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Illusory Contingency in Children at the State Fair

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Accurate judgments about personal control depend in part on accurate judgments about the contingency of outcomes because noncontingent outcomes are inherently uncontrollable. Yet children often fail to recognize noncontingency when they see it. In a developmental study of such failures, children's contingency judgments were assessed following their participation in chance activities at a state fair. Younger children (aged 6–10 years) regarded the outcomes of these activities as controllable—that is, most of them saw the outcomes of their own performance as caused by skill-related factors and regarded such factors (age, intelligence, effort, and practice) as significantly influencing the outcomes of other children's performance. Older children (aged 11–14 years), by contrast, generally identified the outcomes of their own performance as caused by luck, and they minimized the role of skill-related factors in the performance outcomes of others. Yet even the older children regarded such factors as somewhat relevant to outcomes they predicted for others. This was true even of children at formal operational age levels and of children who explicitly identified outcomes as caused by "luck." Moreover, children at both age levels showed evidence of self-serving bias: Those who had won prizes they wanted saw outcomes as strongly affected by effort, but those who had failed to win did not. The findings support Piaget's views on the pervasiveness of perceived contingency in young children. Consistent with adult literature, however, the findings suggest that neither the attainment of formal operations nor the recognition that luck causes outcomes ensures accurate judgments about control.

In theory and research on the psychology of control, perceived contingency plays a central role (see, e.g., Abramson, Seligman, & Teasdale, 1978; Seligman, 1975; Weisz, 1979). For an individual to exercise control over an outcome, two conditions must exist. First, the outcome must be contingent on variations in the behavior of persons similar to that individual; a noncontingent outcome is inherently uncontrollable. Second, the individual must have sufficient competence to capitalize on the contingency that exists—that is, he or she must be able to produce the behavior on which the desired outcome is contingent. (For further details, see Weisz & Stipek, in press.) Mistaken perceptions of contingency can lead to futile attempts to influence noncontingent outcomes (see Langer, 1975), inappropriate losses in self-esteem following uncontrollable failure (cf. Abramson et al., 1978), and even the blaming of innocent victims for adverse noncontingent outcomes (see Lerner, 1977).

Literature from the Piagetian tradition suggests that erroneous perceptions of contingency are to some extent a function of developmental level. In Piaget and Inhelder's (1975) developmental analysis of chance concepts, for example, they argue that children understand the noncontingency of random events only as they develop a grasp of reversible operations. The outcome of a throw of the dice, for example, is not logically reversible. Its fortuitous nature can only be understood when it is contrasted with outcomes that *can* be reversed by inverting a causal sequence. That sort of contrast, however, only begins to make sense during the concrete operations period (elementary

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school age levels) and is not fully understood until formal operations (adolescence).

Early in development, according to the Piagetian perspective, children reason intuitively; they often infer contingency on the basis of mere contiguity of events (for data, see Siegler & Liebert, 1974). Lacking logical operations, the children have no internalized standard representing truly contingent relations against which to test new experience. One result of this is that some events that occur by chance, both in games and in nature, are perceived as contingent on potentially identifiable causes. Piaget and Inhelder (1975) saw evidence of such a perception in many of the "why" questions with which young children so often frustrate their parents. Questions such as "Why isn't there a spring in our garden?" or "Why are you so tall and yet have small ears?" are said to reveal an assumption that identifiable contingencies exist for what are actually chance events in nature. Piaget and Inhelder did not give examples drawn from games of chance, but they would presumably interpret young children's questions about why dice fall into a certain pattern or how a younger child can draw winning cards more often than an older child can (both observed in my own research) as reflecting similar contingency assumptions.

Other examples of erroneous perceived contingency are given in Piaget's (1930) studies of causal reasoning per se. In one example, a child maintains that "the moon gets bigger because we are growing bigger" (p. 304). Unlike adults, who might say this analogically, the young child, according to Piaget, "means that we actually make the moon grow bigger" (p. 304). Piaget does not give an exhaustive explanation of such errors. They seem likely, however, to be stimulated partly by a limited understanding of the natural world and partly by difficulties in comprehending the relation between cause and effect (for related evidence in the achievement domain, see Nicholls, 1978). Whatever their causes, the kinds of illusory contingency described in the causality literature (e.g., Piaget, 1930, 1976), like those described in the literature on chance (Piaget & Inhelder, 1975), are depicted as declining during development and as largely disappearing with the appearance of formal operational thought.

