Early Systematic Thinking Underlying Moral Values in Children Precognitive Stages: an Information Integration Theory Approach

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Abstract

A sample of 25 children aging from 4 to 5 years old was required to judge twelve scenarios where moral values regarding respect, justice and kindness were manipulated. Participants had to use a jumping frog to rate how respectful a scenario actor was about the behavior of another child in the scenario. Results showed that when manipulated moral values of respect, justice and kindness were high, participants integrated scenery information by using a cognitive summative algebraic rule. It is argued that this kind of systematic thinking at pre-conventional stages of moral development can be typified and further explored by using an Information Integration Approach.

Keywords

Preschool Children´S Judgment; Moral Development; Cognitive Algebra

Introduction

Moral judgment has been typified as a specific, slow, deliberative, and logical style of cognitive implicit processing of moral information (e.g., Morales, Lopez, & Mullet, 2015) like that proposed by Kahneman´s system type 2 (Kahneman, 2011). Piaget, a pioneer in cognitive moral research, proposed that in terms of moral development this is rooted in action and going through a first stage of egocentrism, characterized by unilateralism. A second stage follows, characterized by reciprocity. He suggested the development of two types of morality: heteronomous and autonomous morality. Heteronomous morality is characterized by judgment of what is good or bad based on consequences. Justice is based on obedience and respect to authority in order to avoid punishment. A system of rules is imposed on the outside. On the other hand, autonomous morality considers principles of equality, mutual respect, and cooperative interpersonal relations. A system of principles comes within the person. Decisions are free and rational. Following Piaget's model, Kohlberg (1997) envisioned moral development as a series of incremental universal stages (pre-conventional, conventional and post-conventional), each qualitatively different from the previous one, but also different from any other stage. For a stage, cognitive structures, determined by the interaction of the individual with the environment, are action structures where new structures are superior and the goal is a progressive construction of moral meaning. Moral growth depends on the interaction with the environment. Positive environments will foster development while negative environments will inhibit it.

Here, it is argued that by using an Information Integration Theory approach (IIT; Anderson, 2013) to explore the slow cognitive development in people with intellectual disabilities (Morales, Lopez, & Mullet, 2015; Morales, Lopez, Castro, Charles, Mezquita & Mullet, 2014; Morales, 2012) as a technique to investigate moral development (e.g. Hommers & Anderson, 1991) in a typical population, determination of the genesis of underlying moral cognitive mechanisms at pre-conventional stages can be achieved.

Specifically, the Information Integration Theory (IIT) postulates that relevant stimuli (S_i) are extracted from an environment and psychologically represented through a valuation process (V) with cognitive coefficients (ψ_i). Here, a person is assumed to combine these subjective values (I) by means of a cognitive algebra dominated by addition, multiplication, and averaging to form a unified implicit response (ϱ) that will produce an explicit response (R) through an action operator (A). Figure 1 demonstrates how this cognitive integration process is assumed to operate over three moral values of this study. Here, it is assumed that if a social interaction between two actors in a school environment results in some harm to one of them then information about intensity of aggression, repair of damage

and kindness of participants will elicit systematic thinking to psychologically evaluate moral values regarding respect, justice and kindness.
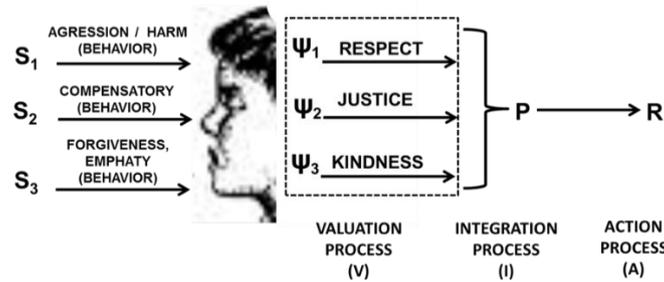

FIG. 1 INFORMATION INTEGRATION FUNCTIONAL DIAGRAM SHOWING RULED COGNITIVE FACTOR INTEGRATION OF RESPECT, JUSTICE AND KINDNESS

The IIT approach provides a method to visually identify data patterns from factor interaction graphs in order to determine universal cognitive principles preceding behavior in several domains. Data patterns in a factor interaction ANOVA graph showing parallel lines will suggest the use of a summative cognitive rule, whereas plot lines showing a fan pattern will suggest a multiplicative integration rule.

