

## Development of the Challenging Behavior Rating Scale: An Instrument to Assess the Challenging Behaviors in Individuals with Intellectual and Developmental Disabilities

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### ABSTRACT

Challenging behaviors are highly prevalent in individuals with intellectual and developmental disabilities (IDD), but the screening and early identification of such behaviors are the most neglected part of the assessment, despite there have been plethora of behavioral intervention studies for challenging behaviors as part of clinical management. A need for broad band screening instrument to assess the challenging behaviors is warranted to increase the knowledge base and to create tiered provision of services. Initial scale items were generated from semi-structured interviews with parents and teachers, and through expert review. The challenging behaviors were further measured in three dimensions namely frequency, intensity and management, which were combined into a single score based on the coding scheme developed by a team of practitioners. The scale was validated through exploratory factor analyses by administering it on a sample of 620 individuals with IDD and thus establishing the five-factor structure and scale reliability. Challenging Behavior Rating Scale (CBRS), the tool developed in the present study consists of 40 items grouped under five subscales: Aggression to People/Objects (9 items), Self-Aggression/Stimulation (11 items), Odd/Repetitive (9 items), Socially Inappropriate (8 items) and Deviant (3 items). The present study paves way for reaffirming the model through confirmatory factor analyses and with more psychometric evidences.

**Keywords:** *Challenging Behaviors; Intellectual and Developmental Disabilities; Assessment; Dimensions; Subscales*

Individuals with intellectual and developmental disabilities (IDD) are not only predisposed to skill deficits, but also present problem behaviors that can impose severe limitations to their learning and quality of life. This can be very challenging to those, parents or teachers, who are dealing with such individuals in having to provide care or education. Often, educators or parents are clueless as to how to deal with the challenging behaviors, which are often diverse and indicative of underlying biological, psychological

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Received: February 15, 2022; Revision Received: November 26, 2022; Accepted: December 04, 2022

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and social concerns for the individual. As the diagnoses and labeling protocols differ across countries, many of the instruments that help early identification and diagnosis may lack cultural sensitivity to local needs. Also, challenging behaviors are so elusive that it may appear only in certain environments and same may be considered as challenging in some settings or cultures but not in others (Smith & Matson, 2010).

Families are devastated of managing challenging behaviors and quite often end up in health risks or abandoning their wards to institutional care (Emerson, McGill & Mansell, 1994). Power et al. (2012) posited that assessment and monitoring of the ability of care givers to cope with challenging behaviors in individuals with IDD is paramount. Unfortunately, only fewer or less of the existing tools monitor the capacity of the parent/care giver to support the person with *IDD* and deal with their challenging behaviours. Given this scenario, it is critical to involve care givers/families in the assessment process and then after empower them with skills and knowledge to deal with challenging behaviours of their wards with *IDD*. The understanding and management of challenging behaviors is a basic concern for families and service providers dealing with individuals with *IDD*. An effective assessment of the behaviors that are challenging is crucial in the first place, so as to pave way for treatment and capacity building of care givers or service providers (Rojahn, Matson, Lott, Esbenseb & Smalls, 2002).

Many of the behaviours assessed by the available instruments are psychiatric or clinical in nature and have more relevance in assessing childhood psychopathology. Although, individuals with *IDD* may exhibit mental health problems like anxiety, depression or even hallucinations, most of them lack expression and can neither communicate nor be directly observed by their symptoms. Therefore, using instruments that are mainly constructed with psychiatric symptoms may not address the pressing concerns of the *IDD* population at all. Moreover, identification of challenging behaviours in individuals with *IDD* varies across settings. As social norms differ with the cultural contexts and so perceptions of challenging behaviours would diverge with such norms and more apart by awareness, resources and care giver's coping strategies. A need for developing a tool that screens for challenging behaviours briefly and at the same time sufficient enough to make outcome decisions to facilitate rehabilitation process for individuals with *IDD* is emphasized.

The few existing tools in India warrants for more psychometric evidences and do not have norms to make outcome decisions. Also, in India, with the increasing need for services to individuals with *IDD* and acute shortage of qualified staff, a less time-consuming tool is warranted in order to facilitate screening and early identification before making an in-depth assessment for behavioral intervention. Such a screening instrument could effectively pave way for allocation of professional help and efficient clinical management. Further, a thorough and systematic evaluation of problem behaviours would enable the knowledge base of wide range of symptoms present in *IDD* children. The present study focused on the item development of the Challenging Behavior Rating Scale (CBRS), a tool to assess the challenging behaviors in individuals with intellectual and developmental disabilities.

