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# Inside the anger: development and validation of a new questionnaire

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## Abstract

**Background** Anger is a multifaceted emotion that is still largely unexplored, particularly in its maladaptive manifestations. Despite the existence of numerous assessments for anger, the complexity of the subject matter warrants the exploration of more evaluation tools. This questionnaire aims to make a valuable contribution by identifying aspects of anger experience that current tools fail to fully encompass. The proposed perspective is an assessment of anger that takes into account the individual's perceptions and emotions regarding themselves and their environment. This study aimed at validating a novel anger questionnaire (InAn – Inside the Anger).

**Methods** The enquiries were administered anonymously to employees of the Brescia municipality through a link. The municipal administration dispatched the link to its staff. The participants provided their informed consent electronically.

The designated contact person originally explained the research to the inmates and specified the time and location for their meeting with the researchers. Notwithstanding the time investment required, we subsequently discovered that individuals could only complete one questionnaire. The inmates signed the written informed consent form. The newly developed anger questionnaire (InAn) was administered to 471 participants. Among these, 438 participants were recruited by the municipality of Brescia and 33 from Bollate prison.

Responses were obtained using the InAn questionnaire, the STAXI-2 State-Trait Anger Expression Inventory 2, and the ANPS 3.1 Affective Neuroscience Personality Scales. Stata (version 18) was used to estimate Cronbach's alpha, perform exploratory and confirmatory factor analyses, correlate items with subjects' attributes, and perform descriptive analyses of the items.

**Results** A total of 471 participants completed the questionnaire. Among these, 438 originated from the town of Brescia, while 33 were from the penitentiary in Bollate. In Bollate, participants only completed the InAn questionnaire.

The InAn questionnaire includes 29 questions, with scenarios evaluated on a 4-point Likert Scale, allowing respondents to identify their level of anger (1= Never, 2= Sometimes, 3= Often, 4= Always).

The exploratory factor analysis (EFA) revealed five factors: Factor 1 'Ineffective arousal management', Factor 2 'Feelings of the self that disturb one's healthy affirmation', Factor 3 "Fragility cannot be integrated," and Factor 4 "In

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defence of boundaries," were identified and accounted for 92.7% of the total variance (Kaiser–Meyer–Olkin [KMO] statistic = 0.8553).

The questionnaire had an overall Cronbach's  $\alpha$  of 0.876, signifying strong internal consistency; the Cronbach's  $\alpha$  values for factors 1 to 4 were 0.7963, 0.8103, 0.6524, and 0.6793, respectively.

We assessed the factor correlation matrix from the final exploratory factor analysis to confirm discriminant validity. We conducted confirmatory factor analysis (CFA) to validate the five-component model.

**Conclusion** The novel anger questionnaire (InAn) seeks to elucidate the foundational developmental aspects and processes that contribute to anger. This is predicated on the notion that this comprehension may benefit both individuals with anger management issues and practitioners

**Keywords** Anger, Questionnaire, Assessment, Self

## Introduction

Recognising insufficient anger management, especially when it leads to violent behaviour, may not require significant professional expertise; however, diagnosing these issues, understanding the underlying factors, and finding effective interventions is a complex task.

In comparison to other forms of suffering or disease, the literature on anger has not yet produced complete and consensus-driven responses to these and other enquiries. For example, there is no unequivocal definition of anger; there is no agreement on whether anger constitutes a fundamental personality trait or a clinically relevant dimension, nor on the factors that transform anger from a healthy expression of self-assertion into a negative and destructive force. The distinctions between anger and hostility are ambiguous, particularly regarding the cognitive foundations of anger compared to the negative and pessimistic thoughts associated with hostility. Additionally, there is a significant deficiency in predictive indicators for the risk of violence, and diagnoses are likely to rely primarily on symptoms [1–3].

In addition to these theoretical enquiries, it is imperative to highlight that diagnosing and treating individuals with anger control issues requires sophisticated clinical expertise. Challenges in this process are associated with the formation of an alliance (both diagnostic and therapeutic), the individual's motivation and understanding of the issue, and the common occurrence of concurrent issues, particularly substance and alcohol addiction.

The clinician's posture should be exploratory, avoiding biases and judgements solely to foster understanding; however, certain situations can significantly affect the clinician and necessitate thorough preparation to maintain an observational framework.

Although it is challenging, understanding the subject and the role of anger within its framework, identifying key aspects of intervention, and structuring the therapy are essential in these situations.

Properly executed clinical interviews are perhaps the most effective method for comprehending the nuances of anger issues. Similar to the clinic for other disorders, a

range of assessment tools, including projective tests, self-reports, and questionnaires, are available to aid clinicians in diagnostic evaluations of anger, encompassing both standardised tests and self-reports. Anger evaluation instruments often seek to detect the frequency, severity, and triggers of anger, as well as examine how an individual manages or expresses this emotion. A pertinent distinguishing feature in the selection of instruments is the explicit articulation of the theoretical framework and the robustness of the psychometric qualities. It should also be noted that various instruments emphasise distinct facets of anger.

The STAXI-2 [4], MMPI-2 Anger Content Scale [5, 6], Aggression Questionnaire [7], and Novaco Anger Scale [8–11] are considered some of the most conceptually and psychometrically robust measures available.

The STAXI-2 differentiates anger from hostility and aggressiveness; it divides state anger, a temporary situation defined by intensity, from trait anger, a lasting disposition evaluated by frequency. The scale evaluates the expression of anger and its regulation, both internally and externally. The STAXI-2 is founded on a robust conceptual framework and possesses excellent psychometric attributes, evaluated across diverse normative populations.

The Novaco Anger Scale assesses anger as a characteristic and its responsiveness in hypothetical scenarios that may provoke anger. It is beneficial for evaluating individuals' typical responses to anger-provoking circumstances.

