THE DIMENSIONS OF MASTERY QUESTIONNAIRE (DMQ): A Manual About Its Development, Psychometrics, and Use *

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Current draft. Will be revised, expanded, and updated periodically.

* Robert J. Harmon, M.D., now deceased, was instrumental in the development of the DMQ. This manual is dedicated to him.

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MANUAL

APPENDIXES

The appendixes listed below are available as separate documents. These documents include: (a) information about the scoring and use of the Dimensions of Mastery (DMQ) questionnaire and (b) copies of the six parallel, age-related forms of the DMQ in English. Copies of the DMQ in Spanish and in Chinese (in either traditional characters or simplified characters) are available upon request.

English Motivation Questionnaire
Infant (6-18 months)
Preschool (1 ½ -5 years)
Child (6-12 years, by adults)
Child (self-ratings)
Teen (self-ratings)
Teen (by adults)

Spanish Motivation Questionnaire
Infant (6-18 months)
Preschool (1 ½ -5 years)
Child (6-12 years, by adults)
Child (self-ratings)
Teen (self-ratings)
Teen (by adults)

Chinese Motivation Questionnaire
Infant (6-18 months)
Preschool (1 ½ -5 years)
Child (6-12 years, by adults)
Child (self ratings)

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The first version of the questionnaire, called the MOMM, was developed by George Morgan, Nancy Busch-Rossnagel, Rex Culp, Kay Jennings and Robert Harmon. Revisions and new items for the DMQ-G were developed by George Morgan, Sandra Pipp, Christine Maslin-Cole and Robert Harmon. The expanded DMQ-E items were developed by George Morgan, Christine Maslin-Cole, Karen Barrett, Nancy Busch-Rossnagel and Robert Harmon. The negative reactions to failure scale items were developed by Karen Barrett and George Morgan. Finally, the items for the current easy Spanish version and the social persistence with peers and with adults' items were developed by Diana Knauf, Nancy Busch-Rossnagel and George Morgan. They, plus Karen Barrett, Kay Jennings and Robert Harmon, refined and simplified the reading level of the items for the current DMQ.

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Dedication

We want to dedicate this manual and the Dimensions of Mastery Questionnaire to Robert John Harmon, MD, colleague, friend, and former professor of child and adolescent psychiatry at the University of Colorado School of Medicine. Bob was not only one of the developers of the questionnaire, but also served as a source of encouragement and support over the 25 years of the development and use of the DMQ and this manual. He died suddenly in February 2006 at age 59 of a heart attack. We will miss him.

Overview and Conceptual Framework

The Dimensions of Mastery Questionnaire (DMQ), described in this manual, assesses several aspects of adults' and children's perceptions of children's mastery related behaviors. The DMQ is one of several measurement techniques, including challenging structured tasks and semi-structured play, which have been developed to assess mastery motivation (MacTurk, Morgan, & Jennings, 1995). The ZERO TO THREE definition of infant mental health and *From Neurons to Neighborhoods* (Shonkoff & Phillips, 2000) identify mastery motivation (the intrinsic drive to explore and master one's environment) as key developmental concepts, which should be assessed as part of a child's evaluation.

Morgan, Harmon, and Maslin-Cole (1990) 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. Mastery motivation has two major aspects: instrumental and expressive (see Barrett & Morgan, 1995). The *instrumental aspect* motivates a person to attempt, in a focused and persistent manner, to solve a problem or master a skill or task which is initially at least moderately challenging for him or her (Morgan, et al., 1990). The *expressive aspect* of mastery motivation produces affective reactions while the person is working at a task or just after completing it. Such affect may or may not be overtly expressed, may or may not be felt, and may assume different forms as the child develops. This definition of mastery motivation evolved over the last 30 years from our research and is more circumscribed than those of earlier investigators (e.g., White, 1959).

The DMQ assesses mastery motivation by having a parent or teacher rate their perceptions of the child's (or for school-aged children and teens rate their own) behavior in mastery contexts. Historically, mastery motivation has been viewed as pertaining primarily to persistence at object-oriented tasks (e.g., Yarrow, Morgan, Jennings, Harmon, & Gaiter, 1982). However, the literature and observations of young children's behavior during tasks led us to include mastery pleasure and, later, negative reactions/distress to failure as expressive aspects of mastery motivation (Barrett & Morgan, 1995; Brockman, 1984; Harmon, Morgan, & Glicken, 1984; Harter, 1981a; White, 1959). Other behavioral observations suggested an expansion of the construct to include social mastery motivation (e.g. Busch-Rossnagel, Vargas, Knauf, & Planos,

1993; Combs & Wachs, 1993; MacTurk, Hunter, McCarthy, Vietze, & McQuiston, 1985; Maslin & Morgan, 1985; Wachs, 1987). Other researchers suggested expanding the construct to include gross motor mastery motivation (Morgan & Bartholomew, 1998; Morgan & Shim, 1993). Data from early versions of the DMQ also suggested an expanded conceptualization of children's mastery motivation.

