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Disordered eating and autism spectrum symptom in a community sample

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DISORDERED EATING AND AUTISM SPECTRUM SYMPTOM IN A COMMUNITY SAMPLE

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Resumo

A presente dissertação teve como principal objetivo investigar a associação entre traços do espetro do autismo e comportamentos alimentares disfuncionais, numa amostra comunitária. A partir de uma perspetiva dimensional, analisou-se de que forma diferentes traços do espetro do autismo (interação social, comunicação, camuflagem social, rigidez cognitiva, comportamentos repetitivos e sensibilidade sensorial) se relacionam com três dimensões dos comportamentos alimentares: ingestão descontrolada, ingestão emocional e restrição cognitiva. Avaliou-se igualmente o papel mediador da tolerância ao *distress* nesta associação. A amostra foi constituída por 241 participantes adultos, que responderam a instrumentos de autorrelato (CATI, TFEQ-R21 e DTS). Os resultados indicaram que os traços de camuflagem social e sensibilidade sensorial apresentaram associações significativas com os comportamentos de ingestão descontrolada e ingestão emocional, enquanto a rigidez cognitiva se associou à restrição cognitiva. Para além disso, a tolerância ao *distress* revelou-se um mediador parcial da relação entre os traços de autismo e a ingestão descontrolada, e um mediador total das associações com ingestão emocional e restrição cognitiva. Estes resultados destacam a relevância de processos emocionais, nomeadamente a tolerância ao *distress*, na compreensão das relações entre traços de autismo e padrões alimentares disfuncionais, em amostras comunitárias.

Palavras-chave: Traços do Espetro do Autismo, Comportamentos Alimentares Disfuncionais, Tolerância ao Distress.

Abstract

The main objective of this dissertation was to investigate the association between autism spectrum traits and dysfunctional eating behaviors in a community sample. From a dimensional perspective, the study examined how distinct autism spectrum traits (social interaction, communication, social camouflaging, cognitive rigidity, repetitive behaviors, and sensory sensitivity) are related to three domains of eating behavior: uncontrolled eating, emotional eating, and cognitive restraint. The mediating role of distress tolerance in these associations was also assessed. The sample consisted of 241 adult participants who completed self-report instruments (CATI, TFEQ-R21, and DTS). The results indicated that social camouflaging and sensory sensitivity traits were significantly associated with uncontrolled and emotional eating behaviors, while cognitive rigidity was associated with cognitive restraint. Moreover, distress tolerance was found to be a partial mediator of the relationship between autistic traits and uncontrolled eating, and a full mediator of the associations with emotional eating and cognitive restraint. These findings underscore the relevance of emotional processes, particularly distress tolerance, in understanding the associations between autistic traits and dysfunctional eating patterns, in community samples.

Keywords: Autism Spectrum Traits, Dysfunctional Eating Behaviors, Distress Tolerance.

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Lista de Abreviaturas

ED/EDs – Eating Disorder(s)

BN - Bulimia Nervosa

AN - Anorexia Nervosa

BED – Binge Eating Disorder

ER - Emotion Regulation

ASD – Autism Spectrum Disorder

FPCEUP - Faculty of Psychology and Educational Sciences of the University of Porto

CATI - Comprehensive Autistic Trait Inventory

CATI_COM – Communication

CATI_SOC - Social Interaction

CATI_CAM – Social Camouflage

CATI_RIG – Cognitive Rigidity

CATI_REP – Repetitive Behaviors

CATI_SEN – Sensory Sensitivity

CATI_TOTAL – Total Score of Comprehensive Autistic Trait Inventory

DTS – Distress Tolerance Scale

DTS_TOTAL – Total Score of Distress Tolerance Scale

TFEQ-R21 - Three-Factor Eating Questionnaire-R21

TFEQ21_UE – Uncontrolled Eating

TFEQ21_CR – Cognitive Restraint

TFEQ21_EE – Emotional Eating

I – Introduction

Eating Disorders

Eating disorders (EDs) are complex behavioral conditions that significantly impact mental, physical, and social well-being (Guarda, 2023). These disorders are characterized by irregular eating patterns and ongoing negative thoughts and emotions surrounding food. The American Psychiatric Association (APA, 2013) identifies several types of EDs, including Bulimia Nervosa (BN), Anorexia Nervosa (AN), Avoidant/Restrictive Food Intake Disorder (ARFID), Binge Eating Disorder (BED), Rumination Disorder, Pica, and various other specified or unspecified feeding and eating disorders. Although these issues can affect individuals of any age or gender, research shows that they are particularly prevalent during adolescence and adulthood, especially among females, with BN and AN being the most observed disorders (Guarda, 2023).

A literature review focusing on EDs among young individuals, published between 2013 and 2022, revealed that the prevalence of these disorders, as outlined in the DSM-5, ranges from 5.5% to 17.9% in females and from 0.6% to 2.4% in males (Silén & Keski-Rahkonen, 2022). A study conducted in a university population showed that 16% of female students and 8% of male students displayed risk symptoms, including purging, compulsive behaviors, and thoughts of thinness, with weight influencing their self-esteem (Hovrud et al., 2019).

Although clinical conditions are the most addressed, it is necessary to highlight that disordered eating exists on a continuum that ranges from non-clinical to clinical groups. This continuum can be divided into three phases: individuals without symptoms of EDs (asymptomatic group), followed by individuals who do not meet all diagnostic criteria for EDs but have some suggestive ones, and finally, individuals considered clinical, meeting all criteria for a diagnosis (Carton & Smith, 2013; Christensen et al., 2019).

Distress Tolerance in Eating Disorders

Gaining insight into the mechanisms underlying the onset and maintenance of eating disorders is crucial, particularly through the lens of distress tolerance. While emotion regulation (ER) difficulties have been widely acknowledged in the literature, growing attention has been directed to the more specific construct of distress tolerance, defined as the capacity to withstand

and manage negative emotional states without resorting to maladaptive behaviors (Simons & Gaher, 2005).

Research has shown that individuals with low distress tolerance are more prone to experience intense negative emotions and may engage in maladaptive coping strategies, such as binge eating or purging, to alleviate emotional discomfort (Mikhail et al., 2024). These behaviors may serve as short-term relief but often perpetuate a self-reinforcing cycle, where the inability to tolerate distress contributes to repeated disordered eating patterns (Haynos et al., 2018).

Although dietary restriction is often associated with the pursuit of positive reinforcement - such as social approval or internal rewards like endorphin release (Haynos et al., 2017) - studies on non-clinical populations suggest that restrictive behaviors can also emerge during periods of emotional discomfort. In such cases, low distress tolerance may hinder the use of more adaptive coping mechanisms, reinforcing restrictive eating as a form of emotional avoidance (Haynos et al., 2018).