The Buss–Perry Aggression Questionnaire (AQ) examines aggression as a personality feature while also exploring the concept of anger. It has four scales that evaluate anger, hostility, verbal aggression, and physical aggressiveness. From a psychometric perspective, a two-factor model differentiating physical aggression-anger and verbal aggression-hostility is more compelling [12].

The MMPI-2 Anger Scale [5, 6] facilitates the identification of persons with elevated anger levels, who exhibit more frequent and severe daily anger responses compared to those with lower anger levels.

Additional measures include the Anger Disorders Scale (ADS) [13], which evaluates the frequency, duration, and intensity of explosive anger, along with its impact on relationships and daily functioning. The Anger Self-Report identifies the frequency, contexts, and individual responses to anger; the Daily Hassles Scale (DHS) [14] evaluates daily stress, positing it as a potential trigger for anger; the Structured Anger Assessment Interview examines facets associated with the experience and expression of anger; along with other less frequently utilised instruments.

While these tools possess utility and validity, Pascual Leone et al. (2013, p. 84) assert that “despite a sizable amount of research dedicated to the study and measurement of anger as such [8], the implications for relevant case formulation tend to be limited to mainly behavioural (e.g., [15]) and also classic psychodynamic (e.g., [16]) interpretive frameworks.”

Pascual-Leone asserts that ‘clinical formulations of problematic anger would benefit from a taxonomy of emotions that may accommodate multiple degrees of emotional processes as they pertain to a client at a specific time’ (ibid.).

Our theoretical framework differs significantly, although it undeniably shares points of contact in application; yet, we firmly advocate for methods that can progressively enhance the clinical formulation of anger.

The proposed instrument is designed for research studies but primarily aims to assist clinicians in examining critical aspects related to anger experience and management, thereby aiding subjects in achieving better understanding and balance.

The objective of the proposed questionnaire is based on the theorisation of Sabba Orefice [17]. This approach seeks to investigate the optimal emotional states for developing, sustaining, or altering a psychopathological condition. We considered the usefulness of this paradigm for understanding anger for a variety of reasons. Primarily, it is a universal emotion; according to affective neuroscience, anger is a fundamental affective system, hence selected by the species for survival and common across all mammals. Therefore, anger is recognised as a relevant function by virtue of its “physiological” characteristics. Therefore, it is necessary to ask: when anger takes on inappropriate characteristics, such as intensity, frequency, or quality, which other functions is it responding to? For what purpose? Furthermore, the fact that anger is an emotion that is already present in the early stages of development has prompted reflection on the exploration of certain aspects of childhood development, particularly elementary emotions. These emotions are structured in the first phases of life and often determine the subject’s relationships with themselves, others, and the fate of their future relationships. According to Orefice’s theory,

basic trust is established in the early stages of life, and it is declined in the sense of self-continuity, the acquisition of a boundary, first physical and then emotional and mental, and in the sense of belonging.

Regarding the sense of continuity, it is noted that newborns initially lack a physiological integration of their own states, let alone their bodies. Initially, this is implemented gradually, enabling the recording of state variations and changes in identity continuity. “It’s always me, and sometimes I am hungry and I feel bad, and other times I feel full and I am OK.”

The perception of boundaries is the ability to distinguish between the self and the world, as well as between one’s own needs and desires and those of others. The subject can perceive a physical, mental, and emotional space through the acquisition of boundaries.

In conclusion, the sense of belonging defines the perception of accessibility to others, the world, and life: it is the sense of being legitimate or entitled to be in the world.

The manner in which we perceive, manage, and utilise anger is also influenced by the resilience that is derived from the acquisition of these fundamental functions, in our opinion.

Therefore, in accordance with this approach, we have focused on the potential fragility of acquiring basic trust, in the belief that the identification of basic functioning can provide the clinician with the resources to comprehend the emotions that drive anger and its role in the subject’s economy.

This questionnaire does not intend to include all manifestations of anger or examine every contributing element. Nonetheless, we assert that it possesses significant worth in instances refractory to conventional treatments, particularly when anger management concerns entail profound underlying dynamics.

The examination of these factors excludes the assessment of potential violent actions, as the aim is to concentrate on the internal experience. When confronted with violent acts, assessing the potential presence of certain dynamics explored in the questionnaire may provide interpretative insights for both the patient and the clinician.

## Methods

### Samples under study

This observational study received approval from the Provincial Ethics Committee of Brescia (n°3676), the Director General of the Municipality of Brescia, the prison Administration, and the Director of Bollate Jail. The study was performed in compliance with the Declaration of Helsinki and all ethical standards. Informed permission was acquired from all participants in the study. All

participants have granted consent for the utilisation of the obtained data in publications.

The enquiries were presented to the employees of the municipality of Brescia anonymously via a link for completion. The municipal administration disseminated the link to its employees, ensuring that email addresses were not disclosed to external entities. The finalised questionnaires were dispatched without any oversight or intervention from the municipal administration.

**Inclusion criteria:** individuals must be aged between 18 and 65 years, have no outstanding criminal convictions for violent offences, and be in adequate physical and mental health. The last two conditions were implied if the subjects were capable of working. Participants were asked to provide their age when completing the questions, and they gave their informed consent digitally.