A third body of Piagetian evidence may be relevant to the study of perceived contingency—that is, the literature on "immanent justice." Early Piagetian research (e.g., Piaget, 1932) identified a tendency in young children to perceive noncontingent adverse events as contingent on people's misbehavior. For example, when told a story about a bridge that collapsed under a child who had stolen something, young children often construed that collapse as punishment contingent on the misbehavior. Older children and adolescents, by contrast, were more likely to find plausible naturalistic explanations for adverse events, explanations not invoking contingency between the adverse event and the human behavior.

Thus Piagetian literature on the chance concept, on causal reasoning, and on immanent justice seems to point to developmental declines in various forms of illusory contingency. The actual data offered by Piaget, though, are often limited and largely anecdotal. This is certainly true of Piaget and Inhelder's (1975) analysis of the "chance" concept. Most of their research deals only with notions of randomness and rules of probability; their speculations that young children perceive chance events as contingent are supported almost exclusively by selected examples. Piaget's discussions of causal reasoning have been criticized (e.g., as early as Huang, 1943) for emphasizing investigator-selected anecdotes and examples that do not reflect modal child responses. Recent research by Karniol (1980) on "immanent justice" responses by children has indicated that when probing and carefully standardized interview methods are combined with detailed reporting of results, the kinds of developmental trends reported by Piaget may not be found.

Questions of whether reliable developmental change occurs in illusory contingency are reinforced by non-Piagetian evidence on adults' interpretations of random events. One line of evidence (reviewed by Lerner, 1977) concerns the "justice motive." Findings in this area indicate that even adults show a tendency—perhaps motivationally based rather than cognitively based—to perceive noncontingent favorable and unfavorable outcomes as conseqences of good and bad behavior, respectively. Other research (e.g., Langer, 1975; Wortman, 1975) examined adults' beliefs about chance outcomes independent of considerations of morality and justice. This research, too, points to a persistent belief that chance events are contingent on such human attributes as skill. Both lines of adult research suggest that people in the period of formal operations, like young children, may inappropriately generalize "norms of deservingness" (Lerner, 1977) and skill (Langer, 1975) to chance situations.

The material reviewed above leaves some uncertainty about the nature, or even the existence, of reliable developmental change. Three lines of Piagetian literature point to developmental declines in various forms of illusory contingency. Two lines of non-Piagetian adult research, however, indicate that illusory contingency in moral and achievement contexts persists into adulthood. At least one carefully executed study of children reports no significant developmental differences in perceived contingency in its immanent justice form. Confusion has been fostered by Piaget's use of relatively uncontrolled research methods and by the fact that the various lines of evidence reviewed above focused on different forms of illusory contingency. One means of resolving some of the confusion may be to focus on one form of illusory contingency at a time using methods that are more controlled than those used by Piaget.

In a step in this direction, Weisz (1980) studied children's judgments about noncontingent outcomes in a game designed to appear totally controlled by chance. Kindergarten and fourth-grade youngsters drew cards blindly from a shuffled deck, and the color of the cards drawn determined winnings. After several trials, the children were asked to predict the winnings of other players who differed from one another in age, intelligence, effort, and previous practice with the task—all factors that would affect only contingent outcomes. In general, mistaken perceptions of contingency—inferred from predictions that differed as a function of age and the other competence-related factors—were significantly more pronounced in younger than in older children. Even most older children, however, predicted small differences as a function of these factors. Thus, although most older children, unlike their younger schoolmates, explicitly identified the task as one controlled by luck or caprice, they nonetheless failed to fully appreciate the noncontingency that such an identification logically implied.

The Weisz (1980) study was limited in its implications, however, because it relied on a single laboratory task designed specifically to make the chance-controlled nature of its outcomes clear to the children. Many naturally occurring noncontingent outcomes in real life are not so designed and may well evoke quite different reactions from children. Whether or not the support for Piaget's developmental prediction produced by Weisz is limited to such specially simplified laboratory tasks remains unclear. Developmental patterns that emerge from such contrived circumstances can be credited with greater transcontextual validity if they can also be demonstrated in naturally occurring settings (see Weisz, 1978). For this reason, the setting for the present study was the North Carolina State Fair. Children were interviewed following voluntary participation in four different midway activities, each of which was a task totally controlled by chance.