In a comparative study, Corstorphine et al. (2007) found that women with EDs demonstrated lower distress tolerance and relied more on avoidance strategies, while women without EDs were more likely to engage in emotional problem-solving and scored higher on the Distress Tolerance Scale (DTS), highlighting the relevance of this construct in differentiating clinical and non-clinical populations.

Autistic Traits and Eating Disorders

Given the pivotal role of emotional distress and regulation in eating disorders (EDs), a substantial body of research has focused on understanding these emotional mechanisms. However, there is a growing interest in exploring how EDs may also intersect with neurodevelopmental conditions, particularly Autism Spectrum Disorder (ASD).

The World Health Organization (WHO, 2023) classifies ASD as having a range of diverse conditions, notably including difficulties in communication, especially in terms of social interaction, challenges in transitioning from one task to another, potential intense focus on details, atypical behaviors and exaggerated reactions to sensory stimuli. In the prevalence study of ASD, up to 2020, it was concluded that one in every thirty-six children has a diagnosis of this disorder, being four times more prevalent in boys than in girls (Maenner, 2023).

Individuals on the autism spectrum exhibit a range of behaviors, symptoms, and thought patterns that are collectively referred as autistic traits. These traits, in addition to being present in clinical populations, can also be found in non-clinical and have significant influence across

various domains of functioning (Carton & Smith, 2013; Christensen et al., 2019; Abu-Akel et al., 2019).

Research exploring the association between autistic traits and disordered eating has grown steadily in recent years. While initial investigations predominantly concentrated on anorexia nervosa (AN), evidence has begun to support the broader relevance of autistic features across various eating disorder (ED) diagnoses. For instance, approximately 32% of individuals with AN have received an ASD diagnosis at some point, with 12% maintaining this diagnosis across multiple assessment waves (Nielsen et al., 2015). Meta-analytic findings indicate that individuals with AN consistently score higher than healthy controls on measures of autistic traits, such as the Autism Spectrum Quotient, although they often do not surpass the clinical threshold for ASD diagnosis (Westwood et al., 2015). Furthermore, studies examining diverse ED populations - including bulimia nervosa (BN) and binge eating disorder (BED) - have shown that up to 33% of individuals score above the clinical cut-off for ASD traits, with no significant differences observed between diagnostic categories (Vagni et al., 2016). These findings underscore the importance of investigating the shared mechanisms underlying ASD and EDs, beyond the confines of diagnostic boundaries.

Social Interaction and Communication

Both EDs and ASD involve pronounced impairments in social functioning, particularly in relation to social observation and anxiety. In individuals with AN and co-occurring autistic traits, the fear of being observed while eating has been identified as a significant contributor to heightened anxiety and the maintenance of restrictive eating behaviours, that may serve as maladaptive coping strategies to regulate emotional distress in socially demanding contexts (Kinnaird et al., 2019a). Moreover, individuals with both AN and ASD frequently avoid eating in social settings due to heightened sensory sensitivities and difficulties tolerating environmental stimuli such as noise, crowding, or complex social interactions during mealtimes (Brede et al., 2020).

In addition, persistent deficits in reciprocal social communication and interaction - core features of ASD - may increase vulnerability to social isolation and reduce opportunities for establishing protective interpersonal bonds (Saure et al., 2024). These may contribute to the emergence and persistence of restrictive eating patterns, particularly among individuals with underlying neurodevelopmental vulnerabilities (Brede et al., 2020; Saure et al., 2024).

Social Camouflaging

Camouflaging, or masking, refers to the adoption of non-autistic behaviors, such as maintaining eye contact and mimicking social norms, to reduce stigma and facilitate social integration (Cook et al., 2021). Despite its short-term social benefits, this coping strategy has been associated with greater emotional and physical fatigue, as well as poorer mental health outcomes (Bargiela et al., 2016; Beck et al., 2020).

Camouflaging is more prevalent among autistic females, like the pattern observed in eating disorders (Lai et al., 2017), suggesting a link between the two at this point. Autistic females in EDs inpatient settings have reported engaging in camouflaging by adopting the restrictive eating behaviors of their peers to fit into neurotypical environments (Brede et al., 2020).

Cognitive Rigidity and Repetitive Behaviors

Rigidity is a core feature of autism and has long been central to its diagnostic framework (Zucker & Losh, 2008). Notably, starvation itself can exacerbate behavioral rigidity. Classic studies on human starvation have shown that when adult males were restricted to half their usual caloric intake, they developed rigid patterns related to food preparation, selection, and consumption - closely resembling behaviors observed in AN (Grave et al., 2011).

Among individuals with eating disorders, cognitive fixations, and repetitive behaviors specific to disordered eating are commonly reported, such as the need to consume foods in a particular order, at a set pace, or based on specific characteristics like color (Zucker & Losh, 2008).

Sensory Sensitivity

Around 23% of individuals with EDs exhibit traits linked to ASD, such as emotional dysregulation and goal-directed eating behaviors influenced by sensory processing (Samson et al., 2012; Cobbaert et al., 2024). Sensory processing variations, including hypersensitivity and hyposensitivity, are well-documented in autism (Bradley et al., 2024) and have been implicated in ED development. Overwhelming sensory input can lead to distress or compulsive behaviors, while reduced interoception may impair hunger recognition (Kinnaird et al., 2019a; Brede et al., 2020).

A study involving women with ASD and AN, their parents, and healthcare professionals found that sensory aversions, rather than caloric concerns, influenced food restriction, distinguishing it from typical AN pathology (Brede et al., 2020).

Distress Tolerance in Autism Spectrum Disorder

Individuals on the autism spectrum consistently show difficulties in tolerating distressing emotional states, a vulnerability that significantly impacts their psychological wellbeing (Cai et al., 2019). A central factor contributing to this challenge is alexithymia - characterized by difficulties in identifying and expressing emotions - which occur at a disproportionately high rate among autistic individuals (approximately 50%), compared to the general population (around 5%) (Preece et al., 2017).

These difficulties in emotional awareness and articulation contribute to heightened negative emotions and reduced positive emotional experiences (Kinnaird et al., 2019b). Importantly, autistic traits are associated with low distress tolerance and this reduced tolerance leads to reliance on maladaptive coping strategies such as emotional suppression and avoidance, rather than adaptive approaches like cognitive reappraisal, ultimately exacerbating psychological distress (Zhao et al., 2020).

