

COGNITIVE IMPULSIVITY AND SOCIAL STATUS IN PREDELINQUENT PREADOLESCENT MALES

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The relationship between cognitive impulsivity, as measured by Kagan's Matching Familiar Figures Test (MFF), and interpersonal popularity was investigated in a sample of 42 "predelinquent" preadolescent boys in a residential setting. Predictions that the relationship would vary with the specific sociometric situations sampled were generally not confirmed. In fact, both the latency and errors dimensions of the MFF proved to have comparatively little association with social status, with age and intelligence demonstrating much stronger correlations with sociometric scores. Similarities to, and differences from, results with nondelinquent populations are discussed, as are implications for attempts at modifying cognitive style.

Keywords: cognitive impulsivity, social status, predelinquents, preadolescents, males.

Reflection-impulsivity (R-I), as assessed by Kagan's Matching Familiar Figures Test (MFF), has been a much-investigated dimension of cognitive style in recent years. Created to measure the extent to which one pauses to evaluate the results of one's cognitive efforts in a situation possessing response uncertainty, the MFF consists of 12 items, each comprising a picture of an object, e.g., scissors, and five variations plus a duplicate of that picture (Kagan, 1965). The task is to find the duplicate, i.e., match to sample. Considerable interindividual variation in response latency and number of errors has been demonstrated. Reflective persons take longer before offering a response and also tend to commit fewer errors than do their impulsive counterparts (Eskra & Black, 1971; Kagan, 1965).

One area of interest concerning R-I has been the determination of its relationship to interpersonal behavior in "real world" social settings (e.g., Bentler & McClaire, 1976; Block et al., 1974; Glenwick et al., 1976). Researchers have found that cognitively reflective children in public educational settings generally receive more desirable sociometric ratings than impulsive pupils from peers (Glenwick et al., 1976) and teachers (Block et al., 1974), although the relationships vary with the particular situ-

The authors thank the administration, staff, and children of the Children's Home, Kingston, New York, for their cooperation in the present research.

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ations sampled. Thus for fourth graders, impulsivity was negatively correlated with desirability as (a) a listener to one's personal problems and as (b) a partner on a social studies project, but was uncorrelated with popularity as (c) a picnic companion (Glenwick et al., 1976).

It appears that in situations where the attributes characteristic of reflective youngsters are valued, reflective children receive more favorable ratings from peers than do impulsive ones. In the realm of social functioning, the reflective youngster emerges as "comparatively competent, resourceful, empathic, and interpersonally attractive" (Block et al., 1974, p. 626). These results have tended to be stronger for the MFF error dimension than the MFF latency dimension.

Unfortunately, studies on the interpersonal correlates of cognitive impulsivity have to date been confined to nondisordered populations of children. Since impulsivity is often postulated to be a notable characteristic of several types of psychological dysfunction, particularly of the acting out or delinquent variety (e.g., Glueck & Glueck, 1974; Kvaraceus, 1966), the possible association between R-I and the social functioning of behaviorally disordered youngsters would appear to be a potentially fruitful subject for investigation. Consequently, the present study was designed to explore the relationship between cognitive impulsivity and social status in a group of institutionalized "predelinquent" preadolescent males.

In the present research, sociometric peer choices of predelinquents were studied with regard to five specific situations: (a) playing softball, (b) hiking, (c) being a best friend, (d) going on an adventure, and (e) having a snapshot taken. Based on the findings of Block et al. (1974) and Glenwick et al. (1976) concerning the positive qualities (i.e., empathy and resourcefulness) of reflective youngsters, it was hypothesized that predelinquents' impulsivity would be negatively correlated with ratings received on the "best friend" and "adventure" items but not on the other three items.

METHOD

PARTICIPANTS

Participants were 42 white males (M age = 11.01, SD = 1.89) placed in a private nonprofit voluntary residential facility in upstate New York. Though not adjudicated delinquents, they had been referred to the facility by their county's department of social services because of serious acting out, aggression, and predelinquent behavior in their school and community. The boys lived in cottages on the grounds and were involved in a rehabilitation program emphasizing resocialization (through an eclectic approach including milieu therapy, group, and individual counseling) and education (in the on-campus school). Most were from lower socioeconomic status, multiproblem families and came from cities and towns in the mid-Hudson region of New York State.

PROCEDURE

Each participant was individually administered the elementary version of the MFF and five sociometric items by an adult examiner. They were tested after having been at the institution for at least a month and not scheduled for release in the coming month. Average length of stay at time of testing was 17.95 months (SD = 14.03).