### **METHODOLOGY**

The study adopted survey method to collect information about challenging behaviors through semi-structured interviews for item development and through respondent-based behavior rating scale for factor validation.

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### *Participants*

For the development of initial pool of items, two groups comprising of parents and special educators respectively were employed. The groups, parents (Group 1; N=48) and special educators (Group 2; N=18) participated in the initial survey of challenging behaviors present in their wards. Group 1 participants were parents whose children were attending a special school in Chennai, and group 2 participants were special educators who were attending a staff development program in a teacher training institute in Chennai.

The participants (N=40) in the age group of 4 through 9 years from an early intervention center in Chennai were included in the sample for the tryout of the first pool of CBRS items. The sample (N=620) for factor validation of the scale consisted of individuals with *IDD* studying in other special schools located in different parts of Chennai. The age range was between 4 and 58 years, with the median age of 15 years. The gender distribution comprised of males (64%) and females (36%). These individuals are assessed and issued with identity cards under the category of intellectual disability/ autism by competent authority from the State, Government of Tamilnadu and so avail services from those registered special schools for *IDD* in the state.

### *Procedures*

In order to collect the information on challenging behaviours, free listing technique was employed wherein parents were asked to write down in a piece of paper, the challenging behaviours present in their children. They were allowed to write either in English or Tamil, and those who needed help in writing, were helped by the other parents in the group 1. With the group 2, a list of behaviours was provided and the participants were asked to check the occurrence of behaviors in the list and also write any other not provided in the list. The behaviours (Group 1 & Group 2) thus collected were carefully scrutinized for pin pointing (observable, measurable, predictable and modifiable) and so suitably re-worded, removed or consolidated.

### *Ethical considerations*

The present study did not raise any ethical issues for the participants, as there was no duress or harm involved in the course of conducting the study. Participants (parents or teachers), who were informants for their wards were assured of confidentiality, and information about their children were collected only after obtaining their consent and willingness to participate in the study. In compliance with the professional ethics for not ignoring the presence of challenging behaviours in the sample, suggestions and counselling were given briefly after the data collection. Referral was made for any serious concern of challenging behaviors.

## **RESULTS**

Both descriptive and inferential analyses of the data was conducted using SPSS *v.16*. The generalized percentage agreement and kappa was calculated using Microsoft Excel for Windows.

### *Item development, face validity and sample try out*

The list of challenging behaviors collected from the two groups, parents and special educators, were further downsized by combining behaviors that belonged to one common response class, removing those behaviors that are either difficult to pin point or vague in expressions or repetitive in nature. The first pool of items (i=67) was further examined for face validity. Judges comprised of five individuals with advanced degrees in psychology;

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four of them are practitioners while one in teaching. They endorsed for relevance and clarity of each item to challenging behaviours present in individual with *IDD*. The operational definition used is as given by the Royal College of Psychiatrists (2007), “*Behavior of such an intensity, frequency or duration as to threaten the quality of life and/or the physical safety of the individual or others and is likely to lead to responses that are restrictive, aversive or result in exclusion*”. It was provided to the judges and the relevance and clarity of each of the items included in the CBRS was obtained for ascertaining face validity based on the operational definition used. With the judges rating and remarks, items were modified, removed or added to make the final pool of items (see table 1).

