

Down-Syndrome

Biological vs. Social Pressures

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### Introduction

Down-Syndrome, also called trisomy 21, is diagnosed as a genetic disorder. Carriers of an extra copy of the 21th chromosome often exhibit some degree of intellectual disability, including language production. Other visible features are reduced height and facial dysmorphology. Although being firmly rooted in genetics, the genetic makeup between persons is not consistent. Among other variations, chromosomes may be completely or only partially duplicated, and all or a subset of cells may be affected (mosaicism). In addition, expression of the affected genes may vary throughout the body (Karmiloff-Smith et al., 2016).

### Biological Pressures

Individual differences in brain development may occur as early as 20 weeks into gestation. Overarching feature appears to be reduced branching and connectivity in the brain, affecting cerebellum, hippocampus, and cortex. However, different subtypes may have different developmental trajectories for different parts of the body. Karmiloff-Smith et al. (2016) emphasize that phenotypical differences become increasingly differentiated across the life-span. Impact on basic, psychological processes, for example, memory or attentional processes may affect individual trajectories of other, higher-level processes, e.g. speech development. In prior research of the Williams Syndrome, Karmiloff-Smith (2009) promotes the varying impact of different developmental trajectories of neural circuitry to personality. Thus, in some skills, for example, implicit memory, Down-Syndrome children may perform similar to their same-age peers, whereas in other areas there may be differences. From a biological standpoint, the widespread practice of age-matching across a variety of skills is therefore questionable. This viewpoint favors Vygotsky's (1978) individual cognitive construction as a social process over Piaget's (2003) generally staged developmental theory. Biological differences are hard limiting constraints and may only be compensated if systems

or their neighborhood admit compensation. Plasticity of the brain appears to be the connecting element between biological and mental processes in human development (ibid.).

### **Social Pressures**

Down-Syndrome, under the normalizing pressures of modern societies, presents people with social challenges. Today, curricula are optimized to promote availability of employment and thus standard of living. Significant developmental delays generally account for a reduced standard of living. Skew and kurtosis of relevant standards are dependent on the social environment under the unifying pressures of globalization. In addition to cognitive challenges, down-syndrome comes with characteristic facial features that may subject people to discrimination. The author has heard self-reports of adult Down-Syndrome affected people describing others to approach them particularly close and with loud voice, only to be surprised by the normal character of the answer. Alton (1998) advocates differentiation over discrimination with regard to the integration of Down-Syndrome people into mainstream schools. Generally, labelling children with diagnoses also creates stigmata for social marginalization.

### **Conclusion**

With developmental issues, founded in nature or nurture, it is often discussed that the earlier one intervenes, the more likely the outcome will approach what one considers “normal”. Biology, it appears, comes equipped with a set of defaults that differ in their fit with the requirements of one’s environments. Some of these defaults are sufficient to bootstrap self-driven subsequent development. All human infants do need to rely on their social environment. Some genetic setups and early developments do need more or less assistance in different aspects. Adjustment pressures in modern societies tend to drift towards the least common denominator or average. So it is to a large part a question of social desirability and selection pressures *what* needs assistance. Given a well-functioning environment, it is a question of biological defaults *if* and *when* that assistance is required.

## References

- Alton, S. (1998). Differentiation not Discrimination: Delivering the Curriculum for Children with Down's Syndrome in Mainstream Schools. *Support For Learning, 13*(4), 167.
- Karmiloff-Smith, A. (2009). Preaching to the converted? From constructivism to neuroconstructivism. *Child Development Perspectives, 3*(2), 99-102.
- Karmiloff-Smith, A., Al-Janabi, T., D'Souza, H., Groet, J., Massand, E., Mok, K. ..., & Strydom, A. (2016). The importance of understanding individual differences in Down Syndrome. *F1000Research 5*, 389.
- Piaget, J. (2003). *Meine Theorie der geistigen Entwicklung* [My theory of cognitive development]. Weinheim: Beltz.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.