

Developmental Processes in Social Inference: Averaging of Intentions and Consequences in Moral Judgment

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Two experiments tested the applicability of Anderson's relative-weight averaging model to children's judgments based on intentions and consequences. Experiment 1 provided support for the model over a wide age range (kindergarten through adult) using stimuli similar to Piaget's in which the intentions ranged from positive to negative and the consequences ranged from neutral to negative. Experiment 2 extended Experiment 1 by including consequences ranging from positive to negative. In Experiment 2, intentions and consequences interacted suggesting that some modification of the assumptions of the averaging model is necessary to fully account for the data. Data from the two experiments suggest that both intentions and consequences influence judgments at all ages examined and that developmental changes in moral judgments are continuous rather than stagelike. These developmental differences can best be described by changes in the weights of intentions and consequences. The major developmental change appears to be a decrease in the weight of consequences with increasing age. The possibility of using algebraic models to describe the results of studies that have attempted to influence the relative importance of intentions and consequences in children's moral judgments is discussed.

A major issue in studies of children's moral judgment has been the extent to which children of different ages use intention and outcome information in judging another's deeds. Piaget (1965) proposed that children progress from a stage of "moral realism" or objectivity to a stage of "moral subjectivity" between the ages of approximately 5 and 12. According to Piaget, during the

stage of moral objectivity children judge deeds primarily in terms of the outcomes or consequences of the deeds. In contrast, a morally subjective child judges a deed primarily in terms of the intentions of the actor and not in terms of the consequences.

Piaget seems to imply that both intention and consequence information will be used in making moral evaluations, but does not provide a way of representing the relative contribution of these cues to moral judgments. Researchers have attempted to use the proportion of variance accounted for, the extremity of the evaluative responses produced by outcome and intent information (Parsons, Ruble, Chereskin, Feldman, & Rhoads, 1976), or a ratio called the "Intention Judgment Quotient" (Hebble, 1971) to index the relative importance of intentions and consequences in determining moral judgments. As yet, there has been no attempt to specify the *processes* involved in combining intentions and consequences in formulating moral judgments or to relate

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such a theory to developmental change in the influence of intention and consequence information.

The two experiments reported here represent initial applications of information integration theory (Anderson, 1971; 1974) to children's moral judgments. This approach assumes that each piece of information has a psychological value (a scale value) on the dimension of judgment and that the scale values of the information presented are combined to produce an integrated psychological impression, which is then translated into a response on the experimenter's scale. Theories of the manner in which information is combined are expressed mathematically, and the relative contribution of each variable is a part of the equation describing the way in which the information is combined.

A particular model of information integration that appears to provide a good account of the manner in which adults combine intention and consequence information is the relative-weight averaging model (Lane & Anderson, 1976). For moral judgments based on intentions and consequences, the averaging model can be written

$$\psi_{ij} = \frac{w_I s_{Ii} + w_C s_{Cj} + w_0 s_0}{w_I + w_C + w_0}, \quad (1)$$

where s_{Ii} and s_{Cj} are the scale values of the i th and j th intentions and consequences respectively, and w_I and w_C are the weights of the intentions and consequences. The weights can be considered to be representations of the psychological importance of intentions and consequences for the judgment. The ψ_{ij} is the psychological impression of the i th intention and j th consequence combination. The term $w_0 s_0$ is usually called the "initial impression"—that is, the subject's impression in the absence of any information (or bias toward positive or negative judgments in general). If it is assumed that (a) the values of w_I and w_C remain constant over all levels of s_I and s_C , (b) the values of s_{Ii} and s_{Cj} are independent of the combinations in which they occur, and (c) that the subject's response, R_{ij} , is linearly related to ψ_{ij} , then the model pre-

dicts that intentions and consequences will have additive effects on the subject's judgments. There should be no interaction of intentions and consequences in an analysis of variance, and the data should plot as a parallel set of curves.

An additive model for the combination of intentions and consequences also predicts that there should be no interaction of intentions and consequences. The additive model,

$$\psi_{ij} = w_I s_{Ii} + w_C s_{Cj} + w_0 s_0, \quad (2)$$

can be distinguished from the averaging model in Equation 1 by examining judgments of stimuli involving only intention information or only consequence information. The averaging model predicts that the effect of intentions will be greater when there is no consequence information presented, while the additive model predicts that the effect of intentions will be independent of the effect of the information with which it is combined. If the judgments are plotted as a function of the level of intentions, the averaging model predicts that the slope of the judgments of intention-only stimuli should be steeper than the slopes of the judgments of intention-consequence combinations. This follows from Equation 1, since the slope is predicted to be proportional to the effective weight of intentions. When intentions and consequences are combined, the effective weight of intentions is, $w'_I = w_I / (w_I + w_C + w_0)$. When only intention information is presented, $w'_I = w_I / (w_I + w_0)$. An analogous prediction holds for stimuli involving only consequence information.

