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Factor Structure, Measurement Invariance Across Gender Sub-Groups, and Normative Data for the Italian Translation of the UPPS-P Impulsive Behavior Scale in Italian Community-Dwelling Adults

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Abstract

To evaluate the factor structure and measurement invariance of the Italian translation of the UPPS-P Impulsive Behavior Scale, while providing also normative data, 797 community dwelling adults were administered the UPPS-P online. Omega coefficient values suggested adequate internal consistency reliability for all the UPPS-P scales. Weighted least square mean and variance adjusted (WLSMV) confirmatory factor analysis (CFA) showed adequate fit for the a priori five-factor model of the UPPS-P items. Measurement invariance findings supported the scalar invariance of the UPPS-P items across male and female sub-group (RMSEA = .052, CFI = .921, Δ -CFI = .002), thus allowing gender comparisons in terms of latent factor mean scores. Based on these findings, normative data and T scores for the UPPS-P scale score distribution among Italian community-dwelling adults were provided. Hopefully, our findings may help clinicians and researchers to use the UPPS-P in their routine assessment of impulsive behaviors.

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1. Introduction

Impulsivity is a relevant psychological and psychiatric construct, which represents an important aspect of a variety of forms of psychopathology (Whiteside & Lynam, 2001). However, literature reflects numerous inconsistencies in the conceptualization and measurement of impulsivity (Whiteside & Lynam, 2001; see also Evenden, 1999; Moeller et al., 2001; Sharma et al., 2014).

Starting from these considerations, Whiteside and Lynam (2001) developed the UPPS Impulsive Behavior Scale (UPPS), in order to provide consensus on which traits are measured across different existing impulsivity measures. In their seminal study Whiteside and Lynam (2001) said that impulsivity is “an artificial umbrella term” that comprises four different personality traits from three different Five-Factor Model (FFM) domains (i.e., neuroticism, extraversion, conscientiousness). To examine their hypothesis, Whiteside and Lynam (2001) factor analyzed 17 subscales from the most widely used impulsivity measures with four facets of the Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992). Results of their analyses identified four distinct but related factors that aligned with the four FFM facets; these factors were used to select items that form the scales of the resultant measure (Few et al., 2015). The four factors included in the original version of the scale were Urgency, (lack of) Premeditation, (lack of) Perseverance and Sensation Seeking. Urgency measures the tendency to engage in impulsive behavior in response to negative emotions and it is the impulsivity facet of neuroticism (Cyders et al., 2007; Few et al., 2015). Lack of Premeditation captures the tendency to act without thinking and without consideration of potential consequences; it represents the facet of conscientiousness (Cyders et al., 2007; Few et al., 2015). Lack of Perseverance is the inability to remain focused on a task and is related to problems in maintaining goal-directed behavior when performing tasks that may be boring or difficult (Few et al., 2015). This factor represents the self-discipline facet of conscientiousness. Finally, Sensation Seeking captures both the tendency to enjoy activities that are exciting and openness to activities that could potentially be dangerous, and it is the excitement-seeking facet of extraversion (Cyders et al., 2007; Few et al., 2015).

In 2007, Cyders and colleagues proposed the existence of a fifth factor, labeled Positive Urgency. The authors argued that impulsive action under extreme positive emotions also exist and were not well conceptualized or measured in the literature. Therefore, Cyders and colleagues (2007) created a scale of positive urgency, that reflects rash behavior under extreme positive mood, which was later incorporated into the UPPS-P scale.

The full version of the UPPS-P Scale (UPPS-P; Lynam et al., 2006) is composed of 59 items, with 10-14 items per scale, assessed on a 4-point Likert-type scale. The UPPS-P has been translated into numerous languages (e.g., see Kämpfe et al., 2009; Van der Linden et al., 2006), including Italian language (e.g., Fossati et al., 2014). Despite encouraging findings have been reported for the Italian translation of the UPPS-P, its psychometric proprieties have been tested only in a clinical sample (Fossati et al., 2016). Thus, up to now, no extensive data on the measurement properties of the UPPS-P among Italian community-dwelling adults have been provided and no normative data have been developed. The availability of normative data would

be useful both from a clinical perspective (e.g., making it possible to rely on the UPPS-P for assessment purposes) and research point of view (e.g., selecting at risk participants).

