

Psychosocial Correlates of Temperament in Children with Intellectual Disabilities

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Abstract: Temperament is a significant variable which affects multiple dimensions of human functioning. Present research explored the relationship of personal variables with temperament in a sample of 105 children diagnosed with ID in Lahore, Pakistan. The sample included both girls ($n = 46$) and boys ($n = 59$) and mean age was 9.02 ($sd = 2.02$). Rothbart's temperament questionnaires and Adaptive Behavior Scale were employed to assess temperament domains and adaptive functioning of participants. Intellectual functioning, adaptive functioning and clinically significant behavioral problems were studied as significant correlated of temperament. Gender differences were also explored across domains of temperament, surgency and negative affectivity revealed significant mean differences across gender. Intellectual functioning shared positive association with surgency and effortful control and inverse with negative affectivity. Behavioral problems shared positive association with negative affectivity and negative relationship with other two domains.

Keywords: Temperament, Intellectual Disability, Psychosocial Factors

1. Introduction

The literature over past many years has placed lots of attention on temperament as this is considered to be one of the most significant intra personal factor influencing human functioning and development (Bates, 1986; Slabach, Morrow, & Wachs, 1991). Temperament is defined as relatively stable traits depicting behavioral predispositions. Different theoretical models reported in literature described the dimensions of temperament. Galen presented early historical temperament theory with a combination of both emotional and physical characteristics explained as four humors or temperaments (Stelmack & Stalikas, 1991). Thomas and Chess (1990) presented one of the most comprehensive models of temperament as stylistic components of behavior depicted through nine sub dimensions grouped into three broad categories namely easy or flexible, difficult or feisty and slow-to-warm-up or fearful child. These nine dimensions are threshold, distractibility, intensity, rhythmicity, adaptability, activity level, mood, attention span persistence and approach/withdrawal (Slabach, Morrow, & Wachs, 1991).

Rothbart, Ahadi, Hershey and Fisher (2001) proposed another widely reported temperament model and identified three broad dimensions of temperament that are related to the Big Five personality factors of Neuroticism (negative affectivity), Surgency (extraversion/self regulation) and Conscientiousness

(Effortful control). In Rothbart's model, self-regulation has a prominent place and is a core component of temperament. Effortful control develops during toddlerhood and it exerts brakes on motor activities and unregulated negative emotionality and enhances child's ability to adapt to environmental demands (Rothbart & Derryberry, 2002). Negative affectivity mainly reveals one's problems regulating sadness, fear, anger and frustrations etc. The reciprocal and continued dynamic interactions between temperamental regulation and reactivity contribute to instability of temperament expression overtime (Rothbart, 2007). Most of the models of temperament reported that although temperament is based on biological predispositions, expression of these predispositions may vary in light of culturally formulated role expectations and value.

As literature from time and again highlight the significance of temperament in codetermining both typical and atypical functioning, more researchers and clinicians consider temperament as pertinent part of assessment and management of developmental psychopathologies. Intellectual disability (ID) is reported as one of the most common developmental disability affecting the course of typical development in children and adolescents with marked problems in functioning (American Psychiatric Association (APA), 2013). Intellectual disability is reported to have high social cost as it influences not only the life of sufferers but also disrupt the functioning of a family and society in general (Katz & Lazcano-Ponce, 2008), which made professionals become more interested in factors directly affecting the functioning of children with ID. Many researchers have identified temperament as a variable significantly affecting the typical development along as well as course and prognosis of ID (Bailey, Hatton, Mesibov, Ament, & Skinner, 2000). Most researchers linked low or weak effortful control and surgency traits and high or strong negativity affectivity traits with psychopathologies and general dysfunctional behaviors and stress the need to study the personal factors that are likely to influence this link (Healey, Brodzinsky, Bernstein, Rabinovitz, & Halperin, 2009). The factors that are generally believe to influence the formulation of temperament and course and prognosis of developmental problems include intellectual functioning, gender, severity of the problem, adaptive functioning, quality and provision treatment services etc. On the basis of literature reviewed the present article will focus on assessing adaptive functioning, intellectual functioning and clinically significant behavioral problems as main correlates of temperament and will also explore the gender differences in temperament profiles of participants.