Because the sample of 52 included 11 youngsters aged 12, 13, and 14, it was possible to explore whether illusory contingency extends into age levels associated with formal operational thought. Because the chance tasks yielded naturally occurring successes and failures (in the children's efforts to win desired prizes), it was also possible to probe for evidence of self-serving bias. Weisz (1980), building on research with adults (e.g., Wortman, Costanzo, & Witt, 1973), found modest evidence of such bias. Children who received high and low winnings, respectively, differed marginally in directions consistent with the preservation of self-esteem. The evidence was limited, but it might have been so because it was derived from experiences of incomplete failure and success (i.e., the children won either once or four times out of five tries). The fair activities, by contrast, led to more clear-cut and extreme outcomes (children either won or failed to win desired prizes) and may thus provide a more powerful test of self-serving bias in children.[1]

Method

Among the booths along the fair midway were four that featured totally chance activities: an electronic horse race on which participants placed bets, a pond from which participants pulled plastic ducks with prize information painted underneath, a giant dice throw with months and holidays on the die faces, and a giant dice throw with various colors on the die faces. Four male–female pairs of university students spent evenings circulating from one chance booth to another (each pair at a different booth) on a randomly predetermined schedule. As soon as a family (at least one parent and one child) arrived and the child tried the chance activity, the experimenters approached, identified themselves as students conducting a survey of "people's experiences at the fair," and asked to interview the participating child and one parent (out of earshot of each other). When the interview was completed, the students returned to their observation point and approached the next family whose child tried the activity.

The children were asked whether they had won the prize they wanted or not. Then they were asked, "Why do you think it turned out that way? What caused you to win [not to win] the prize you wanted?" and "How good are you at [name of chance activity] compared to most other kids your age?" Then, to give the child practice at predicting future performance, an interviewer held up five fingers and said, "Suppose you were to try [the chance activity] five times. How many times do you think you would win the prize you want?" Using the same procedure, the child was asked to predict the winnings (out of five tries) of (a) a first grader and a tenth grader, (b) a "smart kid" and a "kid who was not very smart," (c) one who "tried really hard and really concentrated" and one who "hardly tried at all and didn't even pay much attention to the game," and (d) one who "got to practice all she or he wanted" and one who "did not get to practice at all." The questions on variations in grade, intelligence, effort, and practice were randomly ordered for each child.

Of the 71 families approached, 65 agreed to participate, but 4 terminated before the interview was completed. In an effort to select only children who understood the questions and attended carefully to the interview, we set fairly strict standards for acceptability of data from the remaining interviews. Data were excluded for children who (a) indicated that they did not understand a question, (b) demonstrated a lack of understanding by predicting more than five wins on any question, (c) failed to answer any of the paired prediction questions, or (d) received help from a parent. Of the 61 completed interviews, 52 met all of the criteria for inclusion. One of these was randomly dropped from the appropriate cell to form a 2 (Age, i.e., 6–10 vs. 11–14) × 2 (Outcome, i.e., won desired prize vs. did not win) design with proportional cell sample sizes. Of the 30 younger children, 10 (mean age 8 years 8 months) had won the desired prize, and 20 (mean age 8 years 8 months) had not. Of the 21 older children, 7 (mean age 12 years 1 month) had won and 14 (mean age 11 years 5 months) had not. Thus age level and outcome were orthogonal factors in the design (point biserial r between age and outcome = .08).

Results

Preliminary analyses of variance on the dependent variables described below included sex as a factor, but over all of these analyses there were no sex main effects and only two dissimilar interactions involving sex. Thus sex was not included in the analyses reported below. Preliminary analyses comparing children matched for age group and outcome (i.e., win vs. lose) but differing as to which student interviewed them revealed no interviewer effects, so data were collapsed across interviewers.

Unstructured Questions

Children's answers to the question about what caused them to win or not to win were classified as either *perceived contingency* (e.g., "I'm not that good at the games because I don't play them much"), *perceived noncontingency* (e.g., "Just luck"), or *not codable* (e.g., "I don't know"). Using this scheme, two independent coders showed 96% agreement. Uncodable responses were about twice as common among younger children as among older ones, so the results with this measure should be interpreted cautiously. A Fisher exact probability test revealed no significant effect of outcome. The age differences, however, were striking, with 8 of 11 younger children showing perceived contingency (the three who gave noncontingency answers were all 9 or older) but 14 of 17 older children showing perceived noncontingency, $\chi^2(1) = 7.71$, $p < .01$.

Analyses of the "How good are you com-

[1] In the research with adults, a common finding has been that people tend to make self-attributions for favorable outcomes but external attributions for unfavorable outcomes. (For conflicting views on the consistency and interpretation of the findings, see Bradley, 1978; Miller & Ross, 1975). Most of this research has involved subjects' judgments about personal outcomes. The present focus on contingency independent of personal competence (see first paragraph of this article) required that winning and losing children make judgments concerning the performance of others.

