

Construction and Standardization of an Impulsivity Scale for Adolescents

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ABSTRACT

Impulsivity, defined as the tendency to act without foresight, comprises a multitude of constructs. Impulsivity has been linked to a number of socially deviant behaviours such as aggression, substance abuse, and psychopathologies such as bipolar disorder, attention deficit hyperactivity disorder, and borderline personality disorder, antisocial personality disorder, suicide attempt etc. It is a significant concern among the adolescent population. Hence this variable needs to be studied systematically. The purpose of the present study was to construct and standardize an impulsivity scale for adolescents. The draft scale having 60 items and 5 dimensions was administered to 600 adolescent students. The researchers developed the final Impulsivity scale for adolescents having 30 items, 16 of the items were favorable while 14 were unfavorable. The items were selected basing on the high t-value and each of the dimensions of the scale was given equal weightage. The results of the present study reveal that it is an internally consistent measure of Impulsivity and has potential utility for measuring impulsivity among adolescents.

Keywords: Construction, Standardization, Impulsivity, Adolescents

The term 'Impulsivity' has been one of the most frequently applied and researched cognitive constructs (DeYoung, 2016). Impulsivity has been linked to a number of socially deviant behaviours such as aggression (Grimaldi et al., 2014), substance abuse (Swann et al., 2004), and psychopathologies such as bipolar disorder, attention deficit hyperactivity disorder (Winstanley et al., 2006), and borderline personality disorder, antisocial personality disorder (American Psychiatric Association, 2000), suicide attempt (Singh et al., 2018) etc. Impulsivity is a risk factor associated with reactive aggression and antisocial behaviour during adolescence (Orue et al., 2016). Impulsivity is one of the most frequently examined constructs in psychology. Impulsivity also plays a prominent role in understanding and diagnosis of various forms of psychopathologies.

Hence, it's an urgency to study this variable systematically. To reduce the impulsivity level of the adolescents' proper interventions should be taken by the schools and for this a comprehensive measure of impulsivity is needed to assess the existing level of impulsivity and to evaluate the effectiveness of those interventions.

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Measurement of Impulsivity

While the clinical literature is consistent in describing the importance of impulsivity in a number of psychiatric disorders, there has been much more inconsistency in the definition of impulsivity. Due to conceptual inconsistencies and contextual consideration, there is no comprehensive theory regarding the concept of impulsivity. Consequently, there is equal confusion in attempts to measure the construct and there is no consensus that all the instruments are measuring the same construct. However, there are primarily two methods of impulsivity assessment viz., self-report measures and Behavioural laboratory measures of impulsivity.

Self- Report Measures of Impulsivity:

Self-report measures rely on an individual's self-perception of their behavior. Self-report measures have been by far the most commonly used technique for measuring impulsivity among young adolescents and adults.

The Barratt Impulsiveness Scale-11 (BIS-11) is one of the most widely used scales for the assessment of impulsivity. The first BIS was developed in 1959 by Dr. Ernest Barratt. Its currently used version was designed by Patton and his colleagues (1995). According to them, there are three main subscales (attentional impulsiveness, motor impulsiveness, and non-planning impulsiveness) within 30 items. Dickman (1990) developed the Dickman Impulsivity Inventory basing on the proposal that there are two types of impulsivities that are significantly different from each other: Functional impulsivity and dysfunctional impulsivity. Cloninger (1999) developed Temperament and Character Inventory Impulsiveness (TCI) which is an 8-item subscale of the novelty-seeking dimension.

Whiteside et al. (2001) developed the UPPS Impulsive Behavior scale containing 45-item. This scale was designed to measure impulsivity across dimensions of the Five Factor Model of personality. The UPPS includes 4 sub-scales: lack of premeditation (tendency to act without thinking), urgency (tendency to act rashly under extreme negative emotions), lack of perseverance (inability to remain focused on a task) and sensation seeking (tendency to seek out novel and thrilling experiences). In 2007, Cyders and colleagues created a scale of positive urgency, which was later incorporated into the UPPS scale. Zapolski et al. (2011) developed a child version of the UPPS-Scale to measure UPPS-model of impulsivity traits. Similarly, Mayhew et al. (2014) developed a 17-item Recent Rush Impulsivity Scale.

Behavioural Laboratory Measures:

Impulsivity is also measured as a behaviour. Such as whether or not an individual can suppress a keystroke response or an eye saccade when given a stop signal in a go/ no go situation, suppress an automatic response to read a word to describe the colour of a word, or how likely someone is to choose between rewards that appear sooner but are smaller than those which appear later.