Against this background, the present study aimed at (a) evaluating the five-factor structure of the UPPS-P items in a sample of community-dwelling Italian adults. Consistent with previous UPPS-P studies (e.g., Fossati et al., 2016; Watts et al., 2020), we relied on weighted least square mean and variance adjusted (WLSMV) confirmatory factor analysis (CFA). Additionally, we also tested the adequacy of a second-order factor model of the UPPS-P items in which Negative Urgency and Positive Urgency first-order factors are influenced by a second-order Urgency/Emotion factor, while Lack of Premeditation and Lack of Perseverance first-order factor are influenced by a second-order Deficit in Conscientiousness factor; finally, Sensation Seeking factor represents the only dimension which influenced by the second-order Sensation Seeking factor (e.g., Cyders et al., 2013). Based on previous reports on the UPPS-P (Cyders, 2013; Cyders & Smith, 2007; Watts et al., 2020), and on Fossati and colleagues' (2016) findings, we expected that the UPPS-P five factor structure will be tenable also in its Italian translation; (b) evaluating the measurement invariance of the UPPS-P a priori five factor structure across subgroups based on participant's gender. Measurement invariance deals with the psychometric equivalence of a construct across groups, and in our study its assessment will allow showing that UPPS-P constructs (i.e., Negative Urgency, Lack of Premeditation, Lack of Perseverance, Sensation Seeking, and Positive Urgency) have the same meaning in male and female participants (Putnick & Bornstein, 2016). In other words, if measurement invariance hypothesis could be considered tenable, UPPS-P trait scores observed in the two groups could be compared (e.g., mean differences could be safely computed), and could be considered to have the same meaning across male and female participants (Cyders, 2013). Based on Cyders' (2013) results, we hypothesized that UPPS-P had an invariant five-factor structure across male and female participants; (c) evaluating the internal consistency reliability of the UPPS-P scales. Although the most widely used internal consistency reliability index is Cronbach's alpha (Cronbach, 1951), it is rarely an appropriate measure of reliability, because of its assumptions overly rigid and almost always violated (see McNeish, 2018). Thus, in the present study we relied on omega (ω) coefficient, which represents a factor analytic model-based estimate of the reliability (true score variance over observed score variance) of unit-weighted test scores (Rodriguez et al., 2016). Based on previous studies (Cyders et al., 2007; Fossati et al., 2016; Lynam et al., 2006) we expected that UPPS-P scale scores were provided with adequate reliability indices even among Italian community-dwelling participants; and (d) providing normative data of the UPPS-P scales.

The availability of normative data for the Italian population will enhance the possibility to rely on the UPPS-P as a measure of impulsivity in applied contexts (e.g., clinical assessment). In line with Minnesota Multiphasic Personality Inventory-2 tradition (MMPI-2; e.g., Ben-Porath, 2012), we will provide non-gendered *T* scores for the UPPS-P scale scores. Non-gendered norms are those in which men's and women's scores are combined into one comparison sample that is used to develop norms to evaluate UPPS-P scores of persons from either gender. In line with the MMPI-2 tradition (Ben-Porath & Forbey, 2003), the rationale for relying on nongendered norms was to allow for the use of the UPPS-P normative data across a wide range of assessment contexts for which gender-based norms are prohibited due to possible discrimination reasons (e.g., Sellbom, 2019). Moreover, as mentioned, in the present study we will formally assess the measurement invariance properties of the UPPS-P scale score to ensure that it is possible to compare UPPS-P observed scores across subgroups based on participant's gender.

In the present study, we will provide both normalized and uniform *T* scores for the UPPS-P scale. Normalized *T* scores were computed based on the assumption that the latent traits measured by the UPPS-P were assumed to have an underlying normal distribution in the population from which the normative sample was drawn. Moreover, in line with Tellegen and Ben Porath' (1992) considerations for the MMPI-2 scales, we computed uniform *T* scores of the UPPS-P scales to allow for profile interpretation. Indeed, uniform *T* score involves comparisons of scores on different scales and they allow to obtain percentile-comparable scores (Tellegen & Ben Porath, 1992).

2. Materials and Methods

2.1 Participants

The sample was composed of 797 Italian community dwelling adult participants. One hundred eighty-two participants (22.8%) were male and 615 (77.2%) were female. Participants' mean age was 28.04 years, $SD = 8.92$ years. Seven hundred seventy-five participants (84.7%) were unmarried, 94 (11.8%) were married, 19 (2.4%) were divorced, and 1 (0.1%) was widow/widower, whereas eight participants (1.0%) refused to disclose his/her civil status. Twenty-eight participants (3.5%) had junior high school degree, 320 (40.2%) had high school degree, 351 (43.9%) had university degree, 96 (12.0%) had graduate school degree, and two participants (0.3%) refused to report their educational level. Twenty-six participants (3.3%) were blue collars, 122 (15.3%) were white collars, 9 (1.1%) were managers, 125 (15.7%) were liberal arts practitioners, 76 (9.5%) reported other professions (e.g., housekeeper, retailer, craftsman, etc.), and 429 (53.8%) were university students; ten participants (1.3%) refused to disclose their profession.

