DOCUMENT RESUME

ED 422 108 PS 026 813

AUTHOR MacPhee, David; Fritz, Janet J.; Miller-Heyl, Jan; Hite, Judy

TITLE Assessing Mastery Motivation in a Head Start Sample.

PUB DATE 1998-07-00

NOTE 13p.; Paper presented at the National Head Start Research Conference (4th, Washington, DC, July 9-12, 1998). For other "Mastery Motivation" papers, see PS 026 811-815.

CONTRACT 90YD0011

PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS Child Rearing; Construct Validity; Interpersonal Competence; *Measurement Techniques; *Parent Attitudes; Parent Child Relationship; *Preschool Children; Preschool Education; Psychometrics; *Student Motivation; Test Reliability; *Test Validity

IDENTIFIERS *Mastery Motivation; Project Head Start

ABSTRACT

Although mastery motivation appears to predict school success, individual assessment of mastery motivation is too time consuming and limits the application of this research. This study examined the psychometric properties of the Dimensions of Mastery Questionnaire (DMQ). The study focused on the validity of the measure for Head Start parents, whether it correlates with individually administered mastery tasks, and the relation of child-rearing practices with child mastery motivation. Participating were 176 Head Start children and their families from 6 rural communities in Colorado. Ten percent of the sample were Hispanic; 31 percent, American Indian; and 53 percent, Anglo. Caregivers completed a battery of questionnaires, including the DMQ, Social Skills Rating System, and three measures of child-rearing practices. The Battelle Screening Inventory was administered, and children were given mastery tasks to assess their goal-oriented mastery behavior and preference for challenge. Findings indicated that mastery motivation can be reliably reported on the DMQ by Head Start parents. The instrument had adequate interrater agreement, internal consistencies, and cross-time stabilities with these parents. The factor structure was somewhat different from the test blueprint, yet was interpretable. There were difficulties documenting the instrument's convergent validity, with the most plausible explanation being that reports of child behavior across different contexts tend not to correspond very well. The DMQ was more strongly related to parent rating of children's cooperation and assertiveness, implying that some of the scales tap an aspect of preschool social competence. (Contains 12 references.) (KB)

Assessing Mastery Motivation in a Head Start Sample

David MacPhee

Janet J. Fritz

Jan Miller-Heyl

Judy Hite

Colorado State University

Funding was provided by a Head Start/University Partnership Grant (#90YD0011). This study was presented as part of a symposium, "New measures of mastery motivation for infants through primary grades" at Head Start's 4th National Research Conference (July 1998).

The authors wish to thank George Morgan for his suggestions at various phases of this study. The participants' willingness to give of their time is especially appreciated. Address correspondence to David MacPhee in the Department of Human Development and Family Studies, Colorado State University, Fort Collins, CO 80523. E-mail: macphee@cahs.colostate.edu

Cognitive development is intertwined with motivation, particularly effectance. Effectance is the intrinsic motivation to effect change in the environment, to initiate and persist with challenging tasks (Jennings et al., 1984; MacTurk et al., 1995). Toddlers' mastery motivation is modestly related to preschool cognitive functioning (Jennings et al., 1984), but few studies have examined preschool effectance in relation to later school success. For example, Alexander and colleagues (1993) found that attention span affected test score gains in the first grade and predicted performance in each of three subsequent years. A review of research on the early identification of at-risk learners concluded that preschool tests do not predict later success as well as observations of children's abilities to follow directions, attend to tasks, and systematically approach tasks (Rogers & Webster, 1987).

Although mastery motivation appears to predict school success, current methodology limits the application of this research. Specifically, individual assessments of mastery motivation are too time consuming for screening purposes. In this study, we examined the psychometric properties of a parent-report measure of children's mastery motivation, the Dimensions of Mastery Questionnaire (Morgan et al., 1993). We were interested in whether the DMQ is valid for Head Start parents, and whether it correlates with individually administered mastery tasks. We also hypothesized that parents who encourage autonomy have children who more likely to explore independently, and thus have higher levels of mastery motivation. Authoritarian parents, in contrast, should have children who are more inhibited and thus less likely to engage in new or difficult tasks.

Method

Sample

Head Start children (N = 176, M = 4.10 years) and their families were recruited from six rural communities in the Four Corners area of Colorado. Approximately 10% of the

families were not eligible for Head Start but their children were enrolled in a preschool program located at a Head Start site. The families' mean income was $17,300, and the parents had completed 12.6 years of education. The sample was 10% Hispanic, 31% American Indian, and 53% Anglo. Families in four of the communities (n = 116) were enrolled in a 12-week parent/child intervention. Comparison families received Head Start services and life-skills workshops. Although we have found DMQ scores to improve as a result of the intervention, this paper will focus on the pretest assessments.