As for the inmates, they were initially approached by the liaison from the educational-treatment sector, who,

**Table 1** Demographic characteristics of the whole sample, female e male

	Whole sample	Sex		p-value
		Female 288(75.6%)	Male 93(24.4%)	
Age				
median (25–75)	50(42–55)	49(41–55)	50.5(43–56)	0.2423
18–30 years	20(5.3%)	14(4.9%)	6(6.4%)	
31–45 years	117(30.7)	91(31.6%)	26(28%)	
46–60 years	224(58.8%)	171(59.4%)	53(57%)	
> 60 years	20(5.2%)	12(4.2%)	8(8.6%)	
Center				
Brescia	374(98.2%)	288(100%)	86(92.5%)	
Bollate	7(1.8%)	.	7(7.5%)	
Educational level				
middle school	18(4.7%)	11(3.8%)	7(7.6%)	
graduate				
high school diploma	166(43.7%)	118(41%)	48(52.2%)	
university degree	196(51.6%)	159(55.2%)	37(40.2%)	
Profession				
police officer	40(10.8%)	18(6.3%)	22(26.2%)	
administrative technician	171(46.2%)	138(48.2%)	33(39.3%)	
social worker	38(10.3%)	36(12.6%)	2(2.4%)	
teacher	61(16.5%)	60(21%)	1(1.2%)	
worker	46(12.4%)	24(8.4%)	22(26.2%)	
manager	14(3.8%)	10(3.5%)	4(4.8%)	
Marital status				
married	207(55.3%)	160(55.6%)	47(54%)	
cohabitant	53(14.2%)	45(15.7%)	8(9.2%)	
divorced	47(12.6%)	43(15%)	4(4.6%)	
single	65(17.4%)	38(13.2%)	27(31%)	
widower	2(0.5%)	1(0.3%)	1(1.1%)	

Qualitative variables are expressed as counts and percentages, while quantitative variables are expressed as median (25–75). P values were calculated using the Kruskal-Wallis's test for age

at the researchers' request, identified those convicted of violent offences. The contact person provided a preliminary overview of the research to these individuals and specified the time and location for their meeting with the researchers. A readily accessible room was furnished. Additional information regarding the research was presented, and all enquiries were addressed. Individuals in the room were at liberty to navigate and participate in the group completing the questionnaires. Notwithstanding the time investment, we subsequently determined that individuals could complete only one questionnaire. The InAn questionnaire was available in Arabic; nonetheless, the issue, as identified retrospectively, was primarily one of literacy rather than merely a linguistic barrier. Some requested the option to complete the questionnaire in their cell at their convenience. It was therefore agreed to leave some protocols to be filled out in envelopes and deposited in a specially constructed urn. Despite these safeguards, only 7 out of the 33 questionnaires were completed without omissions or contradictory information. The incarcerated individuals finalised the written informed consent.

A total of 471 individuals completed the questionnaire, comprising 438 respondents from the municipality of Brescia and 33 from Bollate prison. In Bollate, the participants responded solely to the InAn questionnaire.

The factor analysis had 381 participants (374 municipal employees and 7 inmates). The sample comprised a higher proportion of women than men (75.6% versus 24.4%); nonetheless, all subjects in Bollate prison are male. 51.6% of the entire sample possess a university degree, while 55.3% are married. Administrative technicians constituted 46.2% (Table 1).

### Questionnaire

The InAn questionnaire was initially created in Italian and subsequently translated into English. The back translation was conducted by a native Italian speaker (Appendix 1).

The InAn questionnaire consists of 29 questions, with psychological state assessed on a 4-point Likert scale, allowing respondents to identify their level of anger (1 = Never, 2 = Sometimes, 3 = Often, 4 = Always). The cumulative response scores range from 27 to 108, with higher scores indicating a greater prevalence of anger-related disorders.

The response "I don't know" was omitted from the questionnaire.

### Construction of the instrument

In order to construct the questionnaire, we have primarily taken into account the three dimensions of trust, and for each one, we have identified potential areas of connection with the experience of anger.

In terms of the sense of continuity of self, we hypothesised that the fragility of this acquisition could make it difficult to consider self-evolution. A goal of change, a path of maturation, or the development of capacity allows individuals to invest in aspects that are not yet present but have the potential to integrate and become part of their identity in a progressive manner that does not compromise it; this represents a change in continuity. If the continuity of oneself is compromised, it becomes difficult to contemplate change, unless it is in the context of rupture, fall, or discontinuity. When a subject experiences negativity, a restriction, or a vulnerability, the perspective can shift to removing what is no longer functional. In this context, anger can serve as a “transformative” function, a means by which the individual seeks an immediate transformation, such as transforming what is subjugated or victimised into what is imposed, dominated, or transformed from a fearful sentiment into a sense of strength and self-reliance. The item “Have you ever had unpleasant and/or disturbing thoughts that you would like to get rid of?” and “Do you find that you express anger as a sudden outburst?” may serve as precursors to this mode of operation.

Furthermore, the lack of one’s own continuity may result in a predominantly “external” reading of the causes that generate anger. The cause of the anger would be that it was exclusively identified with external events, without sufficient consideration of the event’s internal dynamics or psychological dynamics. In the event of an inability to acknowledge the weight of personal characteristics, the external world may be deemed solely responsible. This would result in the subject being unable to play an active role in modifying certain situations and identifying solutions. A stimulus-response situation would be established, in which the object would be devoid of any weight, such as a billiard ball moved by external force.

In particularly challenging situations, the subject may feel victimised by an unfavourable outcome and trapped in a situation without any potential for change. In this case, anger could be interpreted as the struggle to free oneself from a hostile situation. Items that could potentially indicate these aspects include, for example, “Do you ever feel ‘trapped’ in your life, with the sense that there is no way out? One can react with anger when faced with different situations and events. Please indicate how often the situations listed below provoke you with anger. When others want to put you in a position of inferiority.”

In this context, however, with a different nuance, one might place those experiences where the individual manifests emotional distress on a physical level – When situations worry or disturb you, how often do you experience the following feelings? Persistent alarm; Stomach pains; Physical restlessness; Tachycardia (heart beats fast); Intestinal disorders - or, more concerning, instances

where anger takes on a dissociative quality - “People often say anger can cloud judgment. Have you ever been so angry that you lost control of your actions?”