In the present study, the UPPS-P was administered to participants in its Italian translation and anonymously. In order to participate in the present study, participants were required to speak Italian as their first language in order to avoid cultural and lexical bias in questionnaire responses. Because of the COVID-19 pandemic contrast measures, participants completed the study online and volunteered to take part in the study receiving no economic incentive or academic credit for their participation. All participants were treated in accordance with the Ethical Principles of Psychologists and Code of Conduct. To be included in the sample, participants had to document that they were of adult age (i.e., 18 years of age or older), and to agree to online written informed consent in which the study was extensively described.

UPPS-P was scored by an independent group of trainee psychologists who were blind to the aim of the study and to participants' identity.

2.2 Measures

2.2.1 UPPS-P Impulsive Behavior Scale (Lynam et al., 2006). The UPPS-P is 59-item self-report questionnaire, which was designed to measure five dimensions of impulsive behavior: Negative Urgency (12 items), (lack of) Premeditation (11 items), (lack of) Perseverance (10 items), Sensation Seeking (12 items), and Positive Urgency (14 items). For ease of presentation, in the present study the Premeditation and Perseverance scales were reverse scored to reflect lack of premeditation and lack of perseverance, respectively. The UPPS-P showed adequate psychometric properties (Cyders & Smith, 2007; Whiteside & Lynam 2001) also in its Italian translation (Fossati et al., 2016).

2.2.2 Measure Translation Procedures. Equivalence with the original meaning of the items was the guiding principle in the translation process (Denissen et al., 2008). First, the UPPS-P was independently translated into Italian by one of the authors (A.F.), and by two other clinical psychologists who were fluent in English. After reaching a consensus, we had an English mother-tongue professional translator translate the Italian version back into English, and this English back-translation (Cha et al., 2007; Geisinger, 1994; Van De Vijver & Hambleton, 1996) was sent to the first author of the UPPS-P. If the latest version differed from the English original, the translators came to an agreement on the definitive Italian translation (Fossati et al., 2014, 2016).

2.3 Data Analysis

Omega coefficient and mean inter-item correlation (MIC) were used to evaluate the internal consistency of the UPPS-P scale scores in the whole sample.

Weighted Least Square Mean and Variance corrected (WLSMV) Confirmatory Factor Analysis (CFA) was used to assess the five-factor model of the UPPS-P items. All CFAs were carried out using Mplus 8.5 (Muthén, 1998-2018). In order to assess model fit, we calculated Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMSR) in addition to goodness-of-fit chi-square test. Following Hu and Bentler’s (1999) suggestions, the WLSMV χ^2 goodness-of-fit statistic, TLI and CFI values $\geq .95$, SRMSR values $< .06$, and RMSEA values close to $.06$ were considered as indicating good model fit; TLI and CFI values of $.90$ and higher, an RMSEA value of $.08$ and lower, and a SRMSR value $< .08$ were considered indicators of an adequate fit.

Although the topic is controversial in the assessment of item-level measurement invariance (e.g., Sass & Schmitt, 2013), we tested the following invariance models: a) a configural invariance model with invariant factor loading pattern; b) a metric invariance model with equal number of factors and factor loadings across groups; and c) a scalar invariance model with invariant factor loadings and thresholds. The DIFFTEST procedure was used to evaluate the presence of significant differences in goodness-of-fit function between nested models (Muthén & Muthén, 1998-2015).

3. Results

The descriptive statistics and item-total correlation corrected for part-whole overlap for the UPPS-P scales are reported in Table 1.

Table 1. UPPS-P Impulsive Behavior Scale Item Analysis: Descriptive Statistics and Part-Whole-Corrected Item-Total Correlation Coefficients in Italian Community Dwelling Adults (N = 797).

Negative Urgency	<i>Mdn</i>	<i>SD</i>	<i>r_{it}</i>
2. I have trouble controlling my impulses. (R)	2.00	0.93	.66
7. I have trouble resisting my cravings... (R)	3.00	1.02	.45
12. I often get involved in things I later wish... (R)	2.00	0.99	.55
17. When I feel bad, I will often do things I... (R)	2.00	1.00	.66
22. Sometimes when I feel bad, I can't seem... (R)	2.00	1.03	.60
29. When I am upset I often act without... (R)	2.00	0.99	.71
34. When I feel rejected, I will often say... (R)	2.00	0.97	.63
39. It is hard for me to resist acting on my... (R)	3.00	0.97	.54
44. I often make matters worse because I act... (R)	2.00	0.99	.74
50. In the heat of an argument, I will often... (R)	2.00	0.99	.66
53. I always keep my feelings under control.	2.00	0.85	.21
58. Sometimes I do impulsive things that I... (R)	2.00	0.97	.74
Lack of Premeditation			
1. I have a reserved and cautious attitude...	2.00	0.81	.45
6. My thinking is usually careful and...	2.00	0.75	.51
11. I am not one of those people who blurt...	2.00	1.00	.40
16. I like to stop and think things over...	2.00	0.79	.68
21. I don't like to start a project until I know...	2.00	0.85	.44
28. I tend to value and follow a rational...	2.00	0.75	.56
33. I usually make up my mind through...	2.00	0.73	.71
38. I am a cautious person.	2.00	0.81	.69