Measures

At the pretest, all caregivers completed a battery of questionnaires that included the following:

- four scales from the DMQ--object-oriented persistence; motor persistence; persistence in social play with adults and with peers.
- the Social Skills Rating System (Gresham, 1986), which measures externalizing and internalizing behavior problems as well as social skills.
- three different measures of child-rearing practices. The first, the Parent-Child Relationship Inventory (Gerard, 1994), has scales on limit setting, open communication, and encouragement of autonomy. Next, parents read a series of vignettes depicting common child-rearing problems, which are followed by various questions on causal attributions and anger. Parent responses to the vignettes are content coded, and these are assigned scores from low (punitive) to high (nurturant). The final parenting measure was a Likert scale on use of harsh punishment. These measures were completed at yearly intervals, but today I will only focus on the pretest information.

In individual sessions, the children were given the Battelle screening inventory (Newborg et al., 1984) and a series of mastery tasks adapted from Jennings et al. (1984; 1988). The mastery tasks included a curiosity box containing nine occluded objects, puzzles that varied in difficulty, stacking cups, a magnetic fishing game, and Barrel of Monkeys. In our follow-up assessments, the curiosity box was modified to make it lighter and to include other attractive, manipulable objects such as a kaleidoscope, ViewMaster, ministamper, and noisemaker. We also included more challenging, developmentally appropriate puzzles, substituted Tricky Triangle (a jumping game with pegs) for the stacking cups, which were too easy even for the younger children, and included mazes as well as the games Operation and Jenga.

Goal-oriented mastery behavior was coded as the percent of the total time spent attending to and manipulating the objects as well as trying to solve the problems. We also coded off-task behavior, bids for help, and prompts as well as success in solving the tasks. To assess preference for challenge, children were given three tasks such as stringing beads or stacking blocks; for each, they selected a difficulty level, from easy to hard. Interrater reliabilities on each measure exceed 90%. At the conclusion of the session, the examiner completed the Behavior Rating Scale (Bayley, 1993) items on task orientation and affect regulation.

Results & Discussion

Psychometrics of the DMQ. The DMQ's stability over 12 weeks, for the intervention group (n = 47), was .48 for the total score but exceeded .61 for persistence in play with adults and peers (.39 for object-oriented; .42 for motor). Mother-father agreement for 51 pairs was high for the scales related to social tasks (r = .60 and .63) but was modest for the

object-oriented (r = .36) and motor scales (r = .40). Finally, the internal reliability of the total DMQ score (α = .86) was higher than any of the scale alphas (.65 to .76).

A factor analysis resulted in nine factors, five of which had one or two items, which might explain the lower scale alphas. When constrained to a four-factor solution (see Table 1), (a) the motor and object-oriented items generally loaded on their own factors, (b) items from the two persistence at social play scales (adult, peer) formed a single factor (α = .77), and (c) the fourth factor was comprised of items from three scales on giving up easily or avoiding challenges. Thus, the factor structure is interpretable but doesn't correspond precisely to the author's blueprint.

Convergence of the DMQ and mastery tasks. Before considering how the DMQ relates to the individually administered mastery tasks, we wanted to see whether these task scores were interrelated in a meaningful way. We dropped the number of bids from further analyses because they were rare and uncorrelated with the other measures except the number of prompts (r = .49). A single bipolar dimension explained the correlations fairly well (see Table 2): (a) goal-oriented behavior, time on task, and successful completion of tasks intercorrelated .39 to .79, and they also correlated with examiner ratings of task orientation; (b) number of prompts and off task were modestly correlated; and (c) off task and prompts were negatively related to time on task and to ratings of task orientation. However, preference for challenge was unrelated to the other mastery measures.

Regarding convergent validity, a composite DMQ score was related to neither mastery task scores nor to examiner ratings of task orientation. However, children's persistence in peer play, on the DMQ, was somewhat related to goal-oriented behaviors (r = .16, p = .04) as well as to successful completion of the tasks (r = .18, p = .02) and examiner ratings of task orientation (r = .20, p = .02). As well, DMQ scores were correlated with parent

reports of the children's social skills (r = .41 for object-oriented and r = .42 for peer-play persistence). These results combined suggest that some variance on the DMQ is related to children's cooperation and assertiveness.

Next, we examined gender and age differences. We did not have a hypothesis about gender but believed that older children would be more goal directed. In terms of gender, only one t-test was significant, about what would be expected by chance: Boys were more likely to select difficult tasks on the preference for challenge measure ($t(129) = 2.03$, p = .045). Older children were significantly more successful on the mastery tasks (r = .39, $p <$ .001) and were rated as more task oriented (r = .41). Stronger results were obtained when developmental level, on the Battelle, was used instead of child age, with advanced children less off task (r = -.33) and more goal directed (r = .26) as well as successful. On the total DMQ, only persistence in social play varied with developmental level (rs = .22 for the adult scale and .30 for the child scale).