Experiment 1 tests the averaging model for children's moral judgments with a range of stimuli similar to those used by Piaget (1965). Stories involving intentions ranging from positive to negative and accidental consequences ranging from slightly negative to very negative were rated by children in kindergarten, second, and fifth grades. In addition, stories involving only intention information and only consequence information were included to test between the additive and averaging models. Experiment 2 extends Experiment 1 by including consequences ranging from positive to negative.

EXPERIMENT 1

Method

Subjects

Subjects were 25 kindergarten (14 females, 11 males), 39 second-grade (19 females, 20 males), and 33 fifth-grade (19 females, 14 males) children from a local elementary school who participated with parental permission. All children who obtained parental permission were included in the study. One second-grade and one kindergarten subject were discarded because they failed to understand the instructions. In addition, a sample of 9 college students (5 females, 4 males) was also obtained.¹ The mean ages of the three groups of elementary school children were 65.5, 89.3, and 127.5 months for kindergarten, second and fifth grades, respectively.

Stimuli

Nine stories were constructed by combining three intentions with three different outcomes. Intentions always preceded the consequences. The three intention sentences were:

1. This little girl wanted to help set the table to make her mother happy.
2. This little girl wanted to see what kinds of things were on the kitchen shelf. She thought she was allowed to climb up to look on the shelf.
3. This little girl wanted to get a cookie. Her mother told her that she couldn't have a cookie.

The three consequences were constructed by entering the appropriate intention ("get out the dishes," "look," or "get a cookie") in the following sentences.

1. She climbed up on the kitchen cupboard to (intention), and even though she was careful, she slipped and a dish almost fell off the cupboard and broke.
2. She climbed up on the kitchen cupboard to (intention), and even though she was careful, she slipped and 2 dishes fell off the cupboard and broke.
3. She climbed up on the kitchen cupboard to (intention), and even though she was careful, she slipped and 10 dishes fell off the cupboard and broke.

In addition to the nine intention-consequence combinations, three intention-only, and three consequence-only stories were constructed by modifying the sentences above. For example, "This little girl wanted to set the table to make her mother happy, so she climbed up on the kitchen cupboard to get out the dishes."

Rating Scale

For the kindergarten and second grade children, a series of four frowning faces ranging in size from 7.5 to

¹ This experiment was also run with a sample of 45 college subjects using a rating scale ranging from -5 to +5, labeled "very bad" to "very good." The results were very similar to those reported for the smaller sample here, but since the response scale differed, the results are not reported in detail.

3.5 cm in diameter was used to represent the "bad" portion of the rating scale. The largest frowning face was labeled "very bad" by the experimenter, and the smallest frowning face was labeled "a little bit bad." A similar series of smiling faces was used to represent the "good" portion of the scale, with the largest and smallest smiling face labeled "very good" and "a little bit good." For the fifth-grade and college subjects, the response scale consisted of the integers from 1 to 8, with 1, 4, 5, and 8 labeled "very bad," "a little bit bad," "a little bit good," and "very good," respectively.

Procedures

The kindergarten and second graders were run individually. The nine intention-consequence stories, plus the three intention-only and, three consequence-only stories were read to the subject in one of three random orders by a female experimenter. The subjects were instructed to imagine that each story pertained to a little girl who was 5 years old, and that each story was about a different little girl. The 15 stimuli were preceded by two "warm-up" stories, the positive intention-only and the negative intention-negative consequence stories. The subject was asked to repeat each warm-up story to the experimenter before he or she was asked to rate the character. The experimenter did not continue until the subject was able to accurately repeat the story. At the end of each story the subject was asked whether the little girl in the story was a good girl or a bad girl. Depending on the subject's answer, the experimenter presented either the smiling or frowning faces and asked the subject to indicate "how good" or "how bad" by pointing to one of the faces.

The fifth graders were run in two classroom groups. The experimenter explained the response scale and then read the stories one at a time to the subjects while they recorded their responses in individual booklets. For the college age subjects, the stories were printed on two pages in a random order preceded by the instructions. The subjects read the stories and recorded their judgments.

Results

Preliminary analyses revealed no main effect or interactions due to sex of subject. Therefore, sex was not included as a factor in any of the analyses reported below.