43. Before I get into a new situation I like to...	2.00	0.79	.55
48. I usually think carefully before doing...	2.00	0.80	.73
55. Before making up my mind, I consider all...	2.00	0.76	.67
Lack of Perseverance			
4. I generally like to see things through to...	1.00	0.75	.62
9. I tend to give up easily. (R)	2.00	0.94	.40
14. Unfinished tasks really bother me.	2.00	0.82	.51
19. Once I get going on something I hate to...	2.00	0.86	.39
24. I concentrate easily.	2.00	0.90	.49
27. I finish what I start.	2.00	0.79	.76
32. I am able to pace myself so as to get...	2.00	0.87	.61
37. I am a person who always gets the job done.	2.00	0.81	.74
42. I almost always finish projects that I start.	2.00	0.80	.71
47. Sometimes there are so many little... (R)	2.00	1.02	.41
Sensation Seeking			
3. I generally seek new and exciting... (R)	2.00	1.00	.56
8. I'll try anything once. (R)	2.00	1.04	.51
13. I like sports and games in which you... (R)	2.00	1.06	.35
18. I would enjoy water skiing. (R)	2.00	1.11	.50
23. I quite enjoy taking risks. (R)	1.00	0.89	.69
26. I would enjoy parachute jumping. (R)	2.00	1.16	.66
31. I welcome new and exciting experiences... (R)	2.00	1.03	.67
36. I would like to learn to fly an airplane. (R)	2.00	1.14	.56
41. I sometimes like doing things that are a... (R)	2.00	1.01	.71
46. I would enjoy the sensation of skiing... (R)	2.00	1.14	.64
51. I would like to go scuba diving. (R)	3.00	1.19	.46
56. I would enjoy fast driving. (R)	2.00	1.16	.51
Positive Urgency			
5. When I am very happy, I can't seem to... (R)	1.00	0.91	.65
10. When I am in great mood, I tend to get... (R)	1.00	0.83	.76
15. When I am very happy, I tend to do... (R)	1.00	0.84	.76
20. I tend to lose control when I am in a... (R)	1.00	0.88	.70
25. When I am really ecstatic, I tend to get... (R)	1.00	0.85	.78
30. Others would say I make bad choices... (R)	1.00	0.93	.71
35. Others are shocked or worried about the... (R)	1.00	0.80	.74
40. When I get really happy about... (R)	1.00	0.76	.75
45. When overjoyed, I feel like I can't stop... (R)	1.00	0.95	.76
49. When I am really excited, I tend not to... (R)	1.00	0.95	.75
52. I tend to act without thinking when I am... (R)	1.00	0.95	.76
54. When I am really happy, I often find... (R)	2.00	0.98	.62
57. When I am very happy, I feel like it is... (R)	3.00	0.99	.41
59. I am surprised at the things I do while in... (R)	2.00	1.06	.57

Note. $r_{i\cdot}$: Item-total r coefficient corrected for part-whole overlap. Items with an (R) are reverse scored, so that higher values indicate more impulsive behavior.

The goodness of fit indices for the *a-priori* five factor model of the UPPS-P items were as follows, WLSMV CFA $\chi^2(1642) = 6495.52, p < .001$, RMSEA=0.061, 95% confidence interval= 0.059 to 0.062, $p < .001$, CFI = .91, TLI = .90, SRMSR = .075. Factor loadings based on Weighted Least Square Mean and Variance corrected (WLSMV) Confirmatory Factor Analysis (CFA) are listed in Table 2. Moreover, in the present study, the second-order factor model of the UPPS-P items showed adequate fit indices in WLSMV CFA, WLSMV CFA $\chi^2(243) = 6515.73, p < .001$, RMSEA=0.061, 95% confidence interval = 0.059 to 0.062, $p < .001$, CFI = .90, TLI = .90, SRMSR = .076.

Table 2. UPPS-P Impulsive Behavior Scale Factor Structure: Weighted Least Square Mean and Variance Adjusted Confirmatory Factor Analysis Factor Loadings (N = 797).

