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Scientific Director Alessandro Zennaro

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⬢ Research

▲ Experiences & Tools

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Sensory processing correlates with adaptive behaviors but not with symptom severity in Italian children with autism spectrum disorders

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ABSTRACT. Oltre a difficoltà di comunicazione e interazione sociale e comportamenti e interessi ripetitivi e ristretti, i disturbi dello spettro autistico (ASD) presentano sovente atipie sensoriali, il cui impatto sul fenotipo è ancora oggetto di dibattito. In questo studio, il profilo sensoriale di 76 bambini autistici italiani in età prescolare e scolare, valutato con la versione italiana del questionario *Sensory Profile – 2*, è stato correlato con la gravità dei sintomi misurati attraverso i punteggi di comparazione derivati dall'*Autism Diagnostic Observation Schedule – 2 (ADOS-2)* e con il funzionamento adattivo ricavato dalla somministrazione delle *Vineland Adaptive Behavior Scales – Second Edition (VABS-II)*. I partecipanti allo studio hanno mostrato diffuse atipie sensoriali, che non sono risultate però associate alla severità dei sintomi autistici. Invece, sono emerse correlazioni negative, da moderate a forti, tra i domini Comunicazione e Socializzazione delle VABS-II e tutti i quadranti del *Sensory Profile – 2*, ad eccezione del quadrante Evitamento. Tali risultati suggeriscono l'importanza di una valutazione precoce del profilo sensoriale per aiutare genitori e operatori sanitari a tenere in considerazione questo aspetto sia nella vita quotidiana che nel trattamento riabilitativo.

SUMMARY. Besides social communication difficulties and the presence of repetitive behaviors and restricted interests, autism spectrum disorders (ASD) often embrace sensory atypicalities. The present study aims to assess the sensory processing profile of a sample of Italian ASD children and to test its association with both their symptom severity and adaptive functioning. Parents of 76 ASD children completed the Child Sensory Profile 2 – Italian version (CSP-2) and the Vineland Adaptive Behavior Scales - Second Edition (VABS-II). Spearman correlation was calculated between the CSP-2 quadrant and section scores and the ADOS-2 Calibrated severity scores as well as between the CSP-2 quadrant and section scores and the VABS-II (Communication, Daily living skills, and Socialization standard scores). Our sample showed widespread sensory processing atypicalities. No statistically significant association emerged between sensory profile and ASD symptom severity. Instead, we highlighted a moderate to high negative association between VABS-II Communication and Socialization and all quadrants, except Avoiding. Our findings suggest the importance of an early evaluation of the sensory profile to help parents and healthcare professionals take these aspects into consideration both in daily life and in rehabilitation treatment.

Keywords: *Autism spectrum disorders, Sensory processing, Adaptive behaviors*

INTRODUCTION

Autism spectrum disorder (ASD) is a multifactorial and heterogeneous group of neurodevelopmental disorders characterized by pervasive deficits in social interactions and communication, and a repertoire of restricted and repetitive behaviors and interests (American Psychiatric Association, 2022). Data from the Centers for disease control and prevention (2023) reported that 1 in 36 children aged 8 years was diagnosed with ASD in the United States, with a male/female ratio of about 4:1 (Maenner et al., 2023). Recently, an Italian nationwide study found an overall prevalence of 13.4 ASD children per 1,000 aged 7-9 years, with a male-to-female ratio of 4.4:1 (Scattoni et al., 2023).

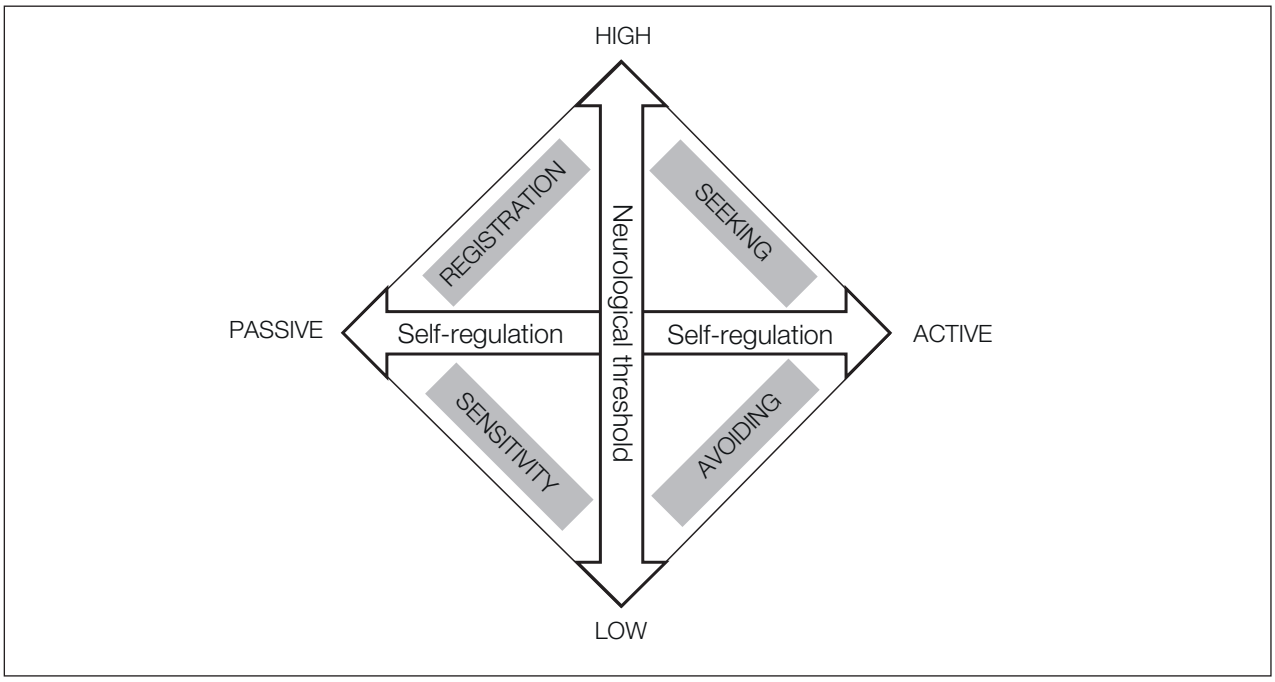
Atypical sensory processing is considered one of the earliest signs of ASD, with a prevalence between 45% and 95% of individuals, depending on the characteristics of the samples and on the evaluation procedures (Ben-Sasson et al., 2009). Starting with the *Diagnostic and statistical manual of mental disorders – Fifth edition* (*DSM-5*; American Psychiatric Association, 2013), sensory abnormalities were included in the second domain of autistic symptoms as "hyper- or hypo-reactivity to sensory input". Sensory processing refers to a multidimensional model of response to environmental stimuli, which allows the selection, modulation, integration, and organization of various types of sensory information to promote the adaptive functioning of the organism. According to Dunn's sensory processing framework (Dunn, 1999), there is an interaction between the neurological thresholds, i.e., the amount of stimuli required to elicit a neuronal activation, and the individual self-regulation, i.e., the strategies implemented in response to sensory inputs. Both these aspects vary along a continuum (see Figure 1). Specifically, neurological thresholds range from low (the nervous system is easily activated) to high (a high amount or intensity of stimuli is required to induce a neural response). As for self-regulation, the continuum spans from active responses (the individual's attempt to control their exposure to sensory stimulation) to a passive attitude (the individual does not implement any strategy to prevent hyperstimulation or to meet their high neurological thresholds). The interaction between the neurological thresholds and the self-regulation determines four patterns of sensory processing: (i) Seeking (i.e., the degree an individual obtains sensory stimuli), characterized at the extremes of the two continua by high neurological thresholds and active self-regulation; (ii) Avoiding (i.e., the degree an individual is bothered by sensory stimuli), with low neurological thresholds and active self-regulation at the extremes; (iii) Sensitivity (i.e., the degree an individual detects sensory stimuli), with low neurological thresholds and passive self-regulation at the extremes; (iv) Registration (i.e., the degree an individual misses sensory stimuli), with high neurological thresholds and passive self-regulation at the extremes. Each individual's sensory profile is characterized by a unique combination of these four patterns. Being at the extremes of one or more of these sensory patterns can impair effective participation and well-being in everyday contexts.

In individuals with ASD, unusual sensory processing is already evident in early toddlerhood and becomes more pronounced over the second year of life (Wolff et al., 2019). The sensory atypicalities occur then across all ages and can involve each sensory modality (i.e., visual, auditory, tactile, olfactory, taste, vestibular, and proprioceptive), impacting the regulation and the appropriate response to environmental stimuli (Ben-Sasson et al., 2009; Boucher, 2017). Nevertheless, a univocal ASD sensory profile has still to be defined (Leekam, Nieto, Libby, Wing, & Gould, 2007). In fact, on one hand, hypo-responsiveness was described as the most common pattern of atypical sensory processing related to behavioral challenges (Baranek, David, Poe, Stone, & Watson, 2006), while on the other hand, hyper-sensitivity was indicated as the most commonly impaired response (Ben-Sasson, Gal, Fluss, Katz-Zetler, & Cermak, 2019). Interestingly, both hypo- and hyper-responsiveness often co-occur in the same individual with ASD (Hazen, Stornelli, O'Rourke, Koesterer, & McDougle, 2014).

Moreover, only a few studies have explored the relationship between the sensory profile and ASD symptom severity. In this context, Kadlaskar et al. (2023) found that profound sensory atypicalities were associated with more significant social difficulties in autistic children, while Zachor and Ben-Itzchak (2013) even suggested that sensory abnormalities may reflect a distinct clinical phenotype with more severe autistic symptoms and lower cognitive ability. Thus, more research is needed to delve deeper into this thematic area.

Sensory abnormalities have also been investigated in relation to adaptive behaviors. In particular, Jasmin et al. (2009) demonstrated that children with ASD who adopt avoidance responses to some sensory stimuli showed greater deficits in self-care skills, such as eating and getting dressed. Moreover, ASD children with sensory-seeking or sensory-sensitivity profiles seemed to have more deficits

Figure 1 – Dunn's sensory processing framework



in communication (Lane, Young, Baker, & Angley, 2010) and in socialization skills (Tomchek, Little, & Dunn, 2015). Consistent with these findings, Dellapiazza et al. (2019) revealed that children exhibiting sensory seeking had lower adaptive scores not only in communication and socialization abilities but also in daily living and motor skills, as measured by the *Vineland Adaptive Behavior Scales – Second Edition* (*VABS-II*; Sparrow, Cicchetti, & Balla, 2005). More broadly, studies suggested that an atypical sensory profile had a negative impact on autonomy (Liss, Saulnier, Fein, & Kinsbourne, 2006), social skills (Thye, Bednarz, Herringshaw, Sartin, & Kana, 2017), and academic achievement (Ashburner, Ziviani, & Rodger, 2008). However, other studies were unable to replicate those findings (McCormick, Hepburn, Young, & Rogers, 2016). Given these conflicting results, more research is needed to better understand the relationship between atypical sensory processing and adaptive behaviors. Indeed, the characterization of the child's sensory profile could lead to more effective treatment strategies, which in turn could contribute to the subsequent development of several adaptive abilities, improving the quality of the child's present and future life.

Following this line, the purpose of the current study was twofold. The first aim was to assess the sensory processing profile in Italian ASD children using the *Child Sensory Profile 2 – Italian version,* a standardized and validated instrument. We expected to confirm widespread sensory atypicalities also in our sample.

Considering the discrepancy of results in the literature, our second aim was to assess the correlation between the sensory profile and both ASD symptom severity and adaptive behavior. We hypothesized that atypical multisensory processing in individuals with ASD could have cascading effects on their adaptive behavior and ASD symptom severity.

METHODS

This observational, cross-sectional, and multicentric study was conducted in three different Italian clinical centers (IRCCS Stella Maris Foundation, a tertiary care university Hospital, the Regional center for autism spectrum disorders, AOUI Verona, and the Observation, diagnosis and education laboratory, University of Trento) that adhered to all recommended data security and informed consent procedures, after ethics committee approval (NCT06335030).

Participants

The participant group comprised 76 children diagnosed with ASD (*M* age: 6.02 years, *SD*: 2.34; 62 males and 14 females). Inclusion criteria were: (1) children from 3 to 11 years and (2) previous clinical diagnosis of autism, established by a multidisciplinary team using a standardized process, including the ADOS-2 (Lord et al., 2012; Italian adaptation, 2013), administered by licensed and trained psychologists. Exclusion criteria were: (1) brain structural abnormalities; (2) genetic syndromes or focal neurological signs; (3) pre- or perinatal fetal distress or severe prematurity; (4) epilepsy, and (5) severe visual, auditory, and/or motor impairment.

Parents were requested to fill out the Italian version of the CSP-2 (Dunn, 2014; Italian adaptation, 2020). In addition, they were interviewed using the VABS-II (Sparrow et al., 2005; Italian adaptation, 2016), which is usually part of the clinical evaluation.

Measures

Sensory processing was assessed using the Italian version of the CSP-2. This questionnaire for caregivers of children aged 3-14:11 years contains 86 items. Parents are asked to rate their child's responses to everyday events on a five-point Likert scale. According to Dunn's sensory processing framework, scores are calculated for each sensory processing quadrant: Seeking, Avoiding, Sensitivity, and Registration. Moreover, items are organized into six sensory sections (Auditory, Visual, Touch, Movement, Body position, and Oral) and three behavioral sections (Conduct, Social-emotional, and Attentional), providing specific scores for the different sensory channels and for the behavioral aspects possibly associated with sensory processing. Scores between one and two standard deviations (*SD*) from the mean are respectively expressed as "More than others" or "Less than others". In addition, scores two *SD* or more from the mean are labeled as "Much more than others" or "Much less than others". Lower or higher SP-2 scores imply more atypical sensory patterns. Thus, these patterns result in a normal, moderately atypical, or clearly atypical profile of processing of individual sensory channels, modulation, behavior, and emotional responses (Dunn, 2014).

ASD symptom severity was established using the ADOS-2, which is a semi-structured observation considered the gold standard for assessing ASD features. Five different ADOS-2 modules are available, to be chosen based on an individual's expressive language and developmental level. The whole observation is divided into 25 to 30 items across symptom domains: social interaction, communication, repetitive and stereotyped behaviors, and play. Three scores are provided: Social affect (SA), Restricted and repetitive behaviors (RRB), and Total score. With the purpose of comparing scores across the different modules and over time, ADOS-2 calibrated scores (Calibrated severity scores - CSSs, ranging from 1 to 10) have been developed for SA, RRB, and Total score (Hus, Gotham, & Lord, 2014). Different levels of autistic symptoms correspond to different CSSs: indeed, scores 8 to 10 indicate a high level of autistic symptoms, 5 to 7 a moderate level, 3 to 4 a low level, and 1 to 2 refer to a minimum level or absence of symptoms.

Adaptive functioning was assessed using the VABS-II. This semi-structured and standardized caregiver interview of 297 items measures adaptive behaviors from childhood to adulthood (0 to 90 years old) within four domains, including multiple subdomains: Communication (Receptive, Expressive, and Written subdomains), Daily living skills (Personal, Domestic, and Community subdomains), Socialization (Interpersonal relationships, Play and leisure time and Coping skills subdomains), and Motor skills (Gross and Fine subdomains). VABS-II provides a Composite scale representative of the overall adaptive behavior level. Standard scores (M = 100; SD = 15) are available for domains and Composite scale: higher scores indicate better levels of adaptive behavior against age-related expectations. The score can be placed in a range indicating different levels of child functioning and, therefore, different levels of support needed.

Since Motor skills cannot be assessed with the VABS-II in children older than 7 years, in our study we focused on Communication, Daily living skills, and Socialization.

Data analysis

Preliminarily, the distribution of the CSP-2 and VABS-II scores and ADOS CSSs was assessed with the Shapiro-Wilk normality test.

To explore the association between sensory aspects and ASD symptom severity, Spearman correlation was calculated between the CSP-2 quadrant and section scores and the

ADOS-2 CSSs. Moreover, we grouped our participants according to the ADOS-2 symptom levels and we assessed possible differences in the CSP-2 scores using the Kruskal-Wallis test.

Spearman correlation was also computed between the CSP-2 quadrant and section scores and the VABS-II Communication, Daily living skills, and Socialization standard scores to test the relationship between sensory atypicalities and adaptive functioning.

All analyses were conducted with the R Statistical Software (v4.3.0; R Core Team, 2023), and significance levels were adjusted using the Bonferroni multiple-comparison correction.

RESULTS

For all participants (N = 76), we calculated the ADOS-2 CSSs and the CSP-2 quadrant and section scores, whereas the VABS-II scores were obtained only for 52 children.

Sensory processing profiles

As shown in Table 1, several children scored higher than 1 *SD* above the mean in the CSP-2 quadrants and sections. Considering quadrants and sections singularly, more than half of the participants scored in the *More/Much more than the others* categories in the Avoiding and Sensitivity quadrants, the Auditory section, and all three behavioral sections. Interestingly, 14% of the children were evaluated lower than 1 *SD* under the mean in the Visual section.

As for combinations of quadrant scores outside the norm, 17 participants (22.4%) had all quadrant scores in the *More/Much more* or *Less/Much less than the others* categories, whereas the second most represented quadrant combination outside the norm was Avoiding, Sensitivity and Registration (11 children, 14.5%), followed by Avoiding and Sensitivity (8 children, 10.5%), as displayed in Figure 2. To note, only 13 children (17,1%) scored in the *Just like the majority of others* category in all quadrants.

Regarding the sensory sections, 67 children (88.2 %) scored outside the norm in at least one, but only 4 participants (5.2 %) in all sections (see Figure 3). Almost half of our participants fell into the *Much/More than others* or *Much/Less than others* categories in two sensory sections (20 participants, 26,3%) or only in one (16 participants, 21,1%). In the first case, the most represented combinations were Auditory and Touch (4 children), Auditory and Visual (3 children), and Auditory and Movement (3 children). Instead, in the case of single sections, the most common were Auditory (5 children), Oral (4 children), and Visual (3 children).

Regarding the behavioral sections, the most recurring combination outside the norm was Conduct and Attention (11 children, 14.5 %), with 60 children (78.9 %) having at least 1 and 27 (35.5 %) having all behavioral section scores outside the norm (see Figure 4).

Sensory profile and ASD symptom severity

The ADOS-2 CSSs (*M* and *SD*) are reported in Table 2. Most participants showed a moderate ASD symptom level in SA and Total CSSs and a high level in RRB CSSs.

According to the Shapiro-Wilk test, the following variables were not normally distributed (p<.05): Registration, Visual, Touch, Movement, Body position, Oral, SA CSSs, RRB CSSs, and Total score CSSs.

The Spearman correlation between each CSP-2 score (quadrant and sensory and behavioral section scores) and each CSS showed only weak associations, with none reaching statistical significance (p<.05) after the Bonferroni correction (see Table 3).

Considering the broad participants' age range (3-11 years), a Spearman partial correlation was additionally run to control for the possible effect of age on the association between CSP-2 scores and CCSs. Since the previous results were substantially confirmed, age does not seem to represent a confounding variable in this association.

To further explore the relationship between the sensory profile scores and the ASD symptom severity, we tested for possible differences in the CSP-2 quadrant and section scores among our participants grouped according to their ADOS-2 symptom severity level. Since only few children fell into the minimum level (3 for SA CSSs, 1 for RRB CSSs, and none for Total score CSSs, see Table 2), they were included in the low level group for the subsequent analyses.