INSTRUMENTS

The MFF assessed R-I. Latency (in tenths of a second) to first response and number of errors were recorded for each of the 12 items. Each participant's mean latency and total number of errors for the 12 items were then calculated.

The five sociometric items were based on the format of Gardner and Thompson's (1958) Syracuse Scales of Social Relations. The advantage of these scales is that they require a person to rate, and to receive a rating from, every other person in his group. This prevents a situation, often found in popularity studies, where there are a few "stars" and isolates, with the vast majority left out. Scores on each item may range from 1 (*very unpopular*) to 13 (*very popular*). As mentioned above, the five sociometric items constructed for the present investigation involved popularity with respect to (a) playing softball, (b) hiking, (c) being a best friend, (d) going on a n adventure, and (e) having a snapshot taken. The mean score received from all peers on each item was calculated for each youngster.

IQ scores on the Wechsler Intelligence Scale for Children (WISC), administered previously to the children, were available to the investigators.

RESULTS

Boys' mean MFF latency per item was 13.15 seconds ($SD = 6.59$) and MFF total errors score was 5.83 ($SD = 2.29$). Mean WISC Full Scale IQ was 98.38 ($SD = 11.17$).

Three types of analyses were performed on the data: (a) a correlation matrix to explore the relationships among all the variables (the five sociometric items, MFF latency, MFF errors, age, and WISC IQ); (b) t tests and analyses of covariance to determine whether reflective and impulsive groups differed on sociometric scores received; and (c) a stepwise multiple regression to investigate the contribution of MFF errors, MFF latency, age, and IQ to variance in sociometric scores received. Each analysis will be discussed in turn.

CORRELATION MATRIX

The correlation between MFF latency and MFF errors was significant ($r = -0.64$, $p < .001$) (see Table 1), as was that between age and MFF errors ($r = -0.26$, $p < .05$). That is, increased MFF errors are associated with shorter latencies and with decreased age. The correlation of IQ with both MFF errors and MFF latency was not significant; neither was that between age and MFF latency nor between age and IQ.

The correlations of both MFF latency and MFF errors with the five sociometric items enabled assessment of the separate relationship to social status of each of these two dimensions of cognitive impulsivity. As Table 1 indicates, none of these correlations was significant. However, age and IQ were significantly positively correlated with ratings received on each of the five sociometric items (r 's ranged from 0.34 to 0.50).

Finally, the intercorrelations among the five sociometric items were calculated. A strong degree of association was revealed, with the intercorrelations all highly significant ($p < .001$), ranging from 0.78 to 0.98.

TTESTS AND ANALYSES OF COVARIANCE

To determine the joint (i.e., simultaneous) relationship of MFF latency and

TABLE 1
CORRELATION MATRIX FOR FIVE SOCIOMETRIC ITEMS, MFF LATENCY, AND ERRORS, AGE, AND WISC IQ.

| <i>Variable</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|---------|---------|---------|---------|--------|----------|--------|-------|
| 1. Soc 1 | | | | | | | | |
| 2. Soc 2 | 0.98*** | | | | | | | |
| 3. Soc 3 | 0.78*** | 0.80*** | | | | | | |
| 4. Soc 4 | 0.96*** | 0.97*** | 0.82*** | | | | | |
| 5. Soc 5 | 0.92*** | 0.93*** | 0.84*** | 0.95*** | | | | |
| 6. MFF latency | -0.07 | -0.07 | 0.04 | 0.00 | 0.00 | | | |
| 7. MFF errors | -0.16 | -0.16 | -0.14 | -0.20 | -0.13 | -0.64*** | | |
| 8. Age | 0.51*** | 0.49*** | 0.34** | 0.50*** | 0.36** | 0.00 | -0.26* | |
| 9. WISC IQ | 0.44** | 0.45*** | 0.47*** | 0.44** | 0.41** | -0.03 | -0.20 | -0.03 |

Note: Soc 1 = playing softball; Soc 2 = hiking; Soc 3 = being a best friend; Soc 4 = going on an adventure; Soc 5 = having a snapshot taken.

* $p < .05$; ** $p < .01$; *** $p < .001$.