Although researchers in western countries are studying temperament in varied populations, there is dearth of research on this particular area in Pakistan. Keeping in view the gap in knowledge related to temperament in local context, the present study was planned to offer some significant information regarding this significant area of functioning specifically for intellectual disabilities population. The results of current study will be useful to identify the specific pattern of different temperament domains in children with ID and factors most relevant to temperament indigenous to Pakistani culture. The results of present research can be very useful to assist clinicians understand the temperamental factors relevant to children with ID and plan most relevant and effective treatment plan.

1.2 Objective

The objectives of this research include the following

1. To explore the temperamental traits of children with intellectual disability.

2. To assess the strength of adaptive functioning, intellectual functioning and behavioral problems as correlates of temperament domains.
3. To explore the gender differences in temperament profiles of participants.

2. Method and Material

2.1 Sample

Non probability purposive sampling method was employed to select a sample of 105 children diagnosed with intellectual disability. The age range for all participants was from 5 to 11 years with mean age of 9.02 ($sd = 2.02$) and included both boys (56.2 percent) and girls (43.8 percent). The sample was approached in developmental pediatric department, child psychiatry departments and special education institutes of Lahore city. Only those children were selected who were assessed on standardized psychological assessment tools and whose reliable informant was available.

Exclusion Criteria - Children below 5 or above 11 years of age were excluded from the sample. Comorbid developmental psychopathologies, incomplete or no standardized assessment and absence of a reliable informant were the other exclusion criteria for children in the clinical group.

2.2 Instruments

The measures used to collect information in this study included demographic questionnaire, Adaptive Behavior Scale, Childhood Behavior Questionnaire and Temperament of Middle Childhood Behavior Questionnaire. The details are mentioned below

2.2.1 Demographic Questionnaire

A detailed demographic questionnaire was completed for each participant. It requested basic questions related to personal and information of the children and details relevant to their developmental problems like IQ, history of psychiatric illness in the family, details of structured assessment, behavioral management plans, type of professional services seek and total duration of professional help seeking etc.

2.2.2 Indigenous Adaptive Behavior Scale

An adaptive behavior scale developed in study I was completed for each child to assess the adaptive functioning of children studied in this phase. The scale was individually administered and consisted of a composite adaptive functioning score and four subscales score. The four subscales are daily living skills, social skills, self care skills and home living skills. This scale demonstrated satisfactory psychometric characteristics along with adequate sensitivity and specificity analyses.

2.2.3. Children's Behavior Questionnaire – Teacher Short Form (CBQ-T)

Urdu version was employed to assess temperament of children. It consists of 94 items and developed by Teglasi (2003), assesses three broader big five domains and 17 temperamental dimensions. Each statement is rated on 7 point Likert scale from (1) extremely untrue to extremely true (7) keeping in mind child's behavior in past six months (Putnam & Rothbart, 2006). Like other temperamental scales of Rothbart, CBQ-T reported to have good evidence of adequate validity and reliability ranging from .45 to

.93 (Teglasi, 2003; Putnam & Rothbart, 2006). The original questionnaire was translated and adapted to be used in the present study with the approval of original author.

2.2.4 Temperament in Middle Childhood Questionnaire (TMCQ)

Comprising 157 statements and developed by Rothbart in 1989, assesses 15 sub temperamental dimensions grouped into three broader big five domains namely surgency, effortful control and negative affectivity was used to assess temperament of children from 8 to 11 years. Parents and or teachers rate children on 5 point Likert scale from (1) extremely untrue to (5) extremely true. TMCQ noted to have a good evidence of adequate psychometric characteristics, reliability ranging from .59 to .96 (Putnam & Rothbart, 2006) and validity ranging from .36 to .81 (Putnam, 2006).

2.3 Procedure

After sorting permission from concerned authorities and consent from parents, researcher first reviewed the personal case files of the children seeking professional services for developmental psychopathologies. The relevant details of assessment like clinical diagnosis, IQ, duration of professional service utilization and nature of individualized educational plan were noted. Only those files were chosen that included a formal clinical diagnosis along with complete developmental and syndrome specific assessment on standardized tools by a professionally trained clinical psychologist. Files that lack the assessment details and or clinical diagnosis were not considered for selection. A detailed interview was conducted with the caregivers of selected participants for completing the demographic questionnaire, temperament questionnaire and adaptive behavior scale. At the end, caregivers were offered a free debriefing session which was availed by almost 91 percent participants.

