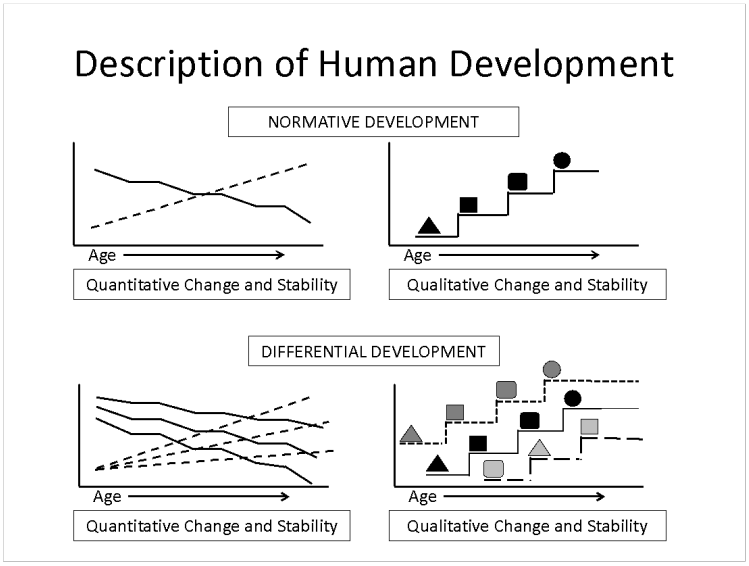
Goals of Lifespan Developmental Science, going deeper

Research methods are tools that serve scientific ways of knowing, and their utility depends on the extent to which they can help researchers reach their scientific goals. From a lifespan perspective, developmental science has three primary goals: to describe, explain, and optimize human development (Baltes, Reese, & Nesselroade, 1977; see Table 1.1). Because these goals are embedded within the larger meta-theory created by the lifespan perspective, they target two kinds of development: (1) patterns of ***normative change*** and ***stability***; and (2) patterns of ***differential change*** and ***stability***. When researchers say they are interested in understanding ***normative*** stability and change, they mean typical or regular age-graded patterns of individual change and constancy. When researchers want to understand ***differential development***, they mean the different pathways that people can follow over time, including differences in the amount, nature, and direction of change. Moreover, researchers understand that some development entails ***quantitative changes*** (often called "trajectories") and others involve ***qualitative shifts***, such as the reorganization of existing forms or the emergence of new forms.

TO DESCRIBE HUMAN DEVELOPMENT

What does it mean to *describe* human development?
Description is the most basic task for all scientists. For developmental scientists, description involves depicting, portraying, or representing patterns of development in their target phenomena. As shown in the figure below, this includes description of *normative* development, or typical quantitative and qualitative age-graded changes and continuities, as well as identifying the variety of *different* quantitative and qualitative pathways the phenomena can take.



What does it mean to describe *qualitative* changes in development?
In general, describing qualitative change involves depicting the age-graded organizations and re-organizations in the constituents of a phenomenon, sometimes referred to as phases, stages, structures, or developmental tasks. The clearest descriptions of qualitative shifts can be found in Piagetian and neo-Piagetian accounts of development, which depict sequences of qualitatively different structural reorganizations of cognitive and affective processes (e.g., Case, 1985).

How can the description of *stability* be part of the goals of developmental science?
It may seem surprising that developmentalists would be interested in identifying time windows during which phenomena are stable or unchanging. It seems like *stable* phenomena would be left to non-developmental scientists to study. Such questions make sense if you assume that stability is the default state of all phenomena. If that is the case, then of interest are states that differ from this default, namely, states of change. However, it is also possible to assume that the natural state of affairs is movement, flux, or change. From this perspective, it is important to describe not only the qualities and directions of these changes, but also to document states that manage to differ from this default, namely, periods of stability, continuity, or constancy.

TO EXPLAIN HUMAN DEVELOPMENT

How is the *explanation* of development different from its description?
Explanations refer to explicit accounts of the factors that cause, influence, or produce the patterns of changes and stability that have been described. These are completely different from descriptions themselves. Descriptions answer questions like "what?" (i.e., the nature of the target phenomena), "how?" (i.e., the ways in which phenomena can change or remain the same), and "when?" (i.e., the ways in which these patterns appear as a function of age or time), whereas explanations focus on "why?". Researchers can compile the most comprehensive description of the development of a phenomenon, and not have discovered a single thing about the causes that underlie it. In the description of age-graded patterns of change and stability, age by itself

(that is, time since birth) cannot explain *why* these patterns occur. Age (and other measures of time) can provide a metric along which change and stability can be plotted, but they are only considered to be *markers* or symptoms of the workings of the temporally-graded causal factors that explanatory accounts are trying to identify.

Explanations targeting normative development focus on the causes that underlie typical patterns of change and stability. Causal processes can remain the same over development, resulting in what can be called "explanatory continuity," or different causal processes may be involved in explaining similar phenomena at different ages, resulting in "explanatory discontinuity." Of course, description and explanation are linked—the search for explanations is guided by signposts originating in the patterns of development that have been described-- but even when normative descriptions have been ascertained for decades, it often takes many more decades for causal accounts to be well-established and accepted.