A 4(Age Level) \times 3(Intentions) \times 3(Consequences) analysis of variance on the children's ratings yielded main effects of intentions, $F(2, 204) = 133.80$, consequences, $F(2, 204) = 137.12$, and age, $F(3, 102) = 5.40$. The main effect of age reflects the fact that the adults' ratings were slightly more positive than those of the other age groups (mean ratings = 4.37, 3.36, 3.44, and 3.06, for adult through kindergarten, respec-

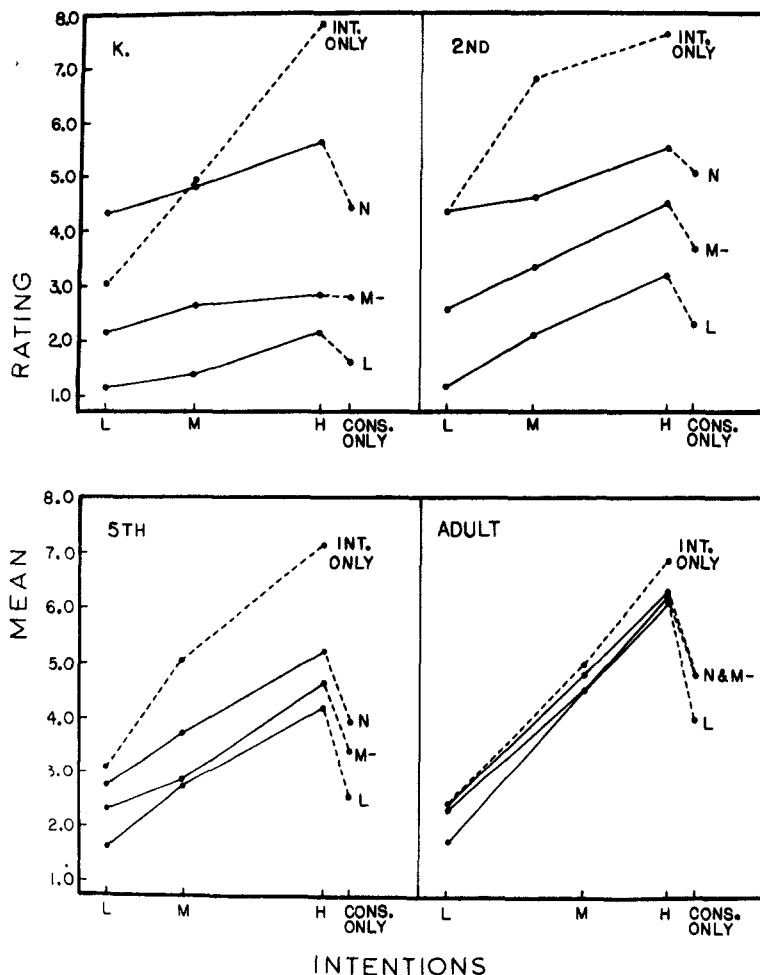


Figure 1. Mean judgments of story characters as a function of intentions (L = cookie, M = look, H = set table), with a separate curve for each level of outcome (L = 10 dishes broken, M = 2 dishes broken, N = a dish almost broken).

tively). Age level interacted with both intentions, $F(6, 204) = 8.08$, and consequences, $F(6, 204) = 12.22$. All other effects were nonsignificant.

Parallelism Prediction of the Averaging Model

Figure 1 presents the subjects' mean ratings with a separate panel for each age group. The mean ratings in each panel are plotted as a functions of intentions, with a separate curve for each level of consequences. The levels of intentions on the abscissa are spaced according to the margin-

al means for each age group (with the exception of consequences only, which is arbitrarily positioned). The parallelism prediction of the averaging model appears to hold up graphically as well as statistically, as shown by the absence of an intention by consequences interaction. Supplementary analyses of each group alone showed that the main effects of both intentions and consequences were significant, $p < .01$, at each age level (with exception of adults, who showed no significant effect due to consequences, $F[2, 16] = 2.04$),² and that the

² The larger sample of college subjects showed a

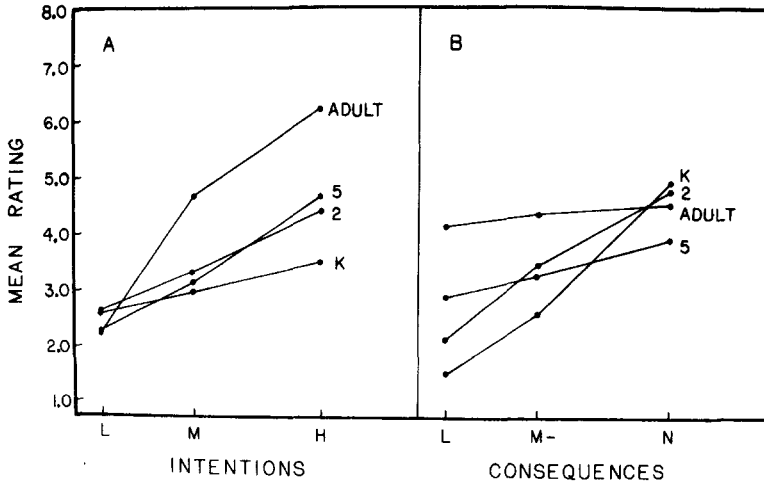


Figure 2. (A) Mean judgments as a function of intentions with a separate curve for each age level. (B) Mean judgments as a function of consequences with a separate curve for each age level.