Table 1
Predicted Winnings on Children's Paired Prediction Questions

	Characteristics of hypothetical child							
Group making predictions	Grade 10	Grade 1	Smart	Not smart	Try	Not try	Practice	No practice
Children aged 6–10	3.16	1.58	3.25	1.61	3.30	1.09	3.78	1.54
Children aged 11–14	2.23	1.55	1.88	1.59	2.18	1.18	2.43	1.55
Children who lost	2.49	1.49	2.52	1.67	2.16	1.40	2.88	1.42
Children who won	2.91	1.64	2.48	1.53	3.31	.87	3.32	1.68

pared to most other kids?" question focused on whether children indicated they were the same as "other kids" (perceived noncontingency), better, or worse (both perceived contingency). There were marginal effects of outcome, $\chi^2(2) = 4.89$, $p < .10$, primarily because of the fact that only 13% of the children who won the desired prize claimed to be "worse," whereas 46% of the children who did not win said they were worse. The two age groups did not differ significantly; only a minority of both younger (30%) and older (39%) children answered correctly that they were the same as their peers in ability at the task.

Paired Prediction Questions—Magnitude of Perceived Effects

Age group effects. The four structured paired prediction questions were analyzed by means of four separate 2 (Age) × 2 (Outcome) × 2 (Trial) repeated measures analyses of variance (ANOVAS). The trial factors in the four analyses were grade (i.e., Grade 10 = Trial 1, Grade 1 = Trial 2), intelligence, effort, and practice, respectively. All four ANOVAS revealed a significant trial main effect, indicating that children who were older, who were smarter, who tried harder, or who had practiced, were expected to win more than were their respective younger, less intelligent, less diligent, and less practiced counterparts, all four $Fs(1, 47) > 10.00$, all $ps < .01$. In addition, all four ANOVAS showed a significant Age × Trial interaction, indicating that the predicted superiority of tenth grade, smarter, more diligent, and more practiced children was more pronounced among younger than among older children (see Table 1), all four $Fs(1, 47) > 4.0$, all $ps < .05$. Tukey's honestly significant difference (HSD) tests on the four pairs of questions revealed that younger children predicted significantly different outcomes as a function of grade level ($p < .01$), intelligence ($p = .05$), effort ($p < .01$), and practice ($p < .01$) but that none of these four differences was significant for older children.

Table 1 also reveals that the four Age × Trial interactions were actually shaped almost entirely by age differences in predictions for the higher levels of the four characteristics—that is, Grade 10, intelligence, effort, and practice. In each of these four conditions, younger subjects predicted higher winnings than did older subjects (HSD p values all $< .05$). At the lower levels—that is, Grade 1, not smart, does not try, and unpracticed—the younger and older groups made very similar predictions, and no age group differences approached significance.

The role of outcome. Over the four 2 × 2 × 2 ANOVAS, only one, the analysis of the try versus no-try predictions, yielded a significant Trial × Outcome interaction, $F(1, 47) = 10.34$, $p < .01$. Tukey's HSD test revealed that the try/not-try difference among children who had won the prize they wanted (mean difference = 2.45) was significant ($p < .01$) but that the difference among children who had failed to win (mean difference = .77) was not. Thus winning children saw effort as more influential in determining outcomes than did losing children.[2]

[2] A curious aspect of the paired prediction data necessitated an additional set of analyses. A small minority of subjects occasionally predicted higher winnings for first than for tenth graders, for not very smart than for very smart children, and so on. Because these anomalous predictions occurred somewhat (albeit nonsignificantly) more often in older than in younger subjects, they were

Table 2
Number of Children Making Various Contingency Judgments

Characteristics of hypothetical child	Age (in years)	Predicted winnings: Same	Predicted winnings: Different	Significance test
10th grade vs.	6–10	4	26	$\chi^2(1) = 4.09$*
1st grade	11–14	9	12	
Smart vs.	6–10	6	24	$\chi^2(1) < 1$ (*ns*)
not smart	11–14	5	16	
Try vs.	6–10	4	26	$\chi^2(1) < 1$ (*ns*)
not try	11–14	4	17	
Practice vs.	6–10	5	25	$\chi^2(1) < 1$ (*ns*)
no practice	11–14	5	16	

Note. The "Same" column shows the number of children who predicted that performance outcomes would be identical for a 1st and for a 10th grader, for a smart and for a not smart child, and so on. The "Different" column shows the number of children who predicted different outcomes for a 1st and for a 10th grader, and so forth.
* $p < .05$.

