DOCUMENT RESUME

ED 176 926 RC 011 636

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TITLE Piagetian Conservation in Navajo Children.
PUB DATE Apr 79
NOTE 6p.; Paper presented at the Rocky Mountain Psychological Association Meetings (Las Vegas, Nevada, April 1979)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Abstraction Levels; *American Indians; Child Development; Children; *Cognitive Development; Concept Formation; *Conservation (Concept); Cultural Differences; *Developmental Psychology; Developmental Stages; Elementary Secondary Education; Human Development; Perceptual Development; Reservations (Indian)
IDENTIFIERS *Navajo (Nation); *Piagetian Theory

ABSTRACT

In order to determine the cognitive development of Navajo children in terms of Piagetian conservation of number, mass, and continuous quantity, 168 Navajo children at seven different age levels from 5 to adult were presented with a series of three conservation tasks. The tasks consisted of a standard object and an equivalent object that could be made to vary quantitatively and perceptually. The resulting incidence of conservation was low. Conservation was both age and task related. Subjects under 9 years of age did not conserve, but conservation increased towards adulthood, with adults measuring 78% conservers. More conservation occurred on the number task than on either of the others. The data support the Piagetian thesis that children develop cognitively according to a predetermined order of stages, but the low incidence of conservation among Navajo children suggests a "time-lag" in cognitive development for the group as compared to the dominant Western culture. This leads to the idea that Piagetian theory may be ethnocentric. (Author/SB)

Paper presented at Rocky Mountain Psychological Association Meetings. Las Vegas, Nevada. April, 1979

PIAGETIAN CONSERVATION IN NAVAJO CHILDREN

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ABSTRACT

The purpose of the experiment was to determine the cognitive development of Navajo children in terms of conservation of number, mass, and continuous quantity. The subjects were 168 Navajos from an isolated community on the Navajo reservation, distributed so that there were 12 males and 12 females at age levels: 5, 6, 7, 9, 11, 13, and adult. Each subject was administered a series of three conservation tasks. Each task consisted of a standard object and an equivalent object that could be made to vary quantitatively and perceptually (variable object). The materials for these objects in the number, mass, and continuous quantity tasks were, respectively: 10 plastic disks, modeling clay, and water. The procedure for each task was to present the subject with the standard object and variable object in its equivalent form, and have the subject judge the quantitative equivalence of the two objects. Next, the variable object was transformed perceptually, but not quantitatively, and the subject again judged the quantitative equivalence of the objects. Subjects who made a correct judgement were classified as conservers.

The results showed that the incidence of conservation was low. On the 504 conservation tasks administered, 360 subjects (71.4%) were classified as nonconservers. It was also found that conservation was age related. Subjects younger than 9 years did not conserve. At older ages there was a significant monotonic increase in conservation up to the adults (78% conservers). Additionally, conservation was task related. More conservation occurred on the number task than on either of the other tasks.

These data, obtained in Navajo children, agree with the Piagetian thesis that all children develop cognitively according to a predetermined order of stages. The low incidence of conservation among the Navajo children suggests a considerable "time-lag" in cognitive development for this group as compared to the dominant Western culture. The "time-lag" is largely attributable to Navajo-cultural factors, which suggests that Piagetian theory may be ethnocentric.

Table 1. Total number and percentage of subjects across age groups who were classified as nonconservers, transitionals, or conservers under the number, mass, and continuous quantity conservation tasks.