Some of the behavioural measures are as follows: The delay of gratification paradigm, also known as the "marshmallow test," is one easily recognisable impulsivity test. The marshmallow test was created in the 1960s to evaluate children's self-control and willpower. Logan et al. (1997) developed Stop Signal Task (SST) where the participants are instructed to respond as quickly as possible to a visual 'go' signal presented on the computer screen, but to inhibit this response if an auditory 'stop' signal is given. Stop signals are presented after varying delays following 25% of 'go' signals. Richards et al. (1999) developed Adjusting Delay Discounting task to measure the ability to delay gratification. Similarly, Mitchell (1999)

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developed Experiential Discounting/ Work Task, a real-time delay discounting procedure, where participants make choice between a reward of \$0.30 which they have a chance of receiving after a period of delay (0 to 60s), or adjusting smaller reward that is immediate and certain.

Another task was developed by Dougherty et al. (2002). This was named as Immediate and Delayed Memory Task (IMT/DMT). Similarly, Newman et al. (2003) developed Go/ No Go task in which the participant is presented with two randomly altering stimuli, and instructed to respond quickly to one of the stimuli but not the other. One of the two stimuli is presented more frequently, forming a pre-potent response for those stimuli. So, in this task the inhibitory control of the participant is measured.

Rationale of the Study

Impulsive behavior is viewed as a counterproductive by society and impulsivity has been found to be related to a number of socially deviant behaviors such as aggression (Houston et al., 2003), substance abuse (Swann et al., 2004) and psychopathologies including bipolar disorder, attention deficit hyperactivity disorder (Winstanley et al., 2006), borderline personality disorder, antisocial personality disorder (American Psychiatric Association, 2000) etc. Studying these relationships during adolescence and emerging adulthood is of particular importance, because this is when such things are initiated and impulsive behavior is elevated. Impulsivity is a risk factor in the Indian context too (Singh et al., 2018). To reduce the impulsivity level, proper interventions, programmes and exercises should be taken and for this there is a requirement of an adequate tool to measure the level of impulsivity. Moreover, a comprehensive measure is also needed to measure the level of impulsivity before and after the intervention to evaluate the appropriateness and effectiveness of those interventions.

After reviewing the measures of impulsivity, the researchers found a lack of an adequate measure of impulsivity. The Barratt Impulsiveness Scale-11(1995) was originally developed for the adults in USA and it was basically restricted to measurement of trait impulsivity. Similarly, the trait impulsivity scale constructed by Mayhew et al. (2014) focused only on two dimensions (Cognitive and motor) of impulsivity. These measures are not for temporary fluctuations of impulsivity. Again, the impulsivity scales developed by Tellegan (1982), Cloninger (1991), Costa et al., (1992) are just subscales of personality inventories. On the other hand, behavioral measure Stop Signal Task (SST) of Logan et. al (1997), Go/Stop Task (Newman et al., 1985) focused only on the 'inhibition' dimension.

Since adolescents have a higher risk of acting impulsively, they have been included in studies of impulsivity. This might be connected to adolescent neurodevelopment. Adolescents who take more risks and are more emotional are more likely to experience different developmental transitions in subcortical limbic areas relative to cortical control regions (prefrontal cortex). Teenagers will therefore depend more on feelings and less on their intellect when making an immediate personal decision (Cassey et al., 2008). As a result, adolescence is a delicate stage of life when substance abuse, depressive symptoms, and other types of problem behavior are on the rise (Piko et al., 2005). A suitable impulsivity measurement technique is required in order to examine adolescent impulsivity. The researcher found a lack of an adequate measure of Impulsivity for the adolescents Moreover, the existing measures of impulsivity were basically developed in other countries. So, the researchers felt a lack of impulsivity measure in Indian socio-cultural context as the statements of the existing self- report measures were for adults.

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Objectives:

The main objective of the study was “**to construct and standardize an impulsivity scale for Adolescents.**” The objective was again divided into 8 sub-objectives for the convenience of conducting the study. These were as follows:

1. To prepare a draft of the impulsivity scale for adolescents.
2. To try out the draft of the impulsivity scale for adolescents.
3. To make item analysis of the impulsivity scale for adolescents
4. To prepare the final impulsivity scale.
5. To determine the reliability of the impulsivity scale.
6. To determine the validity of the impulsivity scale.
7. To determine the norm of the impulsivity scale.