**Table 1 First Pool of Items (I = 67) And Face Validity (N=5)**

<b>Items</b>	<b>Relevance (n, %)</b>	<b>Clarity (n, %)</b>	<b>Remarks</b>
Bangs own head	5, 100%	4, 80%	Bangs his or her head
Bites others	5, 100%	4, 80%	
Bites self	5, 100%	4, 80%	Bites himself/herself
Cries excessively	5, 100%	4, 80%	
Eats inedible things	5, 100%	4, 80%	
Exposes body parts inappropriately	5, 100%	4, 80%	
Flap hands	5, 100%	4, 80%	
Wrings hands	5, 100%	4, 80%	Wrings/Flaps hands
Fondles genitals	5, 100%	3, 60%	
Food Refusal	5, 100%	3, 60%	Spitting/Spilling/ Messing-food
Hits others	5, 100%	4, 80%	
Slaps others	4, 80%	3, 60%	Hits/Slaps Others
Hits self	5, 100%	4, 80%	
Slaps self	4, 80%	3, 60%	Hits/Slaps Self
Hoards unwanted objects	5, 100%	4, 80%	
Interrupts while talking	5, 100%	4, 80%	
Laughs or giggles for no reason	5, 100%	3, 60%	
Makes vocal noises	5, 100%	3, 60%	
Moves off seat	5, 100%	2, 40%	Leaves one’s seat
Obsessed with objects or activities	5, 100%	4, 80%	
Peels/pinches skin on self	5, 100%	1, 20%	Peels/Pinches/Scratches skin on self
Scratches self	5, 100%	4, 80%	
Pokes Eye/Ear/Nose on self	5, 100%	3, 60%	
Pulls own hair	5, 100%	4, 80%	
Rocks Self	5, 100%	4, 80%	
Screams	5, 100%	4, 80%	
Sleep Problems	5, 100%	4, 80%	
Smears faeces	5, 100%	4, 80%	
Spins Around	5, 100%	4, 80%	
Spits on others	5, 100%	4, 80%	
Talks to self	5, 100%	4, 80%	
Throws objects	5, 100%	3, 60%	
Touches or Hugs inappropriately	5, 100%	4, 80%	
Unusually fearful of ordinary things	5, 100%	3, 60%	
Uses bizarre speech (Echolalia/slurred)	5, 100%	4, 80%	
Bangs on others	4, 80%	3, 60%	Bangs/Punches Others
Punches others	4, 80%	3, 60%	
Breaks objects	4, 80%	4, 80%	

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Coils hair (own/others)	4, 80%	3, 60%	
Grinds Teeth	4, 80%	3, 60%	
Inappropriate contact with members of opposite sex	4, 80%	4, 80%	
Kicks others	4, 80%	3, 60%	
Picks nose	4, 80%	3, 60%	
Pinches others	4, 80%	3, 60%	
Pulls hairs on others	4, 80%	1, 20%	Pulls others hair
Pushes others	4, 80%	3, 60%	
Rapid Eating	4, 80%	3, 60%	
Refuses to obey	4, 80%	3, 60%	
Removes Clothing	4, 80%	4, 80%	
Rolls on floor	4, 80%	3, 60%	
Snatches things from others	4, 80%	3, 60%	
Sucks thumb	4, 80%	3, 60%	
Tears paper/clothing	4, 80%	3, 60%	
Throws objects at others	4, 80%	4, 80%	
Too much eating	4, 80%	3, 60%	
Wanders off	4, 80%	3, 60%	
Bangs doors/windows	3, 60%	3, 60%	
Bangs objects	3, 60%	3, 60%	
Clenching fists	3, 60%	3, 60%	
Licks/mouths objects	3, 60%	3, 60%	
Rapid, sudden or unpredictable acts	3, 60%	3, 60%	
Smells (People/Objects)	3, 60%	3, 60%	
Steals objects	3, 60%	3, 60%	
Taps head	3, 60%	3, 60%	
Tattles on others	3, 60%	3, 60%	
Tell lies/Twists truth	3, 60%	3, 60%	
Taps teeth	2, 40%	2, 40%	

As per the eating disorders glossary, food refusal is the refusal by individual to ingest adequate nutrition to maintain appropriate weight and is commonly found in toddlers. Therefore, this item was re-worded for better clarity as “refusing to eat”. Spitting, spilling or messing with food may be described as lack of eating skills or play behavior. As “bangs on others” involves whole body movement and “punches” involves hand movement, “bangs on others” was considered to be more appropriate with “kicks or pushes others”. Further, there was a vague differentiation between “hoards unwanted objects” and “obsessed with objects or activities” and therefore they were combined and re-worded as “obsessed to certain objects or activities”. Items such as “screams”, “rolls on the floor” and “clenching fists” were combined to describe “temper tantrums”, but the items were retained as specified with modification.

Further to the analyses of judges rating, the questionnaire consisting of 67 items was administered on children with IDD ( $N=40$ ) from an early intervention center in Chennai. During the try out, behaviours such as “aimless walking”, “running away from home” and “obsessed for rides” were reported. While “aimless walking” and “running away from home” was grouped in “wanders off (from assigned time or place)”, “obsessed for rides” was grouped in “obsessed to certain objects or activities”. The low or no frequency behaviours were combined with high frequency behaviours of a topographical response class (TRC), which share a common form. As the participants in the sample try out belonged to

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younger age group (4-9 years), items that are less probable such as “steals objects”, “tell lies/twists truth”, “inappropriate contact with members of opposite sex” were retained for further investigation and “smears faeces” was discarded as there was no observation of the behavior in the participants. During the survey, two discrete behaviours (gazes hands and frequent eating) were recorded and therefore included in the second pool of items.