Intention \times Consequence interaction was nonsignificant in all cases.

Adding Versus Averaging Integration Process

In addition to predicting that the data from the Intention \times Consequence design should plot as a parallel set of curves at each age level, the averaging model predicts that the slope of the curve representing the judgments of the intention-only stories should be steeper than the other curves at each age level. This prediction can be seen in all four panels in Figure 1 and is confirmed by the finding of an Intention \times Consequence interaction when intentions only is included as another level of consequences in analysis of variance, $F(6, 612) = 18.81$. This interaction is incompatible with the additive model of Equation 2. An analogous prediction should hold for the consequences-only stories; the vertical spacing of the consequences-only means should be greater than the vertical spacing of the intention-consequence combinations (solid curves). This prediction of the averaging model does not appear to be confirmed, and when consequences only (i.e., no intention) is included as a level of intention, there is no Intention \times Conse-

quence interaction, $F < 1.0$. The failure of this prediction could be accounted for by postulating that the value of w_1 is small relative to the value of $w_c + w_0$ at all ages. If this is the case, it suggests that the major developmental change is a decrease in the value of w_c with increasing age, rather than an increase in the value of w_1 . This possibility is discussed below.

Developmental Changes in Weights

According to the averaging model in Equation 1, the slopes of the curves in Figure 1 are proportional to the effective weight of intentions, $w'_1 = w_1/(w_1 + w_c + w_0)$, and the vertical spacing of the curves is proportional to the effective weight of consequences, $w'_c = w_c/(w_1 + w_c + w_0)$. In Figure 1, it is apparent that with increasing age the slopes become steeper, while the vertical spacing of the curves decreases. The changes in effective weight can be seen more clearly in Figure 2, which plots the Age \times Intention and Age \times Consequence interactions for the present data. The slope of each curve in Figure 2A is proportional to the effective weight of intentions for each age group, and the slope of each curve in Figure 2B is proportional to the effective weight of consequences. It can be seen that the effective weight of

marginally significant consequence effect, $F(2, 88) = 4.40$.

intentions increases with age, while the effective weight of consequences decreases.

Another possible way of accounting for the Age \times Intention and Age \times Consequence interactions in the present experiment might be to postulate that the scale values of the cues change with age. If one assumes that the weights of both intentions and consequences remain constant over age levels, then in order to account for the data, the range of the scale values of intentions must increase with age. Under these assumptions it would be difficult to account for the observation that the slopes of the intention-only curves in Figure 1 shows little developmental change, while the slopes of the intention-consequence combinations show rather large age variation. This observation can be accounted for by postulating a small value of w_I for all ages. Thus, the hypothesis that the weights change developmentally seems to provide a better account of the data of Experiment 1.

The data were fit to the averaging model of Equation 1 with the aid of a computer subroutine (Chandler, 1969), using a least squares criterion, and assuming that the variables w_I , w_C , and s_0 depend on age level. The scale values were assumed to be equal across all ages and the value of w_0 was arbitrarily set equal to 1.0. The correlation of the predictions of the model and the obtained values was .985. The estimated values of the weights and s_0 are shown in Table 1. It can be seen that the estimates of w_I increase only slightly with age, while the estimated w_C show a great decrease with age. This follows from the observation that the slopes of the intention-only curves show little developmental change, while the spacing of the consequence-only means shows a marked decline with age. The estimated scale values of the three intentions

were 8.098, 4.124, and $-.302$, and the estimated scale values of the consequences were 4.489, 2.255, and .697.

Discussion

The averaging model of Equation 1 appears to provide a good account of the developmental trends in moral judgments based on intention and consequence information. The process for making moral evaluations appears to be the same across a broad age range, and the theory provides a meaningful way of discussing developmental change in the relative contribution of intentions and consequences. It appears that the major developmental change is in the absolute weight of consequences, w_C , rather than in the weight of intentions, w_I . These results suggest that developmental change in moral judgment proceeds partly as a result of the child's learning that consequences are *not* relevant to moral evaluations, rather than his learning that intentions *are* relevant. Clearly, even the kindergarten children are aware of the evaluative implications of the intention information.