Definition of the key terms:

Impulsivity:

In this study, impulsivity will be quantified by using the scale constructed by the researcher which will cover 6 dimensions. These dimensions are- a) Urgency: It includes the tendency to act rashly while faced with intense negative emotional context, to alleviate negative emotions, despite the harmful long-term consequences, (b) Lack of Premeditation: Lack of premeditation includes individual’s propensity to act without planning. It includes lack of tendency to take account the consequences of an act before engaging in the act, focus on the choice of smaller, immediately available rewards over more valued delayed rewards, (c) Lack of Perseverance: Lack of perseverance indicates an individual’s tendency to leave task unfinished or give up. This includes the inability to remain focused on a task that may be boring/ difficult, (d) Sensation Seeking: It is a tendency to enjoy and pursue activities that are exciting, and openness to trying new experiences that may be dangerous, (e) Disinhibition: It refers to lack of restraint from activities or habit that may not follow social rules, and (f) Shifting: Shifting includes rapid turn or changes in behaviour. The items will be formed based on these dimensions. The higher scores obtained by the respondent in the items related to these dimensions will indicate the higher in Impulsivity and lower score will indicate low in Impulsivity.

Construction:

In the present study, construction refers to the process of (i) Writing items based on identified dimensions (ii) necessary editing of the statements (iii) try-out of the preliminary draft on a sample (iv) item analysis (discriminating power) of the statements (v) preparation of the final draft of the selected statements for adolescents.

Standardization

In the present study, standardization refers to the estimating Reliability (Split half reliability through Spearman brown’s prophecy formula, and Cronbach alpha), Validity (Content validity, Concurrent validity with BIS-11, Construct validity through Confirmatory Factor Analysis), and Norms (Z-score form) of the Impulsivity scale for adolescents.

- **Delimitation of the study:** The present study is only limited to the Golaghat District of Assam (India) and only to the students of secondary schools of IX and X under Board of Secondary Education, Assam (SEBA) and Central Board of Secondary Education (CBSE).
- **Method of the Study:** Descriptive survey method was used in the present study to collect data for tryout of the Impulsivity scale and standardization of the Impulsivity scale.

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- **Population:** The population of the study comprised of adolescent students of class IX and X of the Secondary schools (Government and Private) under SEBA and CBSE of Golaghat district.

Table 1 Sample for Try- out of the Impulsivity scale for Adolescents

Schools				No of Students		
Stratum1	Stratum 2	Total No of schools	Sample Schools	Male Adolescent	Female Adolescent	Total
Adolescents studying in class IX and X of Rural Secondary Schools (Total schools=271)	Adolescents studying in class IX and X of Rural Government Secondary Schools (155)	155	4 (all the adolescent students of class IX and X present during the visit of data collection)	86	76	162
	Adolescents studying in class IX and X of Rural Private Secondary Schools 116	116	4 schools (All the students of class IX and X present during the visit of data collection)	76	60	136
Adolescents studying in class IX and X of Urban Secondary schools (Total schools=39)	Adolescents studying in class IX and X Urban Government Secondary schools (28)	28	4 (All the students of class IX and X present during data collection)	86	62	148
	Adolescents studying in class IX and X of Urban Private Secondary Schools (11)	11	4 (All the students of class IX and X present during data collection)	70	84	154
Total			16			600

Sample and Sampling: The researchers selected three samples for the samples for the present study. Sample for preliminary of tryout of the draft scale. Sample for actual try out of the draft Impulsivity scale, and sample for the standardization of the scale.

Sample for Preliminary Try out:

For the preliminary try out of the researchers selected one secondary school purposively having co-education. In this phase, data were collected from 40 students.

Sample for Try out:

For the tryout phase, the researchers selected a sample of 600 students of class IX and X from the secondary schools of Golaghat district, Assam. Quota sampling technique was used for

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drawing the sample. The secondary schools of Golaghat were divided into two strata: Rural and Urban and then they were again subdivided into Government and Private secondary schools.

Sample for Standardization:

For the purpose of standardization of the scale, the researchers selected sample for the both version of the scale. The researcher selected the samples using incidental sampling technique. A sample of 156 was drawn from 6 secondary schools for the standardization of the Assamese version of the scale and sample of 50 students from 2 secondary schools was selected in order to standardize the English version of the scale.

Data Collection:

The researchers collected the data in three phases. Data were gathered for the preliminary try out in the first stage, the actual try out in the second step, and the standardization of the Impulsivity Scale for Adolescents in the third step. Firstly, the preliminary try out was done to check the language feasibility, the vagueness of the items and average time taken by the respondents. 40 students participated in the preliminary try out of the scale. The researchers obtained consent from all Heads/Principals of the institutions of the selected schools and explained the rationale behind the data collection. The draft Impulsivity scale for Adolescents was given out directly by the researcher when she visited the chosen secondary schools. At the 2nd stage, the researchers visited 16 secondary schools and the data were collected from 600 students of class IX and X. The sample for the standardization of the Assamese version of the scale was 156, while for English version 50 students were selected.

Analysis and Interpretation:

Objective-1: To prepare a draft of the impulsivity scale for adolescents.