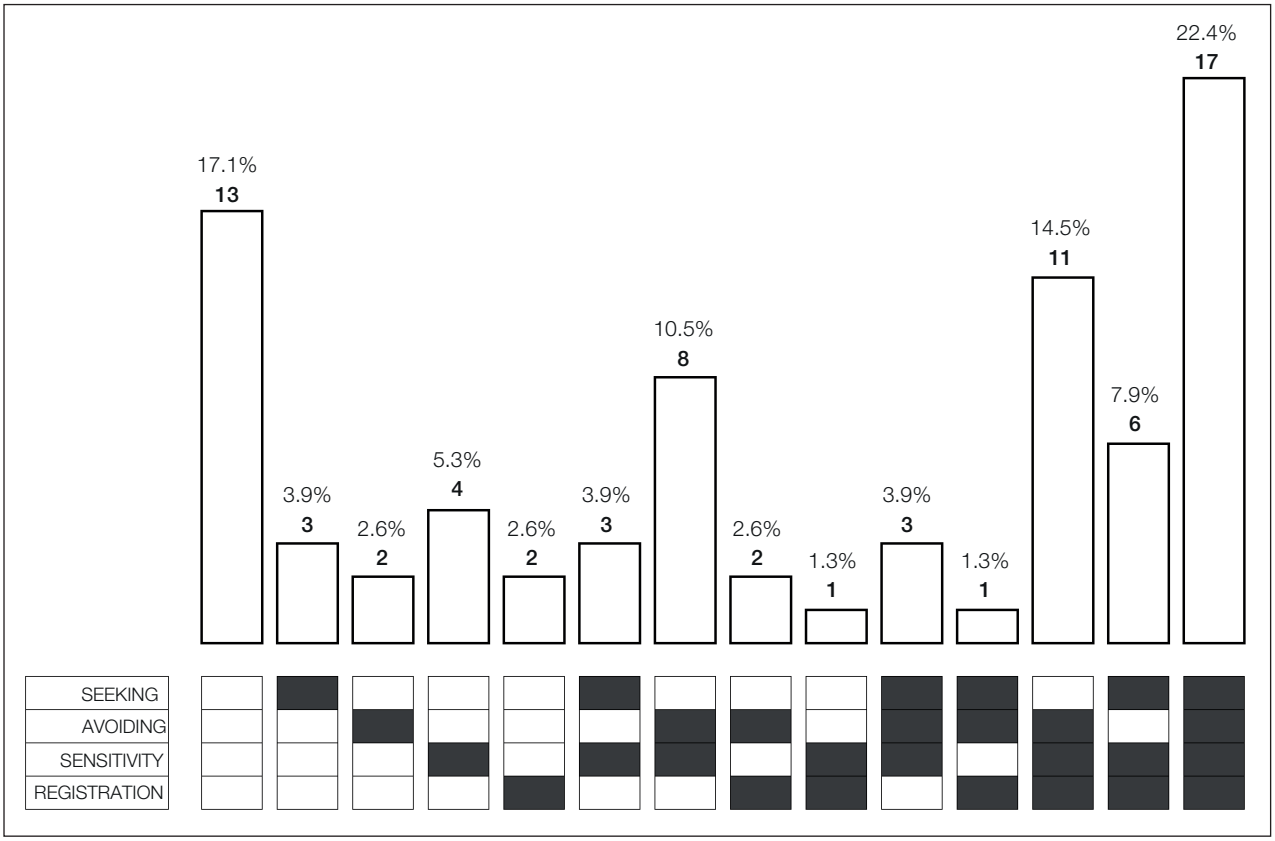
The Kruskal-Wallis test did not reveal any statistically significant difference in the CSP-2 scores between the groups with low, moderate, and high levels of symptom severity (see Table 4).

Table 1 – Percentage of children in each CSP-2 classification system category

	Much less than others	Less than others	Just like the majority of others	More than others	Much more than others
Quadrants					
Seeking	—	1.3%	56.7%	21%	21%
Avoiding	—	1.3%	42.1%	**32.9%**	**23.7%**
Sensitivity	1.3%	—	30.3%	**35.5%**	**32.9%**
Registration	2.6%	1.3%	47.4%	25%	23.7%
Sensory sections					
Auditory	—	5.3%	44.7%	**31.6%**	**18.4%**
Visual	**1.3%**	**13.2%**	64.5%	9.2%	11.8%
Touch	—	1.3%	60.5%	18.4%	19.8%
Movement	—	2.6%	57.9%	17.1%	22.4%
Body position	2.6%	1.3%	65.8%	15.8%	14.5%
Oral	—	1.3%	65.8%	17.1%	15.8%
Behavioral sections					
Conduct	—	2.6%	42.1%	**27.6%**	**27.6%**
Social emotional	—	2.6%	40.8%	**27.6%**	**28.9%**
Attentional	—	1.3%	40.8%	**25%**	**32.9%**

Note. Based on the comparison between quadrant and section scores and the Italian normative data.

Figure 2 – Combinations of CSP-2 quadrant scores outside the norm



Legenda. Bars = number of participants and percentage; black boxes = quadrants outside the norm and their combinations.

Figure 3 – Percentages of participants with CSP-2 sensory section scores outside the norm

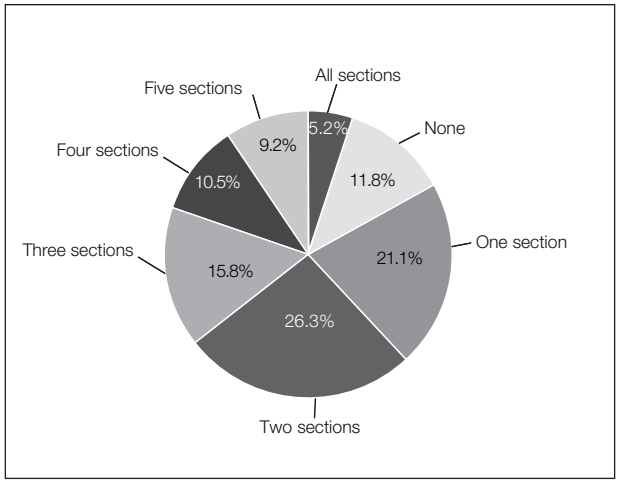


Figure 4 – Percentages of participants with CSP-2 behavioral section scores outside the norm

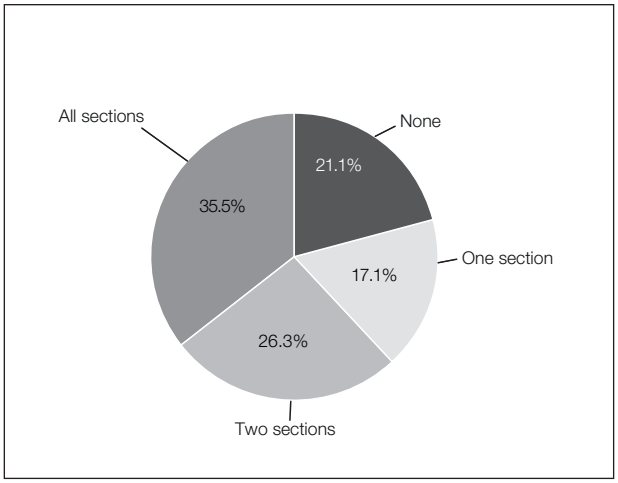


Table 2 – ADOS-2 calibrated severity scores

	CSSs	ASD symptom level			
	Mean (SD)	*Minimum (N)*	*Low (N)*	*Moderate (N)*	*High (N)*
SA	5.59 (1.76)	3	19	44	10
RRB	7.49 (1.91)	1	7	30	38
Total	5.93 (1.30)	0	14	58	4

Legenda. CSSs = Calibrated severity scores; SA = Social affect; RRB = Restricted and repetitive behaviors; N = participants with minimum, low, moderate or high symptom level.

Sensory profile and adaptive functioning

Participants obtained generally low standard scores on the VABS-II Communication (M = 62.38, SD = 18.17, Range = 28-99), Daily living skills (M = 72.48, SD = 14.63, Range = 43-111), and Socialization (M = 70.17, SD = 17.45, Range = 39-108).

As revealed by the Shapiro-Wilk test, all VABS-II domain scores were normally distributed, while several CSP-2 scores, retested in this subsample of 52 participants, followed a non-normal distribution (p<.05): Seeking, Registration, Visual, Touch, Body position, and Oral.

The Spearman correlation between the CSP-2 quadrant scores and the VABS-II domain scores showed a strong negative association between Seeking and Communication and a moderate negative association between Seeking and Socialization. Moreover, moderate negative associations were also found for both Sensitivity and Registration with Communication and Socialization. All these correlations were statistically significant after the Bonferroni correction. As regards the Avoiding quadrant, only weak and non-statistically significant correlations emerged (see Table 5).

In the sensory sections, a statistically significant moderate negative correlation was found between the Visual and Touch sections and Communication, as well as between the Touch section and Socialization.

Considering the behavioral aspects, the Conduct and Attentional sections correlated moderately with Communication, while a statistically significant negative association with Socialization was obtained only for the Attentional section.

In addition, we conducted a partial Spearman correlation to exclude a possible impact of age on the association between sensory profile and adaptive functioning. Again, the results of the previous correlation were substantially confirmed.

DISCUSSION

This study assessed the sensory processing profile in a sample of Italian children with ASD. Our results are consistent with prior findings, showing that children with ASD often exhibit differences in sensory processing patterns across all sensory modalities when compared to typically developing (TD) controls (Alsaedi, Carrington, & Watters, 2023). In fact, the majority of participants displayed high quadrant scores, particularly in the Avoiding and Sensitivity patterns, showing a low neurological threshold for the sensory stimuli, according to Dunn's Sensory processing framework (Dunn, 2014). These findings seem to be in line with some existing evidence that hypersensitivity is the most atypical response in ASD (O'Brien et al., 2009), affecting the ability to provide an adequate response to environmental stimuli and, consequently, to participate effectively in everyday life (Dunn, 2014).

Moreover, the present study revealed auditory processing to be the most affected sensory system, in line with previous studies showing auditory processing abnormalities in ASD children (Alsaedi et al., 2023; Little, Dean, Tomchek, &

Table 3 – Correlation between CSP-2 scores and ADOS-2 CCSs

	SA CSS		RRB CSS		Total CSS	
	rs	*partial rs*	*rs*	*partial rs*	*rs*	*partial rs*
Quadrants						
Seeking	.017	.027	.043	.029	.088	.086
Avoiding	.066	.024	−.019	.001	.011	.022
Sensitivity	.108	.102	.010	.004	.136	.135
Registration	.268	.223	.022	.043	.224	.231
Sensory sections						
Auditory	.181	.127	−.004	.013	.127	.113
Visual	.129	.080	−.092	−.083	.011	.004
Touch	.072	.055	.063	.063	.199	.192
Movement	.079	.084	.053	.044	.140	.140
Body position	.132	.064	−.181	−.166	−.013	−.021
Oral	−.206	−.178	.019	−.009	−.108	−.109
Behavioral sections						
Conduct	.047	.064	.028	.018	.148	.148
Social emotional	.138	.078	−.006	.023	.096	.103
Attentional	.236	.233	.094	.090	.277	.277

Legenda. rs = Spearman's rho; SA CSS = Social affect Calibrated severity score; RRB CSS = Restricted and repetitive behaviors Calibrated severity score; Total CSS = ADOS Total score Calibrate severity score.
Note. No statistically significant correlations ($p<.05$) after the Bonferroni correction.

Table 4 – Assessment of differences in CSP-2 scores between subjects grouped according to the ADOS-2 CCSs symptom levels (Kruskal-Wallis test)

	SA CSS		RRB CSS		Total CSS	
	$\chi^2(2)$	*p*-value	$\chi^2(2)$	*p*-value	$\chi^2(2)$	*p*-value
Quadrants						
Seeking	1.034	.596	1.561	.458	3.65	.161
Avoiding	.420	.810	.022	.989	1.226	.542
Sensitivity	.601	.741	2.327	.312	4.161	.125
Registration	2.316	.314	.108	.948	1.756	.416
Sensory sections						
Auditory	1.565	.457	1.723	.423	1.116	.572
Visual	4.049	.132	1.908	.385	.084	.959
Touch	.566	.753	.191	.909	3.881	.144
Movement	.890	.641	.066	.968	5.252	.062
Body position	1.103	.576	2.184	.335	.049	.976
Oral	1.024	.599	.104	.949	5.788	.055
Behavioral sections						
Conduct	1.791	.408	1.417	.493	5.204	.074
Social emotional	.137	.934	.111	.946	1.080	.583
Attentional	2.268	.322	.679	.712	3.050	.218

Legenda. SA CSS = Social affect Calibrated severity score; RRB CSS = Restricted and repetitive behaviors Calibrated severity score; Total CSS = ADOS Total score Calibrate severity score.

Table 5 – Correlation between CSP-2 scores and VABS-II Communication, Daily living skills, and Socialization scores

	Communication		Daily living skills		Socialization	
	rs	*partial rs*	*rs*	*partial rs*	*rs*	*partial rs*
Quadrants						
Seeking	−.602***	−.602***	−.205	−.203	−.411*	−.427*
Avoiding	−.269	−.281	−.244	−.249	−.332	−.293
Sensitivity	−.593***	−.582***	−.239	−.217	−.485**	−.458*
Registration	−.399*	−.422*	−.271	−.240	−.445**	−.392*
Sensory sections						
Auditory	−.386	−.381	−.228	−.203	−.355	−.323
Visual	−.448*	−.473**	−.206	−.174	−.308	−.266
Touch	−.539**	−.524**	−.292	−.265	−.518**	−.466*
Movement	−.419	−.401	−.223	−.201	−.355	−.331
Body position	−.142	−.168	−.029	−.004	−.049	.005
Oral	−.391	−.404	.007	.004	−.255	−.285
Behavioral sections						
Conduct	−.542**	−.533**	−.353	−.335	−.404	−.398
Social emotional	−.189	−.169	−.146	−.121	−.257	−.175
Attentional	−.450*	−.444*	−.239	−.216	−.433*	−.414

Legenda. rs = Spearman's rho.
Note. * $p<.05$, ** $p<.01$, *** $p<.001$ (after the Bonferroni correction).

Dunn, 2018). Since difficulties affecting the auditory channel can influence language development and contribute to communication difficulties in children with ASD (Marco, Hinkley, Hill, & Nagarajan, 2011), early detection is crucial for appropriate and timely interventions. It is also interesting to note that, differently from the other sensory sections, several participants in our study scored below the norm in the visual domain. Also this result represents a sensory atypicality and means that these children show the behaviors described in the CSP-2 visual section less frequently than their TD peers.

As for the CSP-2 behavioral sections, most children in our sample scored above the norm range. Considering the co-occurrence of high scores in the sensory sections, we can reasonably conclude that atypical sensory processing affects conduct, socio-emotional, and attentive behaviors. These findings are supported by previous research highlighting significant differences in the behaviors associated with sensory processing symptoms between children with and without ASD (Little et al., 2018). Indeed, sensory hypersensitivity, experienced by up to 90% of people with ASD, is considered one of the main causes of behavioral difficulties and disruptive behaviors (Tavassoli, Miller, Schoen, Nielsen, & Baron-Cohen, 2014).

The current study found a lack of correlation between the sensory profile, measured by CSP-2 scores, and ASD symptomatology, measured by ADOS-2. This result could suggest that atypical sensory responsivity is relatively independent of ASD symptom severity. However, it should also be considered that CSP-2 is a questionnaire for parents, whereas ADOS-2 is a semi-structured observation conducted by clinicians. Wolff et al. (2019) showed that parent-reported measures of sensory performance are more strongly linked with other parent-reported measures rather than clinical and observation-based measures. Moreover, Kadlaskar et al. (2023) suggested that the discrepancy between ADOS-2 and other measures of ASD symptom severity could be attributed to contextual variations in children's behaviors. Hence, parents observe their children in daily life, having the opportunity to record different aspects of the symptomatological spectrum in multiple contexts, which is not the case in the clinical evaluation. Therefore, different instruments and contexts may impact our understanding of sensory profiles and how they are linked with autism characteristics.

Nevertheless, the lack of association between sensory atypicalities and ASD symptom severity could also be traced back to some limitations of our study. In fact, the relatively small sample size might have affected the statistical significance of some analyses. In addition, for some of our participants, CSSs were calculated over the ADOS-2 scores obtained from evaluations conducted more than 12 months before the administration of the CSP-2 questionnaire. Therefore, changes in the child's profile might have occurred in this time span. Moreover, it should be considered that most participants had a medium severity level, according to the ADOS-2 total CSS. Therefore, more extreme profiles deserve to be further studied in larger samples to highlight the possible impact of sensory atypicalities on ASD symptoms in specific homogeneous subgroups.

Another aim of our study was to explore the possible association between sensory and adaptive profiles in children with ASD. We found a strong negative association between VABS-II Communication scores and Seeking and a moderate negative association between VABS-II Communication scores and both Sensitivity and Registration. This seems to be in line with previous studies showing that sensory profiles in preschoolers with ASD, particularly Seeking, affect their receptive and expressive language skills (Tomchek et al., 2015).

Our study also revealed a moderate negative association between VABS-II Socialization scores and Seeking, Sensitivity, and Registration. Previous findings have suggested a negative impact of atypical sensory processing on the socio-adaptive abilities of children with ASD, especially in understanding emotion (Thye et al., 2017), joint attention (Baranek et al., 2013), social cognition (Green et al., 2016) and empathy (Tavassoli et al., 2018). In particular, Tomchek et al. (2015) reported that ASD children with a Seeking profile had lower socialization skills and were less receptive to their social environment.

It can be hypothesized that the overload of sensory information from the environment or the difficulty of recording elements functional for socio-communicative purposes could make ASD children less receptive to the social environment and prevent them from having effective communication. Moreover, according to Cunningham and Schreibman (2008), the association between sensory processing and adaptive functioning might indicate that individuals diagnosed with ASD use socially unacceptable behaviors to regulate under-stimulation and to reinforce sensory stimuli.

Concerning the VABS-II Daily living skills, we found no significant correlation with any CSP-2 quadrants. By

contrast, previous studies showed a significant association between atypical sensory processing and both daily living skills (Baker, Lane, Angley, & Young, 2008) and personal autonomy (Jasmin et al., 2009). In particular, in a study with a large sample of children aged 3 to 10 years, Dellapiazza et al. (2019) found that Seeking was associated with lower scores in all Vineland domains. In addition, a longitudinal study (Williams et al., 2018) revealed that higher parent-reported sensory hypo/hyper-responsiveness in early childhood predicted overall lower adaptive behaviors and lower daily living skills in later childhood. However, these findings are inconsistent with a recent study in which predictive factors for the adaptive functioning of individuals with ASD were intellectual quotient, age, and social symptoms rather than an atypical sensory profile (Tillmann et al., 2019).

CONCLUSION

We confirmed widespread sensory atypicalities in a sample of Italian ASD children aged 3 to 11 years assessed with the Italian version of the CSP-2. Despite the prevalence of high scores in Avoiding and Sensitivity patterns as well as in the Auditory section, a notably high variability emerged among our participants' sensory profiles. Therefore, studies with larger samples are needed to identify possible ASD-specific sensory clusters. Furthermore, longitudinal investigations would allow for studying the developmental trajectories of sensory atypicalities in individuals with ASD over time.

Our study did not reveal any association between the sensory profile and the ASD symptom severity, whereas we highlighted a possible impact of sensory atypicalities on adaptive behavior. Interestingly, initial evidence from the literature suggests the impact of cognitive level on adaptive behavior. Therefore, our results should be further replicated in future research with larger and more heterogeneous individuals in terms of symptom severity, also taking into account the possible role cognitive level plays in the relationships between sensory profile, ASD symptom severity, and adaptive functioning.

Finally, it is important to note that the ADOS-2, the gold standard for the evaluation of autistic symptoms, provides only one item dedicated to the sensory aspects. Since sensory processing alterations are a pervasive component of everyday experiences in autistic individuals, and atypical sensory patterns impact adaptive behavior, it is highly recommended to include a sensory-specific tool in the ASD assessment. In fact, it could help parents and teachers become aware of how the sensory features of the environment and everyday life experiences can compromise the child's well-being and how their modulation can promote effective participation and prevent non-functional behavior. Moreover, the early detection of sensory atypicalities could aid professionals in supporting the child's development, preventing a possible negative impact on communicative and social skills acquisition.

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Psychosomatic symptoms and attainment of flow state among adolescents: Role of social networking usage

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ABSTRACT. Lo scopo di questo studio è stato quello di esplorare il ruolo dell'uso dei social media nei sintomi psicosomatici e nello stato di flow degli adolescenti. I dati sono stati raccolti su 200 partecipanti (94 maschi e 106 femmine) con un'età compresa tra 16 e 19 anni (età media 18,58) provenienti da Haryana e Delhi-NCR, regione dell'India. Per raccogliere i dati sono stati utilizzati il *Patient Health Questionnaire (PHQ-15)*, il *Flow State Questionnaire* e il *Social Networking Usage Questionnaire*. I risultati hanno indicato una significativa correlazione positiva dell'uso dei social media con i sintomi psicosomatici e una correlazione negativa con lo stato di flow degli adolescenti. L'analisi di regressione graduale ha rivelato che l'uso dei social network (socializzazione, informazione e intrattenimento) ha contribuito in modo significativo ai sintomi psicosomatici degli adolescenti.

