



# Facing the Facets: Parsing Out Trends within Personality Subgroups in Children with Autism Spectrum Disorder

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## introduction

Students with autism spectrum disorder (ASD) are often given classroom interventions that have little to no efficacy. Although some well-established interventions have been developed for school-age youth, individualized interventions is far from common practice. ASD has been identified as a heterogeneous disorder with multiple syndromes and etiologies. The current literature has yet to identify valid subgroups with key distinct features in the ASD population that can contribute to the better understanding of the disorder. It can be argued that the characterization of autism can be substantially explained in the context of personality. Thus, a bottom-up approach in observing trait differences through both the lens of personality profiles and autism symptomatology may reveal homogenous subgroups. This study uniquely combines the five-factor model of personality, the multiple “autisms” theory in genetic research, and the use of latent profile analysis to identify possible subgroups in the ASD population. Through these possible subgroups, personalized interventions may be possible.

## five-factor model of personality

Openness to Experience (Imagination)	Artistry, Curiosity, Imagination, Insight, Originality, Variety in Interests
Conscientiousness	Efficiency, Dutifulness, Organization, Reliability, Responsibility, Thoroughness
Extraversion	Activity, Assertiveness, Energy, Enthusiasm, Excitement Seeking, Gregariousness
Agreeableness (Benevolence)	Appreciation, Forgiveness, Generosity, Kindness, Sympathy, Willingness to Trust
Neuroticism (Reverse of Emotional Stability)	Anxiety, Depression, Hostility, Impulsiveness, Self-consciousness, Worrying

## latent profile analysis

- Empirically valid method of identifying subgroups within a population (a subset of structural equation modeling)
- Able to identify categorical latent variables utilizing continuous indicator variables (i.e., LPA is capable of identifying latent subgroups when they might not be immediately apparent even with thorough inspection of the collected data)
- Unlike cluster analysis, LPA utilizes a probabilistic model that aims to describe the data distribution; considered a far more empirically stringent method
- Used to identify subgroups in different populations of interest
- There has yet to be any studies that utilize LPA in attempt to identify personality subgroups in the ASD community

## objective

**Research Aim:** Identify possible personality subgroups and trends within school-aged children in the ASD population.

*Hypothesis:* Distinct personality subgroups of children with ASD and personality trends will be identified.

## treatment study

- This study utilized data from a previous randomized-controlled trial intervention study
- N=105 school-aged children with ASD, IQ  $\geq 70$
- Parent-reported personality measure (HiPIC) was given during the intake assessment
  - Statistically valid and reliable child personality questionnaire
  - 144 items, each corresponding to a factor in the FFM framework

## table 1. model fit indices

Solution	LMRT (p-value)	BLRT p-value	AIC	sBIC
1-class			8770.02	8751.83
2-class	217.87 (0.030)	< 0.001	8587.68	8559.89
3-class	136.14 (0.328)	< 0.001	8488	8450.61
4-class	99.065 (0.727)	< 0.001	8424.49	8377.51

Note. LMRT = Lo-Mendell-Rubin Adjusted Likelihood Ratio Test, BLRT = Bootstrap Likelihood Ratio Test, AIC = Akaike Information Criterion, sBIC = sample size-adjusted Bayesian Information Criterion

## figure 1. latent class mean facet rankings

		Class 1	Class 2	Class 3	Class 4
Membership Size (Proportion)		62 (.59)	20 (.19)	16 (.15)	7 (.07)
Benevolence	Altruism	VL	L	L	L
	Compliance	L	H	L	N
	Dominance (R)	H	L	H	H
	Egocentrism (R)	VH	H	VH	VH
	Irritability (R)	VH	N	VH	N
Conscientiousness	Achievement-striving	N	L	H	L
	Concentration	L	N	N	L
	Order	L	N	H	N
	Perseverance	VL	L	H	VL
Extraversion	Energy	L	VL	N	H
	Expressiveness	L	VL	N	N
	Optimism	VL	VL	L	H
	Shyness (R)	VH	VH	VH	H
Imagination	Creativity	N	L	H	H
	Curiosity	L	L	H	H
	Intellect	L	L	H	N
Emotional Stability	Anxiety (R)	VH	H	VH	N
	Self-confidence	L	L	N	N

Key: VL = Very Low (0-2), L = Low (2.001-4), N = Normal (4.001-6), H = High (6.001-8), VH = Very High (8.001-10); (R) = reverse-coded for factor score

## methods

- Latent profile analysis was conducted using participants’ personality facet decile scores collected from the HiPIC data
- Relative model fit was determined by the LMRT, BLRT, AIC, and sBIC
- Statistical indices and theoretical considerations were used to determine the most representative model based on model fit and parsimony
- Trends between personality subgroups are identified by classifying facet decile scores into rankings

## discussion

- 4-class solution was the best fitting model
  - 5-class and higher solutions consisted of latent classes that represented less than 5% of the entire sample--deemed spurious after careful consideration of class characteristics
- Four latent subgroups with distinct personality profiles:
  - Class 1: low in A, C, E, I, S
  - Class 2: low in A, C, E, S, high in I
  - Class 3: low in C, E, I, S, high in A
  - Class 4: normative in A, C, E, high in I, S
- Subgroups’ characteristics and membership proportion were relatively consistent as solutions increased
- Findings suggest that distinct personality subgroups do exist within school-aged children in the ASD population
- Trends within facets between personality subgroups were identified:
  - Altruism was consistently L/VL, while egocentrism and shyness were consistently H/VH
  - Irritability and anxiety ranged from N to VH (but never L/VL)
  - Concentration, expressiveness, and self-confidence ranged from N to VL (but never H/VH)
  - The two facets with the largest range were dominance and energy

## implications and limitations

At this moment, there is a lack of personalized interventions and well-established treatments in the ASD field. Results of this study may inform the identification of optimal treatment interventions based on differences in individuals’ personality profiles and perhaps used to design personalized treatment plans. Benefits will then translate to applied settings such as the classroom and playground, contributing to improvements in students’ academic ability and social skills. One limitation to this study is its small sample size. Future studies should look to identify personality subgroups in additional samples and test interventions for differences in treatment outcomes.