3. Results

The data was analyzed with the assistance of SPSS (20.0) and findings are reported in the following section. The first section discusses the personal and familial demographical characteristics of the participants, whereas, the later section presents the findings related to the objectives formulated for this study.

In general, the boys (56.2 percent) outnumbered girls (43.8 percent) in the present sample. The mean IQ of participants was 41.67 (*sd* = 14.52) and in total, 45.9 percent children reported to have clinically significant behavioral problems. Most of the participants were first born. Majority of the children had 3 siblings (23.8 percent) and the range of number of sibling was from having no sibling to 8 siblings. Most of participants were living in joint family setup, mode family income was 30000 and it ranged from 6000 to 170000. The occupation of most of the fathers was office job, whereas, large majority of mothers was found to be housewives.

One objective was to explore the temperament of the participants and to identify different factors associated with temperamental domains. For this purpose, eighteen sub-domains of temperament broadly categorized in three main domains based on Big Five Model were explored. In total the score on surgency ranged from 8.28 – 30.4 5 and mean score was 16.72 (5.24). On effortful control domain the score ranged from 5.66 - 27.00 with mean score of 14.97 (4.69). The score on negative affectivity ranged from 5.25 – 25.83 and the mean score was 14.40 (6.73). The following table presents the mean scores.

Table 1: Mean and Standard Deviation for Subscales of Temperament

Sub-domains	Full Sample (N = 105)		Girls (n = 46)		Boys (n = 59)		Cohen's <i>d</i>
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	
Activity Level	3.65	(1.28)	3.29	(1.27)	3.46	(1.25)	0.13
Activity Control	2.07	(1.49)	1.95	(1.53)	2.17	(1.49)	0.14
Anger/ Frustration	2.97	(1.62)	3.02	(1.70)	2.90	(1.57)	0.07
Attentional Focusing	3.04	(1.20)	3.29	(1.23)	2.87	(1.16)	0.35
Affiliation	2.34	(1.53)	2.13	(1.59)	2.50	(1.49)	0.24
Assertiveness	1.85	(1.34)	1.83	(1.48)	1.87	(1.25)	0.02
Discomfort	3.12	(1.67)	3.36	(1.73)	2.92	(1.63)	0.26
Falling Reactivity/ Soothability	2.61	(1.32)	2.59	(1.26)	2.59	(1.37)	0
Fantasy Openness	2.05	(1.33)	2.06	(1.42)	2.04	(1.28)	0.01
Fear	3.29	(1.73)	3.55	(1.71)	3.07	(1.74)	0.27
High Intensity Pleasure	3.72	(1.19)	3.42	(1.19)	3.96	(1.16)	0.45
Impulsivity	3.78	(1.21)	3.65	(1.29)	3.89	(1.16)	0.19
Inhibitory Control	3.18	(1.26)	3.33	(1.32)	3.09	(1.20)	0.19
Low Intensity Pleasure	3.51	(1.27)	3.81	(1.27)	3.31	(1.22)	0.57
Perceptual Sensitivity	3.37	(1.33)	3.70	(1.26)	3.14	(1.33)	0.47
Sadness	2.79	(1.47)	2.87	(1.38)	2.71	(1.53)	0.23
Shyness	4.03	(1.25)	4.22	(1.39)	3.92	(1.14)	0.23

The mean score of girls ($M = 15.93$, $sd = 4.62$) on surgency was comparatively lower to boys ($M = 17.39$, $sd = 5.64$). Whereas, the mean score of girls on effortful control was 15.97 ($sd = 4.78$) was relatively higher than boys ($M = 14.29$, $sd = 4.52$). The boys had mean score of 13.77 ($sd = 6.83$) on negative affectivity when girls had 15.03 ($sd = 6.56$) mean score. In general girls scored relatively higher on subscales comprising effort control and negative affectivity as compared to boys.

The mean scores of girls and boys differ significantly on surgency as the t – value was 1.95 , $df = 103$ and $p = 0.05$. On effortful control the scores of boys and girls did not reveal significant mean score differences as t – value was 1.84 $df = 103$ and $p = 0.07$. Negative affectivity domain also revealed significant mean differences across gender as t -value was 0.95 , $df = 103$ and $p = 0.34$.

Another important objective of the present study was to explore the relationship between temperament domains and pertinent variables. In order to investigate the relationship between these variables Pearson product moment correlations were carried out. The table below shows the correlation values of temperament score and cognitive functioning and problem behaviors.