SUMMARY. The aim of this study was to explore the role of social media usage in the 'psychosomatic' symptoms and flow state of adolescents. The data was collected from 200 participants (94 males and 106 female) with the age range of 16 to 19 years (mean age 18,58) from Haryana and Delhi-NCR region of India. The sample was selected using convenient sampling method. Measures of Patient Health Questionnaire (PHQ-15), Flow State Questionnaire and Social Networking Usage Questionnaire were used to collect the data. Findings indicated a significant positive correlation of social media usage with the psychosomatic symptoms and negative correlation with the flow state of the adolescents. Stepwise regression analysis revealed that social networking usage (socialization, informativeness & entertainment) contributed significantly to the psychosomatic symptoms of adolescents. In addition, social networking usage and their dimensions negatively predicted the flow state of adolescents. Health care professionals and government may use the findings of the study to regulate the use of social media especially for adolescents to alleviate the ill effects of social networking usage and promote health related behavior among adolescents

Keywords: *Psychosomatic symptoms, Flow state, Social networking usage, Socialization, Informativeness*

INTRODUCTION

Social media usage among children and adolescents has become a form of mental and behavioral addiction characterized by a strong and continuous desire to remain online and often ignoring other aspects of one's own life (Brailovskaia, Schillack & Margraf, 2020). People hooked to these platforms, when are unable to access social networking sites (SNSs) frequently, they go through unpleasant psychological states like mood swings, unhappiness, restlessness, and worry (Brailovskaia & Teichert, 2020; Kumar & Prabha, 2019; Sabir, Nasim, Majid & Sabir, 2020). Physical and psychological problems, such as feelings of inadequacy or superiority, can also be caused by this addiction (Sabir et al., 2020). While several other studies have emphasized the benefits of using SNS, including how it may help with communication, self-promotion, entertainment, and a sense of belonging (Appel, Marker & Gnambs, 2020; Brailovskaia, Rohmann, Bierhoff & Margraf, 2018; Brailovskaia & Teichert, 2020). According to recent data, 5-10 per cent of Americans (Hilliard, 2022) and over 210 million people globally (Maya, 2022) fulfil the criteria for social media addiction. The use of SNSs has turned into an addictive habit for certain age group.

The use of social media has intruded into almost every aspect of daily life and affects all age groups, with adolescents and children being the most vulnerable populations. Studies show that social media use is associated with severe mental health issues (Przybylski, Orben & Weinstein, 2020), and in adolescents and children, higher levels of social media use have been linked to increased problems with internalizing and externalizing difficulties (Riehm, Feder & Tormohlen, 2019). Excessive social media use has also been associated with body image issues, problematic eating, and is considered a risk factor for behaviors such as alcohol consumption, with the consequences being particularly high among young adults (Holland & Tiggemann, 2016; Moreno, D'Angelo & Whitehill, 2016).

Recent studies have indicated that social media use for more than two hours per day is associated with serious consequences for social and emotional well-being, inflated self-esteem, and heightened vulnerability to harassment (Bozzola et al., 2022; Senekal, Groenewald, Wolfaardt, Jansen & Williams, 2023). Nowadays, adolescents and children report feeling pressured to upload, share their activities, stay connected, and reply quickly to messages, which creates a barrier to reducing or stopping social media use (Shankleman et al., 2021). The issue of excessive time spent on social media has also been linked to poor sleep quality, poor body image, increased emotional issues, and other mental health problems, including suicidal ideation (Memon, Sharma, Mohite & Jain, 2018; Vidal, Lhaksampa, Miller& Platt, 2020; Webster, Dunne & Hunter, 2021). Studies have also reported that excessive social media use by adolescents makes them more prone to deliberate self-harm, which is associated with the normalization of excessive social media use (Moss, Wibberley & Witham, 2023).

Literature reports that social networking has two aspects. One aspect involves people's interaction with one another, they can express themselves, exchange intriguing content. As a result, a completely new cultural paradigm that alters social interaction and has an impact on business and technology has been created. The other aspect includes forced isolation, elevated anxiety, and stress, particularly among kids and teenagers, which leads to change in habits. Young adolescents find it extremely difficult to envision life without Facebook, Instagram, and all of their predecessors. Studies also conclude that social media can have both positive and negative effects (Simms, 2022).

One of the primary drawbacks of social media has been its potential to foster addiction. The act of constantly checking various social networking sites could develop into compulsive behavior. According to researchers, the gratification experienced from receiving 'likes' and 'shares' stimulates the brain's reward center, especially among adolescents. These characteristics also had an impact on emotional states (Abraham, 2022). As a result of constant social media sharing of information and selfies, the obsession with themselves grows. They assessed their confidence by counting the number of 'likes' their social media posts received, and if they didn't get the expected response, they could start feeling uneasy. As a result, some kids and teenagers could believe that they were the center of the universe.

In addition, social interaction plays a vital role in the development of cognitive skills necessary to understand the emotions and perspectives of others. As children grow older, it is crucial for them to learn how to interpret facial expressions and non-verbal cues. Relationships conducted through screens have the potential to undermine real-life connections and social skills in children and teenagers. Individuals addicted to social media may exhibit lack of empathy and struggle with both verbal and non-verbal communication abilities. During times of extreme isolation caused by the pandemic, YouTube,

TikTok, Snapchat etc. provided essential avenues for social interaction, which was a regular part of personal development. However, they were also linked to mental health problems such as anxiety, depressive symptoms, and body image issues (Abraham, 2022).

Evidences indicate that the majority of mental health issues affect somatic functions. Psychosomatic disorders are mental illnesses that manifest as physical symptoms but frequently have unknown medical etiology. It might be challenging for those who have this illness to carry out daily activities because they may worry excessively about their symptoms or have excessive thoughts or sentiments about them. Every physical ailment has a mental component (Kurlansik & Maffei, 2016). Individual differences in how we respond to and manage the disease are significant. It is believed that some physical conditions are more vulnerable to being exacerbated by mental conditions like stress and worry. The severity of a physical illness could fluctuate depending on the emotional condition (Satsangi & Brugnoli, 2017).

A cross-sectional study on internet use and psychosomatic symptoms among university students was carried out by Stiglic and colleagues (Stiglic, Masterson Creber & Cilar Budler, 2022) which investigated the connection between internet use, psychological health, and psychosomatic symptoms among Slovenian university students. The findings indicated that computer science students reported less physical complaints and higher psychological problems than health science students. Kumar and Prabha (2019) carried out a study to examine the association between internet addiction and psychosomatic symptoms, and reported that internet addiction tendency was associated with many psychosomatic symptoms among students.

Schuur, Baumgartner and Sumter (2018) investigated the cross-sectional and longitudinal connections between adolescent social media use, social media stress, and sleep. The results revealed that social media stress was only associated with girls' eventual sleep delay and daytime drowsiness. The results highlighted the need to pay attention to adolescents' perceptions and coping mechanisms for their use of social media rather than just the frequency of usage.

Flow refers to the ideal state of human experience when a person is fully engaged in an activity that provides a balance between challenging tasks and one's skills. Csikszentmihalyi and others, emphasized the importance of clear goals and immediate feedback during the activity (Csikszentmihalyi, 1988; Csikszentmihalyi, 1990; Csikszentmihalyi, 1997). People get completely absorbed in their jobs demanding undivided attention so that they lose track of the concerns and disappointments of daily life. When people engage in their jobs, the feeling of self-fades away, but conversely, after the task is finished, the sense of self becomes stronger. The act of doing something is fundamentally and instantly fulfilling. Flow experiences affect how one perceives time. Hours can seem to pass in a matter of minutes. Autotelic activities result in flow experiences.

The occurrence of flow experiences is influenced by cultural and familial factors. Some cultures and family structures provide more conducive environments for flow experiences to occur. Certain families offer socialization opportunities that help children to develop personality traits and facilitate the experience of flow (Csikszentmihalyi & Csikszentmihalyi, 1992). Additionally, individuals enhance the frequency of flow experiences by seeking out work positions that present challenges which push their skills to the limits.

Engaging in activities such as dance, music, rhythmic exercise, or meditation, and incorporating them into regular practice enhances flow experiences based on rituals. Furthermore, by embracing a lifelong learning mindset, maintaining an open mind, and actively striving to improve the ability to achieve flow, individuals can increase the frequency of flow experiences related to intellectual pursuits. The self-determination theory of motivation offers a better explanation for motivation, which plays a positive role in the flow state (Deci & Ryan, 1980).

The self-determination theory asserts that for individuals to experience psychological growth, they must experience three key elements: autonomy, competence, and connection or relatedness. Autonomy refers to individuals feeling in control of their actions and goals. A sense of self-determination is greatly facilitated when individuals believe they have the ability to take immediate action that will result in meaningful change. Competence involves learning new skills and achieving mastery in tasks. When individuals perceive themselves as having the necessary abilities for success, they are more likely to take actions that align with their goals. Connection or relatedness refers to the need for individuals to feel a sense of attachment and belonging to others. Engaging in activities that promote cognitive, social, and emotional development during crucial periods plays a vital role in an individual's overall development and functioning (Deci & Ryan, 1980).

When in a state of flow, people reach a higher degree of concentration where their focus is entirely on the work at hand and there is no place for interruptions. The ego may momentarily dissolve as a result of their altered perception of time, impaired self-awareness, and other symptoms. Yao, Xie and Chen (2022) investigated how active social media use affected feeling of flow and how academic self-efficacy acted as a mediator. The study found that active social media use significantly and favorably affected the sense of being in the flow. Additionally, frequent usage of social media significantly and favorably affected academic self-efficacy. Zhao and Zhou (2021) looked at the mediating roles of active use and social media flow in order to understand the relationship between COVID-19 stress and addictive social media use. The findings indicated a positive correlation with COVID-19 stress and propensities for addictive social media use. The results implied that people who experienced higher levels of COVID-19 stress were more likely to develop addicted social media use, which might be aided by active use and flow experiences.

Lin and colleagues (Lin, Lin, Turel & Xu, 2020) studied the association between overload, the intention to stop using social media and the buffering effect of flow experience. The stimulus-organism-response (S-O-R) framework and flow theory were combined. The findings were consistent with the S-O-R paradigm and showed that social, informational, and communicational overload (stimuli) increased users' feelings of weariness (organism), which in turn increased users' intents to stop using social media (response).

Another study (Lin, Lin, Luo & Liu, 2021) investigated how social media users altered their discontinuous usage intention, particularly in various psychological states (such as weariness and flow experience), when they meet overload and participated in adaptive and maladaptive coping measures. According to the findings, users' adaptive coping was started by information, communication, and social overload while maladaptive coping was only sparked by communication overload. Pelet, Ettis and Cowart (2017) conducted a study on the best flow experience enhanced by telepresence and social media usage evidence. The results found that the five aspects of flow - enjoyment, concentration, challenge, control, and curiosity - are favorably impacted by telepresence.

Similarly, Mauri and colleagues (Mauri, Cipresso, Balgera, Villamira & Riva, 2011) carried research on 'Why Facebook is so successful?'. A core flow state was described by psychophysiological measurements while using Facebook. The purpose was to understand whether using SNSs caused a particular psychophysiological pattern. According to statistical analysis of the psychophysiological data and pupil dilation, on numerous linear and spectrum indicators of somatic activity, the Facebook experience was considerably different from stress and relaxation.

After conducting an analysis of relevant available studies, it was felt crucial to empirically investigate social media usage, the state of flow, and psychosomatic symptoms among adolescent population. The use of social media among adolescents has increased significantly due to societal advancements, widespread internet access, and the prevalence of smartphones. In India, children begin engaging with social media around the ages of nine and ten, primarily due to easy availability of smartphones, internet access, and the working conditions of parents. The excessive use of social media has various adverse effects on adolescent development, leading to both physical and mental health issues. Following the global COVID-19 pandemic, the screen time of adolescents and other demographics has increased substantially, manifesting in psychosomatic symptoms among adolescents. Research investigating the relationship between social media usage and psychosomatic symptoms has yielded mixed findings, with some studies highlighting the positive impacts of social media while others suggested a negative influence on adolescent development. Furthermore, the use of social media also influences the attainment of the state of flow, particularly among student populations. Nevertheless, the existing literature lack consistency in terms of the positive and negative effects of social media usage on the state of flow in adolescents.

Limited research exists on the relationship between social media use, the state of flow, and psychosomatic symptoms. Additionally, there are contradictory findings regarding the positive impact of flow on academic achievement (Mustafa & Jahan, 2019). Recent researches suggest that the human brain is susceptible to the effects of social media use, and attaining a state of flow requires artificial changes in the brain. The question arises that how do these artificial changes affect individuals and potentially contribute to somatic symptoms? Previous studies have not thoroughly explored the gender differences in these factors, and the samples used in earlier research were limited in their generalizability. The results of studies investigating gender differences in social media use, psychosomatic symptoms, and flow have been inconsistent and contradictory. Stiglic and colleagues' (2022)

study revealed the impact of unequal gender distribution on research outcomes, emphasizing the need for a broader study population. Furthermore, previous studies failed to consider the contribution of flow state to the psychosomatic symptoms experienced by adolescents.

Therefore, the present study aims to explore how social media use affects an individual's functioning and the attainment of the flow state, investigates instances where the flow state may be directed inappropriately or in the wrong direction. By examining these aspects, following objectives and hypotheses have been formulated for the present study.

Objectives

- To assess and compare the flow state, social media use and psychosomatic symptoms among male and female adolescents residing in different rural and urban areas.
- To explore the relationship of social media with the flow state of adolescents.
- To examine the relationship of social media, use with the psychosomatic symptoms of adolescents.

Hypotheses

- There would be no significant difference between male and female on flow state, social media use and psychosomatic symptoms.
- There would be no significant difference between the adolescents of rural and urban areas on flow state, social media use and psychosomatic symptoms.
- Social Media use would be negatively associated with the flow state of adolescents.
- Social media use would be positively associated with the psychosomatic symptoms of adolescents.

METHOD

Participants and procedure

The study was carried out on a sample of 200 adolescents (94 males and 106 female) aged between 16 to 19 years who were attending schools/colleges and hailed from varying socio-economic backgrounds (see Table 1). The participants were selected from northern region states of India. Written permission was obtained from the relevant authorities, principals, and Heads of Departments for conducting the study. The sample was drawn using convenient sampling method, involving personal visits to schools and colleges including public and private institutes of states of northern region of India. Students were approached during their free intervals at their campus so as to not disturb their classes. Since smartphones were prohibited on some school/college campuses, such participants were contacted at their hostels when they had access to their smartphones. The nature and purpose of the study was clearly stated and procedures was well explained to each participant. Informed consent was obtained from the participants. In case of minor participants (below 18 years) assent was sought from participants and consent was taken from the legal guardians of the participants. The correlational design was employed to investigate the relationship of social media usage with the psychosomatic symptoms and flow state experienced of the adolescents. The study was approved by the Department of Psychology, Central University of Haryana. The ethical guidelines of American Psychological Association (APA) were followed during the entire process of study, right from data collection to writing of the manuscript.

Priori analysis

The *a priori* correlation of the bivariate normal model was analyzed for correlation and mean differences between two independent groups using a *t*-test (see Table 2). G*Power software version 3.1 was used to determine the required sample size for the study. A medium effect size ($\rho = .30$, $d = .50$) was calculated for both one-tailed and two-tailed tests. The power analysis output indicated that 115 participants would be required for a one-tailed correlation analysis and 138 participants for a two-tailed correlation analysis. For the *t*-test, 176 participants (88 per group) would be required for a one-tailed test, and 210 participants (105 per group) for a two-tailed test.

Measures

- *Flow State Questionnaire*: The Flow State Scale used in the study was developed by Magyaródi, Nagy, Soltész, Mózes

Table 1 – Demographic characteristics of the participants included in the study

Demographic variables	Category	Percentage
Gender	Male	47
	Female	53
Domicile	Urban	44.5
	Rural	55.5
Age	16	2
	17	26.5
	18	33
	19	19.50
SES	Low SES	10.5
	Middle SES	86.5
	High SES	3
Education	9^{th} to 12^{th}	47.5
	Undergraduate	52.5
Parents education	Illiterate	46
	10^{th} to graduation	36.5
	Post graduate and above	17.5
Father employment	Unemployed	28
	Employed	72
Mother employment	Unemployed	74.5
	Employed	25.5

Legenda. SES = Socio-economic status.

Table 2 – Required sample for the study

Effect size	Required sample for one tail	Required sample for two tail
Medium (ρ = .30)	115	138
Medium (*d* = .50)	176	210

and Oláh, 2013. It consists of 20 items rated on a 5-point Likert scale. The scale includes 11 items that measure the subscale 'Balance between challenges and skill' and 9 items that measure the subscale 'Absorption in the task'. Examples of items include 'I was able to keep up with the challenges' for the balance between challenges and skills subscale and 'The activity totally engrossed my attention' for the absorption in the task subscale. The scale demonstrated acceptable reliability for both factors, with a Cronbach's alpha coefficient of .921 for the balance between challenges and skills subscale and .907 for the absorption in the task subscale. The inter-correlation between the two factors was found to be low but significant, with a correlation coefficient of .221 (p<.01).

– *Patient Health Questionnairre-15*: The PHQ-15 is a subscale of the Patient Health Questionnaire, specifically designed to evaluate somatic symptoms. It originated from the self-administered version of the Primary Care Evaluation of Mental Disorders (PRIME-MD) diagnostic tool, which was developed in the 1990s. The PRIME-MD questionnaire was created with the objective of efficiently diagnosing five prevalent mental disorders in medical settings: depression, anxiety, somatoform disorders, alcohol-related disorders, and eating disorders. In 2013, Kocalevent, Hinz, and Brahler standardized the PHQ-15 for use in the general population, enabling its widespread application and interpretation. The PHQ-15 was used to evaluate physical symptoms, with the exception of two items that were specific to adults. Participants themselves assessed the presence of symptoms they experienced over the past two weeks. Severity was rated on a 3-point scale, ranging from 0 (not bothered at all) to 2 (bothered a lot). The overall PHQ-15 score ranged from 0 to 30, with scores of ≥5, ≥10, and ≥15 indicating mild, moderate, and severe levels of somatization, respectively. The PHQ-15 demonstrates high reliability and validity in clinical and occupational healthcare settings. The scale exhibits strong internal consistency and convergent validity, with a construct validity of .75 and an internal consistency (Cronbach's α) value of α = .82.

– S*ocial Networking Usage Questionnaire*: Gupta and Bashir (2018) developed a questionnaire called the Social Networking Usage Questionnaire. It consists of 19 items and uses a five-point Likert scale. The scale aims to measure four factors: academic socialization, entertainment, informativeness, and social networking use specifically within the Indian population. The internal consistency of the scale was found to be high, with a Cronbach's alpha value of .83. Additionally, the scale demonstrated good convergent validity, ranging from .59 to .89.

RESULTS

The present study aimed to assess and compare social media use, flow state and psychosomatic symptoms between male and female adolescents and between rural and urban participants. In addition, the study also aimed to explore the relationship among these variable. To materialize this aim, the findings of the study are therefore discussed in three parts. First, a comparison of social media use, flow state and psychosomatic symptoms of male and female adolescents is presented. Secondly, a comparison of urban and rural participants on these variables is discussed. Lastly, the relationship among social media use, flow state and psychosomatic symptoms is investigated. All the assumptions related to applied statistics in the study have been thoroughly checked before applying in the study.

An independent-samples *t*-test was conducted to compare social media use, flow state, and psychosomatic symptoms between male and female participants residing in urban and rural areas. Assumptions for applying the statistical tests were checked, and details are provided in Table 3 and Table 4.

The dimensions of social networking usage included socialization, academic activity, informativeness, and entertainment, while dimension of flow state included balance of challenges and skills, absorption in the task. PHQ scores represented psychosomatic symptoms. To compare male and female adolescents on these variable, t-tests were applied. Pearson product-moment correlation and regression analysis were also performed to explore associations between relevant variables and determine the contributions of predictor variables to the criterion variable.

Latent profile analysis (LPA) was applied to identify distinct subgroups among participants who share similar patterns of social media use. The aim was to explore potential group differences in flow state and psychosomatic symptoms across profiles. LPA was also used to identify any heterogeneity and nuanced correlations within the data. A Gaussian mixture model, implemented using Python coding, was applied to detect similar patterns within the subgroups. Varying numbers of profiles (1 to 10) were tested

Table 3 – Score of skewness and kurtosis on study variables

Variables	Skewness	Kurtosis
Socialization	−.046	−.354
Informativeness	.106	−.226
Entertainment	.337	−.788
Balance of challenges and skills	−.221	.187
Absorption in the task	.449	1.571
Academic activity	.292	.110
PHQ	.022	−.627

Table 4 – Score of Kolmogorov-Smirnov and Shapiro-Wilk test on study variables

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	*df*	Sig.	Statistic	*df*	Sig.
Socialization	.082	200	.002	.986	200	.043
Academic activity	.074	200	.009	.987	200	.057
Informativeness	.090	200	<.001	.980	200	.006
Entertainment	.105	200	<.001	.954	200	<.001
Balance of challenges and skills	.073	200	.011	.990	200	.189
Absorption in the task	.104	200	<.001	.967	200	<.001
PHQ	.086	200	.001	.976	200	.002

Legenda. df = degree of freedom.

in the Gaussian mixture model, and for each model, the Bayesian information criterion (BIC) score was calculated to identify the optimal number of profiles by balancing model's complexity and fit.

