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ABSTRACT

A multimethod, multitrait approach was used to examine the relations of aggression and hyperactivity to mastery motivation in preschool children. Parallel measures of multiple facets of mastery motivation were devised from findings in two studies: (study 1) a maternal report questionnaire for 332 twins, ages 3-5, recruited from the twin registry in a Western state; and (study 2) behavioral observations and ratings by trained preschool personnel from the Bethesda Longitudinal Study for 152 normally developing, middle to upper income children during their first 3 years. The findings from both studies indicated that high involvement in and/or vigor at gross motor tasks was associated with high activity, impulsivity, and aggression in preschoolers. Persistence at challenging object-oriented tasks contributed negatively to predicting hyperactivity (Study 1) and impulsivity (Study 2), but did not predict activity level (Study 2), suggesting that the impulsivity aspect of hyperactivity is what is negatively associated with low task persistence. It is argued that, given the high incidence of attention deficit disorders with hyperactivity (ADHD) and aggression in school settings, it is important to study their precursors in preschoolers. Data from the two studies imply that it is important to distinguish between high activity level and hyperactivity, which includes elements of impulsivity and difficulty in maintaining attention to tasks. Teachers may misinterpret social or gross motor mastery attempts, accompanied by high activity level, as ADHD so should be cautioned not to overinterpret what they see. (Contains 11 references.) (KB)

Abstract

Mastery Motivation in Preschool Children: Relations to Aggression and Hyperactivity

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This paper uses a multimethod, multitrait approach to examine the relations of aggression and hyperactivity to mastery motivation. Parallel measures of multiple facets of mastery motivation were devised from a maternal report questionnaire for two samples (study 1) and from behavioral observations and ratings by trained preschool personnel for another sample (study 2). Persistent task involvement is an important element of mastery motivation. The data from both studies and all three samples indicate that high involvement in and/or vigor at gross motor tasks are associated with high activity, impulsivity and aggression in young children. Persistence at challenging object-oriented tasks contributed negatively to the prediction of hyperactivity (both samples in study 1) and impulsivity (in study 2), but did not predict activity level (study 2), suggesting that the impulsivity aspect of hyperactivity is what is negatively associated with low task persistence. Given the high incidence of ADHD and aggression in school settings, it is important to study their precursors in preschool-aged children. These data imply that it is important to make a distinction between high activity level and hyperactivity, which includes elements of impulsivity and difficulty in maintaining attention to tasks. Teachers may misinterpret social or gross motor mastery attempts, accompanied by high activity level, as ADHD so should be cautioned not to over interpret what they see.

Revised from a presentation at the 1997 AERA Conference

MASTERY MOTIVATION IN PRESCHOOL CHILDREN: RELATIONS TO AGGRESSION AND HYPERACTIVITY

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Objectives

The purposes of this paper are: (1) to describe a conceptualization of mastery motivation in early childhood; and (2) to use a multimethod, multitrait approach to provide information about the relations of aggression and hyperactivity to mastery motivation. Parallel measures of multiple facets of mastery motivation were devised from a maternal report questionnaire for two samples and from behavioral observations and ratings by trained preschool personnel for another sample.

Theoretical Framework

Barrett and Morgan (1995) have proposed that mastery motivation is a multifaceted, intrinsic psychological force that stimulates an individual to attempt to master a skill or task that is at least moderately challenging for him or her. The proposed facets of mastery motivation are subsumed under two major aspects: instrumental (e.g., persistence at challenging tasks and preference for moderate challenge and/or novelty) and expressive (e.g., facial, vocal and postural communication of pleasure and, in certain cases, of pride or shame). This view of mastery motivation evolved from research over the last two decades (see MacTurk & Morgan, 1995; Messer, 1993)

Historically, mastery motivation in young children has been operationalized primarily as persistence at object-oriented tasks (e.g. Yarrow, Morgan , Jennings, Harmon, & Gaiter 1982). However, in recent years there has been increased agreement that the construct should be expanded (e.g., MacTurk, Hunter, McCarthy, Vietze, & McQuiston, 1985; Wachs & Combs, 1995). Both young children's play in preschool groups and adult perception questionnaire data serve as the empirical basis for proposing a multifaceted conceptualization of children's mastery motivation. Three domains of the instrumental aspect of mastery motivation have been measured: object oriented persistence, social persistence, and gross motor persistence. Also measured is one facet of the expressive aspect of mastery motivation, mastery pleasure.