We hypothesized that certain child-rearing practices would be related to mastery motivation. First, parents who granted their children more autonomy had children who made more bids for help (r = .27),[1] but contrary to our postulate, the correlations with goal-directed behavior and preference for challenge on the tasks were nonsignificant. Autonomy was correlated .18 (p = .02) with the DMQ. Our second hypothesis was that children's exploratory behavior would be inhibited if their parents were authoritarian, as indicated by punitive discipline, hostile attributions, and anger.

None of the correlations with the mastery task scores were significant, but several of the correlations with the total DMQ were at $p < .01$: hostile attributions (r = -.24), harsh

[1] Given the number of correlations generated, we adopted a more conservative alpha level of $p < .001$.

punishment (r = -.20), democratic limit setting (r = .23) and open communication (r = .38). Thus, children of authoritarian parents appear to be less persistent, although the fact that significant results were found only on the parent-report measure raises the possibility that they are due to shared method variance.

Our results indicate that mastery motivation can be reliably reported, on the DMQ, by Head Start parents. The DMQ has adequate internal consistencies and cross-time stabilities with these parents, as well as interrater agreement. The factor structure is somewhat different from the test blueprint, yet is interpretable. It is notable that all of the item reversals loaded on a separate factor, either because these parents perceive giving up easily to be a separate dimension of mastery motivation or because they responded differently to the items' demand characteristics.

More troubling were difficulties documenting the DMQ's convergent validity. The only scale to correlate with direct observations of mastery motivation was the child's persistence in peer play, and these correlations were rather small. There are several explanations for these results, the most plausible being that reports of child behavior across different contexts tend not to correspond very well (Edelbrock, 1983), especially when one tries to compare ratings with observations (Cairns & Green, 1979). That is, parents are able to draw upon a wealth of personal experience when rating their child on the DMQ, although this benefit is offset somewhat by rater bias. On the other hand, the individual mastery tests are a more limited sample of behavior albeit more controlled in how mastery behavior is elicited and recorded.

The DMQ was more strongly related to parent ratings of children's cooperation and assertiveness, implying that some of the DMQ scales tap an aspect of preschool social competence. This makes intuitive sense because children who are low in social status do not

regulate well their social behavior: Neglected children don't persist in social interactions with new peers whereas rejected children tend to be overly intrusive as well as inept at play. In addition, DMQ scores were related to the measure of developmental level. In theory, mastery motivation is independent of cognitive or motor ability. However, the DMQ items include a number of references to doing a skill "very well," which parents may interpret as competence as well as persistence.

Thus, our results are mixed with regard to the DMQ's validity. As with any research on a new instrument, it will take more than a few studies to validate this measure. We are particularly eager to see how the DMQ fares as a predictor of Head Start children's success in school, because it could then be used as a screening tool to identify children who might benefit from intervention (although we are not sure how one would boost children's persistence).

References

Alexander, K.L., Entwisle, D.R., & Dauber, S.L. (1993). First-grade classroom behavior: Its short- and long-term consequences for school performance. Child Development, 64, 801-814.

Bayley, N. (1993). Bayley Scales of Infant Development (2nd ed.). Orlando: Psychological Corporation.

Cairns, R. B., & Green, J. A. (1979). How to assess personality and social patterns: Observations or ratings? In R. B. Cairns (Ed.), The analysis of social interactions: Methods, issues, and illustrations. Hillsdale, NJ: Erlbaum.

Edelbrock, C. (1983). Problems and issues in using ratings scales to assess child personality and psychopathology. School Psychology Review, 12, 293-299.

Gerard, A. B. (1994). The Parent-Child Relationship Inventory: Manual. Los Angeles: Western Psychological Services.

Gresham, F.M. (1986). Conceptual and definitional issues in the assessment of children's social skills: Implications for classification and training. Journal of Clinical Child Psychology, 15, 3-15.

Jennings, K.D., Connors, R.E., & Stegman, C.E. (1988). Does a physical handicap alter the development of mastery motivation during the preschool years? Journal of the American Academy of Child and Adolescent Psychiatry, 27, 312-317.

Jennings, K.D., Yarrow, L.J., & Martin, P.P. (1984). Mastery motivation and cognitive development: A longitudinal study from infancy to 3½ years of age. International Journal of Behavioral Development, 7, 441-461.

MacTurk, R.H., Morgan, G.A., & Jennings, K.D. (1995). The assessment of mastery motivation in infants and young children. In R. MacTurk & G.A. Morgan (Eds.), Mastery motivation: Origins, conceptualizations, and applications. Norwood, NJ: Ablex.