Why do developmentalists need to *explain* stability?
Just as with descriptions of stability, it may seem that the search for explanations for stability would be a waste of developmentalists' time. And indeed, if researchers assume that the natural state of all phenomena is constancy or continuity, that is, if they assume that all phenomena are inherently at rest, then no explanations for this state are needed. However, if, on the other hand, *change* is assumed, then the natural state of all phenomena is considered to be movement or flux, and explanations are needed for how constancy could be accomplished. Such states of stability or constancy are often described as "steady states," and they are considered to be achieved through active means, such as are visible in all those activities needed to maintain the steady state of "balance" when walking on a narrow ledge or, over longer periods of time, all those activities needed to maintain a constant weight. These active processes are captured in concepts such as maintenance, conservation, preservation, compensation, equilibrium, homeostasis, or homeorhesis.

What is meant by explanations of *differential* patterns of stability and change?
In addition to explaining normative patterns of development, researchers are also interested in providing a causal account for why a target phenomenon should take any of the variety of different pathways it has been observed to follow. Sometimes this task is relatively straightforward—especially when pathways differ only in mean level or age of onset. Then it can be the case that the same factors that explain normative change and stability can also account for different pathways. Pathways are traversed at earlier ages or at higher mean levels because some individuals have more of the factors that promote the phenomena and less of the factors that undermine it. The task of differential explanation is made more challenging when the causal factors that produce normative development are not the same ones as those that generate differential pathways.

TO OPTIMIZE HUMAN DEVELOPMENT

How does optimization differ from explanation?
The goal of *optimization* of human development refers to research and intervention activities designed to figure out how to promote healthy development (also referred to as flourishing or thriving) and the development of resilience. This task goes beyond description and explanation in two ways. First, in order to optimize development, trajectories and pathways must be identified as targets—targets that represent "optimal" development. These kinds of trajectories are often better than normative development, and so represent rare or even imaginary pathways, especially for groups living in highly risky environments. The search for optimal pathways reflects the assumption that individuals hold much more potential and plasticity in their development than is typically expressed or observed.

The second way that optimization goes beyond description and explanation is that even when explanatory theories and research have identified all the conditions needed to promote optimal development, researchers and interventionists must still discover the strategies and levers that can consistently bring about these developmental conditions. One way to understand the difference between explanation and optimization is that, if explanations focus on the antecedents of a developmental phenomenon, then optimization efforts focus on the antecedents of these antecedents.

Optimization efforts are where the identification and testing of culturally-attuned evidence-informed practices take place. Using information from descriptive research and theory to identify healthy or optimal pathways of development, and evidence from explanatory research about the causes of development, researchers are searching for those "essential ingredients" and finding ways to locate or create them, and amplify their effects. Researchers create the bodies of evidence that contribute to the identification of "best" practices, sometimes by case studies of wise and skilled practitioners, sometimes using longitudinal studies of resilient groups of people, sometimes by testing experimental treatments in the lab, or by conducting randomized control trials in the field.

As contextualists, lifespan researchers do not focus primarily on changing individuals, although some interventions are designed to surface individual strengths, foster competencies and skills, and support coping and other mechanisms of resilience. But,

more often, intervention researchers focus on the contexts of development, working to reform and improve them so that they are more supportive of healthy development. For example, if research shows that self-regulatory skills are needed to succeed in Kindergarten, researchers do not train individual Kindergarteners, instead they use explanatory research on the role of pre-Kindergarten teachers and programs to create interventions to help these contextual agents better nurture young children's developing skills. Lifespan interventionists are likely to focus on contexts that promote development, like parents, families, schools, communities, neighborhoods, workplaces, and nursing homes, and the higher-order societal policies and conditions that shape them, as seen, for example, in the criminal justice, education, political, and health care systems.

How do these three goals of developmental science fit together?

In one way, the tasks of description, explanation, and optimization form their own sequence: If a team of developmentalists wants to understand their target phenomenon, first, they must *describe* the development of the phenomenon, by discovering and documenting its developmental course, including both quantitative and qualitative changes and periods of stability. Once its course has been charted, researchers can begin the task of *explaining* the development of the phenomenon, by searching for underlying (or overarching) factors that produce these patterns of change and stability, working toward causal accounts of both normative development and differential pathways. Then when the explanatory network is sufficiently well-established, researchers can begin efforts to *optimize* the development of the phenomenon, by building interventions that target the creation of developmental conditions that support and maintain these explanatory factors. In practice, of course, research is more recursive. Descriptive research suggests targets for optimization; experimental study of interventions can be used to identify causal factors; the analysis of explanatory factors suggests additional potential descriptive pathways; and so on. In fact, the most generative research areas are characterized by the active pursuit of all three of these tasks at the same time.