The data also appear to support the notion that moral judgments change gradually over the age range, rather than following a stagelike progression. However, the data of Figure 1 could be generated by four age groups composed of different proportions of subjects who respond either totally on the basis of intentions or totally on the basis of consequences. Inspection of the individual patterns of responses does not support this interpretation, since 76% of the kindergarten children, 87% of the second-grade children, 94% of the fifth-grade children, and 56% of the adults showed response variation due to *both* intentions and consequences.

Table 1: Estimated Values of w_C , w_I and s_0 in Experiment 1

Age group	w_C	w_I	s_0
Kindergarten	6.418	.894	5.22
Second grade	5.608	1.389	9.29
Fifth grade	.735	.719	3.81
Adult	.201	1.083	5.01

Note. The value of $w_0 = 1.0$.

EXPERIMENT 2

Experiment 1 leaves an important issue unexamined. Previous researchers have found that when the consequence information is positive, even 5-6-year-old children appear to place more importance on intentions in their judgments than when the con-

sequences are negative (Costanzo, Coie, Grumet, & Farnill, 1973; Feldman, Klosson, Parsons, Rholes, & Ruble, 1976; Parsons, et al., 1976; Weiner, & Peter, 1973). Thus, in Experiment 2 the range of consequences was extended to include positive consequences as well as negative ones. In addition, it seemed desirable to replicate the results of Experiment 1 with a different story theme to enhance the generality of the findings.

Method

Subjects

Subjects were 28 kindergarten (18 female, 10 male), 20 second-grade (10 female, 10 male), 12 fifth and sixth graders (5 female, 7 male), and 19 adults (15 female, 4 male). The grade school children were recruited from a local elementary school and participated with parental permission. The mean ages of the three groups of children were 71.5, 97.4, and 139.2 months.

Stimuli

Twelve stories were constructed by combining three intentions with four consequences. Intentions always preceded consequences. The subjects were instructed to imagine that each story pertained to a different little boy who was 5 years old. The three intentions were:

1. This little boy went outside to rake the leaves up to make his mother happy.
 2. This little boy went outside to play, and he thought that it was all right to go outside.
 3. This little boy went outside to play, even though his mother told him to stay in and clean up his room.
- The four consequences were:

1. After he went outside, he looked down and he found 50 cents.
2. After he went outside, he looked down and he found a penny.
3. While he was outside, he accidentally stepped in his mother's flower garden and killed two of the plants.
4. While he was outside, he accidentally stepped in his mother's flower garden and killed all of the plants.

In addition to the 12 intention-consequence combinations, the 3 intention-only and 4 consequence-only stories were also presented. The consequence-only sentences were modified to read, for example, "This little boy was outside, and he looked down and found 50 cents."

Procedures

The procedures of Experiment 2 were similar to Experiment 1 with a few exceptions. Three warm-up stories were used; the positive intention-only, the negative intention-negative consequence, and the moderate

intention-moderately positive consequence stories. For the kindergarten and second graders, the stories were tape-recorded in two different random orders, and the subject was allowed to activate the tape recorder to present each story. Both portions of the rating scale were presented simultaneously to the subject following each story, and the experimenter asked, "How good or how bad was the little boy in the story?"

The fifth and sixth graders were from a mixed homeroom class and were run in one group using the same procedures as in Experiment 1.

Results and Discussion

Preliminary analyses revealed no main effect or interactions due to sex of subject. Therefore, sex was not included as a factor in any of the analyses reported below.

A 4(Age) \times 3(Intentions) \times 4(Consequences) analysis of variance revealed main effects of intentions, $F(2, 150) = 199.55$, consequences, $F(3, 225) = 120.09$, and age level, $F(3, 75) = 12.72$. The main effect of age is again due to the fact that the adults' ratings were slightly more positive than those of the other age groups (mean ratings = 5.14, 4.28, 4.02, and 4.15, for adult through kindergarten, respectively). As in Experiment 1, age level interacted with both intentions, $F(6, 150) = 9.21$, and consequences, $F(9, 225) = 7.71$. In addition, the Intention \times Consequence interaction was significant, $F(6, 450) = 12.97$.

Figure 3 presents the mean ratings, plotted as a function of the level of intentions with a separate curve for each level of consequences. Qualitatively, the Age \times Intention and Age \times Consequence interactions replicate Experiment 1. With increasing age, the effect of consequences (vertical separation of the curves) decreases and the effect of intentions (slope) increases. Supplementary analyses of each age group separately showed that the main effects of intentions and consequences were significant, $p < .01$, at each age level replicating the results of Experiment 1 that *both* intention and consequences are important in determining moral judgments at all ages examined.

It can again be seen that the intention-only curves are steeper than the curves for the intention-consequence combinations, as predicted by the averaging model.