Paired Prediction Questions—Incidence of Perceived Effects

The preceding analyses of age differences give the impression that older children had a relatively clear perception of the noncontingent nature of the state fair activities. Another perspective on the data, however, indicates that even the older children failed to fully appreciate the uncontrollability of their performance outcomes. A fully accurate grasp of noncontingency would lead one to predict precisely equal winnings for a tenth and a first grader, a practiced and an unpracticed child, and so on. The majority of the older children, like most of the younger ones, were unwilling to carry their belief in noncontingency that far! Older children were more likely to predict equal winnings than were younger ones, but as Table 2 shows, the age effect was significant for only one of the four paired predictions. Would children who have attained formal operations recognize that the paired predictions should all be the same? To answer this question, protocols for all children aged 12 and above were examined separately. Of these 11 children, only 3 predicted equal winnings on all four paired questions, so evidently the advent of early formal operations does not ensure an accurate concept of noncontingency.

Does the recognition that outcomes are controlled by luck ensure recognition that the outcomes do not vary with competence-related factors (age, intelligence, etc.)? Apparently not. Of the 16 children who explicitly described their performance as due to luck, only 5 proceeded to predict precisely equal winnings in each paired prediction question. Of the remaining 11, 1 child made the perceived contingency error on one paired prediction, 3 made the error three times, and 7 made the error all four times. Some of these children's answers suggested an effort (at that point unsuccessful) to come to grips with the noncontingent nature of luck. For example, one child predicted no wins for the "not very smart" child but predicted one win for the "smart" child "if lucky." Another child who predicted five wins for the child with practice, predicted two wins for the child who had no practice but then added "and *that* by luck only."

more likely to have deflated mean difference scores for the older group. To check against the possibility that this phenomenon might account for the age differences reported above, ANOVAS were recomputed, with anomalous predictions coded as blanks. In the 2 (Age) × 2 (Outcome) × 2 (Trial) ANOVAS on each of the four pairs of predictions, previously significant Age × Trial interactions remained significant for the questions about intelligence ($p < .05$), effort ($p < .05$), and practice ($p = .05$), and fell to a marginal level ($p = .06$) on the questions about grade level. Also, the previously significant outcome effect on the predicted impact of effort remained significant ($p < .05$). Thus previous effects lost in magnitude, but all remained either significant or marginally significant.

Task effects. The preceding analyses did not include task (i.e., horse race, colored dice, etc.) as a factor because all the tasks were totally controlled by chance, and thus all paired predictions should have been equal regardless of task. One might reasonably ask, however, whether the four tasks differed in their power to evoke the illusion of contingency. To explore this question, we conducted four single-classification analyses of covariance, with task as the independent variable and child's age and outcome as covariates. The four dependent variables were the predicted difference between a tenth- and a first-grade, "smart" and "not very smart" child, and so on. In none of these analyses were task differences significant (all $ps > .14$).

Discussion

How does illusory contingency change with development? The present findings suggest that two kinds of changes occur as children mature from early elementary age levels to early adolescence. First, as children develop, they are less likely to explain their own noncontingent performance in ways that imply controllability and are more likely to attribute such performance to "luck" and other uncontrollable factors. In the present study and in Weisz (1980), virtually no early elementary school age children attributed the chance outcomes of their performance to uncontrollable factors, but a majority of older children did so. A second change that seems to occur with development is that children show markedly reduced expectations regarding the impact of competence-related factors on noncontingent events. Younger children (like those in Weisz, 1980) predicted significantly different levels of success for actors differing in age, intelligence, effort, and practice, whereas older children did not.[3] The findings across four tasks in a natural setting are consistent with the Piagetian view that young children perceive noncontingent events as covarying with people's behavior and that only with development does such illusory contingency begin to dissipate.

In addition to this evidence on the direction of development, the findings suggest a hypothesis regarding the nature of developmental change. For low levels of the four personal attributes (i.e., first grade, not smart, etc.) the two age groups sampled showed low-outcome expectancies that were similar in magnitude. It was only when high levels of the personal attributes were specified (i.e., tenth grade, smart, etc.) that the two age groups diverged significantly. This suggests the possibility that children across a broad range of developmental levels assume that there are certain baselines for chance outcomes under conditions of low skill and effort—that is, that no matter how low in intelligence, effort, and so on, people may sink, they are still expected to win at least certain minimal amounts. According to this reasoning, the impact of developmental change would be felt primarily in judgments about children not covered by the baseline assumption—that is, children above minimal levels of intelligence, effort, and so on. An intriguing, though speculative, possibility for future consideration is that this "baseline assumption" is actually an incipient chance concept.