Low distress tolerance has been linked to emotional avoidance, behavioral disengagement, and rumination - strategies that may provide temporary relief but tend to sustain internalizing symptoms over time (Schwartzman et al., 2024). Notably, these challenges are not restricted to clinically diagnosed individuals, even non-clinical populations with elevated autistic traits report increased emotional reactivity, social anxiety, and interpersonal difficulties, emphasizing that distress tolerance operates dimensionally across the autism spectrum (Freeth et al., 2013; Li et al., 2023).

Considering that both EDs and ASD exist along a spectrum and that their traits may manifest in both clinical and non-clinical populations (Mansour et al., 2016), it becomes crucial to explore their interrelation in community contexts. Examining the roles of distress tolerance within this intersection may provide valuable insights into the mechanisms underlying disordered eating behaviors, contributing not only to a broader understanding of these processes across the general population but also to the development of more effective and targeted clinical interventions.

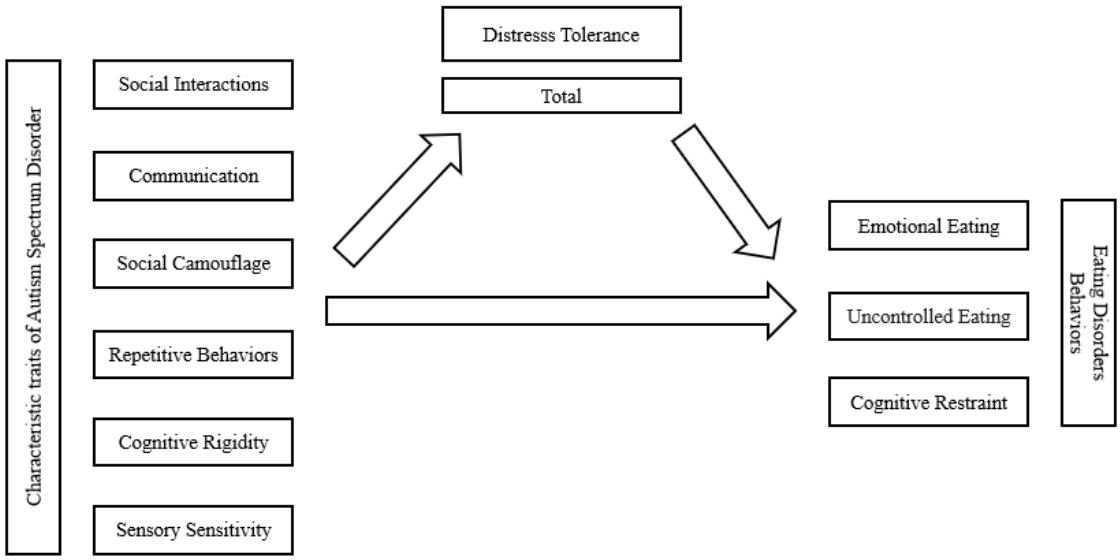
II – Objectives

This study aims to understand how, in a community sample, the characteristic traits of ASD (Social Interactions; Communication; Social Camouflage; Repetitive Behaviors; Cognitive Rigidity; Sensory Sensitivity) influence eating behaviors and cognitions (Emotional Eating; Uncontrolled Eating; Cognitive Restraint). We will try to understand if distress tolerance impacts this interaction.

The module hypothesized is schematically presented in Figure 1.

Figure 1

Relation between autistic traits and dysfunctional eating behaviors and the influence of distress



To understand the aim of this study, the following research question was developed:

Q1 - Is presence of autistic traits in a community sample associated with the presence of characteristic behaviors of eating disorders?

Q2 - Does distress tolerance mediate the relationship between autistic traits and eating disorder behaviors in a community sample?

To answer Q1, the following hypothesis was developed:

H1 - Autistic traits significantly explain the variability in eating behavior in a community sample.

To answer Q2, the following hypothesis was developed:

H2 - Distress tolerance mediates the relationship between autistic traits and dysfunctional eating behaviors in a community sample.

III – Methods

Participants and study design

The sample consisted of 241 participants, with the inclusion criterion being that participants were over 18 years old, and no exclusion criteria were applied. The sample was community-based. To gather a substantial number of participants, a snowball sampling strategy was employed – they were invited to share the questionnaire with others who might be interested in taking part in the study.

The data collection process took place entirely online. The questionnaire was developed using Google Forms. At the Faculty of Psychology and Educational Sciences of the University of Porto (FPCEUP), the link to the questionnaire was published on the faculty's portal, specifically under the research section. Additionally, the questionnaire was shared through various social media networks such as Instagram, Facebook, WhatsApp, and LinkedIn.

This study followed all ethical guidelines and was approved by the Ethics Committee of FPCEUP (Ref.ª 2024-10-03c). Participants were informed about the approximate time required to complete the questionnaire, their right to withdraw at any moment, and the guarantee of anonymity and confidentiality throughout the process. Before beginning the questionnaire, they received detailed information about the study's objectives and provided informed consent. They were then asked to complete a brief sociodemographic section, followed by items related to the instruments used in the research.

Instruments

Sociodemographic questionnaire

Initially, sociodemographic data will be collected, including age, gender, educational qualifications, nationality, employment status, weight, and height. Additionally, participants

will be asked about their general mental health history, with a particular focus on whether they have a history of eating disorders and/or autism spectrum disorder.

Comprehensive Autistic Trait Inventory (CATI)

The Comprehensive Autistic Trait Inventory (English et al., 2021) is a self-report instrument for adults, serving as a measure of autistic traits, specifically within a general population. It consists of 42 items grouped into 6 dimensions: Social Interactions (CATI_SOC), Communication (CATI_COM), Social Camouflage (CATI_CAM), Repetitive Behaviours (CATI_REP), Cognitive Rigidity (CATI_RIG), and Sensory Sensitivity (CATI_SEN). Despite these scales, the total can also be calculated (CATI_TOTAL). Through a 5-point Likert scale, with options such as "Definitely Disagree," "Somewhat disagree," "Neither agree nor disagree," "Somewhat agree," and "Definitely agree," individuals are required to consider how well the statements describe them. It's noteworthy that regarding those related to social nature, one should think about a situation with strangers rather than with family or friends. Higher values on this scale indicate a greater number of autistic traits. Although the CATI is not intended for clinical diagnosis, previous research (English et al., 2021) has identified a cut-off total score of 134 or above as optimal for distinguishing individuals with clinically relevant levels of autistic traits in research contexts.