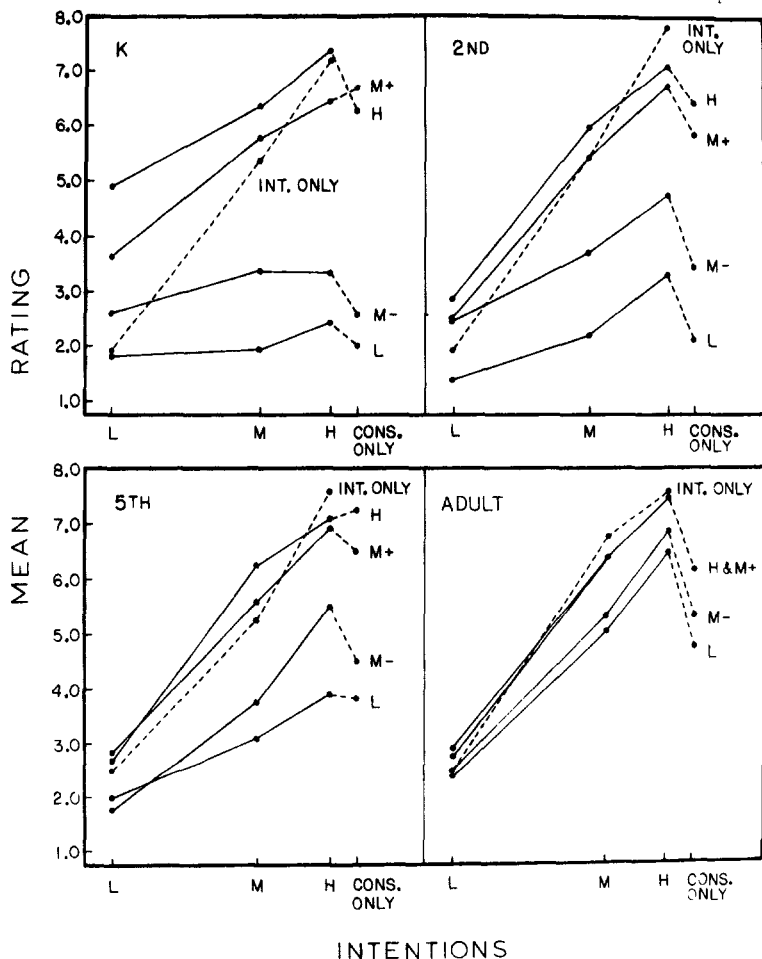


Figure 3. Mean judgments of story characters as a function of intentions (L = play, not supposed to, M = play, thought it was okay, H = rake leaves), with a separate curve for each level of consequence (L = killed all the plants, M- = killed 2 of the plants, M+ = found a penny, H = found 50 cents).

Developmental Changes in Weight

Figure 4 shows the Age \times Intention and Age \times Consequence interactions for Experiment 2. The changes in slope with age show that the effective weight of intentions increases while the effective weight of consequences decreases. Estimates of the values of w_I and w_C (presented below) replicate the finding of Experiment 1 that the major developmental change is in the absolute weight of consequences rather than in the weight of intentions. Inspection of the response patterns of individual subjects showed that the Age \times Intentions and Age \times Consequences

interactions were not produced primarily by different proportions of subjects who responded either totally on the basis of intentions or totally on the basis of consequences. Eighty-two percent of the kindergarten, all of the second and fifth graders, and 58% of the adults showed variation due to both cues, replicating Experiment 1 fairly closely.

Interaction of Intentions and Consequences

The interaction of intentions and consequences in Experiment 2 can be seen in that the curves in each panel of Figure 3 diverge

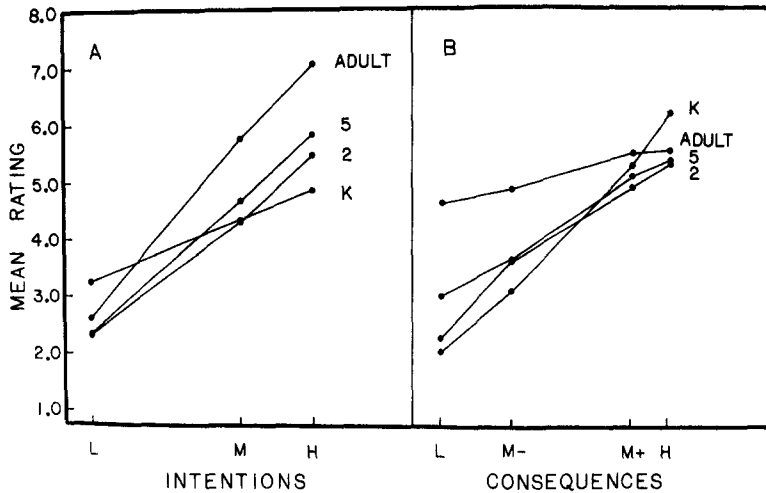


Figure 4. (A) Mean judgment as a function of intentions with a separate curve for each level. (B) Mean judgment as a function of consequences with a separate curve for each age level.