The first pool of 67 items was reduced to 50 items. The 50-item questionnaire developed for the survey of challenging behaviours in individuals with *IDD* is presented in table 2.

***Table 2 Second Pool of Items ( i = 50)***

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Bangs his/her head  
Bites himself/herself  
Pokes Eye/Ear/Nose on self  
Pulls own hair  
Hits/slaps self  
Peels/pinches/scratches skin on self  
Taps head/teeth  
Rocks/ Spins Around  
Wrings/flaps/gazes hands  
Coils hair (own/others)  
Picks nose  
Smells (People/Objects)  
Licks/mouths objects  
Bangs objects  
Makes vocal noises  
Grinds Teeth  
Sucks thumb  
Laughs or giggles for no reason  
Fondles genitals  
Interrupts while talking  
Cries excessively  
Screams/drops on the floor/clenches hands  
Unusually fearful of ordinary things  
Uses bizarre speech (Echolalia/slurred/talking to self)  
Overactive or impulsive  
Obsessed to certain objects or activities  
Wanders off (from assigned time or place)  
Leaves the seat (without permission or purpose)  
Non adherence to routines or commands  
Bites/spits on- others  
Kicks/pushes/bangs on- others  
Pulls others hair  
Slaps/hits/pinches/punches others  
Throws objects at others  
Throws/Breaks (inappropriately) objects  
Bangs doors/windows  
Tears paper/clothing  
Snatches things from others  
Steals objects

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Tell lies/Twists truth  
 Tattles /blames unreasonably  
 Touches or Hugs inappropriately  
 Exposes body parts inappropriately  
 Inappropriate contact with members of opposite sex  
 Removes clothing in public  
 Gobbles or stuffs while eating  
 Refuses to eat  
 Sleep Problems (cannot initiate or sustain)  
 Over eating/frequent eating  
 Eats non-food items

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***Scoring and coding scheme***

The second pool of 50 items constituted the CBRS to assess the challenging behaviours in individuals with *IDD*. Further to measure the behaviours, three dimensions: frequency, intensity and management, were added to the stems. Each of these dimensions were again provided with three response options i.e., frequency (rarely, sometimes and often); severity (mild, moderate and severe); and management (easy, difficult and cannot manage). The behaviors were first surveyed for its occurrence (Yes/No) and if “yes”, then the severity was assessed in three dimensions. The scoring and description of dimensions are presented in table 3.

***Table 3 Scoring and Description of Dimensions***

Frequency	Rarely (1)	Once or Twice in the past one month
	Sometimes (2)	3 to 10 times in the past one month
	Often (3)	More than 10 times in the past one month
Intensity	Mild (1)	Passable with little resistance for change
	Moderate (2)	Passable with high resistance /sufferable with low resistance for change
	Severe (3)	Sufferable with high resistance/inexcusable with low/high resistance for change
Management	Easy (1)	In terms of time and efforts
	Difficult (2)	Either of time or effort
	Cannot Manage (3)	In spite of time and efforts

It became necessary to develop a coding scheme for 27 response probabilities in order to combine the scores from the three dimensions into one severity score. Six judges comprising of two clinical psychologists, one rehabilitation psychologist and three special educators rated on a 3-point scale for the severity measure to 27 response probabilities. The coding scheme and the inter coder reliability of the six judges are presented in table 4.

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**Table 4 Coding Scheme and Inter Coder Reliability**