	Negative Urgency	Lack of Premeditation	Lack of Perseverance	Sensation Seeking	Positive Urgency
2. *I have trouble controlling my impulses.	.79				
7. *I have trouble resisting my cravings...	.53				
12. *I often get involved in things I later wish...	.65				
17. *When I feel bad, I will often do things I...	.81				
22. *Sometimes when I feel bad, I can't seem...	.73				
29. *When I am upset I often act without...	.81				
34. *When I feel rejected, I will often say...	.67				
39. *It is hard for me to resist acting on my...	.57				
44. *I often make matters worse because I act...	.90				
50.* In the heat of an argument, I will often70				
53. I always keep my feelings under control.	.26				
58. *Sometimes I do impulsive things that I...	.83				
1. I have a reserved and cautious attitude...		.55			
6. My thinking is usually careful and...		.69			
11. I am not one of those people who blurt...		.55			
16. I like to stop and think things over...		.83			
21. I don't like to start a project until I know...		.40			
28. I tend to value and follow a rational...		.73			
33. I usually make up my mind through...		.88			
38. I am a cautious person.		.82			
43. Before I get into a new situation I like to...		.53			
48. I usually think carefully before doing...		.85			
55. Before making up my mind, I consider all...		.75			
4. I generally like to see things through to...			.79		
9. *I tend to give up easily.			.47		
14. Unfinished tasks really bother me.			.62		
19. Once I get going on something I hate to...			.32		
24. I concentrate easily.			.62		
27. I finish what I start.			.87		
32. I am able to pace myself so as to get...			.68		
37. I am a person who always gets the job done.			.88		
42. I almost always finish projects that I start.			.86		
47. *Sometimes there are so many little...			.73		
3. *I generally seek new and exciting...				.70	
8. *I'll try anything once.				.71	
13. *I like sports and games in which you...				.41	
18. *I would enjoy water skiing.				.49	
23. *I quite enjoy taking risks.				.96	
26. *I would enjoy parachute jumping.				.67	
31. *I welcome new and exciting experiences...				.84	
36. *I would like to learn to fly an airplane.				.59	
41. *I sometimes like doing things that are a...				.87	
46. *I would enjoy the sensation of skiing...				.70	
51. *I would like to go scuba diving.				.39	
56. *I would enjoy fast driving.				.58	
5. *When I am very happy, I can't seem to...					.77
10.* When I am in great mood, I tend to get...					.89
15. *When I am very happy, I tend to do...					.90
20.* I tend to lose control when I am in a...					.81
25.* When I am really ecstatic, I tend to get...					.88
30. *Others would say I make bad choices...					.81
35. *Others are shocked or worried about the...					.88
40. *When I get really happy about...					.91
45. *When overjoyed, I feel like I can't stop...					.84
49. *When I am really excited, I tend not to...					.87
52. *I tend to act without thinking when I am...					.89
54. *When I am really happy, I often find...					.71
57. *When I am very happy, I feel like it is...					.53
59. *I am surprised at the things I do while in...					.64

Note. *: Reverse-scored item. Bold highlights weighted least square mean and variance adjusted confirmatory factor analysis loadings which were significant at Bonferroni-corrected p -level (i.e., $p < .001$).

Fit indices for the measurement invariance WLSMV CFA models of the UPPS-P are summarized in Table 3.

Table 3. UPPS-P Scales Measurement Invariance Models: Item-Level Weighted Least Square Mean and Variance Adjusted Goodness-of-fit Confirmatory Factor Analysis Goodness-of-Fit Statistics (N = 797).

UPPS-P Invariance Models	χ^2	df	DIFFTEST	df	CFI	Δ -CFI	TLI	RMSEA	RMSEA 90% CI		
									LL	UL	SRMSR
Configural	7120.44***	3284	--	--	.919	--	.915	.054	.052	.056	.084
Metric	7164.80***	3338	110.63***	54	.919	.000	.917	.054	.052	.055	.084
Scalar	7180.68***	3451	195.16***	113	.921	.002	.922	.052	.050	.054	.084

Note. CFI: Comparative fit index; Δ -CFI: Difference in CFI value; TLI: Tucker-Lewis index; RMSEA: Root mean square error of approximation; 90% CI: 90% confidence interval; LL: Lower limit; UL: Upper limit; SRMSR: Standardized root mean square residual; --: Statistic not computed.

*** $p < .001$

The descriptive statistics, internal consistency reliabilities (i.e., ω coefficient), and inter-correlations for the UPPS-P scales are reported in Table 4.

Table 4. The UPPS-P Scales: Descriptive Statistics, Internal Consistency Reliability (i.e., Omega Coefficient) Estimates and Scale Inter-Correlations (N = 797).