Thus, the current Dimensions of Mastery Questionnaire produces seven measures. There are four measures from the *instrumental aspect* of mastery motivation:

1. Persistence at object or cognitive tasks
2. Gross motor persistence
3. Social mastery motivation with adults
4. Social mastery motivation with peers/children

There are also two measures of the *expressive aspect* of mastery motivation:

5. Mastery pleasure
6. Negative reactions in mastery situations

In addition, the DMQ provides another *mastery-related* measure that is considered to be a measure of ability rather than of the motivation to master. We label it:

7. General competence

Typical mastery motivation studies utilized brief behavioral observations of infants working at mastery tasks or during semi-structured play (MacTurk et al., 1995). Thus, researchers have usually observed children for only a small amount of time in a single setting. Parents and teachers, on the other hand, have the opportunity to observe a child over a longer period of time and usually in various settings. Therefore, a questionnaire completed by parents or teachers can augment laboratory observational measures of mastery motivation. The DMQ provides a quicker and easier measure of the above aspects of young children's functioning than that gained from the more lengthy behavioral assessments. Because there is evidence to support the DMQ as a valid measure (a topic to be discussed at length later), this is a significant advantage. We recognize that parents', teachers', and children's own perceptions may be influenced not only by the child's actual behavior but also by characteristics of their own personalities and response biases. Yet, we view parent, teacher, and self-perceptions of mastery motivation to be important in themselves because these perceptions undoubtedly influence the

child's behavior and adults' interactions with the child. Thus, we recommend that investigators interested in mastery motivation use the DMQ not only when behavioral measures of it are too expensive to collect, but also to provide a supplementary point of view when using mastery tasks.

The DMQ or its predecessor, the MOMM, has been used in research studies of over 50 samples of 6-month to 6-year olds, including normally developing, developmentally delayed, and premature children and children from a variety of ethnicities and countries. These children have been assessed by parents and caregivers/teachers. More recently, parallel versions of the DMQ were developed and tested for school-aged children and teens, who were rated by themselves as well as by parents and teachers. This range of ages, ethnicities, and developmental statuses indicates the potential practical or clinical usefulness of the DMQ for assessing a wide range of children, in a wide range of settings, for many applied purposes.

Development of the Questionnaire

The MOMM: An Early Version of the DMQ

When development of the MOMM (Mother's Observation of Mastery Motivation) questionnaire began in the early 1980s, there were no parental report questionnaires designed to assess the motivation of infants and preschool children. Infant temperament questionnaires did assess perceptions of some aspects of persistence (e.g., Carey & McDevitt, 1978; Lerner, Palermo, Spiro, & Nesselroade, 1982; Rowe & Plomin, 1977), but none of them provided adequate coverage of the *motivational* aspects of toddlers' or preschoolers' attempted problem solving and mastery play. Two questionnaires for school-aged children, Gottfried's (1986) Academic Intrinsic Motivation Inventory and Harter's (1981a, 1981b) Intrinsic versus Extrinsic Orientation in the Classroom Scale, came closer conceptually to measuring the aspects of behavior in which we were interested. However, those scales focused on intrinsic versus extrinsic motivation in school, which is only partially applicable to the above definition of mastery motivation. In developing items for the MOMM questionnaire, we drew upon several of Harter's scales and some themes from the persistence scales of infant temperament measures.

In its initial form, the MOMM was intended for 1- to 5-year old children. Items were written to fit seven a priori conceptual scales: 1) persistence at difficult tasks, 2) exploration in

depth, 3) preference for novel/unfamiliar, 4) preference for challenge, 5) works to please adults, 6) dependent on adult help, and 7) reliance on adult feedback.

The first four scales were intended to assess high versus low mastery motivation as it had been measured behaviorally in other early mastery motivation studies (e.g., Jennings, Harmon, Morgan, Gaiter, & Yarrow, 1979; Jennings, Yarrow, & Martin, 1984; Yarrow et al.,1982). Scales four to seven were adapted from Harter's (1981b) Intrinsic versus Extrinsic Orientation in the Classroom scales.