The investigators thoroughly consulted the literature related to construction and standardization of Impulsivity scale for Adolescents. After consulting the related literature, the researcher planned to take the 4 dimensions of UPPS Impulsiveness model developed by Whiteside et al. (2001). Whiteside et al. (2001) aimed to find aspects of impulsivity that are consistent across measures and place them in an inclusive model of personality in an effort to bring more clarity to the range of impulsivity measures that have been placed in a variety of personality theories. The Five-Factor Model of Personality (FFM; McCrae & Costa, 1990) was specifically employed by them to a framework from which to comprehend and in which to position the diverse concepts of impulsivity.

Preparation of the Statements: To prepare the statements of the draft Impulsivity Scale for Adolescents, researchers organized a group discussion with students, research scholars of various departments of Dibrugarh University. They informed clearly the Participants about the dimensions selected for the scale. Then they were asked to think various moments of their life when they or someone they knew showed impulsive behaviour.

The Dimensions considered in preparing the statements of the draft Impulsivity Scale for Adolescents: As a theoretical foundation for the dimensions to construct the Impulsivity scale for adolescents, the researcher chose the UPPS Impulsiveness scale based on the Five-Factor Model of Personality. The scale consists of four subscales/ dimensions viz. Urgency, Premeditation (Lack of), Perseverance (Lack of), and Sensation Seeking. Along with the four dimensions, the researcher included two more dimensions, i.e., disinhibition and shifting after consulting the related literature for the construction of the present scale.

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Table 2 Dimensions of Impulsivity Scale for Adolescents

Dimension	Key Points
Urgency	<ul style="list-style-type: none"> • To commit rash and regrettable action in emotional context. • Act rashly while experiencing negative emotion
Lack of Premeditation	<ul style="list-style-type: none"> • To act without planning • Lack of ability to take into consideration the consequences of an act • Choice of smaller, immediately available rewards over more valued delayed reward.
Lack of Perseverance	<ul style="list-style-type: none"> • Difficulty to remain focused on a task that may be difficult • Difficulty to deal with setbacks • Tendency to leave things unfinished or to Give up
Sensation Seeking	<ul style="list-style-type: none"> • Tendency to enjoy and pursue exciting things • Openness to new things that may be dangerous. • Tendency to engage in thrilling experience • Desire to take physical, social, financial risk
Lack of Inhibition or Disinhibition	<ul style="list-style-type: none"> • Inability to resist internal or external urges or temptations. • Actions when people do not follow social norms about what to say or where to say
Shifting	<ul style="list-style-type: none"> • Rapid changes in behavior • Rapid changes in mood.

Table 3 Distribution of the Statements of preliminary draft Impulsivity Scale for Adolescents:

Dimension	Statement	No of statement	Total
Urgency	Favorable	8	14
	Unfavorable	6	
Lack of Premeditation	Favorable	6	10
	Unfavorable	4	
Lack of Perseverance	Favorable	6	11
	Unfavorable	5	
Sensation Seeking	Favorable	5	8
	Unfavorable	3	
Lack of Inhibition	Favorable	3	7
	Unfavorable	4	
Shifting	Favorable	6	10
	Unfavorable	4	

Preparation of Scoring Key: The Researcher followed Likert's (1932) procedure of scoring. There were five responses against each of the statements namely Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD). The scoring key is shown below.

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Table 4 Scoring Key

Type of Items	Strongly Agree (SA)	Agree (A)	Undecided (U)	Disagree (D)	Strongly Disagree (SD)
Favorable	5	4	3	2	1
Unfavorable	1	2	3	4	5

Reviewing and Editing the Statements: The draft containing statements was given to 12 experts for analyzing the content, language, nature of the items as well as for editing the statements. They reviewed the statements and offered some suggestions. The statements were sent to both English and Assamese language experts since they were prepared in both Assamese and English.

Selecting the items for the draft: Based on the feedback from the experts, some of the statements were modified before they were arranged according to the six dimensions. They are favorable statements and unfavorable statements altogether. After getting the response sheets from the experts, the researchers modified some statements and some of the statements were dropped.

Table:5 Distribution of items for the actual draft of the Impulsivity Scale for Adolescents

Dimension	Statement	No of statement	Total
Urgency	1, 2, 4, 7, 8, 9, 11, 12	Favorable	14
	3, 5, 6, 10, 13,14	Unfavorable	
Lack of Premeditation	15, 16, 20, 21, 22, 23	Favorable	10
	17, 18, 19,24	Unfavorable	
Lack of Perseverance	26, 27, 31,32, 33, 34	Favorable	11
	25, 28, 29, 30, 35	Unfavorable	
Sensation Seeking	36, 37, 38, 39, 41	Favorable	8
	40, 42, 43	Unfavorable	
Lack of Inhibition	44, 45, 49	Favorable	7
	46, 47, 48, 50	Unfavorable	
Shifting	51, 53, 54, 58, 59, 60	Favorable	10
	52, 55, 56, 57	Unfavorable	

Objective -2: To try out the draft of the impulsivity scale for adolescents

Preliminary tryout: The preliminary draft of the present scale was given for try-out by investigators to identify whether the test statements have the power of discriminating between higher group and lower group of the respondents or not.