Aggression and hyperactivity are negatively sanctioned behaviors, and at first glance would seem to be inversely related to all aspects of mastery motivation. However, in a sample of presumably normally developing preschoolers, children who are high on activity level or apparently aggressive may not have a clinical problem. For example, the hyperactivity syndrome, ADHD, involves not only high activity but also impulsivity and attention difficulties. Some amount of these behaviors serves pragmatic functions for young children, especially in groups. For example, assertive behavior and high activity level might be positively related to attempts to master peer relations, enthusiasm, and persistence at motor tasks.

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The relations among the various aspects of mastery motivation and aggression, hyperactivity, impulsivity and activity level, therefore, are of considerable scientific and educational interest.

Method

Study 1

The families of 332 3-5 year old twins were recruited from the twin registry in a Western state. Mothers of the twins were asked to rate each of the twins on the Child Behavior Checklist (Achenbach & Edlebrook, 1983), a widely used measure of children's behavior problems. This study focuses on the aggression and hyperactivity scales.

The mothers also rated each twin on the Dimensions of Mastery Questionnaire (DMQ), which yielded four scales discussed in this paper: object oriented persistence, social persistence, gross motor persistence and mastery pleasure. A number of previous studies with the DMQ (see Morgan et al., 1993) support its reliability and validity. For example, the DMQ differentiated low- and high-risk populations on mastery-related behavior and has shown relations between maternal perceptions of child characteristics and both teacher ratings and standardized test scores. For the present study twins were separated into two sub-samples, which allows a convenient replication of the results, although we acknowledge that these are not completely independent samples.

Study 2

The data for this study were reanalyzed from the Bethesda Longitudinal Study (BLS), conducted at the National Institute of Mental Health, which examined the development of 152 normally developing, mostly middle to upper income children during their first three years. At three, the children attended a five week, experimental, small-group, preschool program during which extensive data were collected about the child's play and interaction with peers, teachers, and their mothers. The children were also given several standardized tests and experimental procedures/tasks (see Yang & Halverson, 1976).

Morgan, Sandel, and Yang (1994) selected variables (i.e., teacher ratings, observer codes, test scores) from the BLS data set that assessed the same four motivation and positive affect domains described in study 1 (persistence at object-oriented tasks, social and gross motor play, and pleasure). Variables in each of these four domains were then factor analyzed to produce a more differentiated set of nine composite variables: two object-oriented persistence, three socially-oriented persistence/involvement, two gross motor persistence/involvement, and two enthusiasm and positive affect scales, each based on 3-5 variables . These motivation and affect composites cover most of the aspects of behavior identified by Barrett and Morgan (1995) as indicators of mastery motivation. The internal consistency reliability (alphas) for these nine composite variables range from .65 to .85 (median .72), which seems satisfactory given the conceptual similarity of the variables in each composite, the relatively small number of variables in each, and the diverse settings and types of scores used to obtain them. Table 1 shows the variables.

We also developed conceptual composites for aggression, impulsivity, and activity level from the teacher ratings, observer codes, and test behaviors of these 3-year olds. The composite

scores had alphas of .83, 73, and, .71, respectively. Impulsivity, activity level, and aggression were higher in boys than girls. See Table 1.

Data Analysis

We ran simultaneous multiple regression analyses with the four or nine motivation and affect variables as predictors and aggression, hyperactivity, activity level and impulsivity, as outcome variables.

Results

Study 1

The left side of Tables 2 and 3 summarizes the results of the twin study.

Aggression. Multiple regression analyses indicated that aggression was predicted for both twins (R=.33 and .35) from a combination of mothers' ratings of gross motor persistence (betas = .16 and .24) and low mastery pleasure (betas = -.20 and -.21). Low persistence at challenging object-oriented tasks was a third significant predictor for twin 1, but not twin 2. Social persistence was not significant.

Hyperactivity. Likewise there were two significant predictors of hyperactivity in both twins (R=.33 and .48): mothers' ratings of low object persistence (-.27 and -.29) and gross motor persistence (.22 and .36). Neither social persistence nor mastery pleasure were significant predictors of hyperactivity.

Study 2

The right side of Tables 2 and 3 summarizes the results of the preschool study.