Distress Tolerance Scale (DTS)

The Distress Tolerance Scale (Simons & Gaher, 2005) is a self-report instrument that measures the level of tolerance to emotional suffering. It consists of 15 items, in which individuals rate their agreement with each item on a 5-point Likert scale, with options such as "Strongly Disagree," "Mildly Disagree," "Feel Neutral," "Mildly Agree," and "Strongly Agree". The Portuguese version, translated and validated by Lucena-Santos et al. (2013), was employed

in this study, with higher scores on this scale reflecting greater capacity in tolerating distress. This instrument is grouped into 4 dimensions: tolerance, appraisal, absorption and regulation. Although the instrument comprises multiple dimensions, only the total score was computed in this dissertation and used to test the relevant relationships (DTS_TOTAL).

Three-Factor Eating Questionnaire-R21 (TFEQ-R21)

The Three-Factor Eating Questionnaire-R21 (Karlsson et al., 2000) is a shortened version of the original 51-item tool, designed to evaluate maladaptive eating patterns. It includes three subscales: Cognitive Restraint (TFEQ21_CR), reflecting deliberate efforts to limit food intake; Uncontrolled Eating (TFEQ21_UE), indicating difficulties in regulating intake in response to hunger or environmental cues; and Emotional Eating (TFEQ21_EE), capturing eating behavior associated with negative emotional states. The questionnaire consists of 18 items, with 17 rated on a 4-point scale and one item ranging from 1 to 8. Higher scores denote greater impairment in eating regulation.

Data treatment

The statistical analysis of the data collected for this study was performed using the Statistical Package for the Social Sciences (SPSS), version 29.0.0.

The results section is structured into four distinct parts. The first part provides a detailed characterization of the sample, including sociodemographic data and relevant clinical history, using descriptive statistics (e.g., frequencies and percentages). The second part presents preliminary analyses focusing on the variables of interest - autistic traits (CATI), distress tolerance (DTS), and eating behaviors (TFEQ-R21) - through descriptive statistics (measures of central tendency and dispersion) for each subscale and total score, followed by Pearson

correlation analyses to explore their interrelationships. The third part focuses on testing Hypothesis 1, and the fourth part addresses the testing of Hypothesis 2.

Initially, it was crucial to assess whether the sample followed a normal distribution. This check was conducted using the Kolmogorov-Smirnov test with Lilliefors correction, given the sample size (n = 241). The test results indicated that only the CATI_TOTAL subscale followed a normal distribution (p = .200), as the p-value exceeded .05. However, by examining the histograms and the skewness and kurtosis values, it was concluded that all variables could be assumed to follow a normal distribution. Skewness values ranged from [-.370, .248], and kurtosis values ranged from [-.982, -.230], indicating a symmetrical distribution with appropriate shapes for subsequent statistical analysis. Based on this evaluation, it was considered appropriate to conduct Pearson's correlation analyses to examine the relationships between the main variables of interest. This step was essential to determine whether the constructs under study were significantly associated with one another, thus justifying the continuation of the subsequent hypothesis testing.

To test Hypothesis 1 ("Autistic traits significantly explain the variability in eating behavior in a community sample."), regression analysis will be performed to evaluate the extent to which autistic traits can predict eating behavior. The analysis will be performed in a multiple linear regression to explore the relationship between CATI traits and the subdomains of the TFEQ-R21.

Finally, in line with Hypothesis 2 ("Distress tolerance mediates the relationship between autistic traits and dysfunctional eating behaviors in a community sample."), simple linear regressions were used to assess the individual associations between variables, followed by multiple linear regressions including both autistic traits and distress tolerance as predictors of eating behavior. The total scores of the CATI and DTS, along with the three subscales of the

TFEQ-R21, were used in these models. This analysis was conducted to explore the mediating role of distress tolerance in the relationship between autistic traits and eating behavior

IV – Results

Sample Characterization

The sample (N = 241) was mostly female, young and predominantly Portuguese, with most participants being students or student-workers with higher education.

With respect to mental health history, 17.4% (n = 42) of participants reported a psychiatric diagnosis, with the most identified conditions being depression, anxiety, obsessive-compulsive disorder (OCD), and attention-deficit hyperactivity disorder (ADHD). Regarding eating disorders, 5.8% (n = 14) of participants indicated a clinical diagnosis. Among these, anorexia nervosa was the most prevalent, followed by binge eating disorder and bulimia nervosa. Notably, none of the participants reported a diagnosis of ASD or Sensory Integration Disorder (SID). The results are presented in Table 1.

Table 1

Sociodemographic characteristics of the sample and descriptive statistics of the instruments

Sociodemographic and clinical variables		
Variable	**n**	**%**
Age		
18-30	184	76.4%
31-50	45	18.6%
>50	12	5.0%
Gender		
Female	166	68.9%
Male	75	31.1%
Level of education		
Until the 12th grade	89	36.9%
Higher Education	152	63.1%

Nationality		
Portuguese	232	96.3%
Others	9	3.7%
Professional situation		
Student/Student-worker	145	60.2%
Unemployed	9	3.7%
Employee	86	35.7%
Retired	1	0.4%
Diagnosis of Psychiatric Illness		
Yes	42	17.4%
No	199	82.6%
Diagnosis of Eating Disorder		
Yes	14	5.8%
No	227	94.2%
Diagnosis of ASD/SID		
Yes	0	0%
No	241	100%

Descriptive statistics of instruments

	Min	Max	M	SD
CATI_SOC	7,00	32,00	18,80	5,19
CATI_COM	7,00	27,00	15,10	4,25
CATI_CAM	7,00	35,00	18,86	5,99
CATI_RIG	7,00	35,00	23,22	5,95
CATI_REP	7,00	35,00	19,86	6,26
CATI_SEN	7,00	35,00	20,21	5,93
CATI_TOTAL	53,00	190,00	116,06	25,26
DTS_TOTAL	16,00	75,00	46,78	12,19
TFEQ21_UE	9,00	36,00	20,27	5,63
TFEQ21_CR	6,00	24,00	13,64	3,87
TFEQ21_EE	6,00	24,00	13,64	5,05

Legend: ASD (Autism Spectrum Disorder), SID (Sensory Integration Disorder), CATI_SOC (Social Interaction), CATI_COM (Communication), CATI_CAM (Social Camouflage), CATI_RIG (Cognitive rigidity), CATI_REP (Repetitive Behaviors), CATI_SEN (Sensory Sensitivity), CATI_TOTAL (Total score of Comprehensive Autistic Trait Inventory), DTS_TOTAL (Total Score of Distress Tolerance Scale), TFEQ21_UE (Uncontrolled Eating), TFEQ21_CR (Cognitive Restraint), TFEQ21_EE (Emotional Eating)

Preliminary Analysis

Descriptive statistics

A preliminary analysis was conducted to examine the distribution of the main variables assessed in this study. Descriptive statistics, including means, standard deviations, minimums, and maximums were calculated for each subscale of TFEQ-R21, CATI, and for the total score of DTS. The results are presented in Table 1.