Sample: During the actual try out, the data were collected from 600 students of class IX and X of 16 secondary schools of Golaghat district of Assam.

Instruction: The researcher included the necessary instructions on the first page of the response sheet. The instructions were written both in Assamese and English Language. Oral instructions were also provided wherever it was needed. The instruction was: “There are some statements in the following pages. You are to read the statements carefully and respond to them. Five alternatives are given against each of the statements, viz., Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. To respond to the statements, use (✓) mark in

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the alternatives that you have chosen. There is no right or wrong answer because this is not an exam. Please be as honest as you can in your response. The data will be used only for research purpose and all the information will be kept totally confidential.”

Time limit:

Scoring Procedure: The same scoring procedure of Likert was followed in actual try out phase.

Objective-3: To make item analysis of the impulsivity scale for adolescents

The third objective of the study was “to make Item analysis of the draft Impulsivity scale for Adolescents.”

The responses of the 600 respondents were scored using the proposed scoring key. After that the respondents were arranged in descending order based on their scores. After arranging in descending order 27% (162) of the respondents from the top and 27% of the respondents from the bottom were extracted. Two groups were formed by this process, i.e., high and low scoring group. Following that the mean scores of each item by high scoring group and the low scoring group were computed and the difference between these mean scores of the high scoring group and low scoring group on a particular item/ statement was computed. The difference between these mean scores was considered as the discriminating power of that particular item. To find out whether the discriminating power of a particular item is significant or not, ‘t’ value equal to or greater to 1.75 ($t > 1.75$) was selected for the final draft of the Impulsivity scale. A ‘t’ value equal or greater to 1.75 means significant difference between the two groups on a particular item. The following formula was used for calculating t-value:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

Table:6 Statement/Item-wise discriminatory power value of the Impulsivity Scale for Adolescents

Dimension	Statement	t-value	Category (Favorable/ Unfavorable)	Result
Urgency	4	8.682	Favorable	Selected
	9	7.859	Favorable	Selected
	2	7.061	Favorable	
	1	6.880	Favorable	
	8	6.612	Favorable	
	11	5.499	Favorable	
	7	5.153	Favorable	
	12	3.067	Favorable	
	10	11.439	Unfavorable	Selected
	14	10.321	Unfavorable	Selected
	5	5.950	Unfavorable	Selected

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Dimension	Statement	t-value	Category (Favorable/ Unfavorable)	Result
	3	5.077	Unfavorable	
	6	4.808	Unfavorable	
	13	3.569	Unfavorable	
Lack of Premeditation	23	13.368	Favorable	Selected
	20	8.991	Favorable	Selected
	21	8.981	Favorable	Selected
	16	7.824	Favorable	
	15	6.273	Favorable	
	22	3.170	Favorable	
	19	4.962	Unfavorable	Selected
	18	4.799	Unfavorable	Selected
	17	4.791	Unfavorable	
Lack of Perseverance	24	4.766	Unfavorable	
	32	14.506	Favorable	Selected
	33	12.078	Favorable	Selected
	27	9.689	Favorable	Selected
	31	8.858	Favorable	
	34	7.311	Favorable	
	25	5.373	Favorable	
	26	4.655	Favorable	
	30	6.329	Unfavorable	Selected
	35	6.002	Unfavorable	Selected
	29	5.213	Unfavorable	
Sensation seeking	28	3.426	Unfavorable	
	38	-0.255	Favorable	Selected
	36	2.158	Favorable	Selected
	37	2.569	Favorable	Selected
	41	2.158	Favorable	
	39	-0.255	Favorable	
	42	4.966	Unfavorable	Selected
	40	2.256	Unfavorable	Selected
Lack of inhibition or disinhibition	43	-1.715	Unfavorable	
	44	11.973	Favorable	Selected
	49	11.787	Favorable	Selected
	45	4.012	Favorable	
	46	11.793	Unfavorable	Selected
	47	6.924	Unfavorable	Selected
	48	7.019	Unfavorable	Selected
Shifting	50	6.076	Unfavorable	
	53	14.273	Favorable	Selected
	59	14.179	Favorable	Selected

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Dimension	Statement	t-value	Category (Favorable/ Unfavorable)	Result
	60	13.212	Favorable	Selected
	54	11.794	Favorable	
	58	5.122	Favorable	
	51	3.836	Favorable	
	56	10.483	Unfavorable	Selected
	55	9.956	Unfavorable	Selected
	52	7.992	Unfavorable	
	57	5.366	Unfavorable	

Objective-4: To prepare the final impulsivity scale.