Morgan, G. A., Maslin-Cole, C. A., Harmon, R. J., Busch-Rossnagel, N. A., Jennings, K. D., Hauser-Cram, P., & Brockman, L. (1993). Parent and teacher perceptions of young children's mastery motivation: Assessment and review of research. In D. Messer (Ed.), Mastery motivation in early childhood: Development, measurement and social processes (pp. 109-131). London: Routledge.

Newborg, J., et al. (1984). Battelle Developmental Inventory Screening Test: Examiner's manual. Dallas, TX: DLM Teaching Resources.

Rogers, J.G., & Webster, R.E. (1987). A research review of early identification of at-risk learners. ERIC Document ED326-299.

Table 1

Factor Structure of the DMQ

Item	I	II	III	IV
Repeats motor skills (climbing, throwing) to do them well (M)	.78			
Tries hard to throw balls etc. in order to do it well (M)	.75			
Repeats skills like jumping or running until does them well (M)	.75			
Gets involved in trying to catch or kick balls (M)	.74			
Tries to do well in physical play, even if it's hard (M)	.51			
Repeats a new skill until can do it very well (O)	.47		.38	
Explores a new toy/object before going on to something else (O)	.45		.31	
Tries hard to get adults to play with him/her (AP)		.71		
Tries hard to get adults to continue playing (AP)		.68		
Enjoys playing make-believe with adults (AP)		.67		
Tries to get other children to play imaginary games (CP)		.65		
Gets very involved in pretend play with other children (CP)		.56		
Takes an active role when plays with adults (AP)	.40	.53		
Enjoys interacting with adults; tries to keep them involved (AP)		.51		
Tries to keep play going for a long time with other kids (CP)	.41	.47		
Likes to "talk" on phone or play "house" with other children (CP)		.43		
Tries to complete things, even if it takes a long time (O)			.67	
Works for a long time at putting things together (O)			.66	
Tries to finish puzzle-like toys even if they are hard (O)			.58	
Tries to master cause-and-effect toys (O)			.58	
Works for a long time trying to get something open (O)			.56	
Waits for turn, to keep play going with other children (CP)			.55	
Tries to master activities like exercising or dancing (M)		.30	.36	
Avoids getting involved in games with other children (CP)				.70
Gives up easily if cannot master physical skills (M)				.67
Gives up easily, if something is hard to do (O)				.63
Avoids physical games and doesn't try to do them real well (M)				.62
If a toy is challenging, stops playing after a short time (O)			.33	.57
Gives up quickly in pretend play with adults (AP)				.54

Note. Factor loadings of < .30 are omitted. (M) = motor item; (O) = object-oriented item; persistence in play with children (CP) and adults (AP).

Table 2

Convergence of the Dimensions of Mastery Questionnaire and Mastery Tasks

	1.	2.	3.	4.	5.	6.	7.
Mastery Tasks							
1. Off task							
2. Number of prompts	.21**						
3. Goal directed	.00	.10					
4. Time on task	-.61***	-.48***	.74***				
5. Success	-.13	-.03	.79***	.39***			
6. Preference for challenge	-.04	-.07	.07	.00	.17*		
Examiner Ratings							
7. Task orientation	-.40***	-.30***	.63***	.53***	.57***	.07	
Dimensions of Mastery Questionnaire							
8. Total score	-.03	.07	.05	.04	.04	-.06	.13

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

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Assessing mastery motivation in a Head Start sample.	
Author(s): D. MacPhee, J. Fritz, J. Miller-Heyl, & J. Hite	
Corporate Source:	Publication Date: July 1998

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents	The sample sticker shown below will be affixed to all Level 2A documents	The sample sticker shown below will be affixed to all Level 2B documents
PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 1	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 2A	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 2B
Level 1 ↑ ☑	Level 2A ↑ ☐	Level 2B ↑ ☐
Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy.	Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only	Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, → please

Signature: David MacPhee	Printed Name/Position/Title: David MacPhee Associate Professor
Organization/Address: Colorado State University, Fort Collins CO 80523	Telephone: 970-491-5503 FAX: 970-491-7975
	E-Mail Address: macphee@cahs.colostate.edu Date: 8/18/98

(over)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:	Karen E. Smith, Acquisitions ERIC/EECE Children's Research Center University of Illinois 51 Gerty Drive Champaign, Illinois 61820-7469

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
1100 West Street, 2nd Floor
Laurel, Maryland 20707-3598

Telephone: 301-497-4080
Toll Free: 800-799-3742
FAX: 301-953-0263
e-mail: ericfac@inet.ed.gov
WWW: http://ericfac.piccard.csc.com