TFEQ_R21 and DTS do not have established cut-off points in the literature however, the analysis of mean values and respective standard deviations provides an overall view of the response patterns in the community sample. These statistical indicators offer a useful reference for interpreting the general tendency of eating behaviours and distress tolerance reported by participants, even in the absence of defined normative criteria. In the supplementary materials, Table A presents the percentiles, allowing for an alternative analysis of the data.

Using the established cut-off score of 134 on the CATI_TOTAL (see Methodology), 62 participants (25.7%) in the current sample scored above this threshold, indicating a notable proportion of individuals with elevated autistic traits in this community-based sample.

Correlations analysis

Preliminary Pearson correlation analyses were conducted to explore the relationships between autistic traits (CATI), eating behaviors (TFEQ-R21), and distress tolerance (DTS_TOTAL). Significant correlations were observed across these constructs, with coefficients ranging from weak to moderate, except for three correlations, which were not statistically significant. These preliminary results provided an empirical basis for the subsequent regression and mediation models that test the hypotheses of the study. Detailed correlation coefficients and statistical values are available in the supplementary material (Table B).

Hypothesis 1: "Autistic traits significantly explain the variability in eating behavior in a community sample."

Multiple linear regression between CATI subscales and TFEQ21_UE

The first multiple regression analysis was conducted with the aim of investigating the extent to which autistic traits explain eating behaviors, as assessed by the uncontrolled eating (TFEQ21_UE). The model included CATI subscales: Social Interactions (CATI_SOC), Communication (CATI_COM), Social Camouflage (CATI_CAM), Repetitive Behaviours (CATI_REP), Cognitive Rigidity (CATI_RIG), and Sensory Sensitivity (CATI_SEN).

The model was significant [$F(6,234) = 9.65$, $p < .001$], indicating that the set of predictor variables contributes significantly to explaining the dependent variable. The model indicates that approximately 20% of the variance in emotional eating is explained by the predictor variables ($R^2 = .20$).

Regarding the individual coefficients, the traits CATI_CAM ($B = .17$, $\beta = .20$, $p = .032$), and CATI_SEN ($B = .17$, $\beta = .18$, $p = .042$) showed positive and statistically significant effects on uncontrolled eating. The remaining traits - CATI_SOC ($p = .957$), CATI_COM ($p = .204$), CATI_RIG ($p = .326$), and CATI_REP ($p = .148$) - did not show significant effects. These results indicate that attempts to mask traits and heightened sensory sensitivity may better explain uncontrolled eating behaviors when compared to the other CATI subscales.

Multiple linear regression between CATI subscales and TFEQ21_CR

A multiple linear regression analysis was conducted to examine whether different CATI traits predict eating behaviors, as assessed by the cognitive restraint (TFEQ21_CR). The model included all CATI subscales, as predictors.

The model was statistically significant [$F(6,234) = 5.55$, $p < .001$], explaining approximately 13% of the variance of cognitive restraint ($R^2 = .13$).

The analysis of coefficients showed that CATI_CAM ($B = 0.23$, $\beta = 0.35$, $p < .001$), and CATI_RIG ($B = .11$, $\beta = .18$, $p = .036$) had positive and statistically significant effects on cognitive restraint, indicating that attempts to camouflage traits and cognitive rigidity explain more of the variance in cognitive restraint related to eating than the other CATI subscales. The other traits - CATI_SOC (p = .179), CATI_COM ($p = .852$), CATI_REP ($p = .219$) and CATI_SEN ($p = .901$) - were not significant predictors of this dimension.

Linear regression between CATI subscales and TFEQ21_EE

A multiple regression analysis was conducted to investigate the extent to which CATI traits explain eating behaviors, assessed through the emotional eating (TFEQ21_EE).

The ANOVA was significant [$F(6, 234) = 8.76$, $p < .001$], indicating that the set of predictor variables contributes significantly to explaining the dependent variable. The model revealed that approximately 18% of the variance in emotional eating is explained by the predictor variables ($R^2 = .18$).

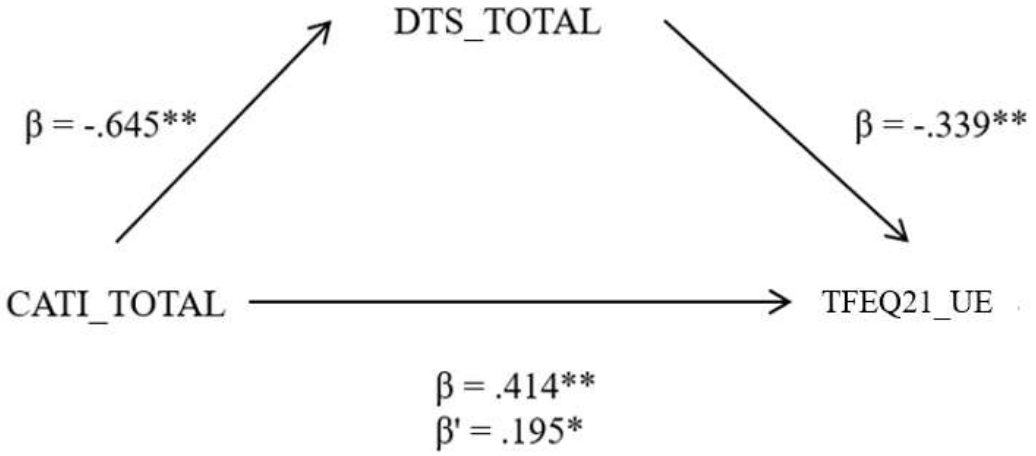
The analysis of the coefficients indicated that the traits CATI_CAM ($B = .26$, $\beta = .31$, $p < .001$), and CATI_SEN ($B = .19$, $\beta = .22$, $p = .011$) had positive and significant effects on emotional eating. This implies that attempts to camouflage traits and sensory sensitivity are key factors in explaining emotional eating, indicating that individuals who face these challenges may be more prone to engage in emotional eating as a coping mechanism. In contrast, the traits CATI_SOC ($p = .641$), CATI_COM ($p = .054$), CATI_RIG ($p = .470$), and CATI_REP ($p = .811$) did not show significant effects.

Hypothesis 2: "Distress tolerance mediates the relationship between autistic traits and dysfunctional eating behaviors in a community sample."