UPPS-P	<i>M</i>	<i>SD</i>	ω	MIC	Scale Inter-correlations (i.e., Pearson <i>r</i> Values)				
					1	2	3	4	5
Negative Urgency	2.18	0.66	.92	.40	--				
Lack of Premeditation	1.82	0.53	.91	.39	.42	--			
Lack of Perseverance	1.91	0.56	.90	.38	.38	.52	--		
Sensation Seeking	2.14	0.70	.91	.37	.41	.31	.13	--	
Positive Urgency	1.72	0.67	.97	.52	.70	.43	.35	.56	--

Note. ω : Omega coefficient; MIC: mean inter-item correlation. The nominal significance level (i.e., $p < .05$) was corrected according to the Bonferroni procedure and set at $p < .005$. Pearson *r* values $> |.10|$ are significant at $p < .005$.

Tables 5 and 6 show normalized and uniform *T* score for the UPPS-P scales.

Table 5. Normalized T score for the UPPS-P scales (N = 797)

Negative Urgency		Lack of Premeditation		Lack of Perseverance		Sensation Seeking		Positive Urgency	
Score	Normalized T score	Score	Normalized T score	Score	Normalized T score	Score	Normalized T score	Score	Normalized T score
1.00	23	--	--	--	--	--	--	--	--
--	--	--	--	1.00	27	1.00	27	--	--
1.08	28	--	--	--	--	--	--	--	--
--	--	1.00	30	--	--	--	--	--	--
--	--	--	--	--	--	1.08	31	--	--
1.17	32	--	--	--	--	--	--	--	--
--	--	--	--	1.10	33	--	--	1.00	33
--	--	--	--	--	--	1.17	34	--	--
1.25	35	1.09	35	--	--	--	--	--	--
1.33	37	--	--	1.20	37	1.25	37	--	--
--	--	1.18	38	--	--	--	--	1.07	38
1.42	39	--	--	--	--	1.33	39	--	--
1.50	40	1.27	40	1.30	40	1.42	40	--	--
1.58	42	--	--	1.40	42	1.50	42	1.14	42
1.67	43	1.36	43	--	--	1.58	43	--	--
--	--	1.45	44	1.50	44	--	--	1.21	44
1.75	45	--	--	--	--	1.67	45	--	--
1.83	46	1.55	46	1.60	46	1.75	46	1.29	46
1.92	47	1.64	47	1.70	47	1.83	47	1.36	47
2.00	48	--	--	--	--	1.92	48	--	--
2.08	49	1.73	49	1.80	49	2.00	49	1.43	49
--	--	1.82	50	--	--	2.08	50	1.50	50
2.17	51	--	--	1.90	51	2.17	51	1.57	51
2.25	52	1.91	52	--	--	2.25	52	1.64	52
2.33	53	--	--	2.00	53	2.33	53	1.71, 1.79	53
2.42	54	2.00	54	2.10	54	2.42	54	1.86	54
2.50	55	--	--	--	--	2.50	55	1.93	55
2.58	56	2.09	56	2.20	56	2.58	56	2.00, 2.07	56
2.67	57	--	--	2.30	57	2.67	57	2.14	57
2.75	58	2.18	58	--	--	2.75	58	2.21	58
2.83	59	2.27	59	2.40	59	2.83	59	2.29	59
--	--	2.36	60	2.50	60	2.92	60	2.36	60
2.92	61	--	--	2.60	61	3.00	61	2.43, 2.50	61
3.00	62	2.45	62	--	--	3.08	62	2.57, 2.64	62
3.08	63	2.55	63	2.70	63	3.17	63	2.71, 2.79	63
3.17	64	2.64	64	2.80	64	3.25	64	2.86, 2.93	64
3.25	65	2.73	65	--	--	3.33	65	3.00	65
3.33, 3.42	66	2.82	66	2.90	66	--	--	3.07	66
--	--	2.91	67	3.00	67	3.42	67	3.14, 3.21	67
3.50	68	--	--	3.10	68	--	--	3.29	68
3.58	69	3.00	69	--	--	3.50	69	3.36, 3.43	69
3.67	70	3.09	70	3.20	70	3.58	70	3.50	70
--	--	--	--	3.30	71	--	--	3.57, 3.64	71
3.75	72	3.18	72	--	--	3.67	72	3.71	72
--	--	3.27	73	3.40	73	--	--	3.79	73
--	--	--	--	--	--	3.75	74	3.86	74
3.83	75	3.36	75	3.50	75	3.83	75	--	--
--	--	3.45	76	--	--	--	--	3.93	76
3.92	77	--	--	--	--	3.92	77	--	--
--	--	3.55	78	3.60	78	--	--	--	--
--	--	--	--	--	--	--	--	4.00	79
4.00	80	--	--	--	--	4.00	80	--	--
--	--	3.64	82	3.80	82	--	--	--	--

Table 6. Uniform T score for the UPPS-P scales (N = 797).