Classification	Conservation Task					
	Number		Mass		Continuous Quantity	
	N	%	N	%	N	%
Nonconserver	107	63.7	126	75.0	127	75.6
Transitional	24	14.3	10	6.0	7	4.2
Conserver	37	22.0	32	19.0	34	20.2

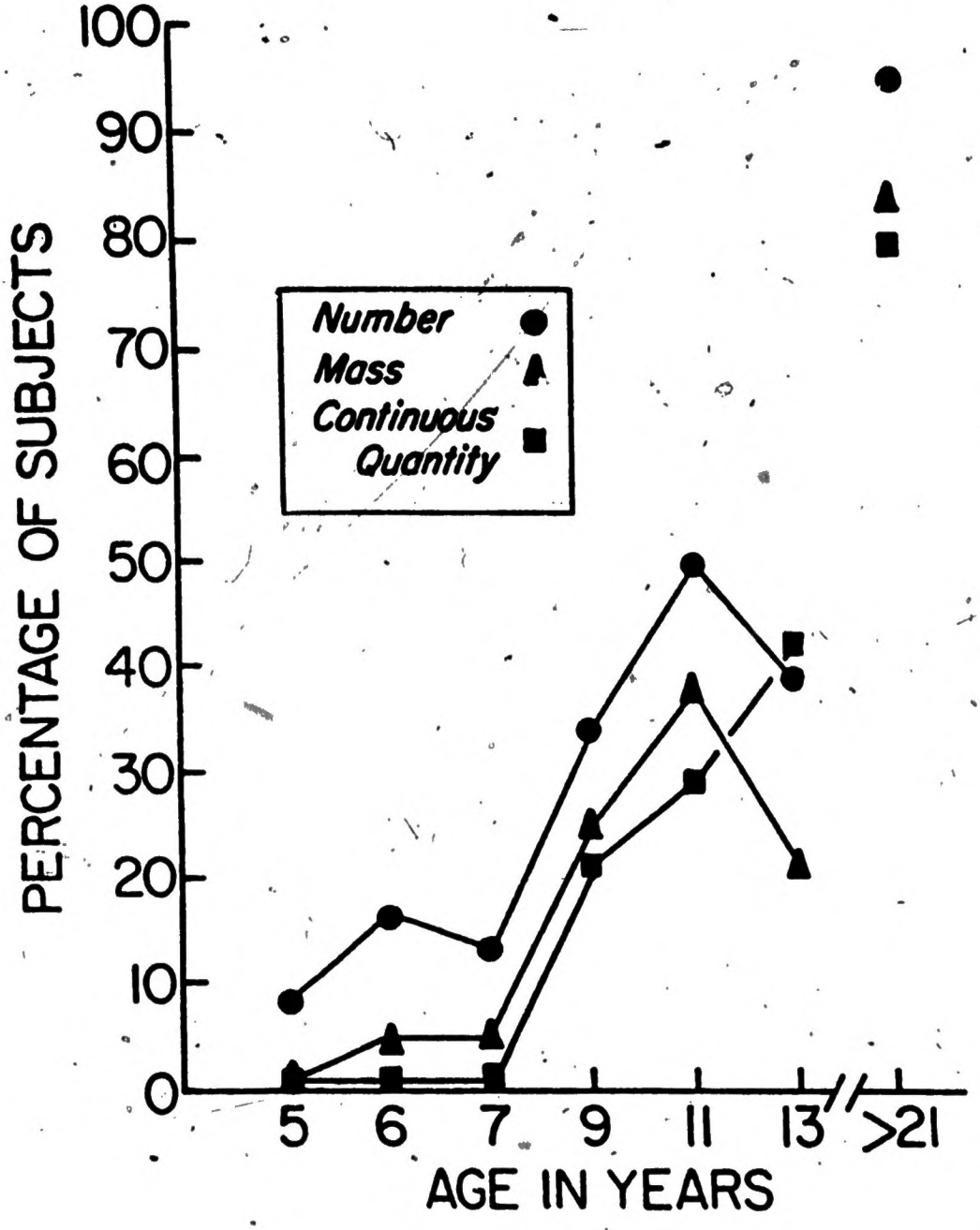

Fig. 1. Percentage of subjects in each age group who were classified as either transitionals or conservers under the number, mass, and continuous quantity conservation tasks.

