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# Communication Development and Behavior Analysis in Children with Autism

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## Introduction

The acquisition of language and communication milestones is highly variable in children with neurodevelopmental conditions like autism spectrum disorder (ASD). Delays in expressive language are among the signs for ASD that are amplified over time into widespread delays and atypicality in other domains. Over time, children with ASD also exhibit highly variable language profiles – such that some develop fluent language and some never acquire phrase speech, while others who have delayed onset of words and phrase speech catch up later in childhood.

Language regression is characterized as a loss of previously acquired words or a stagnation of language development, and there is some evidence that regression defined as language loss is specific to ASD. Regression may be seen in other disorders, such as early-onset acquired epileptic aphasia in children with rolandic epilepsy, but overall the clinical manifestations of regression reported in epilepsy differs from that reported in ASD. Moreover, language loss is rarely reported on the Autism Diagnostic Interview (ADI) among those with specific language impairment.

## **Social Communication Interventions**

The prevalence of regression among children with ASD largely depends on the type of study conducted; more recent studies with at least partially prospective data suggest that regression may be more common in ASD than is retrospectively reported. Studies using parent surveys report an average prevalence of 41%, clinical samples report an average prevalence of 34%, and population samples report an average of 22%. Other forms of regression affecting social and adaptive functioning have also been reported in autism among other conditions. Yet, no specific associations have been identified between language regression and genetic factors or autism symptom severity.

The association between regression and later development in various domains has been inconsistent across studies, in part attributed to a reliance on retrospective parent reports. As regression occurs early in life, often prior to diagnosis, the reliability of parent recall has been questioned. Hus and colleagues, comparing repeated Autism Diagnostic Interview-Revised (ADI-R) interviews for language milestones, reported 'telescoping' with the consequence that more children met language delay criteria as they grow older, in spite of the original parent report that their language was not delayed. Older studies tended to report that a regression profile is associated with worse functioning at the time of recall, slow and atypical speech development, or never reaching complete functional speech. In contrast, more recent evidence points to considerable catch-up among those with regression in their subsequent language development.

# Augmentative and Alternative Communication

Prospective longitudinal studies of infant siblings have addressed problems in parental recall and offered opportunities for direct comparisons between infants who later develop autism versus those who do not. They revealed a more complex picture, raising the possibility that the diverging trajectories in most infants who later develop ASD may be the same phenomenon that parents of older children retroactively label as 'regression'. In both direct assessments and concurrent parent reports of social communication skills, infant siblings who later developed ASD and those who did not were indistinguishable in social communication skills at 6 months (e.g., gaze to face, smiles paired with eye contact, and/or vocalizations). The two groups displayed diverging trajectories thereafter, with the ASD group reaching a plateau or falling behind in social communication skills. By 12 months, the differences were significant, with the gap continuing to widen through to 36 months. In another study, measuring prospective trajectories of cognitive development, showed evidence for skill loss or plateau in infants with a family history of ASD that was not specific to those later diagnosed with ASD. Prospective studies suggest that parents may be more able to identify regression in cases in which the child has already developed some skills that are easy for parents to observe but not in cases where the child is experiencing delays in developmental milestones.

As such, it is possible that language regression in ASD, defined as early language loss, may be more the rule than the exception, as one manifestation of atypical brain development impacting multiple domains, including early social communication and motor development. Moreover, operational definitions of regression in ASD may conflate potentially distinct phenomena,

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namely losing previously acquired skills, a plateau (or a stagnation) in skill acquisition, or a slower rate of skill acquisition. More studies are needed to address key knowledge gaps related to regression in ASD and how it interacts with the variable rates of language and communication development. In the current study, we analysed data from a large cohort of children with ASD followed up since diagnosis to address three objectives. First, we examined the prevalence, timing, and correlates of regression, defined as parent-reported language loss occurring prior to 7 years of age. Second, we contrasted profiles of expressive and receptive communication in children with and without a regression profile from the time of diagnosis until around 10 years of age. Finally, we tested the potential influence of socio-demographic predictors (biological sex, maternal education, family income) and developmental predictors (fine motor skills, cognitive skills), known to be associated with trajectories of development of expressive and receptive communication.

In sum, although language regression can be alarming in the subgroup with otherwise near-typical development, our findings confirm that its occurrence does not necessarily foreshadow worse long-term developmental outcomes. Our trajectory analyses highlight the marked variability in communication trajectories in children with autism, both with and without regression. Variability in communication outcomes in our sample was associated with some of the factors known to impact rates of language development in the general population, such as income. Future research identifying modifiable factors linked to the external environment could prove especially useful in promoting early language as a protective mechanism for subsequent development. Our study focused on language regression because language loss has received the most interest in ASD, but future studies should assess possible loss in multiple domains using more refined measures.