After the item analysis, the researchers decided to keep 30 items for the final scale as planned earlier. The items having comparatively high t-value were selected for the final scale and each of the dimensions was given equal weightage.

Table: 7 Distribution of items of the final Impulsivity Scale.

Dimension	Statement/Item No		No of Items		Total
	Favorable	Unfavorable	Favorable	Unfavorable	
Urgency					5
	2, 3	1, 4, 5	2	3	
Lack of Premeditation	8, 9, 10	6,7	3	2	5
Lack of Perseverance	13, 14, 15	11, 12	3	2	5
Sensation Seeking	17, 18, 19	16, 20	3	2	5
Lack of Inhibition	24, 25	21, 22, 23	2	3	5
Shifting	28, 29, 30	26, 27	3	2	5
Total			16	14	30

Objective-5: To determine the reliability of the impulsivity scale.

Considering the nature of the present scale, the researchers decided to estimate internal consistency reliability. So, the Split Half Method and Cronbach's Alpha were adopted to determine the reliability of Impulsivity Scale for Adolescents.

Reliability coefficient by Split half method: To determine the

The researchers calculated Cronbach Alpha to find out the internal consistency reliability for the Impulsivity scale for adolescents. Cronbach's alpha was calculated by the following formula.

$$r_{tt} = \alpha = \left(\frac{n}{n-1} \right) \frac{\sigma_t^2 - \sum(\sigma_i^2)}{\sigma_t^2}$$

For the Assamese version of the Impulsivity scale for Adolescents, the reliability coefficient using split half method was .79 and Cronbach alpha was .72. While for the English version it was .77 and .76 respectively.

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Objective-6: To determine the validity of the impulsivity scale.

The researchers decided to determine content validity and concurrent validity of the Impulsivity Scale for Adolescents. The researcher forwarded the items to experts for feedback on the content, structure, and coverage of the items in order to determine the content validity of the Impulsivity scale for Adolescents. The researcher selected the scale's items after receiving the suggestions, and some of the items were modified and some of them were eliminated. So, basing on the judgements, the scale has content validity.

The concurrent validity of the Impulsivity Scale for Adolescents was estimated by determining coefficient of correlation between the two set of scores, i.e., scores obtained from the Impulsivity Scale for Adolescents and Scores obtained in the Barratt Impulsiveness Scale-11. BIS-11 (Patton et al., 1995)

The concurrent validity index for the Assamese version of the Impulsivity Scale for Adolescents was found to be .73. The index of concurrent validity for the English version of the Impulsivity Scale for Adolescents was found to be .69.

Objective-7: To determine the norm of the impulsivity scale

To estimate the norms of the Impulsivity Scale for Adolescents, the researchers converted the raw score of the selected sample to Z-Score. The Z-Score was determined by the following formula:

$$Z = \frac{X - M}{\sigma}$$

The details of the Z-Score are given below.

Table: 8 Z-score norms for the Impulsivity Scale for Adolescents. (Assamese Version)
Mean=79.33; SD= 12.66, N=156

Raw Score	Z-Score	Raw Score	Z-Score	Raw Score	Z-Score
52	-2.16	74	-0.42	96	1.32
53	-2.08	75	-0.34	97	1.40
54	-2.00	76	-0.26	98	1.47
55	-1.92	77	-0.18	99	1.55
56	-1.84	78	-0.11	100	1.63
57	-1.76	79	-0.03	101	1.71
58	-1.68	80	0.05	102	1.79
59	-1.61	81	0.13	103	1.87
60	-1.53	82	0.21	104	1.95
61	-1.45	83	0.29	105	2.03
62	-1.37	84	0.37	106	2.11
63	-1.29	85	0.45	107	2.19
64	-1.21	86	0.53	108	2.26
65	-1.13	87	0.61	109	2.34
66	-1.05	88	0.68	110	2.42
67	-0.97	89	0.76	111	2.50
68	-0.89	90	0.84	112	2.58
69	-0.82	91	0.92	113	2.66
70	-0.74	92	1.00	114	2.74

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Raw Score	Z-Score	Raw Score	Z-Score	Raw Score	Z-Score
71	-0.66	93	1.08	115	2.82
72	-0.58	94	1.16		
73	-0.50	95	1.24		

Dimension -Wise Z-Score Norm for Assamese Version of the scale

Table No.9 Dimension 1: Urgency

Mean=12.17; SD= 3.30; N=156

Raw Score	Z-Score	Raw Score	Z-Score	Raw Score	Z-Score
6	-1.87	12	-0.05	18	1.77
7	-1.57	13	0.25	19	2.07
8	-1.26	14	0.55	20	2.37
9	-0.96	15	0.86	21	2.68
10	-0.66	16	1.16		
11	-0.35	17	1.46		