With respect to the acquisition of boundaries, we have hypothesised that specific bodily and psychological boundary injuries play a significant role in establishing the presumptions for the expression of anger that may also be violent. In the event that the boundaries were not honestly acquired, it is possible that you may experience feelings of exclusion or, conversely, the risk of an invasion. In the first instance, the boundary may be perceived as a barrier that should not exist, or as a wall that separates the subject from the world. In the second case, a lack of boundaries can lead to a fear of being in the hands of others, which can lead to exclusion or harm. In severely compromised situations, the hostile reaction may be an “attempt” by the subject to break a sense of exclusion or protect themselves from an invasion. As a result, the legitimacy of one’s space appears to be critical: the more one’s own mental and emotional spaces are perceived as legitimate, the less the subject will be in the position of having to defend them with violence or giving up assertive self-advocacy. These aspects are illustrated by the following items: “Imagine someone cuts you off while driving. Would you think they are asserting power over you?” “You may not be able to express your disappointment externally. In your experience, what are the obstacles that prevent you from expressing your disappointment? The fear of being isolated because of this.”

In terms of the sense of belonging, self-commitments of varying degrees may be expressed in one’s own emotions, which can range from feeling unlovable and excluded to not feeling entitled to be a part of the world. It is hypothesised that in situations of greater gravity, when feelings of intense shame (humiliation) are experienced or when one’s right to exist is threatened, there may be reactions of intense anger that could lead to the elimination of the other. Items in this area indicate possible links between anger and fear, potential relationships in which the subject has been afraid or feared for his or her physical survival.

The items were omitted due to a significantly elevated proportion of absent data. Perhaps these are topics that require a different setting than the administration of a questionnaire.

The preliminary questionnaire comprised 75 items. Using the remaining 72 items, we conducted an initial exploratory factor analysis (EFA) without imposing restrictions on the factors to determine if some things failed to contribute to the overall variability explanation. Consequently, we removed 28 items that failed to differentiate among any specific factors. Ultimately, we resolved to evaluate the 29 items.

### Questionnaire Description

An interpretation and description of the factors was proposed based on the item groupings as determined by the factorial analysis. This interpretation and description differ from the initial hypothesis, but it is consistent and compatible with the theoretical framework regarding base trust, as described in the Orefice model.

Four factors were identified and named as follows: Ineffective arousal management, Feelings of the self that disturb one's healthy affirmation, Fragility cannot be integrated, and In defence of boundaries. Examples of items that make up the first factor are: 'When situations worry or disturb you, how often do you experience the following feelings? Persistent alarm, Stomach pains, Physical restlessness, Tachycardia (heart beats fast) Intestinal disorders'; 'Do you find that you express anger as a sudden outburst?

Examples related to the second factor are: "You may not be able to express your disappointment externally. In your experience, what are the obstacles that prevent you from expressing your disappointment? The fear of not being a good person; The fear of being isolated because of this".

Ineffective arousal management, Feelings of self that disturb one's healthy affirmation, Fragility cannot be integrated, and In defence of boundaries. Examples of elements that constitute the first factor include: "When situations worry or upset you, how often do you experience the following feelings?" Chronic alarm, abdominal discomfort, physical agitation, tachycardia; intestinal disturbances. Do you often manifest anger through abrupt outbursts?

Examples of the second factor include: "You may not be able to express your disappointment externally. In your experience, what are the obstacles that prevent you from expressing your disappointment? The fear of not being a good person; The fear of being isolated because of this".

The elements that emerge in the third factor, fragility cannot be integrated, are: "One can react with anger when faced with different situations and events. Please indicate how often the situations listed below provoke you with anger When, for some reason, you feel inadequate; When you feel particularly vulnerable".

In factor 4, In Defence of Boundaries, we find, for example, the elements: " One can react with anger when faced with different situations and events. Please indicate how often the situations listed below provoke you with anger When someone tries to intimidate or dominate you; When others want to put you in position of inferiority".

In our opinion, factors related Ineffective arousal management and In defence of boundaries refer to deficiencies in the acquisition of self-continuity, while Feelings of self that disturb one's healthy affirmation and Fragility cannot

integrated indicate difficulties with self-boundaries. It is essential to highlight the contiguity between these aspects, which together contribute to the formation of fundamental trust: it is difficult to conceive of self-continuity in the absence of boundaries that delineate it.

A more detailed description of the factors, including all related elements, is presented later in the factor analysis.

Furthermore, two validated questionnaires were administered: the STAXI-2 (State-Trait Anger Expression Inventory 2) and the ANPS 3.1 (Affective Neuroscience Personality Scales).

Responses to the InAn questionnaire were juxtaposed with those from already validated questionnaires to evaluate criterion validity.

### ANPS 3.1

The Affective Neuroscience Personality Scales (ANPS) is a self-report instrument initially introduced by Davis, Panksepp, and Normansell in 2003 [18]. The scale is intended to assess fundamental affective states, emphasising personal emotions and behaviours rather than cognitive or social evaluations. The ANPS is regarded as a tool for indirectly evaluating an individual's emotional disposition in relation to personality. The creators of the scale regard the ANPS scales as tertiary (thought-mediated) representations of the impact of diverse primary emotional systems on individuals' lives [19].

Multiple iterations of the scale exist. The latest version is ANPS 3.1 [20] ANPS 3.1 was translated into Italian by two scholars with the approval of the sole surviving author, Ken Davis. The translated versions were evaluated to create a final version, which was subsequently examined by an English-speaking expert and compared to the original English text.