The literature does not support the idea that at Piaget´s pre-operational cognitive stages nor at an early pre-conventional stage, cognitive algebra should not appear. However, academic research regarding slow cognitive development like that involving Down syndrome people (Morales & Lopez, 2013) suggests that by using an IIT approach, systematic information integration rules can be found at very early stages of moral development. In order to deal with this academic interest in early moral development in a typical population, the following IIT study was implemented.

Method

Participants

A preschool sample of 25 children aging from 4 to 5 years old (12 males and 13 females) was investigated in this study. Participation in the study was voluntary and no economic reward was provided. Debriefing was provided to all participants, parents, and caregivers. All participants lived in Monterrey, Mexico.

Instrument and Materials

Twelve short social interaction scenarios between two children in a classroom were built, having in mind a repeated measure factorial design that combines in an orthogonal way three factors and their levels (3x2x2). That is, 3 (Respect: High vs. Medium vs. Low) x 2 (Justice: High vs. Low) x 2 (Kindness: High and Low).

At the end of each scenario, the study participant was asked to rate on a scale the probability that a scenario actor was respectful about another child´s behavior. An example of this scenario set follows:

Gaby and Pepe are schoolmates and they are very good friends. While they were trying to make a drawing as a team, Pepe took Gaby´s chair and Pepe threw Gaby´s crayons to the floor. Gaby got very angry and shouted at Pepe. Pepe apologized to Gaby; however, even when she accepted his apology, she was sad since all of her crayons were on the floor and she could not find her pink crayon. Pepe then showed high kindness because he gave Gaby his own pink crayon while he began looking for Gaby´s missing crayon.

How respectful was Gaby with Pepe?

The response scale showed a frog at the left extremity, and a 10-plot path leading to a panel showing the expression "Very Respectful". We explained to participants that the frog was going to jump from its present position to the right of the response scale as a function of respect toward an actor´s behavior. Thus, if the behavior

was not respectful at all, the frog was not going to move from its initial position. If the behavior was very respectful, the frog jumped from dot to dot from its present position to the right extremity of the scale, depending on how a participant judged that a scenario actor´s behavior showed respect.

Procedure

First, informed consent was obtained from all participants in verbal form and approval was obtained from the institutions to which they belonged. Clarification for concepts like "respect", "justice" and "kindness" was provided using examples. The researcher verbally described the scenario to each participant and showed pictures of the actors in the scenario. After each story was read, the experimenter reminded participants of the critical pieces of information. Participants then rated the degree of respect. They were allowed to compare their responses and change them. Scenarios were randomly presented to each participant, and they required between 20 and 30 minutes to complete the study.

Results

A mixed 3x2x2 ANOVA was carried out over the participants´ judgments from all experimental conditions. Table 1 shows an ANOVA table describing the main effects resulting from scenery manipulation.

TABLE 1 ANOVA MAIN EFFECTS

SOURCE	SSQ	df	MS	F	P
RESPECT	359.5	2	179.8	21.80	0.000*
JUSTICE	0.20	1	0.20	0.04	0.839
KINDNESS	20.80	1	20.80	3.05	0.094
RESPECT* JUSTICE	5.10	2	2.60	0.41	0.667
RESPECT* KINDNESS	1.60	2	0.80	0.15	0.862
JUSTICE* KINDNESS	2.10	1	2.10	0.43	0.517
RESPECT* JUSTICE* KINDNESS*	7.30	2	3.60	0.78	0.417