<b>Response Probabilities</b>	<b>Rater 1</b>	<b>Rater 2</b>	<b>Rater 3</b>	<b>Rater 4</b>	<b>Rater 5</b>	<b>Rater 6</b>	<b>Pairs</b>
Rarely, Mild, Easy	1	1	1	1	1	1	15/15
Rarely, Moderate, Easy	1	1	1	1	1	1	15/15
Rarely, Severe, Easy	2	1	2	1	2	2	7/15
Sometimes, Mild, Easy	1	1	1	1	1	1	15/15
Sometimes, Moderate, Easy	1	1	1	1	1	1	15/15
Sometimes, Severe, Easy	2	2	2	2	2	2	15/15
Often, Mild, Easy	1	1	1	2	1	1	10/15
Often, Moderate, Easy	1	2	2	2	1	1	6/15
Often, Severe, Easy	2	2	3	2	2	1	6/15
Rarely, Mild, Difficult	1	1	1	1	1	1	15/15
Rarely, Moderate, Difficult	2	2	3	2	2	2	10/15
Rarely, Severe, Difficult	3	2	3	2	2	2	7/15
Sometimes, Mild, Difficult	1	2	2	1	1	1	7/15
Sometimes, Moderate, Difficult	2	2	2	2	2	2	15/15
Sometimes, Severe, Difficult	3	3	3	2	2	3	7/15
Often, Mild, Difficult	2	2	2	2	2	2	15/15
Often, Moderate, Difficult	2	2	2	3	3	2	7/15
Often, Severe, Difficult	3	3	3	3	3	3	15/15
Rarely, Mild, Cannot Manage	2	2	2	2	1	2	10/15
Rarely, Moderate, Cannot Manage	3	3	2	3	3	3	10/15
Rarely, Severe, Cannot Manage	3	3	3	3	3	3	15/15
Sometimes, Mild, Cannot Manage	2	2	2	2	3	2	10/15
Sometimes, Moderate, Cannot Manage	3	3	3	3	3	3	15/15
Sometimes, Severe, Cannot Manage	3	3	3	3	3	3	15/15
Often, Mild, Cannot Manage	1	2	2	2	3	2	6/15
Often, Moderate, Cannot Manage	3	3	2	3	3	3	10/15
Often, Severe, Cannot Manage	3	3	3	3	3	3	15/15
Generalized Percentage Agreement Statistic (GPAS)							308/405

As there were more than two raters, generalized percentage agreement statistic (GPAS) was used and results showed to be 76% agreement among the raters, which is acceptable. Further, in order to establish that this coding scheme is reliable, Kappa (Fleiss, as cited in Hruschka, Schwartz, St John, Picone-Decaro, Jekins & Carey, 2004) was calculated and results showed .70, which is acceptable. The coding scheme (see table 5) was evolved using the mode of the observations in 27 items and in case of ties in modes, higher value was used. In this manner, the scores of the three dimensions into single severity score was derived using the coding scheme. Severity for non-occurrence of the behavior was imputed as 0.

**Table 5 Final Coding Scheme**

<b>Response Probabilities</b>	<b>Coding Scheme</b>
Rarely, Mild, Easy	1
Rarely, Moderate, Easy	1
Rarely, Severe, Easy	2
Sometimes, Mild, Easy	1
Sometimes, Moderate, Easy	1
Sometimes, Severe, Easy	2
Often, Mild, Easy	1
Often, Moderate, Easy	2
Often, Severe, Easy	2
Rarely, Mild, Difficult	1



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Rarely, Moderate, Difficult	2
Rarely, Severe, Difficult	2
Sometimes, Mild, Difficult	1
Sometimes, Moderate, Difficult	2
Sometimes, Severe, Difficult	3
Often, Mild, Difficult	2
Often, Moderate, Difficult	2
Often, Severe, Difficult	3
Rarely, Mild, Cannot Manage	2
Rarely, Moderate, Cannot Manage	3
Rarely, Severe, Cannot Manage	3
Sometimes, Mild, Cannot Manage	2
Sometimes, Moderate, Cannot Manage	3
Sometimes, Severe, Cannot Manage	3
Often, Mild, Cannot Manage	2
Often, Moderate, Cannot Manage	3
Often, Severe, Cannot Manage	3

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***Factor structure and internal consistency***

In order to find out the number of interpretable factors, exploratory factor analyses using the principal components method with oblique rotation were applied to the 50-item scale to reduce the items into smaller homogenous domains. The Kaiser-Meyer-Olkin measure (.85) and Bartlett's test ( $p = .000$ ) confirmed the suitability of the data for factor analyses. A step-wise approach was used beginning with a one factor solution and an additional factor was added until the last factor had fewer than three items with loadings greater than [.50], thus providing five factor solution. Tabachnick & Fidell (as cited in Costello & Osborne, 2005) have recommended .32 as a minimum criterion for loading of an item in a factor. An item was retained in a factor only if it had a loading of at least [.32] on that factor. It can be noted that all the coefficients in factor loadings are greater than .32 (minimum criterion) and at least 3 items are greater than .50; with overall average factor loading of .54. The item-factor correlation ranged from .38 to .71. George and Mallery (as cited in Gliem & Gliem, 2003) has provided reliability norms for Cronbach's Alpha: Excellent ( $\geq .90$ ), Good ( $\geq .80$ ), Acceptable ( $\geq .70$ ), Questionable ( $\geq .60$ ), Poor ( $\geq .50$ ) and Unacceptable ( $< .50$ ). The Cronbach's alphas were good for one factor, acceptable for two factors and questionable for two factors.