Table 5 presents the means, standard deviations, and *t*-scores for male and female adolescents. Additionally, Table 6 displays the means, standard deviations, and *t*-scores for rural and urban adolescents. The correlation analysis results for the study variables are presented in Table 7. Further analysis is presented in Tables 8 and 9, which includes the results of multiple stepwise regression analysis using social networking usage as the predictor variable and flow state as well as psychosomatic symptoms as the criterion variables.

The results presented in Table 5 indicate that a significant difference was observed in academic activity between male and female adolescents (t = 3.744, df = 198, p<.01). Female participants scored significantly higher on academic activity (M = 7.51) compared to male participants (M = 5.63). Regarding socialization, informativeness, and entertainment in social media usage, as well as absorption in the task of flow state, female participants scored slightly higher than male participants. However, these differences were not found to be statistically significant. Similarly, for the balance of challenge and skills and the Patient Health Questionnaire (PhQ), male participants scored higher than female participants, but these differences were not statistically significant.

Table 5 – Mean, SD and *t*-score on social media use, flow state and psychosomatic symptoms of male and female adolescents

Variables	Gender	*Mean*	*SD*	*N*	*t*-score
1. Social networking usage					
a) Socialization	Male Female	14.67 15.06	3.94 4.20	94 106	−.684
b) Academic activity	Male Female	5.63 7.51	3.76 3.34	94 106	3.74**
c) Informativeness	Male Female	8.63 8.91	2.46 2.68	94 106	−.757
d) Entertainment	Male Female	10.36 11.49	3.74 16.78	94 106	−.638
2. Flow state					
a) Balance of challenges and skills	Male Female	10.02 9.45	3.73 4.395	94 106	.816
b) Absorption in the task	Male Female	8.40 8.77	2.53 2.68	94 106	−.996
3. Psychosomatic symptoms					
a) PhQ-Tot	Male Female	19.74 18.59	5.27 5.82	94 106	1.456

Legenda. PhQ = Patient Health Questionnaire.
**p<.01

According to Table 6, significant differences were observed between adolescents residing in urban and rural areas on the measures of socialization and informativeness of social networking usage (t = 3.65, df = 198, p<.01; t = 3.72, df = 198, p<.01). Urban participants scored higher than rural participants on these measures. However, no significant difference was found between urban and rural participants on the measures of academic activity and entertainment in social networking usage. In terms of the absorption in the task of flow state measure and the Patient Health Questionnaire, adolescents residing in urban areas scored higher than those in rural areas, and these differences were found to be statistically significant (t = 3.96, df = 198, p<.01; t = 3.37, df = 198, p<.01). Urban participants also performed better on the balance of challenge and skills measure, but this difference was not statistically significant.

Correlational analysis

Pearson product-moment correlation analysis was applied to examine the relationships between socialization, academic activity, informativeness, and entertainment measures of social networking usage with the balance of challenges and skills, absorption in the task of flow state, and psychosomatic symptoms (PhQ) measures. Given that

Table 6 – Mean, SD, and *t*-score on social media use, flow state and psychosomatic symptoms of rural and urban adolescents

Variables	Gender	*Mean*	*SD*	*N*	*t*-score
1. Social networking usage					
a) Socialization	Urban	16.02	4.16	89	3.65**
	Rural	13.96	3.80	111	
b) Academic activity	Urban	7.00	3.76	89	1.66
	Rural	6.34	3.56	111	
c) Informativeness	Urban	9.52	2.65	89	3.72**
	Rural	8.18	2.36	111	
d) Entertainment	Urban	12.43	18.10	89	1.50
	Rural	9.77	4.00	111	
2. Flow state					
a) Balance of challenges and skills	Urban	10.37	10.37	89	1.86
	Rural	9.28	9.29	111	
b) Absorption in the task	Urban	9.34	2.66	89	3.96**
	Rural	8.00	2.42	111	
3. Psychosomatic symptoms					
a) PhQ-Tot	Urban	20.58	5.78	89	3.37**
	Rural	17.97	5.17	111	

Legenda. PhQ = Patient Health Questionnaire.
**p<.01

the descriptive tables showed significant differences only between male and female participants on academic activity, while other variables did not exhibit significant differences, correlation analysis was applied on both groups together to explore the relationship of social networking usage and flow state with the psychosomatic symptoms of rural and urban adolescents.

The results indicated in Table 7 indicates that socialization was found to have a positive correlation with psychosomatic symptoms (r = .501, p<.01) and a negative correlation with the balance of challenges and skills (r = −.381, p<.01) and absorption in the task (r = −511, p<.01) of the flow state measure. Academic activity showed positive correlations with psychosomatic symptoms and both dimensions of the flow state measure, but these coefficients were not statistically significant. Informativeness, as a dimension of social networking usage, exhibited positive correlations with psychosomatic symptoms (r = .586, p<.01) and negative correlations with the balance of challenges and skills (r = −.322, p<.01) and absorption in the task (r = −.806, p<.01) of the flow state measure. Entertainment demonstrated a positive correlation with psychosomatic symptoms (r = .138, p<.05) and a negative correlation with the balance of challenges and skills (r = −.317, p<.01). The relationship between entertainment and absorption in the task of the flow state measure was not found to be statistically significant.

Regression analysis

Multiple stepwise regression analysis was applied to know the contribution of predictor variables in the criterion variables. All the dimensions of social networking usage measure were entered in the regression model with one criterion variable in the dependent column.

Table 8 displays the findings of a multiple stepwise regression analysis examining the relationship between social networking usage and psychosomatic symptoms. The results indicate that the combined factors of informativeness and socialization accounted for around 40 per cent of the variability in psychosomatic symptom scores. Specifically, informativeness alone contributed to 34.3 percent of the variance in psychosomatic symptom scores (F = 103.57, p<.01), while socialization accounted for 5.8 percent of the variance (F = 18.95, p<.01). Both informativeness and socialization of the social networking usage measure were identified as positive predictors of psychosomatic symptoms in adolescents. This implies that higher levels of informativeness and socialization were associated with increased psychosomatic symptoms (β = .448, β = .277).

Table 9 presents the results of multiple stepwise regression analysis for the relationship between social networking usage and the balance of challenges and skills measure of the flow

Table 7 – Correlations of social media usage (dimensions), with flow-state (dimensions) and the psychosomatic symptoms of adolescents

Variables	Patient health (Psychosomatic symptoms)	Balance of challenges and skills	Absorption in the task
Socialization	.501**	−.381**	−.511**
Academic activity	.039	.052	.001
Informativeness	.586**	−.322**	−.806**
Entertainment	.138*	−.317**	−.019

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

Table 8 – Stepwise regression analysis of social networking usage measure (dimensions) as predictor variables and psychosomatic symptoms (PhQ) as criterion variable

Predictors	*R*	R^2	Adjusted R^2	R^2 change	*Beta*	*F*	*F*-change	*t*-score
Informativeness	.586	.343	.340	.343	.448	103.57**	103.57**	7.03**
Socialization	.633	.401	.395	.058	.277	65.96**	18.95**	4.35**

**p<.01

Table 9 – Stepwise regression analysis of social media usage (dimensions) as predictor variables and balance of challenge and skills (flow state) as criterion variable

Predictors	*R*	R^2	Adjusted R^2	R^2 change	*Beta*	*F*	*F*-change	*t*-score
Socialization	.381	.145	.141	.145	−.270	33.67**	33.67**	3.75**
Entertainment	.472	.223	.215	.078	−.275	28.25**	19.66**	4.40**
Informativeness	.493	243	.232	.020	−.165	21.08**	5.28**	2.29**

**p<.01

state. The results indicate that informativeness, socialization, and entertainment together accounted for approximately 24.3 per cent of the variance in the scores of the balance of challenges and skills measure. Among these variables, socialization contributed 14.5 per cent of the variance in the scores of the balance of challenges and skills (F = 33.67, p<.01), entertainment accounted for 7.8 per cent of the variance (F = 28.25, p<.01), and informativeness accounted for 2 per cent of the variance (F = 21.08, p<.01) in the scores of the balance of challenges and skills measure. Interestingly, socialization, entertainment, and informativeness negatively predicted the balance of challenges and skills (flow state) in adolescents. This means that higher levels of socialization, entertainment, and informativeness of social networking usage were associated with a decrease in the quality of the balance of challenges and skills (flow state) in both urban and rural adolescents (β = −.270, −.275, −.165).

Table 10 presents the results of multiple stepwise regression analysis for the relationship between social networking usage and the absorption in the task measure of the flow state. The results indicate that informativeness and entertainment together accounted for approximately 65.70 per cent of the variance in the scores of the absorption in the task measure. Among these variables, informativeness contributed 65 per cent of the variance in the scores of the absorption in the task measure (F = 367.12, p<.01), while entertainment accounted for only .7 per cent of the variance (F = 188.35, p<.01) in the scores of the absorption in the task measure.

Interestingly, both informativeness and entertainment negatively predicted the absorption in the task (flow state) in adolescents. This means that higher levels of informativeness and entertainment in social networking usage were associated with a decrease in the ability to absorb in the task (flow state) in both urban and rural adolescents (β = −.80, .084).

Table 10 – Stepwise regression analysis of social media usage (dimensions) as predictor variables and absorption in the task (flow state) as a criterion variable

Predictors	*R*	R^2	Adjusted R^2	R^2 change	*Beta*	*F*	*F*-change	*t*-score
Informativeness	.806	.650	.648	.650	−.806	367.12**	367.12**	19.40**
Entertainment	.810	.657	653	.007	−.084	188.35**	4.00**	2.02*

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

Latent profile analysis

Figure 1 shows that the optimal number of profiles was determined to be 1, as it has the lowest BIC score (3301.88). After testing up to 10 profiles, results indicate that adding more profiles increased the BIC score, suggesting that the data does not support additional meaningful subgroups. In the single profile, the mean values across social media dimensions were close to zero, indicating no significant differences among participants in the dataset regarding social media dimensions (Socialization, Academic activity, Informativeness & Entertainment) and flow state (Challenges and skills, & Absorption in the task). This profile represents a generalized, average pattern of social media uses, implying that all participants in this study share a common set of behaviors or tendencies in terms of their social media use.

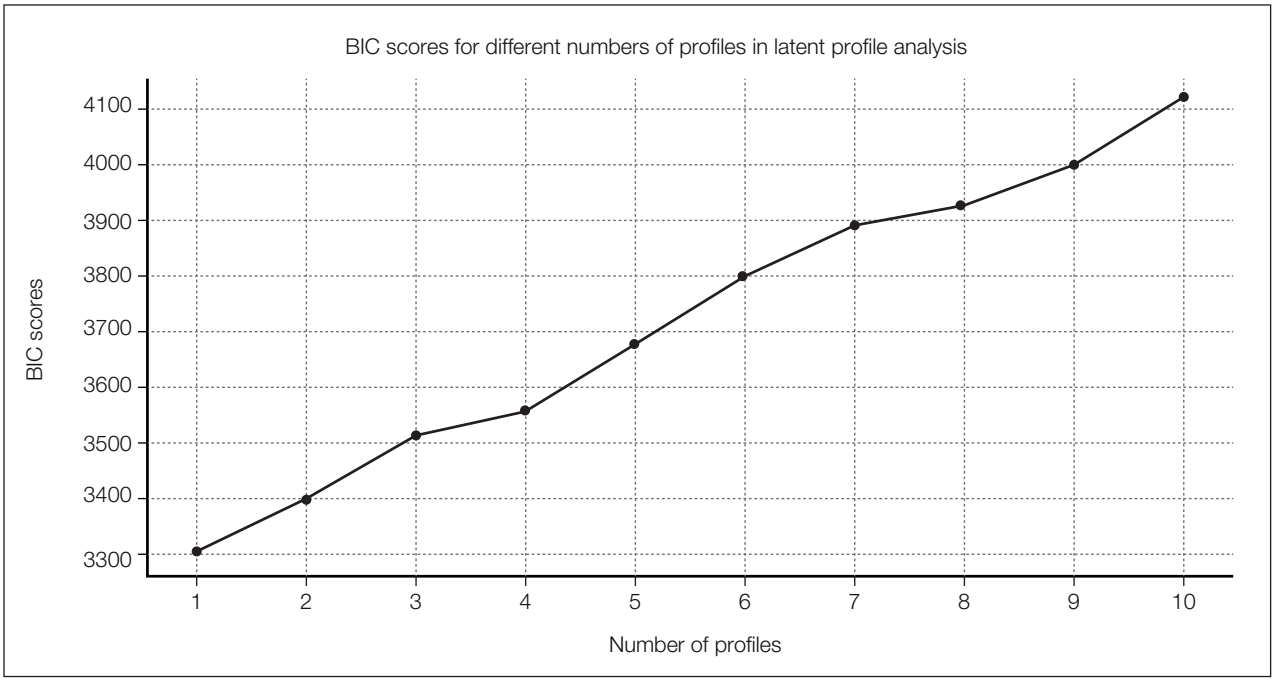
DISCUSSION

In this section the results are discussed in reference to the objectives and hypotheses of the study. Findings of the study have been discussed with the support of the earlier published studies and researchers' observation. Findings indicate that there was a significant difference in gender regarding academic activity of social networking usage. Although gender differences have also been found on different dimensions of flow-state and social networking usage but the difference were not found to be significant. Additionally, no obvious gender difference for adolescent psychosomatic symptoms was found. Previous researches that revealed active social media use had a large and beneficial impact on the sense of being in the flow is consistent with these findings. Furthermore, active social media use significantly and favorably affected academic self-efficacy (Yao et al., 2022). In contrast to the findings of the present study, it was also found that 73 per cent of students used social media for non-academic purposes, with the majority of them visiting the Facebook website. Socialization, informativeness, task engrossment, and psychosomatic symptoms were shown to be more significant in urban than rural participants when using social media, as were flow state and psychosomatic symptoms.

The results of the present study are consistent with previous studies' indicates that worries regarding the possible harm that social media (SM) use may do to adolescents' mental health is quite severe and long lasting. Concerns include the decline in in-person contacts, addiction-like behaviors, cyberbullying, peer pressure, and exposure to suicide stories on social media platforms (Baym, 2010; Bell, 2014; Kraut et al., 1998; Nie, Hillygus & Erbring, 2002; Robinson, Kestnbaum, Neustadtl & Alvarez, 2002).

On the other side, several researchers have emphasized the possible advantages of teenagers using social media. These consist of improved buddy connections, interactions with other groups that offer assistance, and chances for social contact and information access. Studies have indicated that college students who utilize the internet, including social media, report improvements in their social well-being, use of communication tools, and rise in in-person interactions and social contacts (Baym, Zhang & Lin, 2004; Kraut et al., 1998; Reid Chassiakos et al., 2016; Wang & Wellman, 2010). Overall, these findings suggest that while there are concerns about the potential negative effects of social media use, it also

Figure 1 – Scores of Bayesian information criterion (BIC) on latent profile analysis



offers opportunities for social connection and information access. The impact of social media on adolescents' mental health is a complex and multifaceted topic that requires further research and understanding.

The aim of the present research was to explore the relationship of social networking usage, psychosomatic symptom, and flow state. The findings of the study show that the dimensions of social networking use were found to be significantly correlated with psychosomatic symptoms of adolescents. Recent studies have highlighted a growing concern among medical and psychological professionals, as well as the public media, regarding child and adolescent users of audiovisual-based algorithmic social media platforms such as TikTok and WeChat. The studies have identified a troubling trend where users present with or claim functional psychiatric impairment that does not align with or fit into traditional psychiatric classifications (Haltigan, Pringsheim & Rajkumar, 2023). Regarding somatic complaints, a study conducted by Stiglic and colleagues (2022) found a correlation between higher computer use and an increased occurrence of headaches. The study specifically observed that headaches were more prevalent among computer science students compared to health science students. This suggests a potential association between excessive computer use and somatic symptoms, particularly headaches.

The regression analysis pinpointed that socialization and informativeness predicted psychosomatic symptoms. Two dimensions of social media use had a significant role in psychosomatic symptoms When taken as a whole, the studies show how teenage YouTube practices - both in terms of content production and consumption - constitute a dual process of social recognition that includes the ability to see oneself in others as figures with whom one can identify and a desire to be seen by others as valuable individuals. This connection is strengthened by the 'intimate confessional production format' as we have called it (Balleys, Millerand, Thoër & Duque, 2020). The concept of the looking-glass self is a significant component of Cooley's theory of socialization. According to this theory, self-image is formed based on perception of how others perceive us. Cooley proposed a three-step process for the construction of the self. Firstly, people develop an understanding of how we appear to others, considering their perspectives and evaluations of us. Secondly, we experience certain emotions or feelings, such as pride or embarrassment, based on our perception of how significant others perceive us. Thirdly, we imagine the

judgments or evaluations that these significant others may form about us based on their perceptions. In essence, the looking-glass self suggests that our sense of self is influenced by the perception of others and the judgments we believe they make about us. It highlights the social nature of self-formation, emphasizing the role of social interactions and the interpretations we derive from them in shaping our self-concept. Socialization in social media makes it so easy to engage in these three steps, the current trends and the number of likes define an individual's glass self. Socializing on Instagram is a kind of fake self or alternate reality of an individual, while taking a humanistic perspective we can see this as an incongruence between the ideal self and the real self and one of the study was reported that excessive use of social media is not disrupting the socialization power of an individual (Hassan, Saha, Saba, Tuhin & Das, 2019).

The study proposed a negative association between social media use and the flow state of adolescents. The dimension of socialization within social media use was found to have a significant relationship with the balance of challenges, skills and absorption in the task (both dimensions of the flow state). The regression analysis further predicted that socialization, entertainment, and informativeness would have a negative effect on the balance of challenges and skills, indicating either boredom or anxiety in the participants. Flow states, as described by Csikszentmihalyi, (2008) are states of optimal experience where challenges and skills are matched. The current study's findings of a negative relationship between the balance of challenges and skills suggest a deviation from the flow state, potentially indicating boredom or anxiety. Csikszentmihalyi's framework illustrates three regions of momentary experiences: flow, boredom, and anxiety, depending on the alignment of challenges and skills.

Flow itself is neither inherently good nor bad. It is a state that can lead to a more intense and meaningful life experience, as well as a stronger sense of self. However, flow can be achieved in both positive and potentially negative behaviors. For instance, a gambler may experience flow while playing, but eventually, the flow state will end, and the gambler is likely to lose (Csikszentmihalyi, 2008). Similarly, excessive use of social media among children and adolescents can restrict the flow state and may contribute to different mental disorders. In summary, the study suggests that social media usage can impede the flow state among adolescents, and excessive use may have negative consequences on mental well-being.

The study results suggest that the aspects of informativeness and academic engagement within social networking usage have a detrimental impact on the flow state. Moreover, the flow component of 'telepresence' on popular social media platforms such as TikTok and Instagram has been linked to increased levels of depression and anxiety. While these platforms may offer users an escape from their daily concerns, this coping mechanism may not be optimal and can contribute to mental health problems (Roberts & David, 2023).

The activation of the sympathetic nervous system, which is associated with anxiety, may be heightened by excessive social media use. The present study supports the idea that imbalances in mental health and the emergence of psychosomatic symptoms can be attributed to socialization on social media platforms. Other disorders related to social media use have been linked to sleep problems, addiction, anxiety, sex-related issues, behavioral issues, body image issues, physical inactivity, online grooming, headaches, visual problems, and dental issues. (Bozzola et al., 2022; Isham & Jackson, 2022).

The findings of the latent profile analysis (LPA) concluded that the single-profile solution suggests homogeneity in social media use patterns among the participants. This indicates that participants do not vary significantly across the observed dimensions; all groups use social media in a similar way, which in turn affects their flow state and psychosomatic issues. In other words, the dimensions selected in the study do not differentiate individuals within the participant group; instead, each group exhibits a similar pattern of social media use due to shared characteristics that were not captured by the analyzed dimensions.