The ANPS uses a 6-point Likert scale, ranging from 0 to 5, to signify the level of agreement or disagreement with the provided statements. It evaluates six principal emotions, omitting LUST, with 14 measures for each, and incorporates 12 supplementary items that reflect spirituality (not included in the cited study). The scale additionally assesses social dominance and social anxiety, which are not classified as fundamental affective systems.

Examples of items encompass: "Almost any small problem or puzzle stimulates my interest" (SEEKING); "I often worry about the future" (FEAR); "I often feel a strong need to take care of others" (CARE); "When I am frustrated, I usually get angry" (ANGER); "I am known as someone who makes work fun" (PLAY); "I tend to think a lot about losing loved ones" (PANIC/GRIEF/GRIEF). The ANPS's dependability has been validated in multiple investigations, encompassing earlier Italian versions and translations in various European and non-European languages [21].

## STAXI-2

The State-Trait Anger Expression Inventory-2 [4] is a self-report instrument that assesses anger as an emotional state with differing intensities. It consists of 57 items, categorised into six subscales: trait anger, state anger, internal and external anger expression, and internal and external anger regulation. The STAXI-2 comprises five subscales and an anger expression index.

The State Anger Scale (15 items) assesses the level of anger and the propensity to exhibit it at a specific moment, whereas the Trait Anger Scale (10 items) evaluates the frequency of experiencing excessive anger. In the handbook tailored for the Italian population [22], Cronbach's alpha is 0.84.

## Statistical analyses

Qualitative data are represented as counts and percentages, and quantitative variables are represented as medians (25th-75th percentiles). P-values were computed using the Kruskal-Wallis test for age. A p-value of less than 0.05 was deemed statistically significant.

Internal consistency (reliability) was evaluated using Cronbach's alpha, while the relationships among the components were examined by Spearman's correlation.

Exploratory Factor Analysis (EFA) was utilised to examine the correlation structure among item responses and to discern the principal variables. Significant factors must have a thematic logic that aligns with the questionnaire's objective. A factor loading > 0.3 was established. A rotation (varimax) was done to segregate items between factors. For each factor, the mean and standard deviation was computed for all items contained in the factor.

No question was eliminated as the largest number of missing values for a single question was < 20%; nevertheless, 86 participants were excluded from the analysis due to missing values in at least one question. The final number of subjects included in the analysis was 381.

An EFA was again performed removing the seven prisoners (who constitute 1.8% of the sample), but the factor values did not change.

The hypothesised model was assessed by Confirmatory Factor Analysis (CFA) and the fit of the model was described by four goodness of fit indicators: the  $\chi^2$  test, the p close value, the comparative fit index (CFI), the root mean squared error of approximation (RMSEA), and the Tucker-Lewis index (TLI).

Calibration was tested by examining the link between five factors in the MT questionnaire and the factors of the two validated questionnaires, ANPS 3.1 and STAXI-2, using Spearman's rank-order correlation coefficient ( $\rho$ ).

Statistical analyses were performed using STATA® version 18.0 (StataCorp, College Station, Texas, USA).

## Factor analysis

The Exploratory Factor Analysis (EFA) found 4 significant factors among 29 items, which accounted for 92.7% of the total variation. Factor 1, called 'Ineffective arousal management' (nine items), factor 2, 'Feelings of the self that disturb one's healthy affirmation' (eight items), factor 3, 'Fragility cannot be integrated' (four items), and factor 4, 'In defence of boundaries' (four items), accounted for 58.8%, 15.8%, 9.9%, and 8.1% variance explained. (Table 2).

Table 3 displays the findings of the CFA for the item based on the factors recovered in the EFA. The model's P-value was < 0.001, while the other indices revealed an acceptable fit (CFI = 0.812, TLI = 0.790, RMSEA = 0.072). The KMO value was 0.8553 and the Cronbach's alphas between factors varied from 0.810 to 0.652, showing adequate reliability. The overall Cronbach's  $\alpha$  of the questionnaire was 0.8476, showing strong internal consistency.

Spearman's correlation between four factors ranged from  $R = 0.37$  to  $R = 0.52$  (Table 4).

The numerous aspects are described by quickly recalling the condition of normality, the condition of impairment, the higher risk for pathological conditions and the reference items.

## Factor 1 Ineffective arousal management

This factor includes items that aim to show problematic ways of controlling arousal. We understand arousal as a condition of psychophysical alarm that can arise in particular conditions. Faced with such hyperarousal, individuals with sufficient resources will endeavour to comprehend the causes behind the arousal and will tend to be able to manage their emotions and modulate the activation.

On the contrary, if the subject is unable to access his inner world, he will find himself in a state of recognising what is happening simply from a physical point of view as a result of an unidentified feeling. From a psychological perspective, the subject may feel powerless and stuck in a situation that he or she does not understand and from which he or she feels the urge to escape in order to find solace. In this factory, we discover items that suggest activation and an inability to give meaning to the state experienced by the individual.

In such a circumstance, rage, even expressed violently, could represent an opportunity to break out of a state of activation that one does not understand and that could be terrifying.

Items 8, 9, 10, 11, and 12 detect the bodily expression of distress.

Items 26 and 27, on the other hand, reflect the psychic state associated with feeling trapped and the urge to get rid of the state.