Table 2: Correlation between Domains of Temperament, Intelligence and Problem Behaviors (N= 105)

Variables	1	2	3	4	5
1. Intelligence Quotient					
2. Behavioral Problems	-.31**				
3. Surgency	.32**	-.19*			
4. Effortful Control	.28*	-.15*	.49**		
5. Negative Affectivity	-.40**	.40**	-.27**	-.36*	

** $p < 0.01$ (2-tailed). * $p < 0.05$ (2-tailed).

Surgency domain of temperament was observed to share significant inverse relationship with behavioral problems and negative affectivity. Whereas, negative affectivity revealed significant negative association with all variables except behavioral problems that had positive association. The strength of association varies across variables.

Table 3: Correlation of Broader Domains of Temperament and Adaptive Skills (N=105)

	Surgency	Effortful control	Negative affectivity
Daily Living Skills	.42**	.49**	-.39**
Social Skills	.41**	.35**	-.43**
Self Care	.39**	.46**	-.49**
Homeliving Skills	.29**	.29**	-.53**
Total Score	.42**	.45**	-.48**

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

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

The surgency domain consisting of positive temperamental traits like approach, activity control and high intensity pleasure revealed significant positive relationship with all adaptive skills domains. Adaptive skills dimensions showed significant correlation with effortful control primarily including attentional focusing, inhibitory control, perceptual sensitivity and low intensity pleasure traits. Both surgency and effortful control revealed strongest association with daily living skills. However, significant negative association was observed between all adaptive behavior domains and negative affectivity with strongest relationship with home living skills.

Table 4: Correlation between Domains of Temperament and Adaptive Skills Scores (N = 105)

Temperament domains	DLS	SS	SCS	HLS
Activity Level	.29**	.36**	.36**	.29**
Activity Control	.23*	.20*	.29**	.29**
Affiliation	.11	.11	.19*	.26**
Anger/ Frustration	-.47**	-.51**	-.56**	-.57**
Approach/ Positive	.16	.33	.31	.26
Anticipation				
Assertiveness	.06	.08	.12	.16
Attentional Focusing	.35**	.30**	.32**	.20*
Discomfort	-.43**	-.48**	-.54**	-.56**
Falling Reactivity/	-.41**	-.44**	-.51**	-.57**
Soothability				
Fear	-.40**	-.45**	-.51**	-.50**
Fantasy Openness	.03	.01	.09	.14
High Intensity Pleasure	.30**	.33**	.35**	.26**
Impulsivity	.36**	.42**	.44**	.41**
Inhibitory Control	.42**	.31**	.35**	.23*
Low Intensity Pleasure	.36**	.27**	.35**	.22*
Perceptual Sensitivity	.41**	.33**	.40**	.28**
Sadness	-.49**	-.53**	-.59**	-.58**
Shyness	.41**	.37**	.39**	.32**

Note. DLS= Daily living skills; SS= Social skills; SCS= Self-care skills; HLS= Home living skills.

** Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Most of the sub- domains of temperament observed to have significant positive association with adaptive behavior subscales. Anger frustration, discomfort, soothability, fear and sadness subscales have significant inverse correlation with all subscales of adaptive behaviors. Approach positive anticipation, assertiveness and fantasy openness shared non-significant association with all domains of adaptive skills.

Daily living skills related positively with all sub dimensions of temperament but those comprising negative affectivity, suggesting a likelihood that negative traits may hamper or delay acquisition of daily living adaptive skills. The social skills domain revealed to have positive relationship with all dimensions of temperament and had inverse association with most of the sub-domains included in negative affectivity. Discomfort, falling reactivity, sadness and fear indicated significant inverse relationship with social skills. The self care domain revealed to have significant positive relationship with most of the sub-domains of temperament. However, the anger frustration domain of temperament presented reverse pattern through significant negative association. Home living skills like other domains of temperament also shared inverse and strongest association with negative temperament traits. Pointing to that negative temperament traits particularly sadness, problems related to managing anger frustration and emotional

discomfort are likely to restrict the basic home living skills like using domestic gadgets, fixing simple domestic problems, running small home errands etc.

4. Discussion

Temperament is described as significant component directly related and affecting both human functioning and human development (Putnam, Gartstein, & Rothbart, 2006; Schwartz et al., 2009). The current study aimed to explore the psychosocial correlates of temperament in children with intellectual disabilities.