A five factor solution (See table 6) that accounted for 33% of the variance to this model was obtained. In terms of composition of each individual factor: 16.54% (factor 1), 5.27% (factor 2), 4.59% (factor 3), 3.63% (factor 4) and 3.27% (factor 5) of variance was accounted in the model. It should be noted that oblique rotation produces minimum variance while orthogonal rotation tries to maximize the variance to the model. As oblique rotation was used, the factor loadings were obtained from the pattern matrix, which essentially are regression coefficients. The correlations of items to factors are obtained from structure matrix. The items that were discarded from the factor solution are presented in table 7.

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**Table 6 Factor Loadings, Item-Factor Correlations & Cronbach's Alpha of Extracted Factors**

<b>Items</b>	<b>Factor Loadings</b>	<b>Item-Factor Correlations</b>	<b>Cronbach's Alpha</b>
Factor 1			.81
Bangs objects	.37	.49	
Bites/spits on- others	.57	.58	
Kicks/pushes/bangs on- others	.49	.61	
Pulls others hair	.76	.71	
Slaps/hits/pinches/punches others	.51	.55	
Throws objects at others	.69	.69	
Throws/Breaks (inappropriately) objects	.66	.68	
Screams/drops on the floor/clenches hands	.35	.52	
Bangs doors/windows	.71	.64	
Factor 2			.76
Bangs his/her head	.61	.60	
Bites himself/herself	.55	.55	
Pokes Eye/Ear/Nose on self	.58	.58	
Pulls own hair	.73	.65	
Peels/pinches/scratches skin on self	.38	.43	
Hits/slaps self	.58	.56	
Taps head/teeth	.51	.55	
Picks nose	.38	.45	
Wrings/flaps/gazes hands	.35	.40	
Grinds Teeth	.59	.59	
Sucks thumb	.53	.46	
Factor 3			.72
Rocks/Spins Around	.50	.54	
Licks/Mouths Objects	.44	.45	
Fondles Genitals	.54	.56	
Wanders Off (from assigned time or place)	.50	.57	
Leaves the seat (without permission or purpose)	.60	.67	
Touches or Hugs inappropriately	.35	.40	
Exposes body parts inappropriately	.57	.55	
Removes clothing in public	.60	.52	
Eats Non-Food items	.42	.42	
Factor 4			.67
Makes vocal noises	.46	.56	
Laughs or giggles for no reason	.52	.60	
Interrupts while talking	.50	.44	
Cries excessively	.48	.58	
Unusually fearful of ordinary things	.50	.38	
Uses bizarre speech	.51	.47	
Overactive or impulsive	.48	.52	
Obsessed to certain objects or activities	.62	.56	
Factor 5			.62
Steals objects	.62	.64	
Tell lies/Twists truth	.71	.69	
Tattles /blames unreasonably	.76	.70	

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**Table 7 Factor Loadings and Item-Factor Correlations of Discarded Items (Including Free Standing)**

Items	Factor Loadings					Item-factor Correlations				
	1	2	3	4	5	1	2	3	4	5
Coils hair (own/others)										
Smells (People/objects)									.38	
Non adherence to routines or commands									.37	
Tears paper/clothing						.41				
Snatches things from others			.45					.57		
Inappropriate contact with members of opposite sex										
Gobbles or stuffs while eating							.35			
Refuses to eat	.47					.40				
Sleep problems (cannot initiate or sustain)				.32					.40	
Over eating/Frequent eating									.33	

Note. For five factors (1,2,3,4 & 5)

It can be seen from table 7 that items (coils hair -own/others, inappropriate contact with members of opposite sex) did not correlate with any of the five factors and therefore no loadings to the model. Free standing items (snatches things from others, refuses to eat, sleep problems-cannot initiate or sustain) were removed from their factors because they conceptually did not fit into that category. Forty-three items were extracted and 40 items (after removing free standing items) were consolidated with five factors-first (9 items), second (11 items), third (9 items), fourth (8 items) and fifth (3 items). There were two cross loading items (Bites himself/herself & Interrupts while talking), which were retained in the factor in which the loading was higher/appropriate of the shared factors. The Cronbach's alpha was computed on five factor structure (i=40) after removing the free-standing items. The inter-correlation matrix for all the five factors are presented in table 8. The correlation coefficients indicated a positive relationship. It is evident that correlation of factor 5 with factors 2, 3, 4 is very weak.