Relationship between CATI_TOTAL and TFEQ21_UE mediated by DTS_TOTAL

Figure 2

Mediation of distress tolerance between autistic traits and uncontrolled eating



Legend: DTS_TOTAL (Total Score of Distress Tolerance Scale); CATI_TOTAL (Total Score of Comprehensive Autistic Trait Inventory); TFEQ21_UE (Uncontrolled Eating); ** p ≤ 0.001; * p<.05

As seen in figure 2, the results revealed that CATI_TOTAL significantly and negatively predicted DTS_TOTAL (β = -.65, p < .001, t = -13.06), this finding indicates that higher levels of autistic traits are associated with lower distress tolerance. This relationship explains approximately 42% of the variance in the mediating variable [R = .65, R^2 = .42, F(1, 239) = 170.51, p < .001].

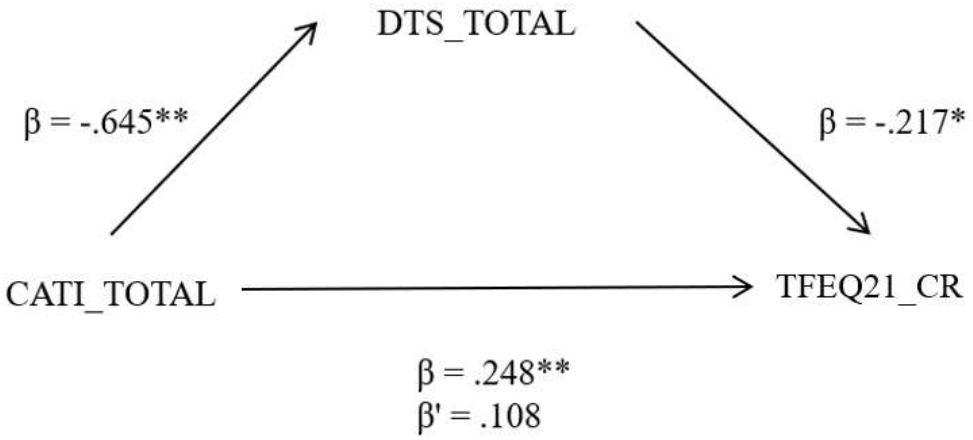
CATI_TOTAL predicted significantly and positively TFEQ21_UE (β = .41, t = 7.02, p < .001), this suggests that higher levels of autistic traits are associated with higher levels of uncontrolled eating. This relationship accounts for approximately 17% of the variance in the dependent variable [R = .41, R^2 = .17, F(1, 239) = 49.32, p < .001].

When DTS_TOTAL was added to the model alongside CATI_TOTAL, both DTS_TOTAL and CATI_TOTAL remained significant predictors of TFEQ21_UE. DTS_TOTAL significantly and negatively predicted uncontrolled eating (β = –.34, t = - 4.58, p < .001), while CATI_TOTAL remained a positive and significant predictor (β' = .20, t = 2.63, p = .009) - Although still statistically significant, the beta coefficient decreased. This model explained approximately 24% of the variance in uncontrolled eating [R = .49, R^2 = .24, F(2, 238) = 37.19, p < .001]. The results indicate that both higher levels of autistic traits and lower levels of distress tolerance are partially associated with uncontrolled eating patterns, supporting the existence of this mediation.

Relationship between CATI_TOTAL and TFEQ21_CR mediated by DTS_TOTAL

Figure 3

Mediation of distress tolerance between autistic traits and cognitive restraint



Legend: DTS_TOTAL (Total Score of Distress Tolerance Scale); CATI_TOTAL (Total Score of Comprehensive Autistic Trait Inventory); TFEQ21_CR (Cognitive Restraint); ** p ≤ 0.001; * p<.05

Since the association between CATI_TOTAL and DTS_TOTAL was already described in the previous analysis, it will not be reiterated here.

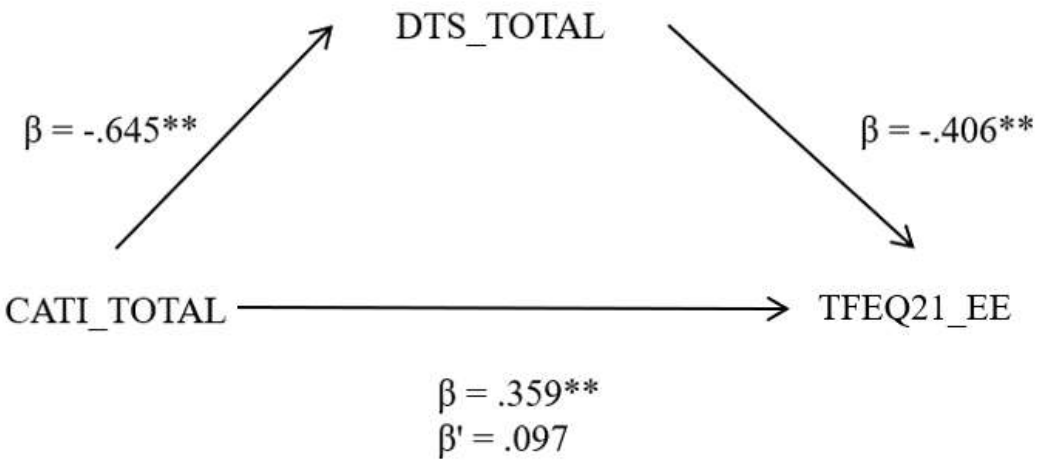
As seen in figure 3, CATI_TOTAL is positive and a significant predictor of TFEQ21_CR (β = .25, , t = 3.95, p < .001), suggesting that higher levels of autistic traits are associated with greater cognitive restraint in eating, with approximately 6% of the variance in the outcome explained by autistic traits [R = .25, R^2 = .06, F(1, 239) = 15.63, p < .001].

When DTS_TOTAL was included in the model alongside CATI_TOTAL to predict TFEQ21_CR, only DTS_TOTAL remained a statistically significant and negative predictor (β = -.22, t = -2.67, p = .008), while CATI_TOTAL lost its significance (β' = .11, t = 1.33, p = .184). This pattern of results suggests that individuals with higher autistic traits tend to have lower distress tolerance, which in turn is associated with greater cognitive restraint in eating behaviors. In summary, this pattern of results supports the presence of a full mediation, indicating that the association between autistic traits and cognitive restraint is fully explained through distress tolerance [R = .298, R^2 = .089, F(2, 238) = 11.59, p < .001].

Relationship between CATI_TOTAL and TFEQ21_EE mediated by DTS_TOTAL

Figure 4

Mediation of distress tolerance between autistic traits and emotional eating



Legend: DTS_TOTAL (Total Score of Distress Tolerance Scale); CATI_TOTAL (Total Score of Comprehensive Autistic Trait Inventory); TFEQ21_EE (Emotional Eating); ** p ≤ 0.001; * p<.05

Since the association between CATI_TOTAL and DTS_TOTAL was already described in the previous analysis, it will not be reiterated here.