Participants of present research scored highest on surgency and relatively lower on effortful control domain. Surgency and effortful control shared positive association, however, both these domains related inversely with negative affectivity. This finding along with the pattern of association between temperament domains was in line with the findings reported by other researchers (Schwartz et al., 2009). The participants scored relatively higher on negative affectivity compared to effortful control which is line with the results of researches that noted the same pattern among children with developmental (Pisula, Kawa, Danielewicz, & Pisula, 2015) and behavioral emotional problems (Foley, McClowry, & Castellanos, 2008).

The present research is significant as it not only explored temperament profiles of children but also investigated the association between personal variables and temperament domains. Although, gender was studied as an important personal variable associated with temperament in the present study, gender was not found to be significantly related to any differences across temperamental domains. Literature in general provides a mix of findings suggesting from non-significant weak correlation to highly significant association between gender and temperament (Yoleri, 2014). The boys scored relatively higher than girls on surgency and this is in line with findings reported by Else-Quest, Hyde, Goldsmith and Van-Hulle (2006) that boys scored significantly higher on surgency whereas, girls scored significantly higher on effortful control. However, on effortful control gender failed to account for any significant differences in scores of boys and girls. This finding of present research can be supported by a study conducted with Indian children which revealed no significant gender differences in developmental functioning of children with intellectual disability (Upreti & Singh, 2016). The possible reason might be that for children with intellectual deficits and other developmental disabilities the primary aim is to assist them to learn functional life skills and at times even primary care givers teach primary life skills free of gender differences. Contrary to common belief girls scored higher on negative affectivity sub- domains including anger frustration compared to boys.

As intellectual functioning is usually considered to be closely linked to many functional behaviors and developmental dimensions (Ji & Yao, 2014) in children with and without physical and developmental problems (Woo & Teoh, 2007); therefore, present research explored relationship of it with temperament. An interesting pattern of relationships between temperament dimensions and cognitive level was noted in present study. Surgency and effortful control were noted to have positive association with intelligence and inverse association was observed with negative affectivity. This converges with results reported in previous researches, noting similar pattern of association between intellectual functioning and temperament particularly among young children (Luciano, Leisser, Wright, & Martin, 2004). Behavioral problem was a related factor which was considered a significant correlate of temperament. The findings

of the present data relate with those reported by Yoleri (2014) that behavioral problems were negatively related with positive temperament traits and positively with traits similar to negative affectivity. Fear, sadness, discomfort and other traits included in negative affectivity are generally associated with low performance and lack of involvement in functional developmental skills. Children with below average intellectual functioning are most likely to get affected by internalized and externalized behavioral problems, these factors in turn are reported to be closely related to fear, emotional discomfort and fearfulness which might have led to a specific pattern of association between intellectual functioning, behavioral problems and temperament traits.

Adaptive functioning when compared to three broad domains of temperament showed to have significant positive association with surgency and effortful control but showed inverse correlation with negative affectivity. This finding is in accordance with the results of other researches (Riggs, Jahromi, Razza, Dillworth-Bart, & Mueller, 2006). Negative affectivity observed to have highest negative correlation with home living skills, whereas, surgency and effortful control found to have highest correlations with daily living skills. Self-regulation is found to share a significant positive relationship with all domains of adaptive functioning with strongest association with daily living skills. This finding is similar to findings of previous researches which concluded that self-regulation is positively related with multiple indices of adaptive functioning from childhood till adulthood (Buckner, Mezzacappa, & Beardslee, 2009). Many studies reported that temperamental traits based on self-regulation and effortful control are predictive of high adaptive functioning among children suffering from intellectual disability (Spinrad et al., 2004), autism (Schwartz et al., 2009) and children following typical developmental pattern (Riggs et al., 2006). The findings of previous researchers support this result by reporting a similar pattern (Schwartz et al., 2009). Negative affectivity showed the strongest negative correlation with home living skills across all groups. The subsequent strength of correlation with other domains of adaptive functioning varied across groups, this variability may be attributable to nature of developmental pattern followed among these groups.

5. Limitations and Recommendations

Despite all the care taken the current research has some limitations. Present study employed a sample which is restricted to only one city and is comparatively small in size. Another limitation is that the percentage of boys in current study outnumbered girls. It is suggested that further research is needed in this area and should employ larger sample involving representations from other cities as well. More representation of girls is strongly suggested to be taken in further studies.

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