Adolescent social media use should be considered seriously in terms of its socialization potential. Active participation on social media can encourage sound psychological growth, either directly or by improving the quality of friendships. It might, however, be at the expense of strained family ties and detrimental impacts on adolescent mental health. On the other hand, inaction and lack of communication can have a bad impact on friendships and family ties, causing unpleasant emotions and having a negative impact on child's healthy growth (Zhang, 2023).

The negative correlation between flow state and social media use suggests that boredom or anxiety may be present. In light of the psychosomatic symptoms observed, social media use was found to provoke anxiety in dimensions such

as stress, psychosomatic symptoms, and depression. Overall, findings highlight the importance of understanding the impact of social media use on mental health, particularly in terms of psychosomatic symptoms and the disruption of flow states. It is crucial to consider the potential negative consequences and promote healthy engagement with social media platforms, especially among adolescents.

Implications

Studies have been done on social media, flow state and its effect on depression and mental health, but there were very few studies which focus on the relationship of psychosomatic symptoms and social media use along with flow state. The study uses comprehensive analysis procedures and advanced statistical techniques. Adolescence is a major crisis beginning in the age, the turmoil of emotions may overpower them. While in a vulnerable state socializing is a challenge, which they are tackling through social media, but the effect is adverse. To control this awareness campaign may be started and naturally flow-inducing tasks should be given. Exploring one's own skillsets and polishing them will give a flow state which provides well-being. Social skills and socialization are to be taught in a practical way in a healthy manner without bullying. To enhance the student's flow state in the classroom, team flow should be maintained. Socializing in social media is to be bound with time. Innovative ideas regarding flow state are the need of the hour. Exposing to a diverse culture, encouraging students to take part in an organization so that they can make friends with those with similar hobbies. Assertiveness training should be given so that they can express themselves. A balance between offline and online socialization is needed. Increasing offline socialization can enhance well-being. Reading and creative art expressions are also required. Information overload is another villain. Application and sharing of knowledge using peer group discussions may help, as well as promoting volunteering activities. Academic activity was found to be higher in females. To enhance it, learning apps which give certain reinforcements, can condition ether gadgets to a learning platform rather than a social media user. Social media use may be restricted by implementing a written rule from the concerned government.

According to the findings, there are particular things parents can do to encourage the kids to experience more flow. They can receive feedback and have clear objectives from parents and significant others. Instead of solely concentrating on what might be advantageous to them in the distant future, parents can acknowledge what interests them right now. Parents can give kids the chance to decide what they do and to think about the effects of their decisions. Parents can motivate children to naturally provide activities they pick for their best effort. As they get older, they may be provided with opportunities to take on more difficult tasks.

Limitations

The self-report measure has been used in this study that has its own limitations, like social media use and participants could respond erroneously. The time duration of the study, sample size, and geographical location of the study might be expanded for generalization of the study.

Although the findings presented useful information but more empirical researches are required to overcome the gaps that has not been filled by this study. An experimental research design may help to explore the underlying brain mechanisms involved in a flow state. The time required for attaining flow after rewiring the effect of social media usage needs to be studied. Longitudinal study will be better. Identifying the brain mechanism involved in the socialization process helps in understanding the reward systems, which can be given in the real world.

The convenience sampling method was applied, which has limitations, such as issues with generalizability and potential researcher bias. The sample size of this study is also a concern, as it can limit the generalizability of the findings. Future studies should consider using more robust and scientific sampling methods with larger sample sizes to enhance the validity and generalizability of the findings. In this study, LPA was also applied; however, due to the small sample size, the findings of the LPA cannot be generalized.

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The Italian validation of the Stirling Child Well-being Scale

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ABSTRACT. L'obiettivo di questo lavoro è l'adattamento italiano della scala Stirling per l'assessment del benessere in età evolutiva. Il questionario è stato ideato da Liddle e Carter nel 2015 con lo scopo di misurare le dimensioni edoniche ed eudaimoniche del benessere. La validazione è avvenuta su un campione di 1130 partecipanti (540 maschi, e 590 femmine, range di età 8-13 anni) ed ha mostrato buoni indici statistici. Il questionario sembra quindi essere un valido strumento per valutare il benessere in diversi contesti (clinico, educativo) e costituisce un riferimento per la ricerca futura, dal momento che queste due componenti del benessere sono ancora scarsamente investigate, soprattutto nella loro dimensione evolutiva.

SUMMARY. The aim of the current work is to validate the Italian adaptation of the Stirling Child Well-being Scale, a questionnaire created by Liddle and Carter (2015) to assess the two psychological dimensions of hedonic and eudaimonic well-being. The questionnaire was validated on a sample of 1130 participants (540 male and 590 females, aged 8 to 13 years). It showed good fit indexes ($\chi^2(87) = 317.01$, $p<.001$, RMSEA = .048, SRMR = .045, CFI = .971, NNFI = .965), and a satisfactory reliability (Cronbach's alpha = .762). The questionnaire revealed as a useful tool to assess well-being in several contexts (such as clinical, educational) other than traditional scales created to specifically evaluate the school-related well-being. Indeed, it allows separate measurement of the two dimensions of hedonic and eudaimonic well-being, constituting a benchmark for future research and comprehension of the composition of these two components, yet to be understood, especially in children.

Keywords: *Children well-being, Hedonic dimension, Eudaimonic dimension*

INTRODUCTION

Well-being: An overview of the construct

Approximately fifty years ago, the World Health Organization (WHO, 1948) defined health as a 'state of complete physical and social well-being and not merely the absence of disease or infirmity'. However, the health indicators of our society continue to be largely focused on infirmity, disease, and negative functioning. Even the epidemiological research is often directed towards measuring the mortality or morbidity rate among the human population rather than quantifying its well-being or positive functioning.

In addition, most of the assessment tools used in psychology, sociology and medicine try to measure problems either physical (illnesses, pain, sleep disorders, symptoms), mental (cognitive malfunctioning, stress, depression, anxiety, hostility), or social (role limitations, domestic uneasiness, or sexual dysfunction). Another controversial issue which is often observed is the lack of agreement on the concept of well-being, health, and positive functioning of an individual. In fact, multiple definitions are proposed to illustrate psychological well-being and happiness (e.g., Keyes, 2002).

Different social sciences scholars have tried to understand what elements people use to positively judge their lives. This definition of subjective well-being has been labeled as 'being satisfied with life' and is based on the people's standards in determining what is positive in life. Therefore, it regards a global assessment of the quality of life of a person according to his or her own subjective criteria.

Historically, the concept of what constitutes well-being has been greatly debated, focusing on two predominant points of view: the hedonic and eudaimonic perspectives. The hedonic well-being is primarily concerned with the immediate states of pleasure and happiness; the eudaimonic is related to the actualization of human potential (Ryan & Deci, 2001). Therefore, there have been conflictual approaches among the different theorists on the concept of well-being and its measurement.

Currently, a growing consensus among researchers can be seen in the idea of what overall psychological well-being is; it comes from the combination of the two above-mentioned perspectives, i.e., hedonic, and eudaimonic. Evidence of an integrative theoretical approach has been provided by the definition of positive mental health as formulated by the World Health Organization (WHO) for which mental health is obtained when 'every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community' (1948). The concept of mental health is often used to define overall psychological well-being; the holistic vision of well-being includes both subjective well-being and overall psychological well-being.

It is useful to explore the use the WHO makes of the term positive mental health with the purpose of highlighting a key problem in today's psychology. Modern psychology is based on deficits (Springer & Hauser, 2006) and it is excessively oriented toward the study of prevention and the treatment of mental illnesses. They claim the need to understand and foster positive feelings, personalities and institutions as well as focusing on well-being as a positive dimension of the state of health. Further research on well-being has confirmed that the notion of psychological well-being may be in a different dimension from the notion of mental illness (Keyes, 2002).

The Stirling Children's Well-being Scale

The *Stirling Children's Well-being Scale* (*SCWBS*) was promoted by the Stirling Council Educational Psychology Service with the objective of creating a holistic scale, formulated in positive terms, and aimed at measuring the emotional and psychological well-being in children from 8 to 15 years of age (Liddle & Carter, 2015). The idea was that such a scale that could estimate the effectiveness of the intervention and projects aimed at fostering children's well-being may be useful as most of the tools available were focused on mental illness rather than on well-being (e.g., McDowell, 2009; Ryan & Deci, 2001). In addition, the well-being scales available were scarcely relevant to developmental populations.

To guarantee that the scale was suitable and relevant for the study of children's well-being, the items that made it up were given to children during a research trial. The items that were the result of complex interpretation or that left space for other possible interpretations by the children were changed or omitted. This served to guarantee that the originated scale could be understood by children and could be perceived as a well-being measurement tool.

The aspects identified targeted different aspects of well-being: trust, usefulness, interest in life, problem solving

skills, autonomy, positive relations, thinking clearly and creatively, energy, happiness and optimism (Ryan & Deci, 2001). Fifteen items compose the scale. Every item consists of a statement expressed in first person that was representative of a component of the mental well-being structure, formulated with words easily understandable by an 8-year-old child. The answers were evaluated on the Likert 5-point scale from 1 (never) to 5 (always). The tendency to give a series of same answers in a mechanical manner, without pausing on the significance of the questions, was more prevalent in younger children even though the studies carried out demonstrated that such a tendency could be a prejudicial factor only for children under the age of eight (Liddle & Carter, 2015).

The original scale developed by Liddle and Carter in 2015 shows good internal reliability with a Cronbach' alpha of .847; the construct validity was assessed by a Pearson correlation with the WHO scale (positive correlation above .7) and the Dubois self-esteem scale (strong positive correlation of .69). The analysis showed a strong significant correlation between the initial scores and the retest scores ($r = .752$, $p<.01$) showing that the scale had good external reliability. No additional factorial analyses were conducted.

In Italy, a few studies have been conducted that focused on social well-being considering separately adolescents and young adults (e.g., Cicognani, Berti & Albanesi, 2001) and elders (e.g., Zambianchi & Ricci Bitti, 2013). Results showed on average low levels of social well-being and significant gender differences, with a level of perceived social well-being higher in males than females.

In a study involving Italian students from primary school and middle school, variations in the scholastic well-being have been analyzed. Tobia, Greco, Steca and Marzocchi (2019) used the questionnaire on scholastic well-being, considering the students' gender and age. Results showed that females report to be more satisfied than males about their school achievement and relationship with their teachers. In addiction, girls showed higher levels of negative emotions (such as anxiety and sense of guilt) compared to males when facing evaluation tasks. Comparing students from primary and secondary school, a significant difference in the perceived scholastic well-being was observed: well-being decreases as students age.

Preliminary research using the SCWBS in the Italian context was conducted by Sacchi, Artuso and Palladino (2022) on middle school children (aged 11 to 13 years) to examine the relationships between their perceived well-being and several components of learning and study skills. Results showed that perceived well-being reduces significantly with age in middle school children; indeed, eight graders showed a well-being few points lower than both sixth and seventh graders. This result confirms previous data with Italian students tested on school well-being (Tobia et al., 2019), showing a decrease in well-being score with age, especially in females. This result may be explained considering the critical step that is taken during this period of middle school, from childhood to early adolescence, a period where negative effects on self-esteem, self-efficacy, motivation, and social relationships are often observed (Konu & Lintonen, 2006).

Aim of the study

The aim of the present study was to test the psychometric properties of the Stirling scale/questionnaire in a sample of Italian children (aged 8 to 13 years), and to contribute to the literature on well-being conceptualization (hedonic *vs* eudaimonic well-being). Specifically, we aimed to test the three-factor solution which corresponded to the factor structure indicated in the original scale. Once the factorial structure was established, we assessed the validity of the scale correlating the performance on the scale with the performance of the AMOS scale, an Italian instrument aimed to assess study approach.

METHOD

Participants

Children were recruited through local mainstream primary and uppers secondary school programs (Grade 3 to Grade 8). The final sample included a total of 1130 children (540 male and 590 females; $M_{age} = 10.56$, $SD = 1.66$).

Schools were in Northern Italy. After collecting informed consent, the questionnaire was collectively administered at schools by Master students of Psychology, at the University of Pavia. The student in charge of data collection introduced the session explaining the general topic of the questionnaire. Then, it was administered. No time limit was contemplated so that each child could complete the questionnaire on her/his own pace. The session lasted about 15 minutes.

Measures

– *Stirling Children's Well-being Scale (SCWBS)*. In agreement with the authors, we have translated the scale from English to Italian. Following the procedure, the items of the questionnaire have been first translated into Italian; then, the items have been submitted to five bilinguals Italian-English individuals who have re-translated the items in English, without knowing the original version. Following this step, a few items have been modified and tested one more time, to ensure the better correspondence English-to-Italian. The SCWBS measures psychological well-being, in particular positive aspects of well-being (in opposition to negative/deficit aspects). The SCWBS is composed of 15 items measured on a 5-points Likert scale (i.e., 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always).

  Each participant is asked to carefully read each item and reflect about how s/he felt or has been thinking about it in the last two weeks. The minimum score is 12, the maximum score is 60. According to the original study (Liddle & Carter, 2015) the 15 items are divided in 3 subcomponents: the items 1, 3, 4, 5, 6, 8, examine the *eudaimonic* dimension of well-being. The items 9, 10, 11, 12, 14, 15 investigate the *hedonic* dimension of well-being. The three remaining items (2, 7, 13) are a control of *social desirability*. See Appendix for the Italian version.

– *Questionnaire on Study Approach (QAS).* This short questionnaire is taken from the AMOS battery (Cornoldi, De Beni, Zamperlin & Meneghetti, 2005), a comprehensive battery devised to study motivational aspects of learning. The student is required to read and analyze a series of information that describe possible study behaviors and then asked to express how much these correspond to her/his personal behavior, study method and study approach. The questionnaire employs a three-point Likert scale, from 1 = little true; 2 = true; to 3 = very true). The participant is requested to describe how s/he feels, that not necessarily identifies how s/he really is. Indeed, the questionnaire is a metacognitive one as it evaluates knowledges and subjective beliefs.

  The 49 items in the QAS refer to 7 fundamental areas that are typical of a good approach to study. Both partial scores (for each of the 7 areas) and a global score (summing up the 7 subscales) can be calculated:

1. Being motivated and interested to learn (motivation);
2. Being able to plan times and study modalities (personal work organization);
3. Being able to take on an active and strategic attitude to learning (strategic processing);
4. Being aware of the different study methods (study flexibility);
5. Being able to focus on the task removing distractions (concentration);
6. Manage school anxiety via self-regulation strategies (anxiety);
7. Consider school in a positive way, as a learning and socialization environment (attitude towards school).

   The QAS gives back partial scores (to accurately assess each of the 7 areas) and a global score (that allows a fast and easy evaluation of the study approach).

Statistical analyses

The R program (R Core Team, 2024) with the 'lavaan' library (Rosseel, 2012) was used. Model fit was assessed using various indices according to the criteria suggested by Hu and Bentler (1998). Since the test included ordinal values (answers at the scales were provided in Likert formats), we used the ordered function in lavaan, which provides correlations for ordinal variables, add thresholds and the mean structure to the model, use DWLS as the estimator, set standard error to robust, and report robust fit measures. Robust statistics were reported, the chi-square (χ^2), the Comparative Fit Index (CFI), the Non-Normed Fit Index (NNFI), and the Root Mean Square Error of Approximation (RMSEA). Chi-square difference test ($\Delta\chi^2$) was used for testing the difference between alternative models. It is worth noting that the robust difference test is a function of two standard statistics and is calculated using standard (not robust) chi-square values. Confirmatory factor analysis was used to ascertain the number of dimensions.

Once the factorial structure was established, we calculated the reliability using Cronbach's alpha. The validity of the scale was assessed correlating the performance on the scale with the performance of the AMOS scale.

RESULTS

Table 1 shows descriptive statistics for the sample.

Table 1 – Descriptive statistics: mean age (years; months, number of participants by gender and total sample numerosity by school grade)

Grade	*M* age	Female	Male	*N*
Third	8; 00	89	77	166
Fourth	9; 00	98	95	193
Fifth	9; 9	92	95	187
Sixth	11; 00	105	98	203
Seventh	12; 00	96	90	186
Eight	12; 9	110	85	195

Confirmatory factor analysis (CFA)

In the first model, a one factor solution was included. The fit was adequate, $\chi^2(90) = 479.86$, $p<.001$, RMSEA = .062, SRMR = .055, CFI = .951, NNFI = .943. We then went forward testing a three-factor solution, which corresponded to the factor structure indicated in the original scale. The model fit was satisfactory, $\chi^2(87) = 317.01$, $p<.001$, RMSEA = .048, SRMR = .045, CFI = .971, NNFI = .965. This model was also statistically superior as compared to the one factor solution, $\Delta\chi^2(3) = 142.03$, $p<.001$. Factor loadings and correlations were all positive and statistically significant (see Table 2). Based on these results, the factor structure of the instrument was confirmed.

Reliability

As performed in the original report (Liddle & Carter, 2015), we calculated the reliability of the overall scale, Cronbach's alpha = .762, which was satisfactory.

Table 3 shows the correlations between the total of the Stirling scale with the various subscales of the AMOS, except for Study flexibility that showed correlations weak and closed to 0. These results showed that the scale has a good predicting value in predicting different attitude toward study, in particular study organization, motivation, concentration and a general positive consideration towards school. In addition, high scores in the well-being scale are negatively related to anxiety.

DISCUSSION

In the present study, the Italian adaptation of the SCWBS is proposed. Confirmatory factor analyses showed the validity of the structure proposed by the authors of the original scale (Liddle & Carter, 2015), and not yet demonstrated. Results also showed a good reliability of the instrument, with significant positive correlations to different study-related variables, such as motivation, organization and concentration. In addition, a negative significant correlation with anxiety also confirms the goodness of the scale.

The high correlations between well-being and study-related variables clearly highlight the association between psychological well-being and attitude towards study, to indicate that they are linked to each other, as expected, according to previous studies and theoretical models on the relation between emotion and academic achievement (see Pekrun, Goetz, Titz & Perry, 2002; Quinlan, 2016). According

Table 2 – Factor correlations and factor loadings for the three factors solutions

	Factor 1	**Factor 2**	**Factor 3**
Factor loading matrix			
Item 1	.663		
Item 3	.407		
Item 4	.419		
Item 5	.485		
Item 6	.402		
Item 8	.579		
Item 9		.549	
Item 10		.564	
Item 11		.589	
Item 12		.539	
Item 14		.676	
Item 15		.652	
Item 2			.400
Item 7			.505
Item 13			.441
Interfactor correlation matrix			
Fact01	1		
Fact01	.742	1	
Fact02	.552	.843	1

Note. All values are statistically significant with $p<.001$

Table 3 – Inter-correlations between the SCWBS and the AMOS scores

	1	2	3	4	5	6	7	8
1. Stirling total	1							
2. Study motivation	.363**	1						
3. Study organization	.445**	.460**	1					
4. Strategy use	.143**	.243**	.183**	1				
5. Study flexibility	.008	.000	.019	.175**	1			
6. Concentration	.468**	.564**	.552**	.187**	−.041	1		
7. Anxiety	−.266**	−.221**	−.162**	−.047	.075*	−.276**	1	
8. Attitude towards school	.469**	.438**	.457**	.105*	−.073*	.563**	.172**	1

Note. N = 1,130.
* p<.05; **p<.01

to the control-value model of Pekrun and colleagues (2002), highest correlations were obtained between well-being and study-related variables that indicate better control on the study activities: concentration, study organization, and attitudes towards study. On the other hand, the negative correlation observed between well-being and anxiety during study, supported the role of emotions as hypothesized in the same model.

Well-being may thus represent a key factor to better understand the relationship between emotions and learning attitude or academic achievement as well as strategy use and effective task control as well as emotions involved. In a developmental period, such as middle childhood, it seems crucial to focus on psychological well-being and being able to measure it, to fully understand it as well as to develop specific interventions to boost well-being in relation to other variables (such as cognitive, metacognitive, emotional-motivational, e.g. Artuso, Carretti & Palladino, 2019).

In a recent review O'Mahony (2022) suggests that well-being should be approached from a holistic multidimensional perspective, that is context- and value- dependent, with a crucial role for social and relational dimensions. We believe the current scale could contribute to investigate and develop this holistic account, in line both with the WHO definition of well-being (1948) and the original purpose of the authors (see Liddle & Carter, 2015).