Pilot work led to a 36-item questionnaire which was completed by approximately 140 mothers of normally developing children and 60 mothers of at-risk or handicapped children aged 9 months to 5 years, some of whom participated in intervention programs (see Table 1). These data were collected as part of several different studies; i.e., Butterfield and Miller (1984); Flagle (1982); Harmon, Morgan, and Glicken (1984); Harmon, et al., (1982); and Jennings, Connors, Stegman, Sankaranarayan, and Mendelsohn (1985). Morgan, Harmon, Pipp, and Jennings (1983) compiled the data about the use of the MOMM. A summary of some of the findings is presented in the following two sections.

Factor structure of the MOMM. Principal components analyses of the mothers' ratings were done for the samples studied with the MOMM. The components produced by analyses of both the high and low risk groups were generally consistent with each other, but differed considerably from the original a priori scales. The first component accounted for about half the variance and contained most questions from the a priori scales of persistence at difficult tasks and preference for challenge, as well as items from the exploration in depth scale and selected items from several other scales. This factor was labeled "general mastery motivation." The second factor labeled "dependence in mastery situations," consisted of questions which dealt with the child's bids to adults for help in playing with toys, especially when the tasks were difficult. These questions had been intended to represent the extrinsic motivation end of the scales adapted from Harter's (1981b) Intrinsic versus Extrinsic Orientation in the Classroom questionnaire. However, answers to these questions may have had less to do with extrinsic motivation than with a more general social orientation, the parents' perception of the child's need

for adult help, or low independence in mastery situations. Other, smaller factors varied from sample to sample and usually accounted for relatively small percentages of the variance.

These first two factors, general mastery motivation and dependence in mastery situations, were used as the basis for two scales in the first version of the Dimensions of Mastery Questionnaire (DMQ-G). Data related to the validity of the MOMM will be presented next, because it supports the validity of the persistence/general mastery motivation and the independent mastery scales of the DMQ-G version and also the validity of the object persistence scale of later versions, which included mostly the same items.

Validity of the MOMM questionnaire. Support for the MOMM questionnaire was obtained in part through comparisons of mothers' perceptions of normal versus at risk children (see Morgan et al, 1983; Morgan et al., 1993). Mothers of Down syndrome, premature, and physically handicapped children (i.e., high risk) rated their children lower on the general mastery motivation factor than did mothers of low-risk children; questions on preference for challenge were especially likely to show significant differences between mothers of high and low-risk infants. Also, Down syndrome children were rated lower than low-risk children on the second MOMM factor (independence in mastery situations). Both teachers (who used a short version of the MOMM) and mothers of the 4 to 5 ½ -year-old physically handicapped children, rated the handicapped children as significantly higher on adult orientation; i.e., lower on independent mastery (Jennings et al., 1988).

Another method used to assess the validity of the MOMM questionnaire was to examine the effects of an intervention program on maternal perceptions of mastery motivation, as well as on the child's behavior. Butterfield and Miller's (1984) intervention raised the children's mastery motivation on the behavioral tasks and raised the mothers' perceptions of their children's mastery motivation as measured by the MOMM (see Harmon et al., 1984).

A third avenue used to provide evidence for the validity of the MOMM was to correlate individual differences in maternal ratings on the questionnaire with behavioral mastery scores. As predicted, the MOMM general mastery motivation score was significantly correlated ($r = .37$, $p < .05$) with infants' actual persistence at tasks (Morgan et al., 1983). In another study, preschool teachers rated the usual behavior of 18 children who had also been tested with the

mastery tasks (Morgan et al., 1983). There was a significant correlation (r =.41, p < .01) between teacher ratings of the child's persistence and independently obtained tester ratings of the child's task orientation (persistence).

These results supported the usefulness of the MOMM questionnaire, but it was felt that the psychometric properties and age appropriateness of the questionnaire could be improved without losing the strengths just described. Thus, a major revision was undertaken. Some items were dropped because they implied abilities that children under three or four years do not appear to have. Other questions about intrinsic versus extrinsic motivation were deleted because they did not seem to be as appropriate for our definition of mastery motivation or for young children as for school-aged children.