**Table 2** Results of Exploratory Factor Analysis, which yielded 4 factors. Factor loadings >0.3 are shown

	Factor1 Worries about oneself - alarm	Factor2 Disturbing self-feelings	Factor3 Vulnerability	Factor4 Alarm of being subjected	Mean±SD	Missing (%)
One can react with anger when faced with different situations and events. Please indicate how often the situations listed below provoke you with anger						
1) When someone tries to intimidate or dominate you				0.6460	2.3±0.87	7(1.49)
2) When others want to put you in position of inferiority				0.6042	2.4±0.91	6(1.27)
3) When, for some reason, you feel inadequate			0.5806		2±0.86	6(1.27)
4) When you feel particularly vulnerable			0.6022		1.9±0.89	5(1.06)
Generally, when angry						
5) Is unable to express his/her disappointment		0.3362			2.1±0.59	2(0.42)
6)						
7) Breaks or throws objects					1.2±0.88	8(1.7)
When situations worry or disturb you, how often do you experience the following feelings?						
8) Persistent alarm	0.5833				1.7±0.87	12(2.55)
9) Stomach pains	0.4970				2.1±0.88	11(2.34)
10) Physical restlessness	0.5436				1.9±0.85	11(2.34)
11) Tachycardia (heart beats fast)	0.5152				1.9±0.89	10(2.12)
12) Intestinal disorders	0.5333				1.7±0.43	11(2.34)
When you are angry, what do you feel would help you to calm down?						
13) Make you pay for the wrong you have received				0.3295	1.5±0.71	10(2.12)
14)						
15)						
Imagine that your behaviour or decision is publicly disapproved of. How do you think you would feel?						
16) Would you feel ashamed		0.8208			2.2±1	11(2.34)
17) You would feel embarrassed		0.7443			2.6±0.96	9(1.91)
18) You would feel guilty for what you had done		0.7225			2±0.97	9(1.91)
You may not be able to express your disappointment externally. In your experience, what are the obstacles that prevent you from expressing your disappointment?						
19) The fear of not being a good person		0.4276			1.5±0.9	86(18.26)
20) The fear of being isolated because of this		0.3669			1.6±0.86	85(18.05)
21) Fear of an aggressive response from the other		0.4180			2.2±0.97	82(17.41)
22) Imagine someone cuts you off while driving. Would you think they are asserting power over you?				0.3196	2±0.94	10(2.12)
23) Imagine you are at a party and you see an acquaintance, but he does not speak to you. Would you think that that he wants to show his superiority			0.3521		1.2±0.48	11(2.34)
24) People often say anger can cloud judgment. Have you ever been so angry that you lost control of your actions?	0.4219				1.4±0.62	.
25) Do you ever hear 'voices inside you angrily urging you to do something?			0.4210		1.2±0.44	4(0.85)
26) Do you ever feel 'trapped' in your life, with the feeling that there is no way out?	0.4529				1.8±0.74	1(0.21)
27) Have you ever had unpleasant and/or disturbing thoughts that you would like to get rid of?	0.5573				1.6±0.7	4(0.85)
28) Do you find that you express anger as a sudden outburst?	0.3380				1.7±0.59	2(0.42)
29) When someone or something upsets you, do you keep dwelling on it?		0.3765			2.4±0.79	10(2.12)

**Table 3** Results of confirmatory factor analysis (CFA)

Factor	$\chi^2$	<i>p</i> -value	RMSEA	CFI	TLI	Cronbach alpha
Easy items						
Factor 1	170.3	<0.001	0.108	0.839	0.786	0.7963
Factor 2	135	<0.001	0.123	0.873	0.823	0.8103
Factor 3	32	<0.001	0.181	0.913	0.738	0.6524
Factor 4	26.4	<0.001	0.163	0.928	0.785	0.6793
Whole model	804.4	<0.001	0.072	0.812	0.790	0.8758

*P*: should exceed 0.05

CFI Comparative Fit Index, should be close to 1

RMSEA Root Mean Square Error of Approximation, should not exceed 0.10

TLI (Tucker-Lewis Index): should be close to 1

**Table 4** Spearman's correlation between four factors

	Mean	Std. Dev.	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.77	0.49	1			
Factor 2	2.11	0.58	0.5209	1		
Factor 3	1.56	0.49	0.4773	0.4223	1	
Factor 4	2.05	0.61	0.5086	0.3731	0.4708	1

Items 28 and 24 detect possible outcomes of the condition of exclusion from the intrapsychic dimension: anger seizes the subject suddenly, as an event that can be recorded by the subject in the role, so to speak, of 'spectator' and similarly, there could be acts of which the subject seems to have reduced awareness.

#### Factor 2 Feelings of the self that disturb one's healthy affirmation

In a sufficiently satisfactory state of mental balance, the person regards his feelings and his life in general as valid. If this legitimacy is weak or deficient, the subject will be inclined to repeatedly look outside for the 'right to exist', which eventually exposes him or her to experiences of dread, humiliation and guilt. From this personal fragility, the other may be viewed as potentially hostile. The absence of psychic space may fuel either an appropriate mode with a more or less violent component or an aggressive claim to one's own space.

Items 5, 19, 20 and 21 point out how the lack of legitimacy of one's own physical and mental spaces and the inability to use aggression in a constructive and vital way, in order to defend these spaces, could lead the subject into a condition in which even declaring a different position, communicating one's disappointment or irritation is already dangerous in itself, both because it can make him feel like a bad person and inadequate to what the outside world expects of him, and because the other could potentially be able to attack or isolate him.

Items 16, 17 and 18 demonstrate how the lack of approval of a behaviour by others can cause feelings of shame, guilt, embarrassment, which become the real drivers of rage. Here it will be relevant to assess the intensity of the feelings experienced.

Item 29 acknowledges the possibility that, following an experience of anger (which may not be openly stated to the other person), the subject is unable to digest it and make sense of it; this may feed ongoing tormented thoughts that overwhelm the mind in a vicious circle that increases arousal.

#### Factor 3 Fragility cannot be integrated

In the normality of existence, feeling in difficulties or fragile can be addressed as a natural circumstance, which does not weaken the value of the self. When the presence of a limit, of a fragility cannot be felt as a normal, physiological situation that can be integrated into the self-image, but is instead a situation that frightens and cannot be tolerated, anger could represent a way out of this condition.

