

# Focus on variability

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# Focus on variability: New tools to study intra-individual variability in developmental data

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## Abstract

In accordance with dynamic systems theory, we assume that variability is an important developmental phenomenon. However, the standard methodological toolkit of the developmental psychologist offers few instruments for the study of variability. In this article we will present several new methods that are especially useful for visualizing and describing intra-individual variability in individual time-series data of repeated observations. In order to illustrate these methods, we apply them to data of early language development. After reviewing the common techniques and measures, we present new methods that show variability in developmental time-series data: the moving min–max graph, and the progmax–regmin graph. In addition, we demonstrate a technique that is able to detect sudden increases of variability: the critical frequency method. Also, we propose a technique that is based on a central assumption of the measurement-error-hypothesis: namely the symmetric distribution of error. Finally, as traditional statistical techniques have little to offer in testing variability hypotheses, we examine the possibilities that are provided by random sampling techniques. Our aim with the present discussion of variability and the demonstration of some simple yet illustrative techniques is to help researchers focus on rich additional sources of information that will lead to more interesting hypotheses and more powerful testing procedures, adapted to the unique nature of developmental data.

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