The Dimensions of Mastery Questionnaire – General Scales (DMQ-G)

Based on the considerations described above, we produced an extensive revision of the questionnaire. The DMQ general scales included 21 items written to be age-appropriate for toddlers and preschool children. However, they also were used successfully with children as young as 7 or 8 months (Hupp & Abbeduto, 1988; Morrow & Camp, 1996) and as old as six years. The questions were written in descriptive, behavioral language similar to that used by mothers. These general scales of the Dimensions of Mastery Questionnaire (DMQ-G) were designed to tap four dimensions of child behaviors that we had observed during the mastery tasks. These dimensions were: 1) general persistence at tasks, 2) mastery pleasure, 3) independent mastery attempts, and 4) general competence for one's age.

As mentioned above, the first and third dimensions were based on the first two factors from the MOMM. The second and fourth dimensions were added to represent two important aspects of the young child's behavior in mastery situations that had not been included in the MOMM.

The first dimension, general persistence, was based on items from the first MOMM factor, general mastery motivation. It did not, however, include items about *preference* for challenge because preference for challenge behavioral tasks had not proven to be appropriate for toddlers (Jennings et al., 1984?). The general persistence scale was intended to correspond to the

typical instrumental mastery motivation measure, which was persistence at behaviorally-administered, challenging tasks.

The second dimension, mastery pleasure, was added because Harmon and Morgan (i.e., Harmon et al., 1984) realized its importance to a conceptually complete view of mastery motivation in early childhood. Mastery pleasure is defined as smiling, laughing or other behavioral indicators of positive affect *during* task-directed behavior or immediately following the solution of a task. It is viewed as a measure of the child's developing sense of self-efficacy and of the second aspect of mastery motivation, the expressive aspect.

The third dimension, independent mastery attempts, was derived by reversing some questions in the second factor of the MOMM questionnaire (dependence in mastery situations) and adding some additional items. Independent mastery attempts are necessary in the standard mastery motivation behavioral assessment situation because the child must work on his or her own in order to achieve a high persistence score. However, they are not sufficient to guarantee high persistence (i.e., a child could resist help or not ask for it and still not persist for an extended period). Thus, the concept of independent mastery attempts was thought to be related to, but not the same as, mastery motivation. We were also interested in this dimension because MacTurk, Hunter, McCarthy, Vietze, and McQuiston (1985), Maslin and Morgan (1985), and Wachs (1987) had attempted to assess social versus object orientation during mastery tasks. We thought that children high on social orientation might be rated lower on independent mastery attempts.

Likewise, the fourth dimension, competence, is not considered to be a measure of mastery motivation, but it is an important aspect of mastery-related behavior. Furthermore, there is an analogous score derived from the mastery tasks, and competence is of general interest to investigators of young children's behavior. The competence items provide an index of a rater's perceptions of the child's abilities, relative to other children the same age, which may be similar to those assessed by the Bayley Scales of Infant Development (Bayley, 1969).

These general scales of the DMQ were used in the studies listed in the second block of studies in Table 1 by over 300 mothers of normally developing and developmentally delayed young children. The DMQ-G items have, with minor modifications, continued to be used with all the more recent versions of the DMQ. Thus, findings from the general persistence, mastery

pleasure, and competence scales of the DMQ-G are relevant to the validity of the current DMQ and are discussed in the summary and conclusions section of the manual.

The Expanded Dimensions of Mastery Questionnaire (DMQ-E)

Research with the infant mastery tasks made it clear that persistence is quite specific to the type of task (Yarrow et al., 1982, 1983). For example, even relatively similar mastery tasks such as those using puzzle-like tasks and those using cause and effect toys did not have very highly correlated persistence scores. In addition, mastery motivation researchers had shown in the early 1980's a growing interest in the expression of persistence during social and symbolic play of toddlers (Maslin-Cole, Bretherton, & Morgan, 1993) and in social behavior during tasks (e.g. Combs & Wachs, 1993; MacTurk, Hunter, McCarthy, Vietze, & McQuisten, 1985; Maslin & Morgan, 1985; Morgan et al., 1991). Thus, there seemed to be clear value in developing ways to assess aspects of mastery motivation not tapped by the four general scales of the DMQ.

In response to these results and concerns, the DMQ was expanded. Five new scales, of three items each, were added to the general items of the DMQ-G. These scales measured persistence during five specific types of play: gross motor, combinatorial, means-end, social, and symbolic. This DMQ-E was used with over 20 samples to rate over 1500 1- to 5-year-old children who were mostly normally developing singletons or twins, but included substantial numbers of developmentally delayed and other at-risk children (see Table 2).