Aggression. The regression analysis indicated three significant motivational predictors out of nine variables for aggression (R = .73). The significant betas were: involvement with peers (.52), vigor at motor tasks (.25) and, involvement in gross motor play (.16).

Impulsivity. There were six significant predictors of impulsivity. The multiple R was .77 and the significant betas were: does not pay attention to adult instructions (-.36), vigor at motor tasks (.34), enthusiasm on the first day and during tests (.30), low involvement with adults (-.21), involvement with peers (.26), and low persistence at challenging tasks (-.15).

Activity Level. The multiple R was .76, with seven significant betas that were similar to those for impulsivity, except that involvement in gross motor play and positive affect over 4 weeks were significant, but persistence at challenging tasks was not.

Discussion and Educational Implications

Morgan & Yang (1995) argued that persistence, enthusiasm, and positive affect are important elements of mastery motivation. Peer involvement and vigor are also two of the elements of a broad definition of mastery motivation. The analyses of these two studies produced some inconsistencies but also quite a bit of agreement across samples and studies, including some initially surprising ones.

The data from both studies and all samples indicate that high involvement and/or vigor at gross motor tasks seem to contribute positively to high activity, impulsivity and aggression in

young children. Enthusiasm during tests and on the first day contributed positively to the prediction of impulsivity and activity level in study 2, but was not significant in study 1.

On the other hand, low mastery pleasure rated by mothers predicted aggression in study 1, but the affect composites were not significant in study 2. Whether and in what direction affect predicts problem behavior is probably due to differences between mother and teacher perceptions and because on the DMQ pleasure is specifically associated with persisting at tasks while in the preschool study it was more generally related to play.

Persistence at challenging object-oriented tasks, contributed negatively to the prediction of hyperactivity (both samples in study 1) and impulsivity (in study 2), but did not predict activity level (study 2) suggesting that the impulsivity aspect of hyperactivity is what is associated with low task persistence.

General social persistence (study 1) was not a predictor of hyperactivity, but in study 2 involvement with peers was positively predictive while involvement with and attention to adults were negative predictors of both impulsivity and high activity level. Perhaps there were opposite effects of involvement with peers and adults, and these may have canceled out any contribution of social persistence in study 1, which did not distinguish between social with peers and adults.

Although clinical levels of hyperactivity (with attention deficit) are clearly undesirable, it may it may well be that high activity level or even impulsivity by itself is not necessarily undesirable in preschoolers. Note that activity level is positively associated with enthusiasm, positive affect during play, involvement with peers, and gross motor play as well as vigor at motor tasks, all of which are hypothesized facets of mastery motivation. It may be that problems in school are forecast only when high activity is combined with impulsivity. This deserves future study.

Given the high incidence of ADHD in classrooms and of aggression in school settings, it is important to study their precursors in preschool-aged children. These data also imply that it is important to make a distinction between high activity level and the hyperactivity syndrome which includes elements of impulsivity and difficulty in maintaining attention on challenging tasks. Teachers may misinterpret social or gross motor mastery attempts, accompanied by high activity level, as ADHD. If this is true, teachers should be cautioned not to over interpret what they see.

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TABLE 1

Specific Variables and Alphas for the Composite Predictor and Outcome Variables for Study 2

Alpha	
	Motivation &Affect
.74	**Persistence at Challenging Tasks & Play Involvement** Perseverance in Problem Solving (4-Wk Rating) Play Involvement Outdoors (4-Wk Rating) Play Involvement Indoors (4-Wk Rating) Play Involvement (1st Day Rating) Coping with Stuck Chair (Experiment)
.77	**Long Play Bouts** Average Playbout Length (4-Wk Observer Indoor Play) Average Playbout Length (1st Day Observer Score) Third Quartile Playbout Length (1st Day Observer Score) Third Quartile Playbout Length (4-Wk Obser. Indoor Play)
.85	**Involvement with Peers** Involvement with Peers during Indoor Play (4-Wk Rating) Involvement with Peers in Quiet Room (4-Wk Rating) Involvement with Peers Outside (4-Wk Rating) Involvement with Peers during Car Rides (4-Wk Rating) Peer Interaction (4-Wk Observer Indoor Play)
.79	**Involvement with Adults & Attempts to Control Them** Attempt to Control Adults (1st Day Rating) Seek Attention and Admiration (4-Wk Rating) Seek Admiration (1st Day Rating) Attempt to Control Adults (4-Wk Rating)
.72	**Pays Attention to Adults** Attention to Story (1st Day Rating) Willingness to Comply/Cooperate(1st Day Rating) Interest in Story (4-Wk Rating)
.65	**Involvement in Gross Motor Play** Gross Motor (1st Day Observer Score) Push Objects (4-Wk Observers Score) Gross Motor Play (4-Wk Observer Score) Push Big Objects (1st Day Observer Score)