Table No. 10

Dimension 2: Lack of Premeditation

Mean=14.18; SD= 3.40; N= 156

Raw Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
6	-2.41	12	-0.64	18	1.12
7	-2.11	13	-0.35	19	1.42
8	-1.82	14	-0.05	20	1.71
9	-1.52	15	0.24	21	2.01
10	-1.23	16	0.54	22	2.30
11	-0.94	17	0.83	23	2.59

Table No.11

Dimension 3: Lack of Perseverance

Mean=12.99; SD= 4.03; N=156

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
5	-1.98	12	-0.25	19	1.49
6	-1.73	13	0.002	20	1.74
7	-1.49	14	0.25	21	1.99
8	-1.24	15	0.50	22	2.23
9	-0.99	16	0.74	23	2.48
10	-0.74	17	0.99	24	2.73
11	-0.50	18	1.24	25	2.98

Table No.12

Dimension 4: Sensation Seeking

Mean=15.1; SD=3.05; N=156

Raw Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-score
7	-2.66	14	-0.36	21	1.93
8	-2.33	15	-0.03	22	2.26
9	-2	16	0.30	23	2.59
10	-1.67	17	0.62	24	2.91

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Raw Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-score
11	-1.34	18	0.95	25	3.24
12	-1.01	19	1.27		
13	-0.69	20	1.61		

Table No. 13

Dimension 5: Disinhibition

Mean=11.4; SD=3.42; N=156

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
5	-1.87	11	-0.11	17	1.64
6	-1.58	12	0.18	18	1.93
7	-1.28	13	0.46	19	2.22
8	-0.99	14	0.76	20	2.51
9	-0.70	15	1.05	21	2.81
10	-0.40	16	1.34		

Table No. 14

Dimension 6: Shifting

Mean=; SD=; N=156

Raw- Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
5	-2.51	12	-0.44	19	1.62
6	-2.21	13	-0.15	20	1.92
7	-1.92	14	0.15	21	2.21
8	-1.62	15	0.44	22	2.51
9	-1.33	16	0.74	23	2.80
10	-1.03	17	1.03	24	3.10
11	-0.74	18	1.33	25	3.39

Table No. 15

Z-Score Norms for the Impulsivity Scale for Adolescents (English Version)

Mean=84.76; SD=12.79; N=50

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw Score	Z-Score
53	-2.48	72	-0.99	91	0.48
54	-2.41	73	-0.91	92	0.57
55	-2.32	74	0.84	93	0.64
56	-2.25	75	-0.76	94	0.72
57	-2.17	76	-0.68	95	0.80
58	-2.09	77	-0.61	96	0.87
59	-2.01	78	-0.53	97	0.96
60	-1.94	79	-0.45	98	1.03
61	-1.86	80	-0.37	99	1.11
62	-1.78	81	-0.29	100	1.19
63	-1.70	82	-0.21	101	1.26
64	-1.62	83	-0.14	102	1.34
65	-1.54	84	-0.06	103	1.42
66	-1.47	85	0.02	104	1.50
67	-1.39	86	0.10	105	1.58
68	-1.31	87	0.17	106	1.66

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Raw-Score	Z-Score	Raw-Score	Z-Score	Raw Score	Z-Score
69	-1.23	88	0.25	107	1.74
70	-1.15	89	0.33	108	1.81
71	-1.08	90	0.41	109	1.90

Table No. 16

Dimension 1: Urgency

Mean=13.62; SD=3.48; N=50

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw Score	Z-Score
7	-1.90	12	-0.47	17	0.97
8	-1.61	13	-0.18	18	1.26
9	-1.32	14	0.11	19	1.55
10	-1.04	15	0.40	20	1.83
11	-0.75	16	0.68	21	2.12

Table No 17

Dimension 2: Lack of Premeditation

Mean=13.4; SD=2.84; N=50

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
7	-2.25	12	-0.49	17	1.27
8	-1.90	13	-0.14	18	1.62
9	-1.55	14	0.02	19	1.97
10	-1.20	15	0.56		
11	-0.85	16	0.92		

Table No. 18

Dimension 3: Lack of Perseverance

Mean=14.14; SD=3.96; N=50

Raw-Score	Z-Score	Raw Score	Z-Score	Raw-Score	Z-Score
7	-1.80	14	-0.04	21	1.73
8	-1.55	15	0.22	22	1.98
9	-1.30	16	0.47	23	2.24
10	-1.05	17	0.72	24	2.49
11	-0.79	18	0.98	25	2.74
12	-0.54	19	1.23		
13	-0.28	20	1.48		