The general scale items also were modified, mostly in minor ways, to make the DMQ easier to answer. The equivalence of the initial general scale scores with this revised and expanded DMQ was tested by asking mothers of 35 children, 29- to 59-months old, to answer both versions about three weeks apart. Half answered the revised version first, and half answered it second. These correlations (general persistence, .85; overall mastery pleasure, .70; independent mastery, .83; and competence, .58) indicate that the scale scores of the two versions are quite highly related. For persistence and independent mastery the correlations indicate good alternate forms reliability and provide an indication of acceptable test-retest reliability. As expected, the correlation was somewhat lower for competence because several items had been changed to improve the psychometric properties of the scale and to try to differentiate competence more clearly from persistence. The overall mastery pleasure scale correlation was

somewhat lower because we attempted to differentiate two related but somewhat distinct concepts: pleasure during the process of goal-directed behavior and pleasure at causing something to happen. The mastery pleasure scale was, thus, expanded and differentiated so that three items each for process pleasure and causality pleasure were included in the expanded DMQ. However, one of the process pleasure items did not correlate with the other process pleasure or the causality pleasure items, producing low alphas. Mainly for this reason, this differentiation was later abandoned.

The Rescored, Five-factor DMQ-E

In the early 1990's, for both psychometric and conceptual reasons, we deleted 5 of the 36 items and reanalyzed the DMQ-E data. This resulted in five scales which were conceptually meaningful and psychometrically stronger than previous formulations. This revised conceptualization included one expressive facet or component of mastery motivation, mastery pleasure, and three instrumental components of mastery motivation, which were: persistence during object play, persistence in social/symbolic play, and persistence in gross motor play of young children. These instrumental components roughly paralleled Harter's (1982) three aspects of perceived competence (academic, social, and athletic) in school-aged children. This new conceptualization also included the overall perceived general competence factor, which was of interest, but not viewed as an aspect of mastery motivation. Thus, the rescored DMQ-E for toddlers and preschoolers had five scales: 1) object-oriented persistence, 2) social/symbolic persistence, 3) gross motor persistence, 4) mastery pleasure, and 5) general competence. As the conceptualization of mastery motivation evolved, we made minor modifications in items to improve the internal consistence of the scales and the readability and translatability of the items (see Busch-Rossnagel, Vargas, Knauf, & Planos, 1993).

The DMQ scales of object-oriented or general persistence, mastery pleasure, and general competence are considered to be essentially equivalent across all preschool versions of the DMQ (G, E, ES, and the current DMQ17) because item wording and content differed at most moderately and because "alternate forms" reliability was adequately high. For example, the new object-oriented (cognitive) persistence scale was highly related to the former general persistence scale (r = .91). The new scale included the general persistence items, related items from the

independent mastery scale, and the items from the former combinatorial and means-end persistence scales. The social/symbolic persistence and gross motor persistence scales were formed from items that had been added for the expanded DMQ (DMQ-E), so they had no equivalents in the four general scales.

In summary, as our conceptualization of mastery motivation evolved, the MOMM became the DMQ-G, which provided measures of both the expressive and instrumental aspects of mastery motivation. The DMQ-E was a further expansion to include other potential domains (e.g., social and gross motor) of an instrumental aspect (i.e., persistence) of mastery motivation. The rescoring of the DMQ-E produced a conceptually and psychometrically stronger questionnaire for toddlers and preschoolers. The evolution of the DMQ up to DMQ-E and a summary of findings about reliability, validity, and correlates of mastery motivation, as measured by the DMQ, were presented in review chapters by Morgan, et al. (1993) and MacTurk, et al. (1995).

The DMQ with Expanded Social Scales (DMQ-ES)

In 1995 and 1996 the DMQ social persistence (i.e., social mastery motivation) items were revised, expanded and split into two scales: social persistence with peers and social persistence with adults. In addition, a second expressive aspect of mastery motivation, negative reactions to failure, was added. Other items and scales remained essentially the same as in the DMQ-E.

The new social scales were intended to assess the young child's attempt at social mastery of the peer environment and of interactions with adults. Social interactions are critical to social and cognitive development, so the motivation to interact with other human beings is a critical component of current notions of mastery motivation (Busch-Rossnagel, 1997; Combs & Wachs, 1993; MacTurk et al, 1985). Research has shown that social mastery (designed to begin, continue and shape social interactions) is distinguished from social interactions initiated and maintained by distress (Wachs & Combs, 1995.) Likewise social mastery motivation is distinct from the temperamental dimension of sociability (Combs & Wachs, 1993; Dichter-Blancher, 1999). The DMQ also distinguishes between social interactions of individuals of unequal status (children with adults) and of individuals of equal status (interactions among peers).