to the right. This interaction was probably not detected in Experiment 1 because the consequences were all in the negative range. In research with adults on both moral evaluations and personality impressions where stimuli of both negative and positive value are used, interactions similar to that of Experiment 2 are found (Birnbau, 1972, 1974; Kanouse & Hanson, 1971). Thus, the results of the present experiment seem to support the idea that the mechanisms behind such evaluative processes are qualitatively similar across a wide age range.

There are several possible ways of modifying the assumptions outlined in the introduction to account for the interaction found in Experiment 2. One possible modification of the averaging model discards the assumption that the scale values of the information are independent of the combinations in which they occur. To account for the present data, one would have to assume that the scale value of the highest piece of information in a set shifts toward the lower piece. For example, in the context of a negative consequence, a positive intention might be viewed as less positive than otherwise.

Another possible way of modifying the averaging model is to discard the assump-

tion that the weights are constant over all levels of the scale values of intention and consequences. One possible alternative is the differential-weight averaging model in which the weights depend on the scale values of the items (Anderson, 1972). In Experiment 2, items with lower scale values would receive greater weight. This model requires that two parameters be estimated for each stimulus, the weight and the scale value. Another possibility is Birnbau's (1972, 1974) configural-weight averaging model in which the weights depend partly on the configuration of the scale values of the information presented. This model requires estimation of only one additional parameter and provides a good account of interactions similar to those of Figure 3.³

³ Another assumption that might be questioned is that the responses, R_{ij} , are linearly related to the psychological impressions, ψ_{ij} . That is, perhaps the interactions in Figure 3 are due to a nonlinear response function. This interpretation would suggest that the data in Figure 3 should be monotonically rescaled to eliminate the interaction. Although the magnitude of the interaction can be greatly reduced by monotonic rescaling, one must still address the question of whether the data *should* be rescaled to parallelism. In support of the interpretation that the interaction of intentions and consequences reflects differences in the ψ_{ij} rather than nonlinearity in the response function, Birnbau (1972) has found that adults' judgments of

Table 2: Estimated Values of w_C , w_I , s_0 and ψ in Experiment 2

Age group	w_C	w_I	s_0	ψ
Kindergarten	2.635	.751	2.78	-.470
Second grade	1.272	.876	3.74	-.477
Fifth grade	1.115	1.138	5.32	-.579
Adult	.296	1.046	5.75	-.093

Note. The value of $w_0 = 1.0$.

Birnbaum's configural-weight model can be written as follows:

$$\psi_{ij} = \frac{w_0 s_0 + w_I S_{Ii} + w_C S_{Cj}}{w_0 + w_I + w_C} + \omega |S_{Ii} - S_{Cj}|. \quad (3)$$

This model was fit to the data of Experiment 2 assuming that s_0 , w_I , w_C , and ω depend on age. The value of w_0 was again set to 1.0 and the scale values were assumed to be the same for all ages. The correlation of the predicted and obtained values was .987. The estimated values of s_0 , w_I , w_C , ω are presented in Table 2. As in Experiment 1, the values of w_C decline with age, while the values of w_I increase only slightly. The estimated scale values of the intentions were 9.354, 5.793, and $-.528$. The estimated scale values of the consequences were 8.293, 7.425, 3.344, and 1.511.

GENERAL DISCUSSION

The averaging model of Equation 1 appears to provide a satisfactory account of the developmental trends in moral judgment obtained in the present study. The major developmental change appears to be in the absolute weight of consequences, rather than in the weight of intentions. The deviations from the model in Experiment 2 are qualitatively similar to the findings in research on personality impressions with adults and appear to be accounted for by a

simple modification of the theory. Overall, the results support the notion that evaluative social inferences involve a similar process over a wide age range.

The averaging model can also probably account for the results of many studies that have attempted to manipulate the relative importance of intentions and consequences in moral judgments. For example, two recent experiments have shown that the use of intention and consequence information by children younger than 9 or 10 years of age depends greatly on the order in which the intention and consequence information is presented (Feldman et al., 1976; Parsons et al., 1976). Feldman et al. found that when intentions were presented last, 4-5-year-old children's judgments showed a greater effect due to intentions, and the subjects' judgments appeared to reflect what they remembered. By postulating developmental change in the degree to which the weight of a cue depends on the order of presentation, the averaging model can account for Feldman et al.'s findings that the judgments of 8-9-year-olds also showed order effects, but that the order effects were not as pronounced as with the younger children. Anderson (1965) has shown that changes in the weights can account for order effects in personality impressions.