Items 3 and 4 expressly show that the situations in which an individual reacts with rage are ones in which he feels inadequate and defenceless. Here, anger could take on a transformative value. In fact, reactivity, with a more or less violent component, can be beneficial in giving the individual, even if only momentarily, a sensation of strength and self-possession.

Item 23 describes a circumstance in which individuals, who may suffer from a sense of inadequacy and inferiority, may take the other's actions as a demonstration of superiority and confirmation of their inferiority. Such feelings may cause rage reactions of varying degrees.

Item 25 may imply an accentuation of the mode underlying the previous items, in which anger is additionally inspired by voices that may induce action. A positive reaction to this item should alert the physician to evaluate the quality and content of the voices, since these are

**Table 5** Spearman's correlation between four factors InAn questionnaire and the factors of the ANPS and STAXI questionnaire

	InAn questionnaire			
	Factor 1	Factor 2	Factor 3	Factor 4
<b>ANPS questionnaire</b>				
FEAR	0.5398	0.4772		
ANGER	0.4284			0.4871
PANIC	0.5002	0.4095		
<b>STAXI questionnaire</b>				
Anger – trait	0.4767			0.5022
Anger Expression-In	0.4896	0.5289	0.4116	0.4156

crucial elements in estimating the likelihood of violent acts.

#### Factor 4 In defence of boundaries

In a normal scenario, rage can be usefully deployed to reconfigure the equilibrium of a relationship (see also Theory of Recalibration, Sell, 2011) and to claim one's physical and emotional space inside a partnership. The presence of solid boundaries therefore allows us to realistically perceive certain relational occurrences as being linked to the traits of the other person's choices of utility and assessments that may be partial or contested. In this situation, anger fosters responses aimed at healthy self-assertion.

Conversely, if the subject senses insecurity about their own space and themselves, they will be more motivated to view others' conduct as forms of attack and to 'defend' their boundaries, even in extreme ways. The choice to defend one's life at the expense of others is not uncommon; the challenge is to recognise if and when one's own survival is viewed as being at risk. The more frightened the subject feels, the more serious the threat, the stronger the need to defend themselves. It is evident that there is no goal here to defend any behaviour, but rather the necessity to identify aspects that are vital for understanding.

Items 1, 2 and 22 indicate attributing to others a desire to abuse power or a demonstration of power and superiority as chosen motivations for an angry reaction.

Item 13 also helps to judge the subject's lack of resources: overcoming the state of fury seems feasible only by actual action, i.e., by making the wrongdoer pay for the wrong done and thus restoring balance.

#### Calibration

Regarding the factor analysis and the comparison with ANPS 3.1, the first notable discovery is that it is only the FEAR ANGER AND PANIC/GRIEF components that correspond with particular questionnaire factors. In our sample, Cronbach's alpha for the FEAR ANGER factor is 0.8674, demonstrating good consistency, while for the

PANIC/GRIEF factor it is 0.3409, showing low consistency but which may be related to the inclusion of only two questions in this component.

No significant connections were discovered with other affective systems. These results are highly interesting but deserve additional clarity.

In Table 5, factor 1 of the InAn questionnaire correlates with the FEAR, ANGER and PANIC/GRIEF/GRIEF constructs of the ANPS questionnaire (0.5398, 0.4284 and 0.5002 correspondingly); factor 2 correlates with FEAR and PANIC/GRIEF/GRIEF (0.4772 and 0.4095) and factor 4 with ANGER (0.4871).

Factor 1 of the InAn questionnaire corresponds with the trait anger and anger expression constructs inside the STAXI questionnaire (0.4767 and 0.4896, respectively); factor 2 connects with anger expression within (0.5289); factor 3 correlates with internal anger expression (0.4116).

#### Discussion

Regarding the confirmatory analysis and the comparison with ANPS 3.1, the first notable discovery is that it is only the FEAR ANGER AND PANIC/GRIEF variables that correspond with certain questionnaire factors.

No significant connections were discovered with other affective systems. These results are highly interesting but deserve additional clarity.

ANPS 3.1 assesses the basic affective systems, i.e. feelings and drives, that have been selected by the species to signal if the subject is well or unwell with respect to survival. In order to survive, it is vital to maintain homeostasis, i.e. to satisfy the demands made by the seven primary emotional systems. In particular, with respect to FEAR, the expected state is that nothing should threaten one's life or body. With respect to ANGER, the desired state is that nothing should stand between one and the gratification of one's demands. With respect to PANIC/GRIEF, the required state is that the person who takes care of one must be available and attentive [23]. These basic affective systems are present in all mammals and located in the PAG. Learning, which takes place throughout life, is based on these systems and allows secondary emotions to form, such as guilt, blame, shame, empathy, trust, pride, etc. There is also a tertiary system in the brain that allows for distancing, containment, mentalisation, and the naming of feelings and awareness [24].

Specifically, the factor linked to inadequate arousal management correlates with all three of the aforementioned emotional systems. When the individual experiences a state of arousal, it is conceivable that the basic affective systems may also be active. This could be due to a fear of abandonment or a protest against such abandonment (PANIC/GRIEF), or anger at the failure to meet a need or want (ANGER), or even a feeling of danger

(FEAR). While we cannot infer what particularly causes a state of arousal, it is indicative that this factor correlates with these basic affective systems.

The factor 'feelings of the self that disturb one's healthy affirmation' connects with PANIC/GRIEF and FEAR, confirming that it is fear of losing the bond (PANIC/GRIEF) and dread of others' reactions that make healthy self-affirmation difficult.

However, the factor 'Fragility cannot be integrated' does not correspond to any of the affective systems of the ANPS. We believe this depends on the fact that this characteristic implies a secondary, not a major one.