Negative reactions to failure was added in view of the growing literature indicating that even toddlers can have negative reactions when they fail at a mastery task (e.g., Alessandri & Lewis, 1993; Lewis, Alessandri, & Sullivan, 1992; Lutkenhaus, 1984; Stipek, Recchia, & McClintic, 1992). Moreover, recent research has confirmed that such responses are observable and occur at an even younger age (e.g., Barrett, 2005; Kelley, Brownell, & Campbell, 2000; Kelley & Jennings, 2003). These negative reactions seemed important to include in the DMQ because both classic and more recent theory suggested that such negative reactions to failure, especially if severe or frequent, could undermine individuals' motivation to master new tasks (e.g., see Atkinson, 1964, 1966; Dweck & Elliott, 1983; Eccles, Wigfield, & Schiefele, 1998). Such a variable might make a separate contribution to the overall degree to which children are motivated to master tasks with which they are faced.

In addition to a preschool version for 18 months – 5 years, which had been the predominant age range for the DMQ-G and DMQ-E, new versions of the DMQ were developed and pilot tested for infants (6-18 months), elementary school children (6 – 12 years), and teens (13 – 19 years). The elementary school-aged and teen versions have forms for the child to rate him or herself and a form for adults (parent or teacher) to rate the child. All the age versions of the DMQ had 14 common items that were thought to be appropriate across ages (see Table 4). The remaining 31 items varied somewhat by age version but roughly paralleled the items in the preschool version. For this near final version of the DMQ, more than 400 children from 6 months to 19 years (including abused children, those with Down syndrome, depressed mothers, and from low income families) were rated by mothers, teachers, or by the teens themselves (see Table 3, top section).

The Current DMQ (Version 17)

In January 1997, the current DMQ version was finalized based on examining the data obtained from the DMQ-ES. The scales and most of the items remained the same, so the DMQ-ES and the current DMQ are essentially equivalent. However, the wording of some items was simplified to make them easier for children themselves and low reading-level adults to read. As much as possible, we used words with reading levels in the primary grades (1-3). Also, several negatively worded (reversed) items were eliminated or reworded because they seemed to have

been miscoded by a number of raters who either did not read them carefully or were confused by the wording. These items had lowered the alphas in several previous samples.

This Dimensions of Mastery Questionnaire has 45 items and seven scales. For a listing of the items see Tables 5-12. The scales include:

Instrumental aspects of mastery motivation

1. Object-oriented persistence (persistence at cognitive tasks, for children and teens)
2. Gross motor persistence
3. Social persistence with adults
4. Social persistence with children

Expressive aspects of mastery motivation

5. Mastery pleasure
6. Negative reactions to failure

Ability to master in contrast to *motivation* to master tasks

7. General competence

Participants

More than 7000 children from 6-months to 19-years of age have been rated with the essentially equivalent DMQ-ES (aka DMQ-16) or with the current DMQ (aka, DMQ-17) (see Table 3). These include more than 250 children with a variety of risk factors or delays. Geographically, children were very diverse, coming from Colorado, from the East, South, Midwest, and the West Coast of America, as well as from the UK, Israel, Australia, and Hungary (where more than 6,000 children and teens rated themselves and also many were rated by parents and teachers). The Hungarian samples were not included in the normative data presented in the tables.

The psychometric "normative" data reported in Tables 5-32 are from approximately 800 children (samples 8-21 and 25 in Table 3) who were rated by their parents, teachers, and/or themselves. The children ranged in age from 6 months to 19 years, with approximately 300 infants, 300 preschoolers, 100 elementary and 100 high school students. Raters included 633 parents, 217 teachers or caregivers, and 183 elementary and high school kids.

The children in the normative samples described in Tables 5-12 were mostly middle-class, white, normally developing American children. However, the parents of infants were a diverse group: the North Carolina infant sample was mostly lower SES and the Denver infant sample was also ethnically diverse. The normative preschool age ratings were mostly for children attending preschools and had considerable cultural, if not parental education, diversity; at least six preschool children were assessed as having special needs. Most of the school-aged ratings were from volunteer families from mid-sized Colorado cities and were predominantly white and middle class, but 8 children had been diagnosed with attachment disorder. The teens were representative of students in a high-school in a mid-sized Colorado city because they included almost all students in four classes.

Thus, with the qualification noted above, these data would probably be representative of typical university research samples of predominately normally developing, low-risk children who agree to participate in a study.