Among the limitations, the sample was all from Northern Italy, we did not collect data in Central or in Southern Italy, so for future studies it would be useful to have samples from other regions, though we did not anticipate differences based on dwelling place. Among future aims, we plan to integrate the data collected with clinical samples, to demonstrate the usefulness of the scale and its efficacy beyond learning-related variables. In addition, it would be worth to correlate the questionnaire to other scales that measure well-being in different contexts.

In sum, the scale allows separate measurement of the two dimensions of hedonic and eudaimonic well-being, constituting a benchmark for future research and comprehension of the composition of these two components, yet to be understood, especially in children. The scale appears promising at measuring a construct related to general well-being. Here, in the validation study, we have specifically investigated the relationship to study success and study-related behaviors, as well as study-related emotions

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APPENDIX

Original statements and Italian translation

Item	Original version	Italian translation
1	I think good things will happen in my life	Penso che accadranno belle cose nella mia vita
2	I have always told the truth	Ho sempre detto la verità
3	I've been able to make choices easily	Sono riuscita/o facilmente a fare delle scelte
4	I can find lots of fun things to do	So trovare molte cose divertenti da fare
5	I feel that I am good at some things	Mi sento di essere brava/o in alcune cose
6	I think lots of people care about me	Credo che parecchie persone si interessino a me
7	I like everyone I have met	Mi piace ogni persona che ho incontrato
8	I think there are many things I can be proud of	Credo che ci siano molte cose di cui posso essere orgogliosa/o
9	I've been feeling calm	Mi sono sentita/o calma/o
10	I've been in a good mood	Sono stata/o di buon umore
11	I enjoy what each new day brings	Mi piace ciò che ogni nuova giornata porta
12	I've been getting on well with people	Sono andata/o d'accordo con le persone
13	I always share my sweets	Condivido sempre le mie caramelle
14	I've been cheerful about things	Mi sono sentita/o serena/o nei confronti delle cose
15	I've been feeling relaxed	Mi sono sentita/o rilassata/o

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Measuring energy in team: The Italian validation of Team Boosting Behaviors scale

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ABSTRACT. Lo studio propone la validazione della versione italiana della scala di Team Boosting Behaviors. Formata da 18 item, misura tre comportamenti diversi: Mood-enhancing, riguarda l'uso dell'umorismo per migliorare il clima nel team; Energizing, ovvero proporre idee e inventare giochi per superare i momenti noiosi; e Uniting, focalizzati sulla costruzione di relazioni tra i membri del team. La ricerca ha coinvolto un campione di 426 dipendenti italiani. I risultati confermano la versione italiana come uno strumento valido e affidabile nella valutazione di questi comportamenti rivolti a migliorare il clima nel team di lavoro, comportandosi come un booster di risorse nell'ottica della Job demand-resources theory.

SUMMARY. Team Boosting Behaviors (TBBs) are defined as energetic and positive actions that aim to enhance mood, energize colleagues, and foster team unity. Reflecting the concept of 'the life of the party', TBBs are assessed using the Italian version of the TBBs scale, which comprises 18 items measuring three distinct dimensions: Mood-enhancing behaviors, Energizing behaviors, and Uniting behaviors. This study sought to validate this Italian version of the TBBs scale using the Job demands-resources model. The sample consisted of 426 Italian employees who completed an online questionnaire. Most participants worked in the private sectors with a permanent contract. The average organizational tenure was about of 11 years. Confirmatory factor analysis, via structural equation modelling, supported the three-dimensional structure of the TBBs scale and demonstrated its empirical distinctiveness from organizational citizenship behaviors (OCBs), thus confirming its discriminant validity. Correlation analyses revealed that Mood-enhancing, Energizing, and Uniting behaviors were positively associated with altruism, civic virtue, and conscientiousness. These findings indicate that the Italian TBBs scale is a reliable and valid tool for evaluating these behaviors in the workplace. While the scale does not directly influence organizational climate or performance, it provides a useful instrument for monitoring and promoting positive group dynamics and improving organizational processes.

Keywords: *Team boosting behaviors, Soft skills, Validation*

INTRODUCTION

Soft skills, or transversal competencies, are gradually more recognized as essential elements for personal and professional success. However, the limited number of validated tools can be a hindrance to measure some of these skills in Italy, requesting relevant efforts for individuals, educational institutions, companies, and the labor market as a whole.

Built on the fundamental concept that a team surpasses the combined abilities of its individual members, previous studies often highlighted processes and outcomes at group level (Kozlowski & Klein, 2000; Li, Zhao, Walter, Zhang & Yu, 2015). Nevertheless, the effectiveness of teamwork remains heavily dependent on the unique contributions of individuals within the team. Essentially, the qualities and behaviors of everyone serve as the foundational elements of teamwork (Mathieu, Maynard, Rapp & Gilson, 2014). The individual contributions may not be evenly distributed among all team members, as certain individuals can wield a distinctive impact, capable of either making or breaking the team.

In this regard, positive energy plays a pivotal role in the success of a team (Felps, Mitchell & Byington, 2006); it becomes essential to pinpoint behavioral expressions that can elevate the team's morale and that of its members (i.e., energy at work). To meet this need in the working world, Fortuin and colleagues (Fortuin, Van Mierlo, Bakker, Petrou & Demerouti, 2021) introduced a new concept, named Team Boosting Behaviors (TBBs), identified in the idiom 'the life of the party'. The formal definition of the life of the party centers on attributes of liveliness, enjoyment, and social influence, more specifically, TBBs are defined as energetic, mood enhancing, and uniting behaviors, directed towards fellow team members (Fortuin et al., 2021). TBBs are referred to the term boosting, meaning to arouse enthusiasm or to vigorously promote (American Heritage Dictionary of the English Language, 2020). In other words, TBBs effectively capture the energy and positivity inherent in the behaviors exhibited by party life (Fortuin et al., 2021). The inclusion of team emphasizes the interpersonal aspect of these behaviors and aligns with our emphasis on team contexts.

Individuals embodying these qualities have the ability to brighten social gatherings with their contagious energy. Their pronounced impact on the social ambiance underscores their potential significance as key contributors to team dynamics. Moreover, the terms 'lively' and 'amusing' associated with being the life of the party highlight energetic, positively oriented social behaviors capable of eliciting favorable emotional responses, igniting enthusiasm, and cultivating a positive and motivating environment. People with high TBBs tend to be proactive on lifting the team's mood, infusing energy, and bringing the team together, with considerable potential to contribute to teamwork engagement (Costa, Passos & Bakker, 2014). The energizing emotions and the active social behaviors may spark energy and enthusiasm in the team and may indirectly contribute to the team's performance. Despite its recognized significance, this phenomenon has thus far evaded scientific scrutiny, leaving the specific behaviors it entails and their implications for team functionality and effectiveness yet to be fully explored (Fortuin, Bakker, Van Mierlo, Petrou & Demerouti, 2023).

TBBs can be situated within the broader literature by considering several key attributes (Fortuin et al., 2021). TBBs align with individual behaviors that can be linked to early research on dimensions of individual behavior in social interaction (Durlauf, 2001). Three dimensions have been highlighted, with slight variations in terminology: dominance, positive expressiveness, and social orientation (Driskell, Driskell, Burke & Salas, 2017). Dominant behaviors exude assertiveness and energy. Positive expressiveness includes spontaneous, playful, and group-oriented behaviors rather than those focused solely on efficient task performance. Finally, social orientation involves warm interpersonal behaviors that aim to bond with others. Based on these universal dimensions of interpersonal behavior, TBBs can be characterized as dominant, sociable, and positively expressive. In addition, these behaviors can exert bottom-up effects on the entire team, and if these behaviors are demonstrated consistently and at high intensity for extended periods, they can greatly improve team dynamics and performance. It is important to identify and cultivate these behaviors among team members to foster a positive and productive work environment.

Moreover, TBBs are conceptually linked to various individual traits and actions, including those exhibited by extra milers. Li and colleagues (2015) introduced the concept of extra milers to describe the behaviors of team members who willingly 'go the extra mile', offering assistance and voicing their opinions. Their study revealed a positive correlation between average helping and voicing behaviors and team-level monitoring, supportive actions, and overall team performance (Li et al., 2015).

Many modern organizations encourage workplace fun, assuming that play and enjoyment during work may have positive implications for the well-being of individual employees and the performance of organizations as a whole (Caracuzzo, Caputo, Callea, Cortese & Urbini, 2024; Lamm & Meeks, 2009). In fact, in today's fun-oriented and distracting work environments, the question is whether TBBs are more valuable when they are aligned with the prevailing team climate/environment or when they add something that the team lacks and may need (Fortuin et al., 2023).

Recent studies have investigated how individual team members can collectively enhance their team's efforts through the practice of TBBs, encompassing mood-enhancing, energizing, and uniting actions. These behaviors aim to cultivate a positive team atmosphere rather than solely concentrating on tasks, goals, or strategic objectives. Given the positive association between teamwork engagement and performance, TBBs hold significant potential for contributing to organizational success. Additionally, they prove to be particularly advantageous when they align with the overall ethos of the team, especially in environments characterized by a fun-oriented and open-to-distraction mindset. Overall, TBBs represent a promising avenue for enhancing team engagement and are expected to become increasingly vital in modern work settings (Fortuin et al., 2023). Hence, our objective has been to validate a measurement tool for this construct, enabling scientific exploration of the impact these behaviors exert within teams.

The Team Boosting Behaviors scale

Starting from interpersonal behaviors conceptualization, the Team Boosting Behaviors (TBBs) scale has been recently developed and validated (Fortuin et al., 2021). In the original validation paper by Fortuin and colleagues (2021), a formal definition of the construct was developed, critical TBBs were identified (Study 1) and, finally, a questionnaire to measure TBBs (Studies 2 and 3) was designed. Study 1 produced three behavioral dimensions that, together, defined TBBs as the extent to which team members exhibit: mood-enhancing, energizing, and uniting behaviors, directed towards other team members. Firstly, mood-enhancing behaviors are characterized by actions such as using humor and adopting a positive perspective on team functioning (Fortuin et al., 2021). Individuals engaging in mood-enhancing behaviors often employ humor, share amusing anecdotes, and reframe negative team events into positive ones. These behaviors underscore the spontaneous and somewhat impulsive nature of mood-enhancing actions, which prioritize social dynamics over task-oriented activities within interpersonal behavior dimensions.

Secondly, energizing behaviors are defined as actions that invigorate the team through energetic initiatives, such as organizing team activities and suggesting innovative ideas to surpass previous achievements (Fortuin et al., 2021). Team members exhibiting energizing behaviors may propose engaging games or initiate friendly competitions during lulls, serving as catalysts for change and innovation. These behaviors position individuals at the forefront of dominance and assertiveness within interpersonal dynamics. Lastly, uniting behaviors are characterized by their emphasis on sociability and fostering togetherness among team members. These actions involve inclusive participation in group activities, facilitating relationships through informal conversations, and showing genuine interest in the interests, work, and personal lives of all team members. Uniters prioritize building camaraderie and strengthening bonds within the team, fostering a sense of unity and cohesion (Fortuin et al., 2021).

The purpose of the Study 2 was to develop a self-assessment tool to measure team empowerment behaviors and its factorial validity (Phase 1). Individual TBBs were assessed through an initial set of 39 items. The result of the exploratory factor analysis suggested selecting 18 items, reflecting the hypothesized three-factor structure (mood-enhancing, energizing, and uniting behaviors). Furthermore, in the same study Fortuin and colleagues (2021) examined the conceptual links between the three dimensions of TBBs and related constructs. The results suggested that the associations were stronger for constructs that reflected behaviors (e.g., personal initiative), which are closer to TBBs, than for more distant, trait-like constructs (e.g., trait activity). Therefore, conceptual linkages showed that TBBs are consistently related to several individual characteristics and behaviors, which can be qualified along the team pathway.

In Study 3, CFA results supported the three-factor structure of the TBBs scale. Furthermore, criterion validity was examined based on correlations of TBBs with conceptually related team variables. TBBs were found to be positively correlated with affective and performance indicators of team effectiveness, indicating good validity of

criteria. Overall, the results confirmed the reliability and factorial, convergent, and criterion validity of the TBBs scale.

Aims of the study

In the present study, we aim to validate the Italian version of the TBBs. Firstly, we examined the factor structure, expecting alignment with mood-enhancing, energizing, and uniting behaviors. Secondly, we assessed psychometric properties through item-total correlations and reliability, anticipating strong reliability across the three dimensions. Finally, we explored the relationship between TBBs and Organizational citizenship behaviors (OCBs), expecting conceptual and empirical differentiation. The perspective of TBBs (Fortuin et al., 2021) posits that employees wield a considerable impact on the social milieu, emphasizing their potential significance as pivotal components in group dynamics (Costa et al., 2014). This aligns with discretional individual behaviors, not directly or explicitly recognized by the formal reward system, but which on the whole promote the effective functioning of the organization, exemplified by OCBs as proposed by Organ (1988). The relationship between TBBs and OCBs is rooted in how employees go beyond their formal job requirements to support team success. Social exchange theory (SET) (Blau, 1964) may explain this relationship. According to SET, individuals in a team or organization are motivated to engage in helpful and supportive behaviors based on the reciprocal exchange of benefits. Applied to the present study, we propose that when team members feel supported, respected, and valued, they are more likely to give back to the team these positive feelings through behaviors, both TBBs and OCBs. While TBBs specifically target team success by enhancing morale, cooperation, and team functioning, OCBs have a broader scope, encompassing actions that benefit the organization as a whole without necessarily improving the immediate team climate or dynamics. Thus, the perspective operates under the premise that TBBs prompt energizing emotions and proactive social behaviors by employing into the energy and enthusiasm within the team, thereby indirectly contributing to team performance (Durlauf, 2001).

Given the growing scientific interest in workplace energy and the absence of an Italian measure on this subject, our study seeks to validate the Italian version of the TBBs. This endeavor aims to address this gap, fostering more empirical research on TBBs in Italy, including its antecedents and outcomes.

METHOD

Translation and administration procedure

For the translation procedure from English to Italian, we followed the recommendations of Beaton and colleagues (Beaton, Bombardier, Guillemin & Ferraz, 2000) through three steps: (1) forward translation and adaptation of the original scale from English to Italian; (2) back translation; (3) revision committee. After the original 18-item English version of the TBBs scale (as presented by Fortuin and colleagues, 2021) was translated into Italian by two experts in work psychology and methodology, the first Italian version was retranslated into English by a bilingual psychologist. Once checked that there were no substantial differences between the final Italian version and the original English version, the final step involved a committee that agreed on the final Italian version.

The present study was part of a research project entitled 'Productive Energy Measure (PEM): A new assessment questionnaire', approved by the Ethics Committee of LUMSA University in Rome in May 2024.

A snowball sampling technique for recruiting participants in this study was used. Snowball sampling is a non-probability sampling method; participants were personally contacted via email by three researchers, according to the proximity, availability, and accessibility criteria. The inclusion criteria were: (a) age>18 years old and (b) employed in an organization. Each respondent was asked to invite other people to fill the questionnaire, and so on.

Regarding the administration procedure, data were collected through an online questionnaire on Google form. Each participant received a link to the questionnaire; the first page stated the research aims and asked them to answer with complete sincerity. Moreover, participants were informed that they voluntarily and anonymously took part in the study after reading and approving its general objectives and the informed consent before completing the questionnaire. The questionnaire required approximately 10 min to complete. Data collection began in May 2024 and ended in July 2024.

Participants

The sample consisted of 426 Italian employees (42.01% males; 57.76% females; .23% missing). Regarding age, the highest percentage of participants was aged 26-35 (42%), compared to others age range, that were, 18-25 (15%), 36-45 (10%), 46-55 (19%), 55-65 (13%) and more than 56 years old (1%).

In regards to educational attainment, 2% completed the compulsory school, 38% had a high school degree, and the remain of the sample had a University degree (i.e., 55.3%) or higher qualification (i.e., 4.7%). The average organizational tenure was about of 11.05 years (*SD* = 10.90). Participants worked mostly in the private sectors (65.3%), compared to public sector (34.7%). Most participants (86%) worked under permanent contracts and 14% were employed on a temporary basis. With regard to organizational size, 53% worked in organizations with more 250 employees, 12% worked in organizations composed from 50 to 250 employees, 23% worked in organizations composed from 10 to 50 employees, and 12% worked in organizations with less than 10 employees.

Participants worked within team equally distributed by number, that were team with less five components (34%), from six to ten components (32%), and more than ten components (34%). The age and team size variables have been codified in dummies to test the invariance measurement. More specifically, for gender dummy variable was male (0) and female (1), while team size was codified as follow: 'less five components' and 'from six to ten components' (0), and 'more than ten components' (1).

Measures

Team Boosting Behaviors (TBBs). Team Boosting Behaviors were evaluated using the Italian version of the TBBs scale. As in its original version (Fortuin et al., 2021) the scale consists of 18 items, measuring three distinct dimensions: Mood-enhancing behaviors, Energizing behaviors and Uniting behaviors. Each dimension was assessed by six items on a 7-point frequency scale, ranging from 0 = almost never to 6 = almost always. The Italian and English versions of the TBBs are presented in Appendix.

Organizational citizenship behaviors (OCBs). Organizational citizenship behaviors was assessed using 15 items from the Italian version of Podsakoff et al.'s (Podsakoff, MacKenzie, Moorman & Fetter, 1990) questionnaire (Argentero, Cortese & Ferretti, 2008). Unlike the original scale, the Italian version of the questionnaire emphasized the three areas most frequently described in the literature to explain and analyze OCBs: Altruism, measured by 6 items (e.g., "willingly help others who have work-related problems"); Civic virtue, measured by 5 items (e.g., "I respect company rules and policies even when no one is watching me"); and Conscientiousness, measured by 4 items (e.g., "I attend functions that are not required, but help the company image"). Participants were asked to evaluate each behavior using a 7-point Likert scale, ranging from 1 = it doesn't describe me at all to 7 = it describes me completely, consistent with Podsakoff et al.'s (1990) questionnaire. The Italian version of the scale showed good psychometric properties (e.g., Urbini et al., 2023). In the present study this measure is reliable for each dimension: Altruism (McDonald omega of .92); Civic virtue (McDonald omega of .86); Conscientiousness (McDonald omega of .86).

Data analysis

Firstly, descriptives and reliabilities (i.e. internal consistency) of the 18 items of TBBs scale and related dimensions were performed using statistical analysis software jamovi (version 2.3).

Secondly, in order to test confirmatory factor structure and measurement invariance of the TBBs scale in the Italian work context, we used linear structural equation models (SEM) via the M-PLUS package (version 8.53). To verify and confirm the factorial structure of the Team Boosting Behaviors scale, a confirmatory factor analysis (CFA) was performed on the data set to identify the best factorial model to fit the data. Thirdly, a series of multigroup confirmatory factor analysis (MGCFA) were tested on the entire sample in order to investigate whether the factor model showed measurement invariance and could be generalized across gender and team size. Following the guidelines and recommendations suggested by Cheung and Rensvold (2002), invariance analyses were performed applying parameter constraints in different step models to examine potential decreases in fit within the groups reported above. A configural invariance model (i.e., no constraints of the unstandardized item factor loadings) was initially tested, then a metric invariance model (i.e., all item factor loadings were constrained equal across groups)

and lastly a scalar (i.e., all factor loadings and intercepts were constrained equal across groups) and measurement (i.e., all measurement errors were constrained equal across groups) invariance model were examined.

Several indices were used for CFA and MGCFA to verify the goodness of fit of the TBBs scale in the Italian context, including the χ^2, the Root Mean Square Error of Approximation (RMSEA) (Steiger, 1990), the Standardized Root Mean Square Residual (SRMR) (Jöreskog & Sörbom, 1982), the Comparative Fit Index (CFI) (Bentler, 1990) and the Tucker-Lewis Index (TLI) (Tucker & Lewis, 1973). A model is usually considered reaching a satisfactory level of goodness of fit when RMSEA is lower than .08. Values of SRMR close to .06 are indicative of a good fit; values between .07 and .08 are considered a moderate fit; and values between .08 and .10 are indicative of a marginal fit. For the CFI and TLI indices, higher values demonstrate better adaptation. Values above .95 indicate very good adaptation; values between .90 and .95 indicate marginally acceptable adaptation; and values below .90 indicate poor adaptation. Also used were the χ^2 and chi-square difference tests ($\Delta\chi^2$) values, presented among the competing models, which assume multivariate normality and are sensitive to sample size. Specifically, a significant $\Delta\chi^2$ suggests rejecting the null hypothesis of invariance (Cheung & Rensvold, 2002), whereas a non-significant $\Delta\chi^2$ is an indicator that the hypothesis of measurement invariance cannot be rejected.

