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VOICE IT OUT LOUD: VIEWING THE WORLD THROUGH AUTISTIC EYES USING ASSISTIVE TECHNOLOGY

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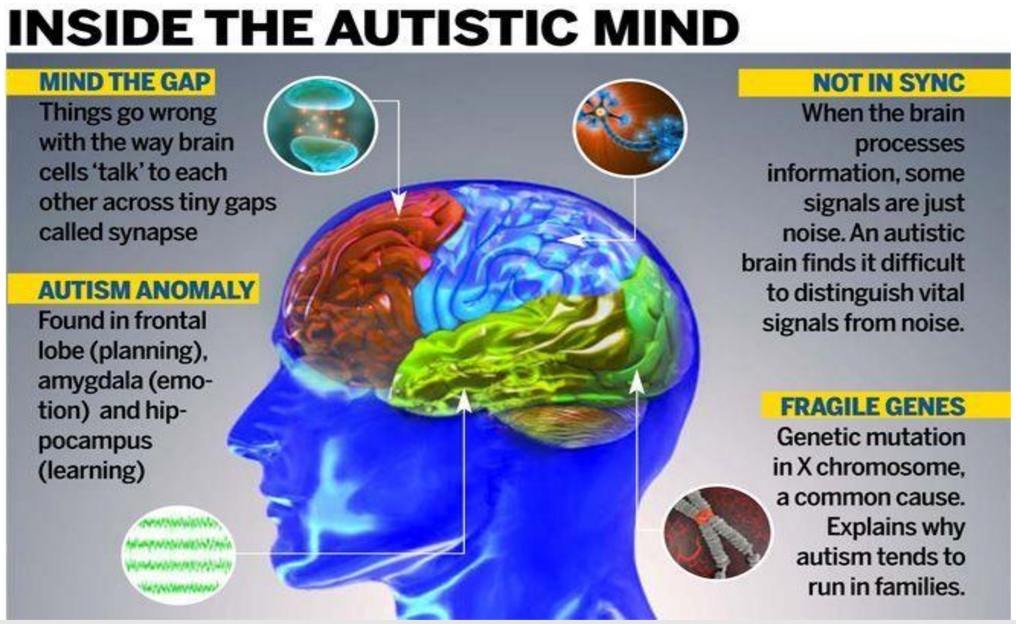
BACKGROUND

•Autism is diagnosed on the basis of three primary areas of impairment: social functioning, language and communication, and repetitive and stereotyped patterns of behavior, interests or activities (APA, 1994; Iacoboni, 2009; Walsh, Morrow, & Rubenstein, 2008; Piven, Elison, & Zylka, 2017; Meyers, 2013; WHO, 1993).

• Research on autism and other neuro-developmental disorders suggests that the social and communication impairments are unique and specific deficits that define the autism phenotype (APA, 1994; WHO, 1993).

•In this context, communication refers to the full range of verbal/ linguistic and non-verbal means for interacting with others.

•The issue surrounding the communication aspect of the disorder is to understand what the specific abnormal pragmatics is pertaining to. To simplify, the issue being studied is the autism, language disorders, and how technology can help that individual improve/gain that communication.



ADDITIONAL INFO AND BACKGROUND

•DeVillers and DeVillers (2014) and Iacoboni (2009) discovered that the ability for one to find their voice and actively engage in the world around them are mirror neurons, neurons that are located in the pre-motor cortex, the supplementary motor area, the primary somatosensory cortex, and the inferior parietal cortex (Iacoboni, 2009).

•Past researchers made convincing cases regarding the role of language development using SGD in several settings, but the one setting that has limited literature is SPG device use in the home (Thunberg, Ashlen, & Sandberg, 2011).

•More specifically, a child with definite understanding of their own feelings and desires, it is necessary to *hear* language used by them to understand what they most desire (DeVillers & DeVillers, 2014). We can observe behavior in expressing wants and needs, but the *proper* verbal expressions for that child's age range can indicate the maturity of the Theory of Mind (ToM) and development of the executive functioning for their stage of life.

PROBLEM

The problem being addressed is the Theory of Mind, Executive Functioning, language development, and the use of Speech Generating Devices that would help the researcher understand how each major network functions in the mind of an autistic individual whom is non-verbal or severely delayed in speech (Dysarthria).

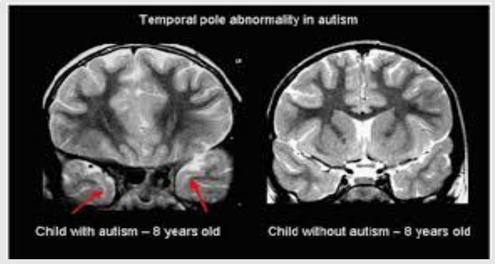
OBJECTIVES

•The purpose of this study is to understand how effective VOCA/speech therapy of non-verbal and severely language delayed individuals are to determine which environment is more effective in the use of Voice Output Command Aides (VOCA's) for today's use of the devices.

•Voice Output Command Aides are commonly used for children whose speech production do not match their appropriate age range as children are normally vocal by the age of 1-2 years of age (Olive, Lang, & Davis, 2008).

Genetics

- The first genes implicated in autism were associated with broader syndromes that included autistic symptoms rather than with pure or non-syndromic autism (Walsh, Morrow, & Rubenstein, 2008).
- Prominent autistic symptoms accompany a genetic metabolic disorder called Phenylketonuria or PKU.
- In addition, children with mutations in the genes associated with tuberous scelerosis (TSC1, TSC2) or the PTEN tumor suppressor gene show prominent autistic symptoms.
- Important clues about the mechanisms underlying autism come from the monogenic disorders Rett's syndrome and Fragile X syndrome (Walsh, et al. 2008).
- Rett's syndrome, caused by mutations in the human MECP2 gene, which encodes the methyl-cytosine binding protein, occurs almost exclusively in girls. Affected girls show normal development for one to two years, followed by the appearance of stereotyped repetitive hand movements and regression of neurological and social skills.



Brain Abnormalities

•In addition to the genetic mutations highlighted as potential areas in the development of autism (Walsh et al. 2008), other factors have been identified as well such as cerebral anatomical abnormalities (Dinstein, Behrmann, Bermn, & Haar, 2014).

•Abnormal cortical thickness was the foremost abnormality reported as one of the abnormal factors associated with the development of the autistic brain which has been linked to several theories, amygdale theory and the under-connectivity of ASD (Dinstein et al. 2014).

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