Even though the "normative" data are mostly for normally developing children, many of the children used in other studies and with earlier versions of the DMQ were at-risk or developmentally delayed. Results using these diverse samples will be discussed in the Summary and Conclusions section. Also, an attempt will be made to provide some tabular data for at-risk or delayed populations in the final DMQ manual.

Procedure

Parents were asked to rate, on a five-point scale (from "not at all typical" to 'very typical"), how typical each of the 45 items was of their child. Teachers or caregivers used the same scales to rate children in their class or group. In addition, older elementary and high school aged children rated themselves. The younger school-aged children (6-10 years old) were read the items individually, and a display with five faces varying from frowning to smiling was used to facilitate their responses.

Twelve preschool children were rated a second time by the same teacher about a month later to obtain a measure of test-retest reliability (see Table 23) and to supplement the alphas provided in Table 22 and the "alternate forms" reliability measures obtained with earlier versions.

Scoring

The appendix illustrates how to compute each of the seven scale scores. Although the same item numbers are used at each age to compute the scale scores, wording for 31 of the 45 items varied somewhat for the four age versions. Thus, the seven scales have the same or similar name at each age but have slightly different meanings at different ages. Seven items are reversed and must be recoded (5 = 1, etc.) before computing the scales.

In addition to (or instead of) the seven scale scores, summary or total scores that combine two or more scales can be computed. We have computed a *total persistence score* from the average of the four instrumental scales. In the past, we also have computed a *total mastery motivation score*, based on the average of the four instrumental and the *mastery pleasure* scales. We are considering computing a *total social mastery motivation score* (the average of the social persistence with adults and social persistence with children scales) and a *total expressive mastery motivation score* (the average of mastery pleasure and negative reactions to failure). The alphas for these "total" scores range from acceptable to excellent.

Norms for a Cross Section of English-Speaking Children

Item norms. Tables 5 – 12 present means and standard deviations for each *item* and for the scales of the current DMQ. These "normative data" include separate tables for parents, teachers and child self-ratings for each age group (infant, preschool, elementary school, and teen) for which there were enough applicable data. These tables also include Cronbach alphas for each scale and corrected item-total correlations for each item. As stated above, the majority of each age and rater group was, white, middle-class, Americans; working class and minority children are included but may be under represented in most of these tables of "norms," especially for the school-aged and teen groups.

The average rating for most items and scales ranged from approximately 3.2 to 4.6 out of 5. These means show that most of the raters viewed all the various aspects of the child's mastery motivation and competence as more typical than not of this child, perhaps indicating some social desirability to the items. The standard deviations for most items were approximately 1, indicating moderate variability and that some raters viewed the child as less motivated than typical. Discussion of the scales scores and internal consistency (alphas) is presented below.

Gender norms. Tables 13-16 present the means and standard deviations of the seven DMQ scale scores for the above children, separately for boys and girls. Table 13 shows that infant boys and girls, 6-18 months old, were rated similarly by *parents* on all seven scales. *Teachers* or caregivers rated infant girls somewhat higher than boys on social persistence with adults.

Table 14 shows that preschool *parents* did not rate boys and girls differently on most dimensions, but they did rate boys somewhat higher on gross motor persistence. Preschool parents rated girls somewhat higher on social persistence with other children, but there was no difference in social persistence with adults. However, preschool *teachers* rated girls as more persistent and more competent on all scales except gross motor persistence and negative reactions to failure. These findings seem consistent with popular perceptions of young children's development.

Table 15 compares elementary school-age (6-12 years old) boys and girls. On social persistence with peers, both *parent* and *teacher* ratings of girls were higher than ratings of boys for these mostly middle-class, white, mid-sized city children. There was little difference for parent ratings on the other scales. However, teachers also rated girls somewhat higher on cognitive persistence, mastery pleasure, and competence. These higher ratings for girls seem somewhat surprising given the few DMQ differences for preschoolers and infants and the common finding in the mastery motivation literature of few gender differences in infant and toddler behavior on mastery tasks. However, school-aged girls, generally, do get better grades and are less likely to have behavior problems than boys so it may be reasonable that elementary school-aged girls would be seen by teachers to have higher levels of mastery motivation.

Table 16 compares self-ratings of boys and girls. Elementary school-aged girls rated themselves somewhat higher than did boys on social mastery motivation with peers and mastery pleasure and slightly higher on the other scales, except competence where there was no difference. These gender difference ratings are similar to those for parents and teachers, which provides some evidence for the validity of the mastery motivation scales. These findings may also indicate that girls are beginning to underrate their competence even in elementary school, relative to the boys' self-ratings and those of parents and teachers.