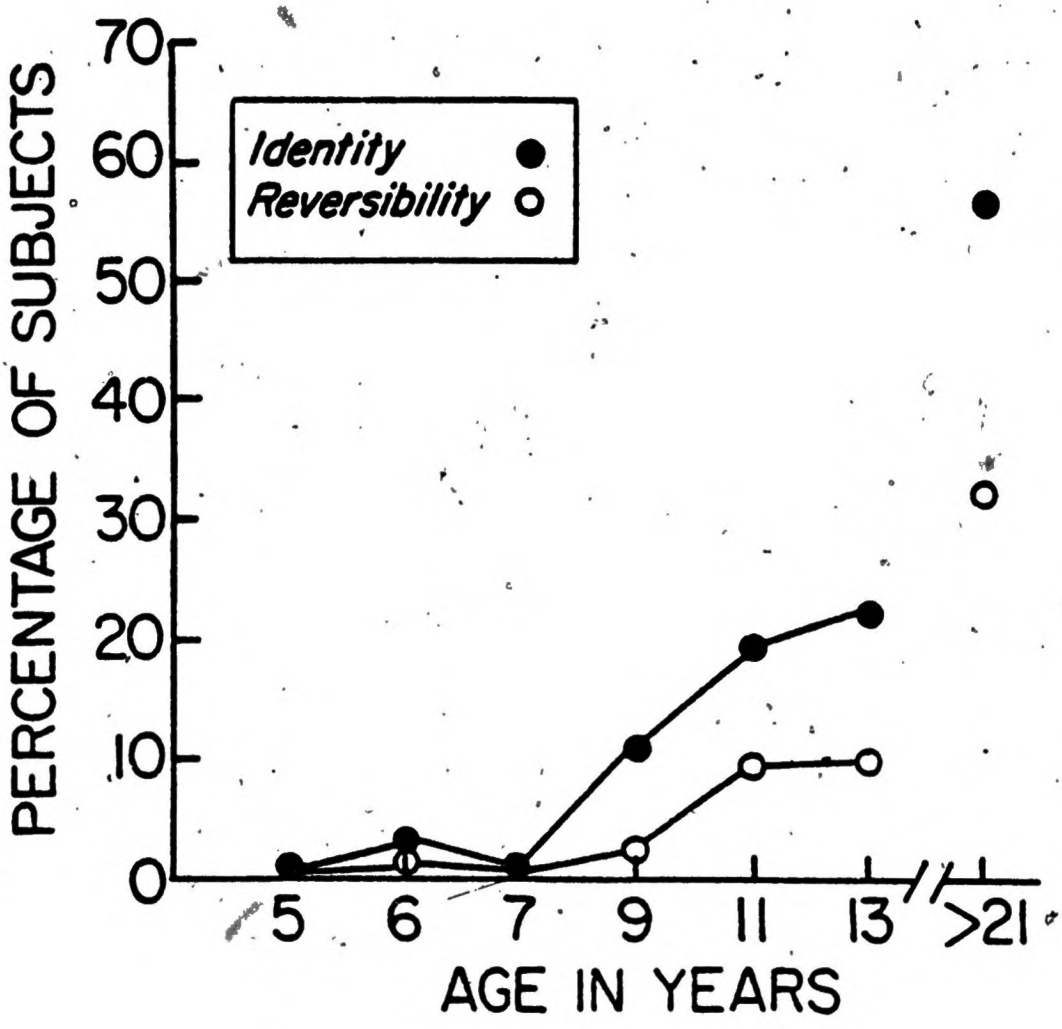

Fig. 2. Percentage of subjects in each age group who gave a conserving response that was categorized as either an identity or a reversibility response under the number, mass, and continuous quantity conservation tasks.