As seen in figure 4, CATI_TOTAL significantly and positively predicted TFEQ21_EE (β = .36, t = 5.94, p < .001), suggesting that individuals with more pronounced autistic traits tend to exhibit higher levels of emotional eating. The model explained approximately 13% of the variance in emotional eating [R = .36, R^2 = .13, F(1, 239) = 35.29, p < .001].

When DTS_TOTAL was added to the model alongside CATI_TOTAL, only DTS_TOTAL remained a negative and significant predictor of TFEQ21_EE (β = -.41, t = -5.43, p < .001), whereas CATI_TOTAL lost its significance (β' = .10, t = 1.30, p = .195). This suggests that individuals with higher levels of autistic traits tend to have lower distress tolerance, and this lower tolerance is positively and significantly associated with higher emotional eating behaviors.

In summary, this sequence of analyses supports the hypothesis of a significant full mediation, demonstrating that the positive relationship between autistic traits and emotional eating is mediated through distress tolerance. The final model, including both predictors, accounted for approximately 23% of the variance in emotional eating [R = .47, R^2 = .23, F(2, 238) = 34.48, p < .001].

V – Discussion

Hypothesis 1: "Autistic traits significantly explain the variability in eating behavior in a community sample"

The results partially support the hypothesis that traits of ASD significantly explain the variability in eating behaviors. Through multiple regression analyses, it was observed that different dimensions of autistic traits show distinct associations with the three types of eating behaviors assessed by the TFEQ-R21.

In relation to *Uncontrolled Eating*, both camouflage traits and sensory sensitivity emerged as significant predictors. A similar pattern was observed for *Emotional Eating*, where camouflage and sensory sensitivity also played a predictive role. These results suggest that individuals who engage in camouflaging behaviors and those with heightened sensory reactivity are more likely to eat impulsively and to use food as a means of emotional regulation. On the other hand, *Cognitive Restraint* was best explained by traits of *cognitive rigidity* and *camouflage*, indicating that restrictive control over food may reflect a need for predictability and control, alongside social adaptation efforts.

The relationship between *camouflage* traits and dysfunctional eating behaviors can be understood through the concept of shame, which is often identified as a risk factor for eating difficulties (Mendes et al., 2021). Shame is characterized as an undesired social emotion that emerges when the self is viewed - either by oneself or by others - as flawed, inadequate, or unattractive, provoking fears of judgment or exclusion (Gilbert, 2000). To cope with these feelings, many people adopt defensive mechanisms such as hiding, masking, or camouflaging aspects of themselves that are perceived as shameful, aiming to reduce stigma and facilitate social acceptance (Duarte et al., 2017). Although camouflaging may initially serve an adaptive function, it often incurs a significant psychological toll, being associated with physical and mental fatigue and poorer mental health outcomes (Bargiela et al., 2016; Beck et al., 2020). This ongoing effort to conform socially, while attempting to avoid rejection, can also contribute to the maintenance or worsening of dysfunctional eating behaviors, thereby increasing the risks linked to these disorders (Bargiela et al., 2016).

Sensory sensitivity - another characteristic commonly observed in both ASD and eating disorders - has been associated with greater symptom severity, emotional dysregulation, and body image disturbances (Kinnaird et al., 2019a). About 90% of individuals on the autism spectrum exhibit unusual sensory responses, which can significantly impact their food

preferences and eating habits, often due to sensitivities to texture, smell, or auditory stimuli related to food (Nisticò et al., 2024). Similar sensory processing differences have been identified in people with anorexia nervosa, even during remission periods, implying that these sensory traits may be enduring characteristics contributing to both the onset and maintenance of eating disturbances (Nisticò et al., 2024). The experience of intense sensory input can cause distress, which may, in turn, provoke compulsive eating behaviors as a means of coping with unpleasant emotional sensations (Kinnaird et al., 2019b; Brede et al., 2020).

Lastly, *cognitive rigidity*, a core trait in ASD, is a key predictor of restrictive eating behavior. Individuals with high levels of rigidity often prefer routines and sameness, which may manifest strict dietary patterns or food selectivity (Adams et al., 2024). People who exhibit strong cognitive rigidity tend to favor consistency and routine, which can be reflected in rigid eating habits or selective food preferences (Adams et al., 2024). This need for stability often results in food neophobia and heightened anxiety when established eating routines are interrupted (Wallace et al., 2018). Research indicates that individuals with anorexia nervosa frequently demonstrate a pronounced adherence to strict dietary rules, calorie monitoring, and rigid beliefs - such as associating fat intake with failure - which may stem from their cognitive inflexibility (Brede et al., 2020; Tenconi et al., 2023). Additionally, such rigid thinking patterns can not only directly foster restrictive eating behaviors but also exacerbate emotional distress, thereby promoting the use of compulsive eating as an ineffective coping mechanism, commonly observed in bulimia and binge eating disorder (Adams et al., 2024).

In sum, these findings highlight that the heterogeneity of autistic traits is reflected in their distinct contributions to various types of disordered eating. The traits of camouflaging, sensory sensitivity, and cognitive rigidity appear particularly relevant in understanding the complex interplay between neurodevelopmental features and dysfunctional eating patterns in this community sample.

Hypothesis 2: " Distress tolerance mediates the relationship between autistic traits and dysfunctional eating behaviors in a community sample"

The results of the mediation analyses revealed a consistent pattern in which distress tolerance emerged as a relevant mediating variable in the relationship between autistic traits and various domains of dysfunctional eating behaviours, so we can say that the hypothesis was confirmed.

For the dimension of *uncontrolled eating*, the results indicated a partial mediation effect. Autistic traits were significant positive predictors of uncontrolled eating and remained significant (albeit with a lower β coefficient) after distress tolerance was added to the model. The inclusion of distress tolerance increased the explained variance in uncontrolled eating from R^2 = .17 to R^2 = .24. At the same time, distress tolerance was found to be a significant negative predictor of uncontrolled eating, partially accounting for the association between autistic traits and this eating behavior. This pattern suggests that, although autistic traits exert a direct influence on uncontrolled eating, lower distress tolerance contributes to intensifying this effect, thereby playing a complementary mediating role.

The analysis involving *cognitive restraint* and *emotional eating* revealed a full mediation effect. Autistic traits were initially significant positive predictors of both behaviors, and their effect sizes decreased after distress tolerance was introduced into the model, becoming non-significant. The inclusion of distress tolerance increased the explained variance from R^2 = .06 to R^2 = .089 for cognitive restraint, and from R^2 = .13 to R^2 = .23 for emotional eating. At the same time, distress tolerance remained a significant negative predictor for both behaviors, suggesting that difficulties in tolerating distress fully accounted for the relationship between autistic traits and these eating behavior patterns. These results underscore the critical role of the capacity to cope with negative emotions in the manifestation of disordered eating among

individuals with heightened autistic traits. These findings emphasize the central role that emotional processes play in both autism spectrum and eating disorders traits.