Alpha	
.66	**Vigor at Motor Tasks** Vigor in Using Bobo (Experiment) Vigor Using a Toy Top (Experiment) Persistent Attempts to get Bell (Experiment) Vigor Retrieving Chair (Experiment) Vigor at Attempts to get by Barrier (Experiment)
.70	**Enthusiasm During 1st Day and Testing** Animation (1st Day Rating Composite) Enthusiasm and Expressive (1st Day Rating) Lack of Caution at Barrier (Experiment) Interest and Enthusiasm (During Testing)
.72	**Positive Affect Over 4 Weeks** Positive Affect in Quiet Room (4-Wk Observer Score) Positive Affect Outdoors (4-Wk Observer Score) Excited (4-Wk Composite Teacher Ratings)
	Outcome Variables
.83	**Aggression and Negative With Peers** Spilling, Attacking and Throwing (1st Day Rating) Negative Peer Interaction (4-Wk Rating) Instigation of Peer Conflict (4-Wk Rating) Negative Behavior Toward Peers (4-Wk Rating) Negative toward Peer Indoors (4-Wk Rating) Negative toward Peer Outdoors (4-Wk Rating)
.73	**Impulsivity** Inability to Delay (toy Top Experiment) Inability to Delay (1st Day Rating) Impatience (4-Wk Rating) Impulsive Composite (4-Wk Rating) Inability to Delay (1st Day Rating)
.71	**Activity Level** Pedometer Reading (1st Day) Nomadic Behavior/Constant Motion (1st Day Rating) Run a Lot in Outdoor Play (4-Wk Rating) Physical Movement Bouts Outdoors (4-Wk Rating) Nomadic/Constant Motion Indoors (4-Wk Rating) Pedometer Reading Across 3 Settings (4-Wks)

Note: 4-wk=Score from the four week experimental nursery school. Rating= teacher ratings. 1st day=Score from the first day when only the child and his/her mother attended the school.

Table 2
Predicting Aggression from Motivation and Affect Using Simultaneous Multiple Regression

	Study 1 - DMQ		Study 2 Preschool
	Twin 1	Twin 2	
N =	164	165	120
Object Persistence	-.23 *	-.14	
At Challenging Tasks			-.11
Long Play Bouts			.03
Gross Motor Persistence	.16 *	.24 **	
Vigor at Motor tasks			.25 **
Involved in GM Play			.16 *
Social Persistence	.12	-.04	
Involved w/Adults			-.12
Involved w/Peers			.52 **
Attention to Adults			-.12
Mastery Pleasure	-.20 **	-.21 **	
Initial Enthusiasm			.16
Positive over 4 wks			.04
R	.33	.35	.73
R^2	.11	.12	.53
F	4.92 **	5.66 **	13.71 **

* $p \leq .05$
** $p \leq .01$

Table 3
Predicting Hyperactivity, High Activity, and Impulsivity from Motivation and Affect Using Simultaneous Multiple Regression

	Study 1 - DMQ		Study 2 - Preschool	
	Hyperactivity		Activity Level	Impulsivity
	Twin 1	Twin 2		
N =	164	165	120	120
Object Persistence	-.27 **	-.29 **		
At Challenging Tasks			.05	-.18 *
Long Play Bouts			.11	-.02
Gross Motor Persistence	.22 *	.36 **		
Vigor at Motor Tasks			.19 **	.34 **
Involved in GM Play			.23 **	.09
Social Persistence	-.09	-.03		
Involved w/Adults			-.25 **	-.21 **
Involved w/Peers			.22 **	.20 *
Attention to Adults			-.22 **	-.36 **
Mastery Pleasure	-.09	-.11		
Initial Enthusiasm			.23 **	.30 **
Positive over 4 wks			.23 **	.13
R	.33	.48	.76	.77
R^2	.11	.23	.58	.59
F	4.92 **	11.76 **	17.09 **	17.63 **

* $p \leq .05$
** $p \leq .01$

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