



Developmental stages, Piagetian stages in particular: A critical review[☆]



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ARTICLE INFO

Article history:

Received 20 July 2015

Received in revised form

18 August 2015

Accepted 23 August 2015

Keywords:

Developmental stages

Stage concept

Piaget

Development

ABSTRACT

Developmental stages in general and Piaget's stages in particular have given rise to considerable controversy. Much of this controversy revolves around the responses that have been given to the following five central questions: (1) Do developmental stages exist? (2) If they exist, where are they? (3) What features define a developmental sequence as a sequence of developmental stages? (4) What psychological processes underlie developmental change? (5) Should we abandon the concept of developmental stages? The main goal of this paper is to present a critical review of such responses, while arguing for a strong conception of development and a “non-received” view of Piaget's theory. After an introduction section, we elaborate on each of the five questions. Finally, we present several reasons why this paper often appeals to Piaget's theory, and why his theory has been greatly misunderstood.

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Developmental stages on the one hand and Piaget's cognitive stages on the other have been the center of considerable empirical research and theoretical controversy (e.g., Bart, 2004; Beilin, 1992a; Bickhard, 1978; Campbell & Bickhard, 1986; Collins, 1982; Dawson-Tunik, Fischer, & Stein, 2004; Feldman, 2004; Fields, 2013; Flavell, 1970, 1982; Fodor, 1983; Gopnik, 2012; Karmiloff-Smith, 1992; Kesselring & Müller, 2011; Kohlberg, 1984; Levin, 1986; Modgil & Modgil, 1982, 1986; Müller, Carpendale, & Smith, 2009a; Pinard & Laurendeau, 1969; Thelen, Schöner, Scheier, & Smith, 2001; Youniss, 1995).

This controversy revolves around answers to the following questions: (1) Do developmental stages exist? (2) If they exist, where are they or where we should look first for them? (3) What features define a developmental sequence as a sequence of developmental stages? (4) What psychological factors and processes underlie developmental change, be it qualitative, discontinuous and stage-like, quantitative, continuous and gradual, or even continuous and discontinuous? (5) Should we abandon the concept of developmental stages?

Drawing on previous literature, this paper offers an answer to, and reflects on, each of these questions, while arguing for a strong

conception of development and a “non-received” view of Piaget's (1983a) theory. Despite the vast literature providing responses to such questions, there is no paper that addresses the main responses to each one in the way this paper does. As will be seen, the majority of the answers to those questions heavily rely on a weak conception of development and a “received” view of Piaget's theory.

In a *strong* conception of development, developmental stages are characterized by the following criteria: (a) *Hierarchy*: stages appear in an invariant, hierarchical order; (b) *integration*: a given stage integrates, albeit overcomes or transcends its predecessor; (c) *consolidation*: before all features that define a certain stage are present, there is a phase of preparation wherein the stage still presents some features of the previous one; (d) *structuration*: a stage is organized by what Piaget (1983a) called *structures d'ensemble* or overarching structures, that is, a way of thinking/knowing which has some formal and logical properties and is applied to different contents; and (e) *equilibration*: if an individual is capable of performing according to the criteria of a given stage, then s/he is at a certain degree of (unstable) equilibrium, and is not cognitively “perturbed” when s/he has to solve problems whose solution does not require competencies that go beyond the competences linked to the stage at hand. For example, the Piagetian formal operational stage represents a higher level of equilibrium than its concrete operational counterpart because, among other things, formal thinking includes two types of reversibility (negation and reciprocity) and concrete thinking only one (negation or reciprocity, but not both). (See Inhelder & Piaget, 1958; Piaget, 1960). In

[☆] Portions of this paper were included in the Symposium, “How Should We Think about Developmental Stages?” (43rd Annual Meeting of the Jean Piaget Society; Chicago, June, 6–8, 2013).

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a *strong* conception of development, developmental stages are “hard structural” (see Kohlberg & Ryncarz, 1990, pp. 204–206) as opposed to “soft” stages, such as Loevinger’s (1976) stages of ego development. With hard structural stages, developmental changes (1) are necessary rather than optional tracks of development; (2) embody operative reasoning which represents interiorized and reversible forms of action, such as Piaget’s (1983a) mental operations, or Kohlberg’s (1984) justice operations; (3) distinguish the content from the form or structure of thought; (4) can be formalized within a rational, normative model (Piaget, 1967); and (5) appeal to an epistemic, or rational, general subject as opposed to a psychological, individual subject (Inhelder & De Caprona, 1997).

As for the “received” view of Piaget’s theory, we think that, among other things, this view wrongly assumes that: (a) it is people, more than their performances and cognitive processes in a given situation or task, who can be characterized in terms of developmental stages; (b) age is a criterion rather than an indicator of development; (c) the chronology of acquisitions is more important than the sequence of transformations; (d) he was more interested in true than in necessary knowledge; (e) Piaget’s overarching structures (e.g., the groupings) are functional entities that are responsible for the emergence of the typical performances linked to a given stage, not formal, logicomathematical properties of such performances and cognitive processes; (f) the subject’s construction of knowledge is a solitary enterprise; (g) there is only a single developmental pathway; (h) when solving Piaget’s tasks, subjects follow rules, mental images, or a preexisting mental logic rather than acting upon objects and coordinating those actions into relational totalities; and (i) only structure and form, not content and meaning, play a central role in operational understanding and development (see Beilin, 1992a,b; Carpendale, 2000; Chapman, 1988, 1992; Inhelder & De Caprona, 1997; Kesselring, 2009; Kitchener, 2009; Lourenço & Machado, 1996; Smith, 1993, 2009).