**Table 8 Inter Correlation Matrix of Five Factors**

Factors	1	2	3	4
2	.39	--	--	--
3	.34	.34	--	--
4	.36	.41	.45	--
5	.31	.07	.11	.12

Based on careful review of item sets under each factor, appropriate domain names for the subscales have been thought out. It is not a definition of the term used but an attempt made to provide an explanation for the items therein. Based on the content of the items in each subscale, the sets were labeled as *Aggression to People/Objects (APO)*, *Self-Aggression/Stimulation (SAS)*, *Odd/ Repetitive (ODR)*, *Socially Inappropriate (SI)* and *Deviant (D)*.

Aggressive behavior is described as any behavior that resulted in injury to others or damage to property. Also, 'Screams/drops on the floor/clenches hands' which are collectively referred to as 'temper tantrums' is considered to be intimidating the people in the context other than the individual exhibiting the behavior by way of threat or blackmail and may be included in 'aggression'. Therefore, *Factor 1* was named as *Aggression to People/Objects*.

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Self-Aggression or Injury was defined as any behavior emitted by the subject that had caused breaking or bruising of the skin or that had the potential of resulting in breaking or bruising of the skin (Pelios, Morren, Tesch, & Axelrod, 1999). It is presumed that self-stimulatory behaviours that are chronic may also result in physical harm leading to tissue damage or abnormalities in development. Example, ‘*Thumb sucking*’ leads to skin breaking and tissue damage and also affects handwriting and speech. Thus, *Factor 2* was called as *Self-Aggression/Stimulation*.

Many individuals with *IDD* engage in odd or repetitive behaviours that persisted independent of social environment. Vaughan & Michael (as cited in Lindberg, Iwata, Kahng & Deleon, 1999) proposed that these behaviours are maintained by automatic reinforcement to the extent that they directly produce their own reinforcing consequences and are sometimes referred to as ‘*Stereotypy*’. Some of these behaviours may result in serious health or social consequences. These behaviours as in *Factor 3* are termed as *Odd/Repetitive*.

In *Factor 4*, for the purposes of the present study, item-sets were described as collection of any behavior or set of behaviours that may be referred to as developmentally immature or disruptive in the context and are considered to be socially unacceptable. The factor was named as *Socially Inappropriate*.

In relativistic view, behavior is defined as deviant by social audience. In general terms, it describes actions or behaviours that were against morality, law and order, or prevailing social norms. Reviewing the items in *Factor 5*, the term ‘*Deviant*’ was considered to be appropriate for domain name.

### *Final item sets of CBRS*

The final item sets ( $i = 40$ ) for the five subscales of the CBRS is presented in Table 9.

**Table 9 Final Item Sets of The CBRS**

<b>Aggression to People/Objects</b>	<b>Self-Aggression/ Stimulation</b>	<b>Odd/Repetitive</b>	<b>Socially Inappropriate</b>	<b>Deviant</b>
Bangs objects	Bangs his/her head	Rocks/Spins Around	Makes vocal noises	Steals objects
Bites/spits on- others	Bites himself/herself	Licks/Mouths Objects	Laughs or giggles for no reason	Tell lies/Twists truth
Kicks/pushes/bangs on- others	Pokes Eye/Ear/Nose on self	Fondles Genitals	Interrupts while talking	Tattles /blames unreasonably
Pulls others hair	Pulls own hair	Wanders Off (from assigned time or place)	Cries excessively	
Slaps/hits/pinches/punches others	Peels/pinches/scratches skin on self	Leaves the seat (without permission or purpose)	Unusually fearful of ordinary things	
Throws objects at others	Hits/slaps self	Touches or Hugs inappropriately	Uses bizarre speech	
Throws/Breaks (inappropriately) objects	Taps head/teeth	Exposes body parts inappropriately	Overactive or impulsive	
Screams/drops on the floor/clenches hands	Picks nose	Removes clothing in public	Obsessed to certain objects or activities	

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Bangs doors/windows	Wrings/flaps/gazes hands	Eats Non-Food items
	Grinds Teeth	
	Sucks thumb	

**Normative Sample Statistics**

The descriptive statistics for five subscales and the challenging behavior composite of the CBRS is presented in Table 10.