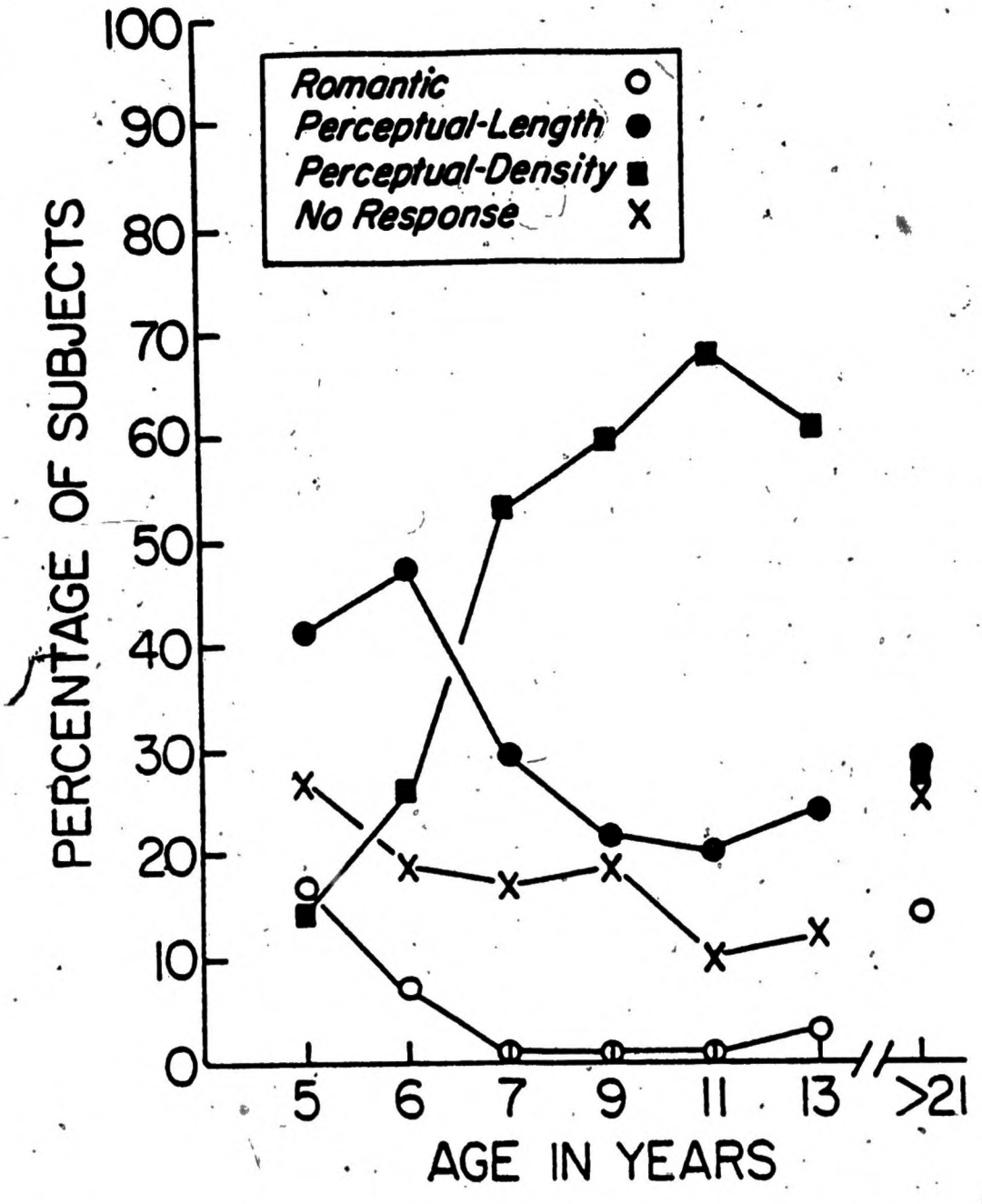

Fig. 3. Percentage of students in each age group who gave a nonconserving response that was categorized as romantic, perceptual-length, perceptual-density, or no response under the number conservation task.