.70	96.38	100.79	92.67
SD	1.82	1.96	2.72	2.48	16.16	17.26	19.47	17.11

*p <.05. **p <.01.

procedure was repeated for the Canyon and Roller-coaster interactive videos. Thus, four measures of heart rate and subjective negative affect (Baseline, Shark, Canyon, and Roller-coaster) were collected. All 360-degree videos were presented in the same order for each participant.

Results and discussion

Table 6 presents zero-order correlation coefficients between BIS, Neuroticism, Anxiety, and Fear scales with self-reported distress (i.e., negative affect) and heart rate. The latter two were uncorrelated, suggesting that subjective distress and heart rate reflect distinct aspects of the stress response. As shown in the Table 6, only Anxiety and Fear scales correlated with both aspects of the stress response—subjective and physiological. However, it is worth noting that all personality scales correlated statistically significant with negative affect prior to the VR phase of the experiment (i.e., at baseline level), except for the BIS scale, which correlated with only one subjective rating of distress during the VR roller coaster scenario. Correlations between Anxiety scale and the subjective level of distress during VR phase of the experiment did not reached statistical significance.

It should be noted that the scales used in this study are overlapping both statistically and conceptually. To ensure transparency in reporting the relationships between the scales of the new questionnaire and those from existing measures, we presented only zero-order correlations between all predictors and criterion variables. Nevertheless, we recommend that future research employ multivariate methods capable of estimating the unique contribution of each predictor, particularly when dealing with conceptually related constructs.

These results add to the predictive validity of the QAAM over Neuroticism and the BIS from BIS/BAS Scales, since the Anxiety and Fear scales predicted both physiological and subjective assessed emotional reactions to stress-provoking VR stimuli.

Study 5—Predicting overearning tendency

The previous study examined the usefulness of the QAAM's avoidance motivation scales in a laboratory setting designed to evoke psychological reactions related to avoidance motivation. The present study will examine the usefulness of QAAM's approach motivation scales in laboratory settings.

There is a scarcity of experimental studies examining approach motivation at the behavioral level. Typically, such studies use implicit measures (e.g., Wittekind et al., 2021). One experimental paradigm that can evoke behavior similar to approach motivation is the so-called overearning paradigm (Hsee et al., 2013), which is fully described in the Method section below. This paradigm has previously been linked to dispositional greed (Zeelenberg et al., 2020). More precisely, this task assesses the, so-called, mindless accumulation of resources (Hsee et al., 2013), that is, the tendency to accumulate more resources than needed. The specific design of this paradigm is suitable for assessing ambition to earn resources (in this case, chocolates) and for measuring consummatory pleasure. Given that the Wanting scale reflects higher aspirations, we expect it to predict the amount of chocolate earned, while the Liking scale is expected to predict how enjoyable participants found the chocolates (i.e., consummatory pleasure).

Method

Participants and procedure

A total of 112 university students (35 males), aged 19 to 25, consented to participate in the study. They completed the QAAM before taking part in the overearning experimental paradigm. The experimental phase consisted of two stages. Participants were given instructions based on Riedel and Stüber (2019), with minor modifications, such as the removal of a limit on the number of chocolates they could earn. They were informed that they would have five minutes to consume the chocolates they earned, and that any uneaten chocolates could not be taken with them.

During the first phase of the experiment, participants were presented with a pleasant five-minute musical composition. Their task was to press a "Noise" button on the computer program, which played an unpleasant 0.3-s sound. They were informed that for every ten instances of noise they listened to, they would earn one chocolate. The computer program displayed both the number of noise presses and the corresponding chocolates earned on the screen. At the end of the five minutes, participants received the chocolates they had earned.

In the second phase, participants had five minutes to consume the chocolates. The number of over-earned chocolates was calculated by subtracting the number of chocolates consumed from the number of chocolates earned. Finally, participants rated the tastiness of the chocolates (i.e., consummatory pleasure) on a five-point Likert-type scale.