A key concept relevant to interpreting these results could be alexithymia, which refers to difficulties in recognizing, comprehending, and communicating emotions. Whether rooted in neurodevelopmental origins or influenced by challenging emotional experiences, alexithymia has been consistently associated with lower distress tolerance (Preece et al., 2020). Individuals exhibiting high alexithymia typically show diminished emotional awareness and differentiation, limited use of adaptive coping mechanisms, and greater impulsivity when faced with emotional stressors (Vuillier et al., 2020) - all aspects pertinent to the findings presented here. Consequently, it is reasonable to suggest that the mediating effect of distress tolerance observed in this research may partly reflect underlying emotional difficulties linked to alexithymia.

Like how alexithymia compromises the ability of individuals with autistic traits to endure negative emotional states, difficulties in handling such emotions may also underpin the emergence of eating disorders. From a theoretical perspective, behaviors like overeating and binge eating are often interpreted as ineffective coping mechanisms used to manage emotional distress (Reichenberger et al., 2021). In the case of anorexia nervosa, some researchers have proposed that restrictive eating may function as a strategy to suppress or avoid experiencing unpleasant emotions (Yiu et al., 2018). Consistent with this notion, evidence shows that individuals with anorexia report feeling more symptomatic after exposure to negative emotional stimuli and frequently describe restrictive eating to regulate emotional distress (Reichenberger et al., 2021).

In summary, the findings of this dissertation, in line with existing literature, highlight a connection between autism spectrum traits, reduced ability to tolerate negative emotions, and the presence of disordered eating behaviors. This association underscores the importance of

considering underlying emotional mechanisms - such as distress tolerance - in understanding the pathways that may contribute to the development and maintenance of eating disorders, particularly among individuals with more pronounced autistic features.

Clinical Implications and Future Directions

The results support a transdiagnostic approach that integrates neurodevelopmental traits, emotional processes, and behavioral patterns, encouraging the development of personalized interventions focused on emotional literacy, acceptance of internal emotional states, and adaptive emotion regulation strategies. Such interventions may reduce dysfunctional eating behaviors by targeting the emotional challenges faced by individuals with autistic traits.

Looking forward, it is essential to extend this line of research into clinical populations where formal diagnoses of autism spectrum conditions and eating disorders are present. This would deepen the understanding of symptom interactions and inform the creation of more precise and effective clinical interventions. Moreover, exploring additional factors such as cognitive flexibility, sensory processing profiles, and interpersonal functioning could offer a more comprehensive understanding of the complex mechanisms involved. Integrating these insights could ultimately improve treatment outcomes and enhance clinical practices addressing these overlapping conditions.

Limitations

This study is limited by its exclusive use of self-report measures, which may be influenced by biases such as social desirability and subjective inaccuracies. The length of the questionnaire could have also impacted participant engagement and response quality. Additionally, the instruments employed are screening tools rather than diagnostic instruments,

so the results should be interpreted with caution and not extrapolated to clinical diagnoses without further clinical validation.

VI – Conclusion

The findings of this study highlight the need for greater attention to autistic traits in the assessment and intervention of eating disorders. Rather than representing a simple diagnostic overlap, these traits may serve as a key to understanding complex and often overlooked clinical trajectories. When we think about eating disorders, autism spectrum traits are not typically the first association - but these findings suggest that this connection deserves greater recognition. By integrating these dimensions, it becomes possible to capture the specificity of certain behavioral and emotional patterns, allowing for more tailored interventions that are sensitive to individual needs and more likely to be effective. This broader perspective contributes to a deeper understanding of both the autism spectrum and eating disorders, fostering more informed and effective clinical responses.

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Supplementary Material

Table A

Percentile Values for the Instruments

		TFEQ21_UE	TFEQ21_CR	TFEQ21_EE	CATI_COM	CATI_CAM	CATI_RIG	CATI_REP	CATI_SEN	CATI_TOTAL	DTS_TOTAL
Percentiles	25	16,0000	11,0000	9,0000	12,5000	14,5000	19,0000	16,0000	16,0000	98,5000	36,0000
	50	20,0000	14,0000	14,0000	15,0000	19,0000	23,0000	20,0000	20,0000	118,0000	46,0000
	75	24,0000	16,0000	18,0000	18,0000	24,0000	28,0000	24,0000	25,0000	134,0000	56,5000

Legend: CATI_SOC (Social Interactions), CATI_COM (Communication), CATI_CAM (Social Camouflage), CATI_REP (Repetitive Behaviours), CATI_RIG (Cognitive Rigidity), CATI_SEN (Sensory Sensitivity), CATI_TOTAL (Total Score of CATI), TFEQ21_UE (Uncontrolled Eating), TFEQ21_CR (Cognitive Restraint), TFEQ21_EE (Emotional Eating), DTS_TOTAL (Total Score of DTS)

Table B

Correlations between CATI, DTS and TFEQ-R21

	1	2	3	4	5	6	7	8	9	10	11
1. CATI_SOC	--										
2. CATI_COM	,360**	--									
3. CATI_CAM	,574**	,432**	--								
4. CATI_RIG	,185**	,227**	,516**	--							
5. CATI_REP	,360**	,487**	,622**	,555**	--						
6. CATI_SEN	,371**	,469**	,600**	,587**	,625**	--					
7. CATI_TOTAL	,622**	,629**	,844**	,709**	,829**	,825**	--				
8. TFEQ21_UE	,202**	,155*	,381**	,333**	,357**	,377**	,414**	--			
9. TFEQ21_CR	,083	,082	,302**	,266**	,154*	,189**	,248**	,493**	--		
10. TFEQ21_EE	,243**	,110	,389**	,221**	,268**	,338**	,359**	,803**	,492**	--	
11. DTS_TOTAL	-,352**	-,409**	-,565**	-,463**	-,481**	-,605**	-,645**	-,465**	-,286**	-,468**	--

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Legend: CATI_SOC (Social Interactions), CATI_COM (Communication), CATI_CAM (Social Camouflage), CATI_REP (Repetitive Behaviours), CATI_RIG (Cognitive Rigidity), CATI_SEN (Sensory Sensitivity), CATI_TOTAL (Total Score of CATI), TFEQ21_UE (Uncontrolled Eating), TFEQ21_CR (Cognitive Restraint), TFEQ21_EE (Emotional Eating), DTS_TOTAL (Total Score of DTS)