MFF errors to sociometric status, the 42 boys were classified as reflective (long latencies and few errors) and impulsive (short latencies and many errors) on the basis of median splits for MFF latency and errors.¹ (The median for errors was 6 and for latency was 11.92 seconds.) Those above the median on latency and below the median on errors were designated as reflective ($n = 17$); their mean total errors were 4.19 and mean latency per item was 17.85 seconds. Those below the median on latency and above the median on errors were designated as impulsive ($n = 15$); their mean total errors were 7.92 and mean latency per item was 8.97 seconds. (Ten participants fell outside these two quadrants.) T tests comparing these two groups with respect to sociometric scores revealed the reflectives to be significantly more popular than the impulsives with regard to being a best friend ($t = 262, p < 0.01$) and a companion on an adventure ($t = 2.09, p < 0.05$), but not on the other three items. When an analysis of covariance with age the covariate was performed, differences on the "best friend", but not the "adventure", item remained significant. When an analysis of covariance with WISC IQ the covariate was carried out, neither of the differences remained significant.

MULTIPLE REGRESSION

To obtain the multiple correlation for predicting scores on each of the five sociometric items for the entire sample, the four predictor variables (MFF latency, MFF errors, age, and WISC Full Scale IQ) were entered into the multiple regression equation according to the percentage of variance in sociometric scores accounted for.

The variables loaded in a similar manner on all five sociometric items. That is, while in all but one case (the "hiking" item) each of the four predictor variables produced a statistically significant increment in the multiple correlation, age and IQ clearly made a greater contribution than did MFF errors and latency to variance in the five sociometric scores. For example, contributors to variance in scores on the "best friend" item were IQ (contribution to variance = 0.21); age (contribution to variance = 0.12); MFF errors (contribution to variance = 0.012); and MFF latency (contribution to variance = 0.002). Contributors to variance in scores on the "adventure" item were age (contribution to variance = 0.25); IQ (contribution to variance = 0.21); MFF latency (contribution to variance = 0.001); and MFF errors (contribution to variance = 0.0005). The general pattern of results was the same for the other three sociometric items, with MFF latency not even entering into the regression equation for the "hiking" item.

DISCUSSION

The significant negative correlations in this predelinquent sample between MFF errors and MFF latency and between MFF errors and age are consistent with students using nondelinquents (e.g., Glenwick et al., 1976; Kagan & Kogan, 1970). The nonsignificant correlation between MFF latency and age is mildly surprising in light of occasional early statements (e.g., Kagan & Kogan, 1970) of the existence of a positive relationship between the two variables. However, the absence of a significant latency-age association is in agreement with more recent studies (e.g., Salkind, 1977) reporting a

¹Dichotomizing the MFF latency and errors dimensions by means of median splits has been a standard, though not uncriticized, procedure in MFF research (Messer, 1976).

“developmental shift” around age 10 or 11 from a reflective (i.e., slow-accurate) to a more efficient (i.e., fast-accurate) style. The older predelinquents in our sample were able to make fewer MFF errors than their younger counterparts without requiring an increase in the time needed to arrive at an answer (i.e., MFF latency); they thus appeared to be utilizing the same amount of time more efficiently. Further support for the comparatively efficient performance of the entire sample of 42 boys is provided by comparing their MFF scores with Salkind’s (1977) normative MFF data on 147 nondelinquent, middle-class 11-year-old males. The present sample committed fewer errors than did the normative group (5.83 vs. 8.39 errors), while requiring less time (i.e., having shorter mean latencies) than the normative population (13.15 vs. 13.61 seconds). It would be interesting to study the cognitive processing and perceptual scanning strategies that facilitated such performance by the predelinquent sample in general and by the older predelinquents in particular.

The high intercorrelations among scores received on the five sociometric items are in accord with Gienwick et al.’s (1976) findings with a nondelinquent, nonbehaviorally disordered sample. Specifically, a child seen in a favorable light by peers in one context is likely to be similarly seen in other contexts, suggesting the presence of dominant personality characteristics and interpersonal styles.

The three types of analyses (correlation matrix, *t* tests, and multiple regression) were consistent with one another in generally failing to indicate a significant association between reflectivity and social status. When such an association was uncovered (on the *t* tests), the results agreed with our hypotheses in that reflectives received more desirable scores on the “best friend” and “adventure” items but not on the other three items. Thus when relatively pure groups of reflective and impulsive youngsters are compared, cognitive style differences among predelinquents may be related to interpersonal preferences (this relationship being dependent upon the particular situations sampled). It should be remembered, however, that even these few significant differences were eliminated when the effects of age and IQ were covaried out.