Table 7. Correlational analysis of four indicators of over-earning paradigm and QAAM scales.

	1	2	3	4
1. Number of earned chocolates				
2. Number of eaten chocolates	.82**			
3. Number of over-earned chocolates	.70**	.29**		
4. Consummatory pleasure	.13	.04	.21*	
5. Wanting	.27**	.23*	.16	.01
6. Seeking	.26**	.17	.18	−.01
7. Getting	.18	.15	.05	−.03
8. Liking	.15	.19*	.02	.17
9. Anxiety	−.13	−.01	−.15	−.13
10. Fear	−.03	−.01	−.03	−.20*

**$p<.01$. *$p<.05$.

Results and discussion

On average, participants earned 4.21 chocolates ($SD=7.14$) but consumed only 2.15 ($SD=2.80$), which was statistically significant (paired t-test = 3.93, $df=111$, $p < .01$). This indicates that, on average, participants earned approximately two more chocolates than they could (or were willing to) consume. However, the large standard deviation of earned chocolates suggests considerable individual variation, which we aimed to explain using the QAAM scales.

Due to the skewed distribution of the results from the overearning task, we calculated Spearman's rank correlation coefficients between the QAAM scales and the four measures of the overearning task (Table 7). The Wanting and Seeking scales correlated with the number of chocolates earned. It seems that in this brief, five-minute task, Wanting and Seeking—as key components for initiating approach motivation—are most relevant for explaining overearning tendencies. Since the Getting scale represents endurance or persistence in achieving long-term goals, it is reasonable that Getting did not correlate with any variable obtained from a task designed to yield short-term gains. In addition, Wanting and Liking correlated with the number of chocolates eaten suggesting that Wanting also plays a role in the immediate gratification of short-term gains.

Liking was expected to predict greater enjoyment in consuming earned chocolates, but the correlation did not reach significance. Instead, Fear negatively correlated with the chocolate taste ratings representing consummatory pleasure. This may indicate the mixed approach-avoidance elements of the task, in which participants had to self-administer aversive stimuli to earn chocolates. The negative correlation with Fear may reflect the discomfort from the unpleasant noise that participants had to self-administer to earn chocolates. It is possible that individuals scoring high on the Fear scale found the noise more distressing, which subsequently diminished their satisfaction with the chocolates. As the noise represents an immediate aversive stimulus, it is noteworthy that Fear, but not Anxiety, correlated with reduced consummatory pleasure. Overall, these results demonstrate the usefulness of the QAAM in predicting behavioral tendencies in a laboratory setting.

General discussion

We have presented the development of a self-report instrument for measuring individual differences in approach and avoidance processes. This multi-study paper demonstrates that all QAAM scales have good reliability coefficients (see Table S4) and that the approach-related scales are unrelated to Anxiety and Fear. The questionnaire possesses both convergent and divergent validity. Specifically, this 27-item instrument successfully captures the four-dimensional structure of approach motivation and the two-dimensional structure of avoidance motivation identified in Krupić et al. (2016), which was based on five different questionnaires comprising a total of 176 items. In addition, the highly stable six-factor solution (see Table S5) is gender invariant and the questionnaire prove useful in laboratory settings, as shown in Studies 4 and 5. All of these findings indicate the usefulness of this new, easy-to-administer questionnaire.

All five studies demonstrate that different aspects of approach motivation vary in their relationships with the Big Five Model (Study 2), various BAS scales (Study 3), and in the behavioral overearning task (Study 5). In addition to the results presented here, the importance of specific QAAM approach motivation scales has been demonstrated in predicting distress levels in individuals with pronounced psychopathy trait during induced frustration (Krupić, 2021). Together, these findings highlight the complexity of approach motivation and the ability of the QAAM to meaningfully assess four distinct facets within this construct.