Negative Urgency		Lack of Premeditation		Lack of Perseverance		Sensation Seeking		Positive Urgency	
Score	Normalized T score	Score	Normalized T score	Score	Normalized T score	Score	Normalized T score	Score	Normalized T score
1.04	34	--	--	--	--	1.00	34	--	--
1.08, 1.13	35	--	--	1.00	35	1.04, 1.08	35	--	--
1.17, 1.21	36	1.00, 1.05	36	1.05, 1.10	36	1.13	36	1.00	36
1.25, 1.29	37	1.09, 1.13	37	1.15	37	1.17, 1.20	37	--	--
1.33, 1.38	38	1.17, 1.18	38	1.20, 1.25	38	1.24, 1.28	38	1.04	38
1.42, 1.46	39	1.23	39	1.30	39	1.32, 1.33	39	1.07	39
1.50, 1.54	40	1.27, 1.32	40	1.35	40	1.38, 1.42	40	1.11	40
1.58	41	1.36	41	1.40	41	1.46, 1.50	41	1.14	41
1.63, 1.67	42	1.41	42	1.45	42	1.54, 1.58	42	1.18, 1.21	42
1.71, 1.75	43	1.45	43	1.50, 1.52	43	1.60, 1.67	43	1.23	43
1.79, 1.83	44	1.50, 1.55	44	1.57, 1.60	44	1.71, 1.75	44	1.26, 1.29	44
1.88	45	1.59	45	1.65	45	1.79, 1.83	45	1.32	45
1.92, 1.97	46	1.64	46	1.70	46	1.88	46	1.36, 1.39	46
2.00, 2.04	47	1.69	47	1.75	47	1.92, 1.96	47	1.43	47
2.08	48	1.73	48	1.80	48	2.00, 2.04	48	1.46, 1.50	48
2.13, 2.17	49	1.77	49	1.85	49	2.08, 2.12	49	1.54	49
2.21, 2.25	50	1.82, 1.86	50	1.90, 1.95	50	2.16, 2.21	50	1.57, 1.60	50
2.28	51	1.91	51	2.00	51	2.25, 2.29	51	1.64, 1.68	51
2.33, 2.38	52	1.95	52	2.05	52	2.33, 2.38	52	1.71, 1.75	52
2.42	53	2.00	53	2.10	53	2.42	53	1.79, 1.82	53
2.46, 2.50	54	2.05	54	2.13	54	2.46, 2.50	54	1.86, 1.89	54
2.54	55	2.09, 2.11	55	2.18, 2.20	55	2.54, 2.58	55	1.93, 1.99	55
2.58, 2.60	56	2.16	56	2.23	56	2.63	56	2.04, 2.07	56
2.65, 2.67	57	2.18	57	2.28, 2.32	57	2.67, 2.71	57	2.11, 2.18	57
2.71, 2.75	58	2.23	58	2.37	58	2.75	58	2.21, 2.25	58
2.79	59	2.27, 2.32	59	2.40	59	2.79, 2.83	59	2.29, 2.32	59
2.83	60	2.36	60	2.45	60	2.88	60	2.36, 2.39	60
2.88, 2.93	61	2.41	61	2.50, 2.55	61	2.92, 2.96	61	2.46	61
2.97	62	2.45	62	2.60	62	3.00	62	2.54	62
3.04	63	2.50	63	2.61, 2.66	63	3.04, 3.08	63	2.61	63
3.08	64	2.55, 2.59	64	2.70	64	3.13	64	2.68, 2.75	64
3.13	65	2.64	65	2.75	65	3.17	65	2.82	65
3.21	66	2.68	66	2.80	66	3.21	66	2.90	66
3.29	67	--	--	2.85	67	3.29	67	2.97	67
--	--	2.77	68	--	--	3.33	68	3.07	68
3.38	69	2.86	69	2.95	69	3.38, 3.42	69	--	--
3.46	70	2.91	70	3.05	70	3.46	70	3.18	70
--	--	2.95	71	3.10	71	3.54	71	3.29	71
3.54	72	--	--	3.16	72	--	--	--	--
3.63	73	3.05	73	--	--	3.63	73	3.46	73
3.71	75	3.18	75	3.30	75	--	--	--	--
--	--	--	--	--	--	3.79	76	3.68	76
3.83	77	--	--	--	--	--	--	--	--
--	--	--	--	3.45	78	--	--	3.86	78
--	--	3.36	79	--	--	--	--	--	--

4. Discussion

As a whole, the present study suggest that the Italian translation of the UPPS-P may represents a psychometrically sound measure of impulsive traits also in community-dwelling adults. Confirming and extending previous results (Fossati et al., 2016; Smith et al., 2007), our study showed that UPPS-P was provided with adequate reliability. Specifically, in our sample UPPS-

P scales showed adequate internal consistency reliability estimates, with ω coefficient values ranging from .90 (Lack of Perseverance) to .97 (Positive Urgency).