The 'In defence of boundaries' aspect corresponds with rage, since beyond the internal dynamics that may drive the subject to regard others as enemies, the reality remains that attacking or defending oneself from an enemy activates the ANGER emotional system and the feeling experienced is rage.

Regarding the confirmatory study and the comparison with STAXI – 2, the 'ineffective management of arousal' and 'factors are correlated with trait anger as measured by the STAXI 2, which identifies individuals who frequently experience anger. Interestingly, these parameters do not connect with the level of anger (state anger), but with a trait component. This verifies the objective of the InAn questionnaire to capture not so much the expression of anger, rather than the presence of this feeling. When discussing individuals with high trait anxiety ratings, Spielberger [21] points out that they typically feel treated unfairly by others and are likely to experience more irritation. This seems to us to be very much in line with the description of the elements in our questionnaire.

We consider this an important finding because it allows us to underline that the characteristics revealed by the InAn questionnaire highlight features of self- and other-perception that may be accompanied by feelings of anger. While it is not certain that anger would be manifested in a violent manner, it is already the frequent presence of anger that deserves attention.

All components in the new questionnaire, with the exception of resilience, correspond with the internal expression of anger, i.e. with how often feelings of anger are experienced but not voiced or suppressed. This also seems to be compatible with the questionnaire's purpose of detecting the sentiments and emotions experienced when a person experiences anger.

As the instruments being compared have various foci, it is not surprising that the amplitude of the correlations is rather small. We can also observe a logical coherence in the assessment of the associated factors. In short, anger can be constructive, but if it persists it may signal concerns for which the subject has not yet found a suitable answer. In the neuropsychanalytic framework, we would argue that the subject has not discovered a

satisfactory 'prediction' and, according to our data, the emotions awaiting a more appropriate reaction are associated with the activation of the key emotional systems of PANIC/GRIEF, FEAR and ANGER. According to the InAn questionnaire, the aspects that the subject may experience as problematic concern ineffective arousal management, the presence of feelings about oneself that hinder healthy self-affirmation, interpreting situations of discomfort in terms of vulnerability, and experiencing a sense of being overwhelmed.

### Limitations

#### *This work has significant drawbacks*

First, the questionnaire attempts to capture certain deep dynamics that may underlie a continuous feeling of rage. It is not necessarily the case that all outbursts of wrath are founded in these same processes. Nonetheless, it seems crucial to us to have a tool that helps to examine these elements and that can allow hypotheses to be put forward in order to explain the causes for such a situation, which is first and foremost burdensome for the subject.

However much a questionnaire may enhance the examination of certain crucial areas, it cannot replace the clinician. It is a tool that can contribute to the understanding of the patient (and in this sense it can also be useful for the patient himself, leading him to question or reflect on certain problems), but knowledge of the other (including diagnosis) needs the space and time of the clinical interview and above all the patient/clinician relationship.

The sample size is quite restricted and administration to a clinical sample is necessary. In fact, it is probable that some factors indicate a low/moderate dependability. However, in our situation, we considered that maintaining the components with this attribute could be valuable for duplicating the questionnaire in future populations. The actual ability to recognise problem situations must be validated on a qualitatively and quantitatively significant sample.

One of the objectives of the questionnaire was also to be able to capture different levels of difficulty with anger and to detect both mild impairments in the acquisition of basic trust and serious impairments that could signal the risk of violent outbursts or, on the other hand, a lack of healthy assertiveness. For this reason, we wanted to have very different subjects in the sample, such as public administration employees, whose work requires a satisfactory level of self-control, and prisoners convicted of violent crimes. Unfortunately, it was difficult to gain access to prisons in the first place. After long waits and challenging bureaucratic procedures, we were informed of a reduction in prison staff, which meant that our request, initially accepted, could not be implemented. We

therefore turned to the Bollate district prison, where we found it easier to make contact, but when entering the questionnaire data, we found that few protocols had been adequately completed. We do not believe that there were specific aspects of the questionnaire that motivated the many omissions. In fact, some prisoners even expressed their appreciation for the questionnaire, which they felt was intended to understand rather than judge them; several dozen of them spent a long time filling in the questionnaires, while others asked to be able to fill them in at their leisure in their cells. The problem seemed to us, and this was subsequently confirmed by the staff, to be one of returning illiteracy.

Another limitation, which is not uncommon, is the imbalance in the sample in favour of female subjects.

Our intention is to propose the tool to larger and more diverse samples, both victims and those at risk of violent acts, with a better gender balance, hopefully from different European countries.

## Conclusions

In summary, we feel that this new questionnaire can clarify the experience of rage and can provide great help in understanding some of the deep dynamics connected with anger. Factor analysis verifies the validity of the concepts enunciated. In particular, the aim to understand the functioning of the subject and the conditions of fragility that may encourage the sensation of anger we believe can promote the creation of an alliance between patients and clinical operators and favour and orientate a taking charge.

## Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12888-025-07465-0>.

Supplementary Material 1.

Supplementary Material 2.

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## Authors' contributions

Authors' contributions: PM, and CT conceived the study, PM collected the materials, PPM and RV analyzed the data, PM, PPM, RV, and CT drafted the paper. All authors revised it and approved the final manuscript.

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## Data availability

The dataset supporting the conclusions of this article is included within the additional file.

## Declarations

### Ethics approval and consent to participate

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and with all ethical principles. This study approved by Provincial Ethics Committee of Brescia Provincial Ethics (N° 3676).

### Informed consent

Statement: Informed consent was obtained from all subjects involved in the study.

### Consent for publication

All subjects have consented to the use of the collected data for publications.

### Competing interests

The authors declare no competing interests.

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