On the other hand, the Anxiety scale shows strong correlations with BIS scales and, to a lesser extent, with scales from other questionnaires that measure fear (Study 3). While the Anxiety and Fear scales are interrelated, their distinct effects can still be observed in the experimental studies presented in Studies 4 and 5. Beyond the data presented in this paper, previous findings show that the QAAM predicts emotional reactions, as measured by electrodermal activity in a virtual reality setting designed to evoke a fear of heights (Krupić et al., 2021). However, given their mutual association (Study 1), it is recommended that future research examine their effects using regression or other statistical analyses that can control for their overlap. For the sake of transparency in reporting data from the new instrument, we report only zero-order correlations.

The Anxiety and Fear scales in the QAAM differ from those in other questionnaires that measure avoidance motivation. These two scales assess the psychophysical effects of fear and anxiety, which makes the QAAM useful not only in clinical psychology but also in affective neuroscience. Namely, in animal research, fear and anxiety are usually studied by observing how animals react in different laboratory situations. Because the QAAM measures the emotional side of avoidance motivation, it can be more easily used to compare results from studies conducted across different species than questionnaires like the BFI-2 (which ask people to rate their own identity), as demonstrated in Study 4.

Limitations

In all studies, a convenience sample was used instead of random sampling, which suggests that the samples may not be fully representative of the population, as the majority of participants were between 20 and 30 years old. Additionally, the questionnaire was tested only in the Croatian language, so future studies should assess the comparability of its psychometric properties in other languages. In Study 4, the order of the videos was fixed, which may have influenced how participants emotionally processed these stimuli.

Despite these limitations, we can conclude that the QAAM is a promising self-report instrument with the potential to advance research on approach and avoidance motivation. This paper provides evidence for its construct, convergent, divergent, predictive, and incremental validity, obtained through cross-sectional studies comparing it with other well-established questionnaires, laboratory studies exploring psychophysiological responses to stress induced by immersive virtual reality technology, and the behavioral overearning paradigm. Finally, it has the potential to reduce theoretical confusion arising from differing measurements of ostensibly the same construct, thereby enhancing the empirical coherence of experimental studies across sub-disciplines, including neuroscience and clinical psychology.

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Appendix

Instruction: Below are statements that describe typical desires, feelings, and behaviors. Please indicate how accurately each statement reflects you as a person using the following response scale:

1	2	3	4	5	6
Completely disagree	Mostly disagree	Slightly disagree	Slightly agree	Mostly agree	Completely agree

Anxiety	1. My voice trembles when I need to speak in front of a large group of people.
Seeking	2. I have many ideas that I'd like to realize one day.
Fear	3. There have been times when I could barely catch my breath due to overwhelming fear.
Seeking	4. I could describe myself as a person with broad interests.
Wanting	5. I want to be an important person.
Getting	6. I don't give up easily when I want to accomplish something.
Anxiety	7. Before important events, my muscles feel tense.
Liking	8. It is quite easy to make me feel happy.
Anxiety	9. Before important events, I can't think of anything else except the task that I need to do.
Liking	10. Even small things make me really happy.
Seeking	11. I am curious about a wide variety of things.
Fear	12. There have been times when I felt frozen, overwhelmed by a strong sense of panic.
Wanting	13. I would like to be a highly respected person in society.
Liking	14. I find joy in small everyday moments.
Anxiety	15. I feel frightened before important events.
Fear	16. I have experienced the feeling of choking due to panic attacks.
Getting	17. I work hard and persistently until I get what I want.
Anxiety	18. Before important events, I can't help but think about the worst possible scenarios.
Anxiety	19. I sweat a lot in stressful or unpleasant situations.
Liking	20. I am often happy and content for no particular reason.
Seeking	21. I often think about new projects or initiatives I could start.
Wanting	22. I would like to have a lot of money.
Fear	23. I have had thoughts that I might die during a panic attack.
Getting	24. I persist until I achieve my goals.
Anxiety	25. Right before an important event, I feel my heart start to race.
Getting	26. I don't quit until I finish what I started.
Wanting	27. I would like to have a strong influence on society.

Note: Croatian version of the questionnaire is available in Table S1 in supplemental materials.