Feldman et al. (1976, p. 559) also concluded that "younger subjects' relative neglect of intent in the normal order of information may be based in part on their failure to remember the material correctly rather than on the differential weighting of the information." It is worth noting that to measure the children's memory for the intention and consequence components of a story, Feldman et al. asked the children to recall the valence of the intention and consequence. After judging a story, the subject was asked whether what the actor tried to do and what actually happened were good or bad. This is not really a measure of the children's memory for the intention or consequence per se, but is a judgment of the intention or consequence component of the story. One would expect contextual shifts in the weights and/or scale values to be reflected in judgments of the component stimuli even if the subject remembered the components

combinations of deeds show a similar interaction, and his results did not seem to be due to a nonlinear response function. Nevertheless, future research should examine the possibility that the interactions in the present experiment are due to a nonlinear response function. Methods for examining this hypothesis have been developed by Birnbaum (1974), but have not yet been applied to children's judgments.

perfectly. Feldman et al.'s data support the notion that some sort of contextual changes occur in either the weights or scale values, that such contextual shifts are order dependent, and that such changes are greater for younger children than for the older children. The degree to which these contextual shifts in the judgments of the component stimuli are due to failure to remember the components accurately remains a topic for future research.

Although it is probably true that memory difficulties contribute to the younger subjects' neglect of the intention information, the results of the consequence-only ratings in both Experiments 1 and 2 show that the age differences in the children's responses must be due in part to different values of the weights independent of memory differences. In the context of the rest of the data of Figures 1 and 3, it is possible to account for the fact that the spread of the consequence-only means decreases with age by postulating that the value of w_c decreases with age. Thus, it appears that even if young children remember the information perfectly (it would be difficult to argue for memory differences in the consequence-only ratings), there is some developmental change in the weight assigned to the information. That is, an important factor in developmental change in moral judgment appears to be a change in the psychological importance of consequences for such evaluations. The children already know that intentions are important for moral evaluations; what they must learn is that accidental consequences are irrelevant.

The results of Experiments 1 and 2 also provide some insight into the inadequacy of the "moral dilemma" technique for providing information about the relative importance of intentions and consequences in moral judgments. In the moral dilemma technique, the child is asked which of two characters is the naughtiest in a pair of stories in which the intentions and consequences conflict. For example, in Experiment 1, if the experimenter had asked the second-grade children whether the child in the "Set the table-10 dishes broken" (H intention-L consequence) story was naughtier than the child in the "Cookie-no

dishes broken" (L intention-N consequence) story, Figure 1B suggests that the children would have chosen the character in the set table-10 dishes story. Thus, the experimenter would have concluded that the children were normally *objective* in their judgments. If the experimenter had chosen the "Cookie-2 dishes broken" (L intention-N consequence) story for comparison, the data suggest that he would have come to the opposite conclusion; the second-grade children's judgments would now appear to be morally subjective. Actually, these children rely on *both* intentions and consequences in formulating their judgments. From data collected using the moral dilemma technique, it is impossible to determine the relative importance of intentions and consequences.

Since many training studies that have attempted to manipulate the relative importance of intentions and consequences in children's moral judgments have used children's responses to moral dilemmas as their criterion measure, it should be apparent that interpretation of their results is difficult (Bandura & McDonald, 1963; Bearison & Isaacs, 1975). It is possible that the procedures in such studies have manipulated only the child's responses to similarly constructed story pairs and not the relative importance of intentions and consequences in determining moral evaluations. Even if such studies have successfully manipulated the importance of intentions in the children's judgments, one cannot determine how much the relative importance of intentions has been manipulated simply by examining the children's responses in the moral dilemma procedure. The data presented in Figure 1 and 3 should be sufficient to convince the reader that "morally subjective" responses to a pair of moral dilemmas could represent widely differing patterns of evaluative responses to intention-consequence combinations. Thus, to fully evaluate the results of any training study, it is necessary that judgments of more than just moral dilemmas be obtained.

Finally, the present study represents a new approach to the study of developmental processes in social inference. Recently, Shantz (Note 1) suggested that develop-

mental researchers attempt to apply theories developed with adults to social inference processes in children. The experiments presented above suggest that algebraic models developed in research with adults provide a useful approach to the description of developmental processes in social inference tasks. Moral judgments are just one of many types of social inference in which people engage. The major concern of developmental research is often the extent to which children of different ages use various types of information. Since algebraic models of information integration are well suited to answer such questions, future research might profitably examine developmental trends in a variety of social inference tasks using algebraic models that have been successful in adult research.

REFERENCE NOTE

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