Finally, divergent validity was investigated using a comparison with alternative models, combining TBBs dimensions with Organizational citizenship behaviors (OCBs) dimensions via the M-PLUS package (version 8.53). More specifically, to investigate the divergent validity, i.e., how TBB scale diverges from another similar construct as the OCBs, the hypothesized measurement model with six distinct latent factors (Mood-enhancing behaviors, Energizing behaviors, Uniting behaviors, Altruism, Civic virtue, and Conscientiousness) was compared via a series of competitive models using the $\Delta\chi^2$ test.

RESULTS

Descriptive statistics and reliability

An item analysis, i.e., means, standard deviations, skewness, and kurtosis were assessed in order to evaluate the goodness of fit of the items in the Italian version (see Table 1). The item analysis showed that items had no extreme means and standard deviations close to zero; furthermore, no item violated normality assumptions, showing skewness and kurtosis values between −2 and +2 (Kline, 2011).

As the assumption about the equivalence of factor loadings may be not supported, reliability was assessed via coefficient omega (McDonald, 1970) rather than Cronbach's alpha coefficient. The coefficient omega was computed for each dimension of the TBBs scale to test reliability and showed excellent internal consistency: Mood-enhancing behaviors = .93, Energizing behaviors = .93, and Uniting behaviors = .92. Furthermore, corrected item-total correlations are between .72 and .86 for Mood-enhancing behaviors, .72 and .82 for Energizing behaviors, .71 and .85 for Uniting behaviors. In sum, these results show good psychometric properties for the 18 items of the TBBs scale and good reliability of each factor.

The descriptive statistics, skewness and kurtosis of the 18 items and reliability for each dimension are reported in Table 1.

Confirmatory factor analysis

The factorial structure proposed in the original version of TBBs scale (Fortuin et al., 2021), composed by Mood-enhancing behaviors, Energizing behaviors, and Uniting behaviors fits with the Italian sample. The three factors overall explained 82.4% of the total variance and all factor loadings (Table 1) were higher .32 (Tabachnick & Fidell, 2014).

In this study, indices indicated acceptable to good fit to the data for the three-factor solution, except for the RMSEA. The following fit indexes were obtained: [χ^2 (132) = 779.94, SRMR = .04, RMSEA = .11, CFI = .91, TLI = .90]. As reported, RMSEA showed a not-so-good fit (Browne & Cudeck, 1992; Little, 2013). However, as noted by Lai and Green (2016) the problem of inconsistent fit indices is not uncommon in applications of SEM, especially between RMSEA and CFI. When these two indexes are inconsistent it does not mean a diagnosis of particular problems in model specification or data (Lai & Green, 2016).

Table 1 – Psychometric properties and reliabilities of TBBs scale

Dimensions	Item	*M* (*SD*)	Skewness	Kurtosis	λ	C_{it}^{c}	ω-i	ω total
Mood-enhancing behaviors (MEB)	MEB1	4.43 (1.58)	−.94	.10	.81	.75	.93	
	MEB4	4.39 (1.10)	−.89	−.15	.86	.83	.92	
	MEB7	3.97 (1.59)	−.63	−.18	.89	.86	.91	
	MEB10	4.32 (1.52)	−.99	.38	.91	.86	.91	
	MEB13	3.65 (1.74)	−.50	−.70	.75	.72	.93	
	MEB16	3.77 (1.69)	−.62	−.45	.80	.76	.92	
								.93
Energizing behaviors (EB)	EB2	3.87 (1.52)	−.57	−.25	.80	.79	.91	
	EB5	3.73 (1.52)	−.49	−.24	.80	.80	.91	
	EB8	4.47 (1.53)	−.99	.29	.75	.72	.92	
	EB11	4.05 (1.55)	−.72	−.26	.84	.80	.91	
	EB14	3.91 (1.55)	−.69	−.18	.88	.82	.91	
	EB17	3.81 (1.61)	−.65	−.35	.85	.79	.91	
								.93
Uniting behaviors (UB)	UB3	4.20 (1.58)	−.82	.07	.85	.80	.91	
	UB6	4.25 (1.56)	−.83	.06	.90	.85	.90	
	UB9	4.50 (1.46)	−1.06	.59	.80	.76	.91	
	UB12	4.13 (1.61)	−.38	−.72	.73	.71	.92	
	UB15	4.49 (1.50)	−1.07	.46	.84	.81	.91	
	UB18	4.02 (1.67)	−.69	−.39	.77	.74	.91	
								.92

Legenda. λ = factor loadings; C_{it}^{c} = corrected item-total correlations; ω-i = omega if item is deleted.

Multigroup confirmatory factor analysis (MGCFA) and invariance across gender and team size

As a further psychometric test to verify the goodness and adaptation of the TBBs scale in the Italian context, we tested a series of multiple-group CFAs, in which different and progressively more stringent forms of measurement equivalence (configural, metric, scalar, measurement error) were used for the variables gender and team size.

The first multiple-group analysis tested a model of configural invariance (Model 1), i.e., an unconstrained baseline model in which all parameters freely differ between male and female samples. The fit of this configural model provides the baseline value against which subsequently specified equivalence models are compared. In fact, all nested models were formally contrasted via the $\Delta\chi^2$ comparison. Model 2 was tested for metric invariance (see Table 2), i.e., all factor loadings are simultaneously constrained across gender groups. More specifically, $\Delta\chi^2$ M2-M1 was non-significant and this suggested that Model 2 (i.e., metric against configural models of measurement invariance) could be considered equivalent, i.e., no significant group differences for factor loading, compared to Model 1. This result indicates that metric invariance is supported. Therefore, males and females attributed the same meaning to the items measured by the latent factors. The third model investigated is the scalar invariance (Model 3), i.e., a model in which the intercepts are constrained to be equal across groups. The results on the comparison M3-M2 showed a significant $\Delta\chi^2$, indicating that scalar invariance is not supported.

A second multi-group analysis was tested on a configurational invariance model (Model 1) of small and medium team size. Model 2 was tested for metric equivalence. Results indicated that Model 2 could be considered equivalent to Model 1, as $\Delta\chi^2$ M2-M1(18) = 11.69 was non-significant. Thus, metric invariance was supported. In other words, employees within small and medium groups attributed the same meaning to the items measured by the latent factors. The third model tested for the scalar invariance (Model 3). Results ($\Delta\chi^2$ M3-M2(18) = 11.73 was non-significant) indicated that scalar invariance is supported. Therefore, the factor model is equivalent across small and medium groups. Finally, we tested the measurement error invariance (Model 4), i.e., a model in which the measurement errors are constrained to be equal across groups. The following results were found: $\Delta\chi^2$ M4-M3(18) = 23.12 was significant. This result indicates that measurement error invariance is not supported.

All fit indices and $\Delta\chi^2$ for Measurement invariance across gender and team size were reported in Table 2.

Divergent validity

Via CFA a hypothesized measurement model (M1) with six distinct latent factors, including three TBBs factors and three OCBs factors was tested. Subsequently, we compared M1 to alternative models: a one-factor model (M2); a two-factor model (M3), with as factor 1 the TBBs dimensions and factor 2 the OCBs dimensions; nine five-factor models (M4-M12), combining, by couple, TBBs dimensions with OCBs dimensions. The fit indices of each model and model comparison are reported in Table 3.

CFA results showed that M1 had acceptable fit indices. Furthermore, the results indicated that $\Delta\chi^2$ was significant; therefore, the alternative models did not fit better to the data than M1.

Therefore, the hypothesized M1 should be preferred (see Figure 1), suggesting that three TBBs dimensions are empirically distinct from OCBs dimensions. In other words, the discriminant validity of the TBBs scale was supported. Furthermore, Mood-enhancing behaviors was positively and significantly correlated with Altruism (r = .42; p<.001), Civic virtue (r = .26; p<.001), and Conscientiousness (r = .25; p<.001). In a similar vein, Energizing behaviors was positively and significantly correlated with Altruism (r = .47; p<.001), Civic virtue (r = .36; p<.001), and Conscientiousness (r = .43; p<.001). Finally, also Uniting behaviors was positively and significantly correlated with Altruism (r = .52; p<.001), Civic virtue (r = .38; p<.001), and Conscientiousness (r = .39; p<.001).

DISCUSSION

Our research indicates that Team-Boosting Behaviors (TBBs) differ from other positive discretionary behaviors, such as Organizational citizenship behaviors (OCBs), that also contribute to organizational success. While OCBs involve extra-role actions that enhance organizational effectiveness and psychological well-being through altruism,

Table 2 – Results of invariance across gender and team size

Invariance	Model	χ^2	*df*	CFI	TLI	SRMR	RMSEA	$\Delta\chi^2$	Δdf	*p*-value
				Gender (Male: *N* = 179; Female: *N* = 246)						
Configural invariance	M1	1002.58	264	.895	.878	.046	.118	–	–	–
Metric invariance	M2	1012.62	282	.901	.892	.066	.110	10.04	18	ns
Scalar invariance	M3	1046.64	300	.899	.897	.066	.108	44.06	18	<.01
				Team size (Small: *N* = 281; Medium: *N* = 145)						
Configural invariance	M1	1049.19	264	.886	.867	.069	.097	–	–	–
Metric invariance	M2	1060.88	282	.896	.887	.050	.114	11.69	18	ns
Scalar invariance	M3	1072.61	300	.897	.895	.051	.110	11.73	18	ns
Measurement error invariance	M4	1095.73	318	.896	.900	.052	.107	23.12	18	<.001

Legenda. Model = model of measurement invariance; *df* = degree of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; $\Delta\chi^2$ = chi squared difference between the compared models; Δdf = degrees of freedom difference between the compared models; M1 = hypothesized 6-factor model; M2 = 1-factor model; M3 = 2-factor model (TBB, OCB); M4 = 5-factor model (MEB and AL).

conscientiousness, and civic virtue, TBBs specifically focus on behaviors that enhance team mood and effectiveness through assertiveness, sociability, and expressivity. This validation study adds to other international versions of the scale, such as the Polish one (Haffer, 2024). TBBs assess the impact of individual team-building behaviors on team dynamics and performance. The scale provides valuable insights into psychological factors that can improve the work environment and serves as a bridge between academics, practitioners, and labour experts, deepening the understanding of psychological aspects of the workplace. TBBs join those approaches which improve work outcomes. Indeed, TBBs act at team level (Bakker, 2022), complementing, for example, the playful work design approach, which acts at the individual level in facilitating positive organizational outcomes, such as OCBs themselves (Caracuzzo et al., 2024).

Limitation and future studies

Limitations of the study concern its cross-sectional design with self-reported data. Assessing individuals' TBBs with observer-rated measures could enhance the depth of the exploration of TBBs' dynamics with team outcomes.

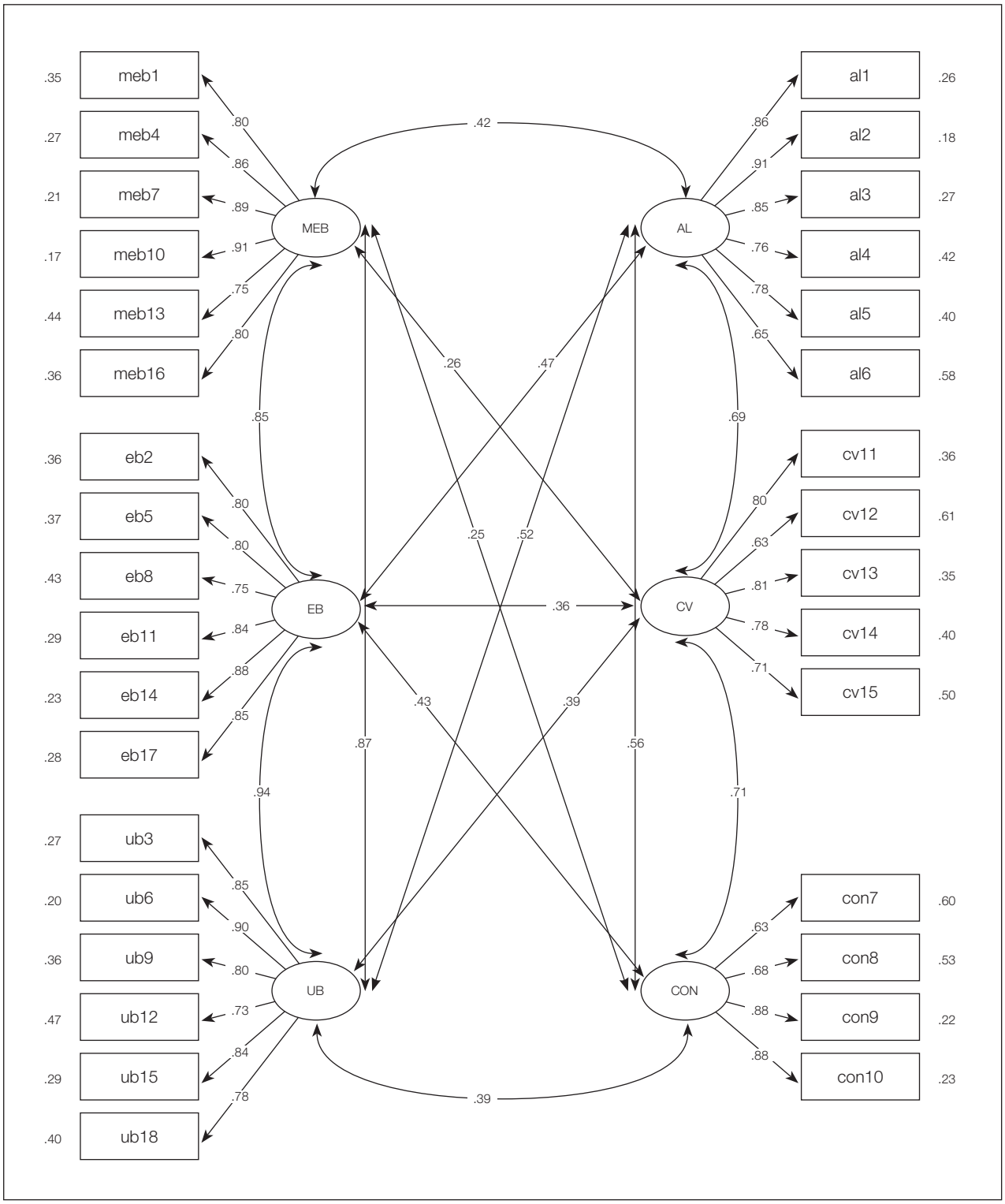
Table 3 – Divergent validity – model comparisons among dimensions' of TBBs and OCBs

Model	χ^2	*df*	χ^2/df	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$	Δdf
M1	1727.108	488	3.53	.895	.887	.077	.060	–	–
M2	5174.468	495	10.45	.605	.579	.149	.146	3.477.36**	7
M3	3008.680	494	6.72	.788	.773	.109	.066	1.281.57**	8
M4	3232.204	485	6.66	.768	.748	.115	.122	1.505.09**	3
M5	2629.651	485	5.42	.819	.803	.102	.114	902.53**	3
M6	2780.213	485	4.82	.689	.653	.123	.116	587.70**	3
M7	3084.724	485	6.36	.781	.761	.112	.104	1.357.61**	3
M8	2496.613	485	5.14	.830	.815	.099	.097	769.50**	3
M9	2671.642	485	5.50	.816	.799	.103	.112	944.54**	3
M10	3023.958	485	6.23	.786	.767	.111	.102	1.296.85**	3
M11	2508.492	485	5.17	.829	.814	.099	.095	781.38**	3
M12	2660.295	485	5.48	.817	.800	.103	.110	933.18**	3

Legenda. Model = model of measurement invariance; *df* = degree of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; Δdf = degrees of freedom difference between the compared models; M1 = hypothesized 6-factor model; M2 = 1-factor model; M3 = 2-factor model (TBB, OCB); M4 = 5-factor model (MEB and AL); M5 = 5-factor model (MEB and CON); M6 = 5-factor model (MEB and CV); M7 = 5-factor model (EB and AL); M8 = 5-factor model (EB and CON); M9 = 5-factor model (EB and CV); M10 = 5-factor model (UB and AL); M11 = 5-factor model (UB and CON); M12 = 5-factor model (UB and CV).
** $p<.001$

Moreover, as mentioned in the Results section, even if the RMSEA values do not fit properly, it might depend on the sample size. Thus, future studies involving different samples should pay attention to this fit index. Additionally, this study was limited to assess the psychometric properties of the TBBs scale, also distinguishing TBBs' dimensions to other similar constructs (i.e., OCBs). Thus, inferential studies evaluating the TBBs' antecedents and TBBs' effects on organizational outcomes are needed. Lastly, since TBBs refer to team-level behaviors, multilevel analyses are necessary to thoroughly understand TBBs' effects on organizational outcomes. Managers could benefit from being aware of TBBs' influence at team level, thus future studies may be designed with the aim of performing multilevel analyses.

Figure 1 – Comparison among TBBs' dimensions and OCBs' dimensions



Legenda. MEB = Mood-enhancing behaviors; EB = Energizing behaviors; UB = Uniting behaviors; AL = Altruism; CV = Civic virtue; CON = Consciousness.

CONCLUSION

This study shows that the Italian version of TBBs scale is a valid and reliable instrument for conducting empirical research in organizations. The TBBs are part of a set of behaviors grounded in a proactive personality. Proactive individuals who engage in actions aimed at enhancing team morale can effectively do so through the three behaviors identified by the TBBs' framework. Given the complex dynamics underlying team building, future research should examine the relationship between TBBs and individual factors (e.g., personality traits, emotions), as well as team-specific characteristics (e.g., context type, team activity, leadership styles, team size, etc.).

Exploring the various ways in which proactivity occurs in the workplace – similar to the existing literature on job crafting and playful work design – provides deeper insights into how both mood and productivity can be improved within teams. This, in turn, helps managers and employees create positive and dynamic work environments that support a healthy balance between psychological well-being and the achievement of optimal performance.

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APPENDIX

Items of English and Italian version of Team Boosting Behaviors scale

ENGLISH [ITALIAN]
Mood-enhancing behaviors (MEB)
1. I make sure that there is laughter in our team [Mi assicuro che ci siano momenti allegri nel mio team]
2. In my team, I make jokes [Nel mio team, faccio battute]
3. I try to entertain my team mates [Cerco di intrattenere/divertire i colleghi del mio team]
4. I add a cheerful touch to our team [Aggiungo un tocco di allegria nel mio team]
5. I break a negative atmosphere in our team with a joke [Quando nel nostro team l'atmosfera è negativa, faccio una battuta]
6. I tell stories when we meet [Racconto storie divertenti quando ci incontriamo]
Energizing behaviors (EB)
1. I take initial action to set our team in motion [Faccio la prima mossa per attivare il mio team]
2. I am the first to take action in our team [Sono il primo ad agire nel mio team]
3. In our team, I set the example by doing [Nel mio team, do l'esempio con i fatti]
4. I propose new ideas for our team [Propongo nuove idee per il mio team]
5. I stimulate our team [Stimolo il mio team]
6. I convince my team mates to join the action [Convinco i miei colleghi di team a partecipare all'azione]
Uniting behaviors (UB)
1. I strengthen the ties between my team mates [Contribuisco a rafforzare i legami tra i miei colleghi di team]
2. I strengthen the ties with my team mates [Contribuisco a rafforzare i legami con i miei colleghi di team]
3. I respond to my fellow team members' need [Rispondo alle necessità dei membri del mio team]
4. I approach my team mates in a personal way [Mi relaziono con i miei colleghi di team anche a livello personale]
5. I assess the atmosphere in our team [Sono attento all'atmosfera che c'è nel mio team]
6. I involve all my team mates in what we do [Coinvolgo tutti i miei colleghi di team in ciò che facciamo]

Note. Items in the Team Boosting Behavior scale are reported in their respective factors: (MEB) = Mood-enhancing items; (EB) = Energizing items; (UB) = Uniting items.

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Measuring job greediness: Development and validation of an Italian scale

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ABSTRACT. Il presente studio si pone l'obiettivo di validare lo strumento Greedy Job Scale (GJS), progettato per misurare la percezione di richieste eccessive di lavoro e la loro interferenza con la vita personale. Sulla base di un campione di 1.208 lavoratori italiani, i risultati delle analisi fattoriali esplorative e confermative hanno mostrato una struttura monofattoriale, con buone proprietà psicometriche. Il GJS fornisce uno strumento affidabile per indagare l'impatto potenziale dell'intrusività del lavoro sul benessere, sui percorsi di carriera e sui risultati organizzativi. Questo studio sottolinea l'importanza di valutare la percezione dei lavori avidi, dato il loro impatto, già documentato in letteratura, sui confini tra lavoro e vita privata e sul benessere generale.