Our findings were consistent with the only Italian study on the five-factor structure of the UPPS-P item (Fossati et al., 2016). Confirming and extending previous findings in Italian clinical adults (Fossati et al., 2016), our WLSMV CFA results supported the *a priori* five-factor structure of the 59 UPPS-P items. All UPPS-P items significantly and positively loaded on their *a priori* defined factors; with the possible exception of Item 53, all the UPPS-P showed standardized factor loadings that could be considered substantial (i.e., standardized loading values $>.30$) on their corresponding factors, with a median standardized loading value of .73, all $ps <.001$.

In the present study, the second-order factor model of the UPPS-P items proposed by Cyders and Smith (2007) was provided with adequate fit indices also among Italian community-dwelling adults. It should be observed that assessing the adequacy of this model did not represent one of the major goals of our study, which was focused on the measurement properties of the UPPS-P. Indeed, despite previous studies showed the UPPS-P three higher-order factors related differentially with theoretically relevant external criteria, including risky behavior (e.g., substance use) and psychological dysfunction (Smith et al., 2007), this structural model does not have implications for the assessment of impulsivity in applied contexts (i.e., UPPS-P scores are not computed according to this higher-order factor model).

To the best of our knowledge, our study is the first to demonstrate measurement invariance of UPPS-P scales in Italian participants. Typically, measurement invariance assessment for a multi-item scale requires evaluating whether the items relate to the construct(s) in the same way for all individuals (Bauer, 2017). If measurement invariance holds, scores and other results between individuals from the different populations can be validly compared (Bauer, 2017). Consistent with findings on the English version of the UPPS-P (Cyders, 2013), our measurement invariance findings supported the hypothesis that the UPPS-P items were provided with scalar invariance. Although the DIFFTEST chi-square value was positive, the difference of the values of CFI (Δ -CFI) indices for the scalar invariance model and the metric invariance model was as small as 0.002, thus suggesting that the difference in goodness-of-fit between the metric invariance model and the scalar invariance model could be deemed trivial by conventional standards (Cheung & Rensvold, 2002). To be overly conservative, our findings suggest that male and female community-dwelling adults could be legitimately compared on their UPPS-P latent factor mean scores.

Finally, we feel that one of the major contributions of the present study is the possibility to provide normative data and *T* scores for the UPPS-P scales in a sample of Italian community-

dwelling adults. In this study, we decided to yield both normalized and uniform T scores, in order to give to researchers, the possibility to choose between these two different T scores. Normalized T scores allow researchers to compare the subject's score with the corresponding normo-distributed scores and are consistent with theoretical consideration suggesting that impulsive behaviors are likely to represent normally distributed characteristics, which becomes dysfunctional in the extreme tails of their distribution. Instead, the use of uniform T scores allow researchers to retain the skewness properties of the raw scores, thus mapping the UPPS-P scores on non-normal distributions that are frequently observed for dysfunctional personality features and psychopathological manifestations, in a way which is consistent with the MMPI-RF approach (Tellegen & Ben-Porath, 1992).

Despite these positive findings, we feel that our study should be considered in the light of several limitations. Although the current study included a moderately large number of participants ($N = 797$), it was based on community dwelling adult participants. Thus, our samples represented convenient study groups rather than samples representative of the Italian population. Moreover, all participants in our study were community dwelling participants; thus, our findings should not be extended to adults from clinical or forensic setting.

In our study, participants were adult volunteers who received no incentive for taking part in the research; extant research indicates that differences exist in the motivation between paid and nonpaid research participants (Gerstein et al., 2004). However, research data offer conflicting findings as to using incentives for participants lead to improved commitment or to biased findings (e.g., Grady et al., 2005).

Finally, our sample included a high rate (i.e., 77.2%) of female participants; however, the high rate of female participants that was observed in our study was consistent with extant research documenting a relative overabundance of women subjects participating in online studies (Gosling et al., 2004; Paolacci et al., 2010), which may reflect women having greater access to computers (either at home or at work) or gender differences in motivation (Paolacci et al., 2010). Of course, this limitation suggests that further studies are needed before accepting our results and care should be used in generalizing our findings to the Italian general population.

As a whole, these limitations stress the need for further replications and extensions before accepting our results. Even keeping the limitations of our study in mind, we feel that our findings may prove useful in providing evidence of the UPPS-P five factor structure, while providing support for the scalar invariance of the Italian translation of the UPPS-P across males and females. The availability of normative data and T scores may help clinicians and researchers to use the UPPS-P in their routine assessment of impulsive behaviors.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any potential conflict of interest.

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