**Table 10 Descriptive Statistics of The CBRS Severity Scores (Subscales & Composite, N =620)**

Scales	Mini mum	Maxi mum	Total Possible Score	Mean	Std. Deviation	Skewness (Std. Error)	Kurtosis (Std. Error)
Aggression to People/Objects	0	27	27	3.00	4.33	2.19(0.10)	5.68(0.20)
Self-Aggression/Stimulation	0	27	33	2.49	3.92	2.83(0.10)	10.49(0.20)
Odd/Repetitive	0	21	27	2.96	3.78	1.96(0.10)	4.59(0.20)
Socially Inappropriate	0	19	24	3.89	3.93	1.22(0.10)	1.14(0.20)
Deviant	0	9	9	0.54	1.30	3.23(0.10)	12.34(0.20)
Challenging Behavior Composite	0	72	120	12.62	12.27	1.55(0.10)	2.60(0.21)

A general guideline for skewness (-1.0 to 1.0) and Kurtosis (-2.0 to 2.0) to assume normal distribution is violated in the present data and the values clearly indicated positive (right) skewness and peaked (Leptokurtic) kurtosis distribution. The only reason attributed to this finding is that there may be a real lack of normality in the trait (challenging behavior) being measured. The sample is characterized by heterogeneous features that cannot be controlled and therefore the symptoms vary largely leading to sample variation in responses. Further, it may be noted that the five subscales and the composite were on a different scale of measurement (see ‘Total Possible Score’ in table 10), warranting test equating and scale fitting by which age specific norms were developed.

**DISCUSSION**

The present study is a pioneering attempt in carrying out systematic investigation of challenging behaviours in a large sample of *IDD*. The main outcome of the study is developing a tool, CBRS, which covered range of challenging behaviours in operant terms, and adding an important dimension, ‘the management’ which was not empirically derived so far in any other study. In addition, the judgment-derived coding scheme of the three dimensions into one single severity score is a unique attempt in the present study.

As there was a lacuna for studies related to challenging behaviours in *IDD* with regard to epidemiology and assessment in India, the present study set out on survey method leading to tool development for aiding the diagnosis and so interventions were not in purview. The focus of the survey was on occurrence of challenging behaviours, its severity and management difficulties, so other important dimensions of challenging behaviours such as antecedents and consequences were not captured. Indirect method of assessment, which

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relied on the subjective judgments of a third party (parent/caregiver or teacher) may be considered as less valid approach, but in large scale survey, use of rating scales based on self-reports is arguably, a feasible approach.

Although, it is relatively common and persistent for individuals with *IDD* to develop challenging behaviours from time to time, it is not necessary to either exhibit same behaviours at all times or all individuals with *IDD* exhibit similar behaviours. It is because of this inherent variability, the frequency data of CBRS was visibly affected. It is opined that the one obtained was ecologically valid data because challenging behaviours are not tasks that one might develop in life span, but due to personal or social inadequacy, they are acquired as conditioned response. As these data sets are always more likely to be collected under different conditions (with lack of representation in the sample) it is doubtful for obtaining enough data to fit into a probability model. Therefore, non-normal data is more common in such population.

Browne & Cudeck (1992) have emphasized that model selection has to be a subjective process involving the use of judgment rather than a mechanical decision-making process. Often there is a tradeoff between statistical and conceptual fitting in model selection. In the present research, in unrestricted factor analysis (that is, EFA), 43 items were extracted. Any further item reduction was dismissed at this point, favoring those items to be included as their frequency (19% to 33% and one item having 8%) was substantial in the present sample. Further, it was reflected that a 3-factor solution would have given a better statistical fit but items would not conceptually fit together. However, the EFA derived model paves way for reaffirming the implied model, with confirmatory factor analyses.

### ***Implication***

CBRS is a 40-item scale developed to assess challenging behaviours in individuals with *IDD*. It helps to classify individuals with *IDD* based on challenging levels and therefore to intervene early. In a systemic approach (Fox, Carta, Strain, Dunlap, & Hemmeter, 2009), the tool would help identify those individuals who may need intensive behavioral intervention on one-to-one basis; those who may be at risk of problem escalation because of lack of initial support and could be helped with parent training and behavior management; and those who may be presented with behaviours that are typical to their disability profile and therefore may need positive behavioral support. The present research recommends that the subscales may be used for behavior intervention studies. The CBC levels may be used for disability policy or educational placement decisions.

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### **Acknowledgement**

The author appreciates all those who participated in the study and helped to facilitate the research process.

### **Conflict of Interest**

The author declared no conflict of interest.

**How to cite this article:** Janaki, B. & Waheeda, M. (2022). Development of the Challenging Behavior Rating Scale: An Instrument to Assess the Challenging Behaviors in Individuals with Intellectual and Developmental Disabilities. *International Journal of Indian Psychology*, 10(4), 780-794. DIP:18.01.075.20221004, DOI:10.25215/1004.075