SUMMARY. Greedy jobs demand excessive time, energy, and emotional investment, eroding boundaries between work and personal life. They perpetuate inequalities, notably by limiting flexibility for those with caregiving responsibilities. The current study aims to validate the Greedy Job Scale (GJS) to assess perceptions of job demands and their intrusion into personal life. A multi-step process involving item development, refinement, and testing was conducted. Using a sample of 1,208 Italian workers, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were employed to validate the scale. The obtained results supported a single-factor solution and demonstrated adequate psychometric properties of the GJS in terms of internal consistency and construct validity. In addition, greedy jobs significantly blur the boundaries between work and personal life, demanding constant availability and responsiveness. Greedy jobs significantly strain individuals, especially when they can undermine work-life balance, especially for individuals managing caregiving responsibilities. The GJS offers a critical tool for future research in understanding how job-related greediness impacts employee well-being, career trajectories and organisational outcomes.

Keywords: *Greedy jobs, Work-life balance, Demands, Burnout, Flexibility, Inequality*

INTRODUCTION

The concept of greedy institutions (GI) was initially introduced by Coser (1967) and further elaborated in *Greedy institutions: Patterns of undivided commitment* (1974). Coser described GIs as entities that make total claims on their members, requiring exclusive and undivided loyalty that "coercion and physical isolation, GIs operate through non-physical means, eliciting voluntary compliance from their members by offering symbolic and material rewards that make continued engagement attractive. These institutions minimise the influence of competing roles and create environments where individuals' identities become embedded within a restricted set of institutional expectations" (Coser, 1974; De Campo, 2013). This framework provides a vital perspective for understanding how institutions maintain control in modern society without resorting to overt coercion.

GIs have been extensively studied in contexts where individuals face competing demands from different institutions, such as the family and the workplace. These institutions often compete for individuals' time and energy, leading to conflicts when one becomes too dominant, a situation particularly evident in high-commitment environments like the military (Segal, 1986; Vuga & Juvan, 2013). In such cases, both institutions demand a level of commitment that can overwhelm individuals' ability to balance roles, creating what Sullivan (2014) calls the perception of greediness. These dynamics have far-reaching implications, especially in contemporary work environments where the expectations placed on employees often blur boundaries, pushing them to prioritise work over other aspects of life consistently.

More recently, the concept of greedy jobs (GJs) has emerged as a related yet distinct, framework for examining the specific characteristics of occupations that require disproportionate amounts of time, energy, and emotional labour. Goldin (2014, 2021) introduced this term to describe jobs that require long working hours and permanent availability from workers, thus exacerbating the perception of work-life conflicts. This is particularly relevant in high-status professions such as law and finance, where long hours are often rewarded with higher pay and prestige but at the cost of personal and family time (Goldin & Katz, 2011). GJs are not merely an extension of GIs; they represent a more focused analysis of how individual job characteristics contribute to broader systemic inequalities, particularly the gender pay gap. While GIs typically refer to institutions as a whole, GJs isolate the occupational aspects that disproportionately burden individuals, especially women, who may seek more flexibility in their work to accommodate family responsibilities (Meekes & Hassink, 2022).

The extension of Coser's concept of greedy institutions to greedy jobs represents a critical advancement in understanding labour market inequalities, particularly concerning gender. Goldin (2014, 2021) introduced the notion of GJ to describe occupations that require substantial time commitment, emotional engagement, and continuous availability, often leading to the erosion of work-life boundaries. These jobs, characterised by their high demands and inflexibility, contribute disproportionately to the gender pay gap, as men are more likely to occupy these positions, while women often choose more flexible but lower-paid roles due to caregiving responsibilities (Wiswall & Zafar, 2018). This divergence in occupational preferences is not merely a reflection of individual choices but is deeply rooted in the structural inequalities embedded within these jobs, where long hours and lack of flexibility are not just expected but are central to success (Goldin & Katz, 2011).

The theoretical underpinning of GJS is grounded in Coser's (1974) original work on greedy institutions, which highlights the tension between multiple competing institutions that demand undivided commitment. This tension is particularly salient in contemporary professional environments where the boundaries between work and personal life are increasingly blurred (Sullivan, 2014). In GJs, workers are expected to devote excessive time and emotional resources to their jobs, often at the expense of personal and family life. These jobs are designed to reward individuals who can offer full-time dedication, creating structural barriers for those who need flexibility, such as women (Pan, 2015). The rigid time demands inherent in GJs thus reinforce gendered divisions within the labour market, limiting women's ability to progress in high-status, high-paying roles (Meekes & Hassink, 2022).

Recent studies have further developed this theoretical framework by examining the characteristics of greedy jobs and their impact on gender inequality. Sullivan (2014) emphasises that while these demands may appear voluntary, the structure of GJs often leaves little room for alternative arrangements, making them inherently inflexible and exclusionary. Furthermore, Sobeck (2024) argues that the perception of job greediness varies depending on institutional and cultural contexts. In countries with strong

labour protections and collective bargaining structures, the impact of GJs may be mitigated, allowing workers more flexibility to balance competing demands (Wasserman, 2023). Conversely, in countries with fewer labour protections, the demands of GJs are more likely to exacerbate work-life conflicts, particularly for women.

Research goal

Despite the growing body of literature on greedy institutions and jobs, limited research has focused on developing tools to measure how workers perceive the demands of greedy jobs. While existing studies, such as Mittlböck's (2023), have examined structural job characteristics like working hours and employer expectations, these approaches have not addressed the need for a reliable and valid scale to capture how individuals perceive the demands of greedy jobs. This study aims to fill this gap by developing and validating a brief scale that focuses on the perception of job greediness. The aim is to move beyond purely objective measures of job structure and incorporate psychosocial factors that influence how workers experience job demands.

METHOD

To validate the Greedy Job Scale, we followed a two-step approach. First, we conducted a literature review to generate and evaluate scale items. We performed a content validity assessment using a panel of four judges to ensure the instrument's clarity. Then, we administered the resulting questionnaire to a sample of employees to test its psychometric properties. Participation was anonymous and voluntary, with informed consent obtained from all individuals. The procedures adhered to the ethical guidelines outlined in the Helsinki declaration. Participants were free to withdraw from the study at any time without penalty or compensation, and data were analysed in compliance with Italian privacy laws, ensuring participant anonymity.

Strategy of analysis

The data analysis strategy involved both exploratory and confirmatory approaches. For the exploratory factor analysis (EFA), a principal component analysis was conducted on the six items with oblique rotation via IBM-SPSS 29.0. Items with factor loadings of at least .32 were retained, ensuring that only items with sufficient explanatory power were included.

Then, confirmatory factor analysis (CFA), using maximum likelihood parameter estimates with robust standard errors (MLR), was conducted using Mplus software to assess the measurement structure of the scale. Following the guidelines provided by Brown (2015), two alternative models were systematically compared. The first model (M1) specified a one-factor structure consistent with the solution obtained from the EFA. In this model, all six items were hypothesised to load onto a single latent factor representing the overarching construct of a **greedy job.** This model assumes that all the characteristics described in the six items collectively represent a single construct of a job that consistently intrudes on personal life and demands high levels of commitment and responsiveness.

The second model (M2) proposed a two-factor structure. The first factor included four items (items 2, 3, 5, 6) focusing on the extent to which work disrupts personal life by intruding into free time, either through direct demands or psychological pressure (i.e., Work intrusion). The second factor consisted of two items (items 1 and 4) reflecting the demand for extended working hours and the need to remain highly responsive to work-related matters, even outside standard work hours (i.e., Work intensity).

To assess model fit, different fit indices were used: the χ^2 goodness-of-fit statistic, the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Fit was considered acceptable when SRMR and RMSEA values were below .08, and CFI and TLI values were above .90 (Byrne, 2009; Hu & Bentler, 1999). Adopting the MLR estimation model, Satorra-Bentler scaled chi-square difference test was used to determine whether the more complex model provided a significantly better fit. In addition to the CFA, internal consistency was assessed by calculating Cronbach's alpha (α) and the omega (ω) index, following recommendations by Hair and colleagues (2010). Furthermore, the CFA results provided information for calculating the average variance extracted (AVE), which is a supplementary internal consistency indicator. This metric offers a more robust evaluation of the scale's reliability, reinforcing the conclusions drawn from traditional methods like Cronbach's alpha.

Participants

An overall sample of 1,208 employees completed the six items on the Greedy Job Scale. The total sample consisted of respondents from various private organisations who completed an online questionnaire hosted on an occupational health website as part of an occupational health survey. The sample was gender-balanced, with 49% identifying as female, and the mean age was 52.4 years (SD = 6.43), ranging from 26 to 66 years.

The sample was split randomly into two equal groups without any specific criteria to conduct the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The EFA was conducted using data from 606 employees, with 51% identifying as female. The mean age in this group was 52.3 years (SD = 6.23), with ages ranging from 27 to 66 years. This analysis was used to identify the underlying structure of the scale and its dimensions.

The remaining 602 participants formed the second group, which was used for CFA. In this group, 53.3% identified as male, with a mean age of 52.23 years (SD = 6.61), ranging from 26 to 66 years. The CFA validated the dimensional structure identified during the EFA, ensuring the scale's robustness across an independent sample.

Scale development

Regarding scale development, the items were created based on the definition of greedy jobs proposed by Goldin (2014, 2021). The current items differ from the ones proposed by Mittlböck (2023), relying on greediness indicators derived using principal component analysis of objective job characteristics, such as working hours and availability requirements. In contrast, to the best of our knowledge, the current scale is the only available measure that focuses solely on individual perceptions of greedy jobs. This scale explores how workers subjectively interpret the demands and expectations of their roles. This psychosocial focus enables a deeper understanding of how greedy jobs are experienced and perceived in the workplace. This resulted in a pool of 6 items focused on core aspects of greedy jobs. These items balanced conciseness and representativeness, ensuring that the scale captured the essential elements of the construct. In particular, brief instruments are advantageous due to time constraints imposed by employers during employee surveys (Fisher, Matthews & Gibbons, 2015). Additionally, concise scales reduce participant fatigue, frustration, and boredom while minimising survey refusals caused by perceptions of excessive length (Burisch, 1984).

The items were subjected to an expert evaluation. The evaluation panel consisted of four women (M_{age} = 39 years, SD = 10.49), including three faculty members with an average of 14 years of experience as industrial-organisational psychologists and one PhD student in their second year of study. The panel was tasked with evaluating each item's relevance, clarity, and coverage. Following Lynn's (1986) methodology, both the content validity of individual items (I-CVI) and the overall scale (S-CVI) were assessed. Each judge received an evaluation sheet to determine the theoretical relevance of each item to the construct of a greedy job. They were asked the question: "To what extent do you believe this item is relevant in assessing the perception of one's job as greedy?". The judges independently rated the items on a four-point Likert scale, where 1 = irrelevant, 2 = somewhat relevant, 3 = quite relevant, and 4 = extremely relevant.

The I-CVI for each item was calculated by dividing the number of judges rated the item as 3 or 4 by the total number of judges. According to Lynn (1986), an I-CVI of 1.00 is required when fewer than five judges are used; therefore, only items with unanimous agreement were retained. As a result, all six items were included in the final scale. The S-CVI was determined by averaging the I-CVIs of all items, with an S-CVI of .80 or higher considered acceptable (Davis, 1992). Given that all items achieved an I-CVI of 1.00, the S-CVI also demonstrated excellent content validity, with a final value of 1.00. Thus, the final scale consisted of 6 items rated on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

RESULTS

The Exploratory Factor Analysis (EFA) identified a single-factor solution, accounting for 58% of the variance. This finding suggests that the scale measures a unidimensional construct effectively. Descriptive statistics, including means, standard deviations, and factor loadings for each item, are presented in Table 1. These values are well within established thresholds, suggesting that the single-factor structure provides a parsimonious and theoretically sound data representation.

Table 1 – EFA results: means, standard deviation and factor loadings of the GJS

Items			*M*	*SD*	Factor loadings
1	Spesso lavoro più ore di quante dovrei o vorrei	I often work more hours than I should or would like to	3.48	1.17	.65
2	Il mio lavoro non mi consente facilmente di 'staccare la spina'	My job does not easily allow me to 'unplug'	2.97	1.24	.78
3	Anche nei momenti liberi ricevo richieste da parte dei miei colleghi o dei miei superiori	Even during my free time, I receive requests from my colleagues or supervisors	3.00	1.27	.81
4	Devo sempre essere 'tempestivo' nelle risposte ai miei clienti o al mio capo, anche nel tempo libero	I always have to be 'prompt' in answering my clients or manager, even during my free time	2.85	1.29	.78
5	Il lavoro e quello che devo fare è spesso un pensiero invasivo, anche nel mio tempo libero	My job and what I have to do is often an intrusive thought, even during my free time	2.64	1.24	.81
6	Faccio molta fatica a pianificare il mio tempo libero a causa dei miei impegni di lavoro	I find it very difficult to plan my free time due to my work commitments	2.27	1.12	.74

Then, the CFA compared the fit of two competing models: a single-factor solution reflecting the EFA results and a two-factor solution positing the presence of two underlying dimensions (potentially named Work intrusion and Work intensity).

The single-factor model demonstrated excellent fit to the data, with fit indices indicating a robust measurement structure, with CFI = .99; TLI = .98, RMSEA = .05, SRMR = .01.

In contrast, the two-factor model yielded the following fit indices: CFI = .93; TLI = .88, RMSEA = .13, SRMR = .15. A Satorra-Bentler scaled chi-square difference test was conducted to compare the two models. The results indicated that the more complex model (Model 1) provided a significantly better fit to the data than the more parsimonious model (Model 2), $\Delta\chi^2(3) = 71.73$, $p<.001$. These findings support the robustness of the single-factor structure identified through the EFA and provide a clear rationale for its selection as the most appropriate model for our data.

Table 2 presents the standardised factor loadings for the selected single-factor model, along with the associated values for Cronbach's alpha (α), omega (ω), and average variance extracted (AVE). Internal consistency was confirmed for the single-factor structure, with all indices exceeding the recommended thresholds, thereby supporting the reliability and validity of the GJS. The unique factor captures the pervasive intrusion of work into personal life, characterised by job demands that extend well beyond regular working hours.

DISCUSSION

The present study aimed to develop and validate the Greedy Job Scale (GJS), a novel tool designed to measure workers' perceptions of job greediness, which reflects the extent to which demanding work environments intrude into personal life. In doing so, we address a central gap in the literature

Table 2 – CFA results: descriptive statistics, standardized factor loadings, and item reliability

	M	*SD*	λ	α	ω	AVE
Item 1	3.48	1.17	.59	.89	.89	.57
Item 2	2.97	1.24	.79			
Item 3	3.00	1.27	.71			
Item 4	2.85	1.29	.74			
Item 5	2.64	1.24	.87			
Item 6	2.27	1.12	.82			

Legenda. λ = standardized factor loadings; α = Cronbach's alpha value; ω = omega value; AVE = average variance extracted.

by moving beyond objective measures to incorporate psychosocial factors that influence how individuals perceive job demands and their intrusion into personal lives. Building on Goldin's (2014, 2021) conceptualisation of greedy jobs as roles that require significant time, energy, and flexibility, the GJS operationalises this construct into a concise and psychometrically sound tool.

The validation process for the GJS involved a rigorous, multi-step psychometric analysis. An exploratory factor analysis (EFA) identified a single factor underlying the scale's items, suggesting that work-life intrusion is best understood as a unified construct. This finding was further supported by confirmatory factor analysis (CFA), which demonstrated an excellent fit to the data, confirming the robustness of the single-factor structure. Alternative models, including a two-factor solution, were tested but failed to achieve acceptable fit indices, reinforcing the appropriateness of a single-factor representation. These results align with the theoretical framework of greedy jobs, where time, energy, and loyalty demands merge into a specific intrusion experience.

Theoretically, the GJS provides a tool to examine how the concept of greedy jobs translates into measurable psychosocial experiences. The current results show that job greediness is a unified reality experienced by employees, consistent with earlier findings by Sullivan (2014). This evidence expands the discussion on how structural demands in occupations limit workers' ability to maintain a balanced life. Moreover, the results corroborate and build upon the work of Mittlböck (2023), who developed a multidimensional scale to measure the perceived greediness of jobs based on autonomy in scheduling, autonomy in work content, and employer intervention during non-work hours. While Mittlböck's scale primarily focuses on structural job characteristics and objective indicators, our scale differs by shifting the emphasis to workers' subjective perceptions of job demands and the psychosocial dimensions of greedy jobs. The Greedy Job Scale captures how individuals experience the intrusion of work into personal life, extending beyond structural aspects such as autonomy to explore how employees internalise expectations of constant availability and emotional engagement. According to Mittlböck, jobs with less autonomy and higher levels of employer intervention were perceived as significantly greedier, as supported by this study's participants, who also reported frequent employer expectations to remain available during personal time. However, the GJS refines this understanding by quantifying not only the impact of these structural demands but also the degree to which workers perceive them as intrusive and all-consuming.

This study highlights the importance of assessing perceptions of greedy jobs, given their well-documented impact on work-life boundaries and overall well-being. Previous research demonstrates that jobs requiring high levels of emotional investment exacerbate work-life conflicts, leading to burnout and reduced job satisfaction (e.g., Lott & Wöhrmann, 2023). Greedy jobs demand time and emotional engagement, contributing to the persistent erosion of work-life boundaries, where employees find it increasingly difficult to disconnect from their professional roles, even when off-duty.

The need to limit such job demands is further supported by research by Zhu and colleagues (Zhu, Sun, Liu & Xue, 2019), who describe the ambivalence of greed in organisational contexts. They found that while greed can enhance task performance through a heightened desire for social status, it also undermines employees' sense of distributive justice, leading to job dissatisfaction and burnout. These insights emphasise the long-term costs of greedy jobs for individuals and organisations, as high emotional exhaustion and dissatisfaction inevitably lead to reduced productivity and employee disengagement.

Cross-cultural variations in the impact of greedy jobs also demonstrate the importance of institutional and cultural contexts in shaping employees' experiences of job demands. Sobeck (2024) highlights how robust labour protections, such as mandatory limits on working hours and policies promoting work-life balance, mitigate the adverse effects of greedy jobs. In contrast, greedy jobs significantly burden workers in countries with fewer labor protections, such as the United States, where the expectation of constant availability is often embedded in workplace culture. This underlines the need for employers and policymakers to promote protections and flexibility that reduce work-life conflicts.

Additionally, structural inequalities perpetuated by greedy jobs warrant close attention. For instance, Dowd and Park (2024) found that women are disproportionately affected by the inflexible demands of precarious work, limiting their access to higher-status, better-paid roles due to caregiving responsibilities and systemic barriers. These findings emphasise how greedy jobs, by demanding undivided commitment, create systemic obstacles that disadvantage workers with greater non-work responsibilities. Although the present study did not examine gender disparities directly, these broader patterns underscore the importance of understanding and addressing how job demands perpetuate structural inequalities.

Study limitations

This study presents some limitations that should be addressed in future research. First, the sample is geographically limited to Italian workers, which may affect the generalizability of the findings to other cultural or national contexts. Labour market institutions and work-life balance policies vary significantly across countries, which may influence how greedy jobs are experienced in EU and extra-EU countries. Second, the study primarily relies on self-reported data, which can introduce response biases, such as social desirability or recall bias. Future research could address this limitation by integrating objective measures to assess the greediness of an organisational context. For instance, future studies might include metrics such as working hours logged, the frequency of after-hours communication or employer expectations explicitly drawn in policies and/or contracts.

Additionally, while the Greedy Job Scale provides a robust measure of workplace greediness, it does not capture all potential job characteristics that may contribute to work-life conflict, such as job insecurity or job design. Future research should explore how different dimensions of job characteristics interact with greediness perceptions and their consequences on career progression and personal well-being. Finally, longitudinal studies would be beneficial to track how perceptions of greediness in the workplace evolve and influence long-term career outcomes and work-life balance.

CONCLUSION

The Greedy Job Scale provides a valuable tool for understanding how job demands intrude into personal life. This study highlights the disproportionate impact of these roles on individuals, particularly caregivers, who need greater flexibility. By exploring the challenges posed by high-demand jobs for work-life balance, the findings pave the way for future research into how job structures affect employee well-being and career progression. In a nutshell, this research not only deepens our understanding of the systemic pressures driving work-life imbalances but also provides a foundation for future studies and policy interventions to create healthier, more sustainable work environments.

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