Table No. 19

Dimension 4: Sensation Seeking

Mean=16.22; SD=3.32; N=50

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
9	-2.17	15	-0.37	21	1.44
10	-1.87	16	-0.07	22	1.74
11	-1.57	17	0.23	23	2.04
12	-1.27	18	0.54	24	2.34
13	-0.96	19	0.84		
14	-0.67	20	1.14		

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Table No. 20

Dimension 5: Disinhibition

Mean=11.82; SD=2.69; N=50

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
7	-1.79	11	-0.30	15	1.18
8	-1.42	12	0.07	16	1.55
9	-1.05	13	0.44	17	1.93
10	-0.68	14	0.81	18	2.30

Table No. 21

Dimension 6: Shifting

Mean=15.56; SD=2.99; N=50

Raw-Score	Z-Score	Raw-Score	Z-Score	Raw-Score	Z-Score
8	-2.53	14	-0.52	20	1.48
9	-2.19	15	-0.19	21	1.82
10	-1.86	16	0.15	22	2.15
11	-1.53	17	0.48		
12	-1.19	18	0.82		
13	-0.86	19	1.15		

Categorization of level of Impulsivity of the Adolescents based on Z-Score:

Basing on the obtained Z-scores, the impulsivity levels of the adolescents were categorized as follows. The categorization was done for the both (Assamese and English) version of the Impulsivity scale.

Table. 22 Categorization of impulsivity level of the adolescents basing on the Z-score obtained in the Assamese version of the scale

SN.	Level of Impulsivity	Range of Z-Score	Range of Corresponding Z-Score
1	Very High	Above 1.50	Above 98
2	High	.50 to 1.50	87 - 98
3	Average	-.50 to .50	73 - 87
4	Low	-1.50 to -.50	60 - 73
5	Very Low	-1.50 or below	Below 60

Table No. 23 Categorization of impulsivity level of the adolescents basing on the Z-score obtained in the English version of the Impulsivity scale

SN.	Level of Impulsivity	Range of Z-Score	Range of Corresponding Z-Score
1	Very High	Above 1.32	Above 102
2	High	.44 to 1.32	91-102
3	Average	-.44 to .44	79- 91
4	Low	-1.32 to-.44	66-79
5	Very Low	-1.32 or below	Below 66

CONCLUSION

The Impulsivity Scale for Adolescents will be beneficial to measure the level of impulsivity of the adolescents particularly in Sociocultural context of India. This will make it easier to evaluate the effectiveness of the interventions and exercises taken to reduce the impulsivity

level of the adolescents. The scale will be helpful in the developing new impulsivity assessment tools for any age group, and it can be adapted in any language based on the necessity of the researcher in the future studies.

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Conflict of Interest

The author(s) declared no conflict of interest.

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APPENDIX

IDENTIFICATION DATA

Name of the Student	:	
Name of the School	:	
Age	:	
Gender (Put a mark in the appropriate box.)	:	Male: <input type="checkbox"/> Female: <input type="checkbox"/>

Instruction

There are some statements in the following pages. You are to read the statements carefully and respond to them. Five alternatives are given against each statement, viz, Strongly Agree, Agree, Undecided, Strongly Disagree, and Disagree. To respond the statements, use () mark in the alternatives that you have chosen. Keep in mind that this is not a test, so there is no right or wrong answer. Please respond as honestly as possible. The data will be used only for research purpose and all the information will be kept strictly confidential.

Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Agree
1. I am always able to keep my anger under control.					
2. I break stuff when I lose a game by a single step.					
3. I feel like leaving home when my parents scold me for making a mistake.					
4. When I win a game, I don't get overwhelmed.					
5. When I am upset with my friends, I am very careful not to say anything hurtful.					
6. I prefer not to begin a project until I know to proceed.					
7. Before making any purchase, I consider my budget.					
8. I enjoy cycling in a hurry.					
9. If I get an advertisement of a new movie, I watch it instantly.					
10. Whenever I have money in my pocket, I spend it away.					

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11. Once I start reading a book, I always finish it.					
12. If I cannot grasp a poem, I concentrate on it again.					
13. I get bored during lectures					
14. If I have to do a difficult math problem, I give up easily.					
15. During my study, I always choose an easy topic and avoid the challenging one.					
16. I avoid risks.					
17. I will try anything for once.					
18. I often like adventures.					
19. I would love to do trekking.					
20. I think twice before engaging in a risky task.					
21. I don't interrupt when someone is talking.					
22. Before speaking, I consider my surrounding.					
23. I speak whatever comes to my mind.					
24. I interrupt them, when someone is talking.					
25. I listen carefully to the questions before giving answers.					
26. I am confident in my abilities.					
27. My mood fluctuates a lot.					
28. I often change my decisions.					
29. When I sit to study, my mind starts to think something else					
30. I am firm at my decisions.					