Much of the controversy around the main responses to each of those questions has had to do with *neo-Piagetian theories*, such as Pascual-Leone’s (1970), Case’s (1992), Halford’s (1993), Fischer’s (1980), and Demetriou’s (1998) approaches (see, for a description of these theories, Knight & Sutton, 2004; Mora, 2007; Shulman, Restaino-Baumann, & Butler, 1985). Neo-Piagetian theorists integrate ideas from Piaget’s theory with concepts and concerns coming mainly from: (a) information-processing approaches, such as the concept of working memory (e.g., Klahr, 1992); (b) differential psychology, such as the problem of intraindividual and interindividual differences in cognitive development (e.g., Sternberg, 2002); and (c) the neurosciences, specifically the role of the brain in the emergence of developmental change (e.g., Burman, 2013; Carey & Gelman, 1991; Diamond, 2006).

The main goal of neo-Piagetian theories is to preserve the strengths of Piaget’s theory as the neo-Piagetians see them, while eliminating its shortcomings. Thus, such theories: (a) maintain certain features of Piaget’s theory, for example, that development proceeds through a process of differentiation and integration (e.g., Case, 1985; Fischer, 1980); (b) elaborate more deeply than Piaget (see Case, 1985) on other features of his theory, for instance, on Piaget’s (1981) idea that affectivity energizes the subject’s performances in every situation; and (c) modify Piaget’s theory in many respects (see Fischer, 1980).

As is known, for a long period of time, Piaget (1967) appealed to logicomathematical notions, such as the groupings and the 16 binary operations of propositional logic, to describe the formal properties of the subject’s cognitive processes and performances on his many tasks. According to neo-Piagetian theorists, such performances should not be described in such terms. Fischer’s (1980) *skill theory*, for instance, describes those performances in terms of increasing integration of skills. For example, the preadolescent’s

ability to coordinate two systems defining a simple abstraction (e.g., to understand that the arithmetical operations of addition and multiplication are the same thing because they both lead to a larger number) involves less integration of skills than the typical adolescent’s ability to understand that such operations are similar because they both combine numbers leading to a larger number, but in a different way. In the operation of addition, numbers are combined through simple units (e.g., $2 + 2 + 2 = 6$), whereas in multiplication numbers are combined through groups of numbers (e.g., $2 \times 3 = 6$) (Fischer, Hand, & Russell, 1984, p. 49).

Differently, for Pascual-Leone (1970, 2000), such performances can be described in terms of quantifiable, continuous changes in a person’s mental capacity, working memory or mental units. For example, to be capable of understanding the proportionality concept one must be able to keep in mind five mental units, such as the two pairs of numbers to be compared (e.g., $2/5$ and $3/7$) and their relation. On the contrary, one only needs to keep in mind two mental units to understand that a given number is larger than another.

In this respect, it is worth mentioning that, at the end of his career, Piaget’s thinking was more oriented toward a *logic of meaning* (Piaget & Garcia, 1983) than a propositional logic (Piaget, 1967). In propositional logic, propositions are true or false, whereas in a logic of meaning propositions can be true, false, but also signifying (e.g., “If I’m a man, I’m mortal; I’m a man. Therefore, I’m mortal”), or nonsignifying (e.g., “If I’m mortal, I’m a man; I’m mortal. Therefore, I’m a man”). Note that all men are necessarily mortal, whereas not all mortals are necessarily men.

Piaget changed his theory regarding other issues of concern to the neo-Piagetians. For example, Piaget’s (1972) idea that formal operations may not be applied except in domains of one’s interest and expertise is an indication that his earlier stand — “I have no interest whatsoever in the individual. I am very interested in general mechanisms, intelligence and cognitive functions, but what makes one individual different from another seems to me far less instructive” (Piaget, 1971a, p. 211) — was relaxed as Piaget got older. Enough alteration took place during Piaget’s late period that some developmentalists have been led to speak about Piaget’s “new theory” (Beilin, 1992b). Unfortunately, Piaget’s new theory seems to have escaped the notice of several developmentalists (e.g., Gelman & Baillargeon, 1983; Siegler, 1997).

Piaget’s idea that individuals can be formal only in certain domains also shows that his *epistemic*, rational and nomothetic subject is not so opposed to a *psychological*, idiosyncratic subject as some of his critics have claimed (e.g., Murray, 1983). Moreover, even those who are convinced that Piaget conceived subjects in terms of their general, nomothetic, rather than individual, idiosyncratic characteristics, have made it clear that Piaget’s emphasis on the epistemic rather than the psychological subject has led to “important misunderstandings and misses the deep and enduring meaning of Piaget’s approach” (Inhelder & De Caprona, 1997, p. 4). Although Piaget (1950a) was more interested in the emergence of new forms of knowing than in individuals’ development, he made careful, detailed naturalistic observations of real, not epistemic, children (e.g., Piaget, 1951).

Developmental stages, Piaget’s stages in particular, have been also criticized for not explaining why development from one stage to the next occurs, and for overlooking or even ignoring individual differences in cognitive development. For example, according to neo-Piagetian theorists, developmental stages such as Piaget’s do not account for the finding that some individuals move from stage to stage faster than other individuals, and that “... a particular situation may facilitate one subject’s ability to solve a problem, whereas it may hinder another’s” (Larivée, Normandeau, & Parent, 2000, p. 828).

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