Despite the developmental gains in sophistication that the findings reveal, the evidence indicates that even older children and adolescents, like many of the adults in the research of Langer (e.g., 1975) and of Wortman (1975), are susceptible to a subtle form of illusory contingency—that is, the belief that factors related to skill outcomes (e.g., factors such as grade level and effort) may not be totally irrelevant to noncontingent outcomes but may instead be associated with slight outcome differences. Even children who correctly identified the outcomes as caused by "luck" fell prey to this form of

[3] Younger and older groups in the present study were older than the corresponding younger and older groups in the study by Weisz (1980); yet the only sign of more advanced awareness of noncontingency in the present sample was that older children at the state fair (unlike the fourth graders of Weisz) did not predict significantly higher winnings for children who tried hard than for those who did not. The absence of markedly more advanced concepts in the state fair sample may reflect the power of the fair atmosphere and activities to induce an illusion of contingency (see the research on adults by Lerner [1977] and by Langer [1975] cited later in this section) and/or the staying power of the illusion across developmental levels (see Weisz & Stipek, in press).

the illusion. A significant implication of this finding for attribution theorists (e.g., Weiner, 1979) who construe "luck" as an uncontrollable cause may be that children often do *not* so construe "luck"!

The persistence of illusory contingency among the oldest, presumably formal operational subjects might be seen as contradicting Piagetian views on development. The Piagetian literature reviewed in the introduction does depict the formal operational youngster as capable of recognizing the noncontingency of chance outcomes. Nevertheless, it should also be noted that Piaget's theories often emphasize intellectual capacity or competence independent of *performance*. It is possible that the older subjects in the present sample had actually developed the cognitive apparatus necessary for identification of noncontingency but that some noncognitive factor(s) prevented the expression of their intellectual capacity. Evidence reviewed by Lerner (1977) suggests that one such factor may be motivation for justice. It does seem only fair, for example, that children who try hard should win more than children who do not. Another factor is suggested by Langer's (1975) research with adults. Habits formed in relating skill outcomes to human attributes can evidently be activated almost reflexively when people reason about chance events for which skill cues are present. Such cues (e.g., competition and active involvement) were abundant in the state fair booths observed here. Thus perhaps the cognitive capacity to identify noncontingency is in place by the period of formal operations, but factors such as those identified by Lerner and Langer continue to interfere with the expression of this capacity. Tasks that activate such factors (e.g., by posing issues of justice or by making skill cues salient) may provoke illusory contingency that is powerful enough to either bypass or overrule logical analysis.

In the only evidence of self-serving bias, children who had won saw outcomes as strongly affected by effort, whereas children who had lost did not. In Weisz (1980), such evidence of self-serving bias as could be found was largely confined to young children, but here the evidence cut across age levels. The strength of the present findings may be due in part to the fact that the state fair activities, to a greater extent than the laboratory task used earlier, entailed competition, choice, and personal involvement—all factors that have been shown to foster illusory contingency in adults (Langer, 1975). Whatever the reason for the present findings, they suggest that in addition to age-related intellectual limitations, a bias toward self-aggrandizement may also lead to mistaken perceptions of contingency in children.

Efforts to understand the origins of illusory contingency may contribute significantly to our understanding of children's behavior in many areas, including moral reasoning and affective responses to life events. In the moral domain, the young child's notion of "immanent justice," discussed above, is essentially the view that "bad" outcomes, even those that actually occur by chance, are consequences of bad behavior. This phenomenon seems akin to "blaming the victim" (see Lerner, 1970)—another manifestation of perceived contingency between the outcomes that people experience and the behavior that precedes the outcomes. A related phenomenon often noted by clinicians is the self-blame that young children engage in when contemplating such adverse life events as the death of a parent (cf. Lifton, 1967) or divorce (Gardner, 1976). In both instances, a central aspect of the self-blame is often that the adverse event was somehow contingent on the child's behavior.

These examples illustrate a fact not often emphasized in the psychological literature on control—that perceiving events as controllable, as contingent on people's behavior, is not always to the individual's benefit. An exaggerated perception of contingency may be quite harmful. The present evidence indicates that such a perception is particularly pronounced in young children. Further efforts to understand this may add to our understanding of developmental change in phenomena ranging from moral judgments to depressive reactions.

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