The general inability to uncover a significant cognitive reflectivity-social status association in the present research (unlike in the Glenwick et al. study) may have been partially due to the nature of our predelinquent sample, which was both fairly homogeneous and fairly reflective on the MFF. The present sample committed fewer errors (5.83 vs. 9.76), had a longer latency per item (13.15 vs. 9.91 seconds), and had a smaller standard deviation for MFF errors (2.29 vs. 4.24) compared with Glenwick et al.’s nondelinquents. Additionally, acting-out, aggressive youngsters may not be so sensitive to cognitive style differences among their peers when such differences do exist. For these and/or other reasons, cognitive impulsivity was clearly not a salient factor in determining one’s popularity.²

The most striking findings were the importance of IQ and age as (a) predictors of social status in a variety of situations and (b) mediators of the reflectivity-social status

²While the participants in the present sample were quite homogeneous in their history of “antisocial”, acting-out behavior, finer classification of them into typological subgroups based on social perception and interpersonal interaction classification systems employed with adjudicated offenders (e.g., Peterson et al., 1959; Sullivan et al., 1956) might have revealed particular subtypes of aggressive predelinquents for whom there is a significant relationship between cognitive impulsivity and social status.

relationship. Research on peer interaction in a wide variety of children's groups (summarized in Hartup, 1970) has reported intelligence and age to act as significant contributing factors in determining individuals' popularity. Our results are in harmony with this conclusion.

Finally, the lack of a relationship between reflectivity and sociometric scores in the present investigation has implications for attempts at altering cognitive style. In recent years several investigators have explored methods of helping people become more reflective. The most promising of such efforts have involved a combination of modeling, verbal self-instruction, and self-reinforcement procedures (e.g., Finch et al., 1975; Meichenbaum & Goodman, 1971). Based on their findings of a significant reflectivity-social status correlation in nondelinquents, Glenwick et al. (1976) raised the possibility that a byproduct of such training to be more reflective could be the enhancement of a child's popularity among his peers. The present results suggest that caution is warranted in generalizing this possibility to acting-out, predelinquent populations. That is, to produce more successful interpersonal functioning, social skills training may need to be introduced as an explicit component of therapeutic interventions for such youngsters.

REFERENCES

- Bentler, P. M., & McClaire, J. A. (1976). A multitrait-multimethod analysis of reflection-impulsivity. *Child Development*, 47, 218-226.
- Block, J., Block, J. H., & Harrington, D. M. (1974). Some misgivings about the Matching Familiar Figures Test as a measure of reflection-impulsivity. *Developmental Psychology*, 10, 611-632.
- Eska, B., & Black, K. N. (1971). Conceptual tempo in young grade-school children. *Child Development*, 42, 505-516.
- Finch, A. J., Jr., Wilkinson, M. D., Nelson, W. M., III, & Montgomery, L. B. (1975). Modification of an impulsive cognitive tempo in emotionally disturbed boys. *Journal of Abnormal Child Psychology*, 3, 49-52.
- Gardner, E. F., & Thompson, C. G. (1958). *Syracuse Scales of Social Relations: Manual of Directors*. New York: World Books.
- Glenwick, D. S., Barocas, R., & Burka, A. A. (1976). Some interpersonal correlates of cognitive impulsivity in fourth-graders. *Journal of School Psychology*, 14, 212-221.
- Glueck, S., & Glueck, E. (1974). *Of crime and delinquency*. Springfield, IL: Thomas.
- Hartup, W. W. (1970). Peer interaction and social organization. In P. H. Mussen (Ed.), *Manual of child psychology* (Vol. 2). New York: Wiley.
- Kagan, J. (1965). Impulsive and reflective children: Significance of conceptual tempo. In J. D. Krumboltz (Ed.), *Learning and the educational process*. Chicago: Rand McNally.
- Kagan, J., & Kogan, N. (1970). Individual variation in cognitive processes. In P. Mussen (Ed.), *Manual of child psychology* (Vol. 1). New York: Wiley.
- Kvaraceus, W. C. (1966). *Anxious youth: Dynamics of delinquency*. Columbus, OH: Merrill.
- Meichenbaum, D. H., & Goodman, J. (1971). Training impulsive children to talk to themselves: A means of developing self-control. *Journal of Abnormal Psychology*, 77, 115-126.
- Messer, S. B. (1976). Reflection-impulsivity: A review. *Psychological Bulletin*, 83, 1026-1052.
- Peterson, D. R., Quay, H. C., & Cameron, G. K. (1959). Personality and background factors in juvenile delinquency as inferred from questionnaire responses. *Journal of Consulting Psychology*, 23, 395-399.
- Salkind, N. J. (1977). Norms for the Matching Familiar Figures Test. Unpublished manuscript available from Neil J. Salkind, Bailey Hall, University of Kansas, Lawrence, Kansas 66045, USA.
- Sullivan, C., Grant, J. D., & Grant, M. Q. (1956). The development of interpersonal maturity: Application to delinquency. *Psychiatry*, 20, 373-385.