As can be seen from table 1, Respect was the only main significant effect $F(2, 48)= 21.282$, p=.000, $\eta2p = .469987$. This significant main effect was followed by a marginal significant factor of kindness and a non-significant effect of justice. Figure 2 shows interaction among study factors.
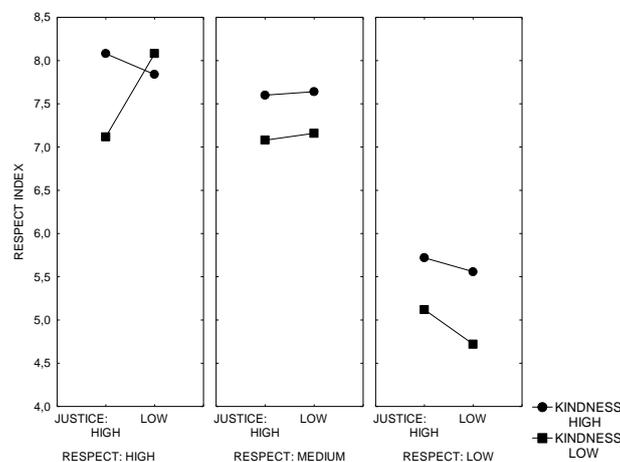

FIG. 2 INTERACTION GRAPH DESCRIBING PARTICIPANTS´ PERFORMANCE THROUGH EXPERIMENTAL CONDITIONS

Notice in Figure 2 that when respect is low and justice is high, a cognitive summative factor integration rule seemed to appear. This result suggests that when certain social circumstances are met, ruled systematic thinking integrating social information of moral values can emerge at early preconvential stages of moral development.

This summative effect seems to be related to a valuation process that is focused only on respect and kindness values. Figure 3 shows this data pattern relation where low values of respect have a differential effect on kindness $F(2,24) = 27.29$, $p = 0.0000$ (comparison).
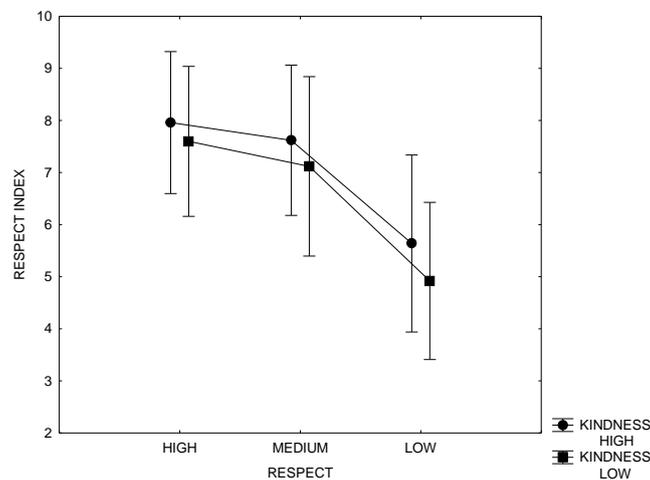

FIG. 3 INTERACTION GRAPH SHOWING HOW PERCEIVING LOW RESPECT IN A STUDY SCENARIO PRODUCES A DIFFERENTIAL CONSIDERATION OF AN ACTOR′S KINDNESS

Discussion

The most fundamental assumption of an information processing theory of development is that thinking relates to mechanisms that process information (Lindsay & Norman, 1977). This leads to the interest on precise analysis of change mechanisms and on self-modification processes during development (Siegler, 1998). Here, the main characteristic of neo-Piagetian theories (e.g., Case, 1985) is to assimilate the strengths of human information processing theories of development into the strengths of a Piagetian approach.

The aim of this study was to look for systematic thinking at early stages of moral development. Specifically, we hoped to identify any trace of a cognitive mechanism to process information regarding moral values. As the current study results suggest, it is improper to conclude that participants in the study are cognitively immature or incapable of producing ruled judgments of moral social situations. Rather, specific social situations elicit higher cognitive processing. From the current study, it is not possible to explain the way respect interacts with kindness or why justice values were not considered. However, it is possible to argue that by using an IIT approach, emerging mechanisms for systematic processing of moral information can be traced. Here, differences among children in processing moral values are assumed to be caused by a valuation process rather than an integration rule. The obtained summation rule must relate to the formation of a posterior stable cognitive stage. More experimental manipulation is demanded in this respect. For instance, the spectrum of moral values considered for a scenario can be widened and mixed with other factors like intention (Berndt & Berndt, 1975), blaming (Bear, Zarain-Uribe, Manning, & Shioni, 2009), etc.

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Authors Introduction

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