Table 16 also shows the self-ratings of teen boys and girls. The boys rated their gross motor (physical activity) persistence and general competence higher than the girls rate themselves on these dimensions. Although there was not a significant difference between boys' and girls' ratings of persistence at cognitive tasks, boys rated themselves slightly higher, which is inconsistent with ratings at other ages and the literature about the school motivation of high-school girls and boys. As might be expected, girls did rate themselves higher on social persistence with peers and, especially, mastery pleasure.

Age norms. Tables 17-19 present means and standard deviations comparing age groups for ratings by parents, teachers, and the children/teens themselves, respectively. Although 14 of the 45 items are identical across the four age forms and the remaining items are intended to assess a similar aspect of motivation at each age, one needs to be cautious comparing across age versions. In terms of *parent* ratings of object/cognitive persistence, there was little difference among the infant, preschool, and early elementary age ratings by parents. The parents of 9-12 year-olds, and perhaps of teens, did seem to rate their children higher. There were few age differences in parent ratings of gross motor persistence and social persistence with adults.

Rater norms. Table 20 presents means and standard deviations comparing parent and teacher ratings for infants and for preschoolers. In general teachers rated the same children significantly lower than their parent. For *infants*, only negative reactions to failure was not rated differently by parent and teachers. *Preschool teachers* rated children lower than their parent did, except on object persistence and negative reactions to failure.

Table 21 presents means and standard deviations comparing parent, teacher, and child self-ratings for 6- to 12-year-olds. In general, as for younger children, teachers rated the same children lower than the parent; this was especially true for the social mastery scales and negative reactions to failure. However, parent and teachers rated cognitive persistence essentially the same. These 6- to12-year-old children rated themselves in terms of average scale scores, more like their teacher rated them than their parents rated them. On social persistence with adults, mastery pleasure, negative reactions to failure, and general competence, the kids rated themselves lower than their parents, as did the teachers. The kids, however, rated themselves substantially higher on cognitive and gross motor persistence then either the parents or teachers had. Only on social persistence with peers did the parents and children have similar average ratings.

Reliability

Table 22 presents evidence that each of the five DMQ *instrumental* scales and mastery pleasure had good (alpha > .70) internal consistency for each scale, for each age, and type of rater, except for elementary school children's self-rating of social persistence with other children (alpha = .61). The alpha for negative reactions to failure and competence, the two shortest scales, ranged from .60-.90 with the lower alphas for self-rating by teens and elementary school children. The median Cronbach alphas for *parents'* ratings of all seven scales for the three age groups were .80, .81, and .84 for the infant, preschool, and elementary school groups, respectively. The median alphas were .69 for elementary school children's *self-ratings*, and .74 for high school kids' ratings, indicating minimally acceptable, somewhat lower internal consistency for self-ratings, especially by the 6-12 year-old children. For *teachers'* ratings, the median alphas for the seven scales were .85, .88, and .89 for infant preschool, and elementary school children, respectively. Thus, the seven scales have adequate to excellent internal consistency, with teacher ratings the highest and child self-ratings the lowest.

Table 23 shows that the short-term stability of the seven DMQ scales for a preschool teacher's ratings a month apart ranged from .68 to .89, median .85. This indicates good test-retest reliability by a teacher and agrees with the good "alternate forms" reliability reported above for the DMQ-E.

Intercorrelations of the DMQ Scales

Tables 24-31 show the intercorrelations of the seven DMQ scales for the several age and rater groups. The median correlations among the four persistence (instrumental) measures were in the .3 to .4 range for parents of infants (Table 24) and preschoolers (Table 26). However, for child and teen self-ratings (Tables 29 and 31), teachers' ratings of infants (Table 25), and teachers' ratings of preschoolers (Table 29), the four persistence scales were more highly correlated (median *r*s in the .4 to .6 range). Parents of school-aged kids showed the most differentiated instrumental ratings (median $r < .1$).

For both parents and self-ratings mastery pleasure was related moderately to the four instrumental (persistence) scales, indicating that it is reasonable to consider mastery pleasure to be an expressive aspect of the broader concept of mastery motivation, even for teens. Teacher

ratings of mastery pleasure and the instrumental scales were even more highly correlated, averaging about .5.

For both parents and self-ratings, the correlation of general competence with the object or cognitive persistence scales was relatively high, .40 -.61, indicating that parents and children view object/cognitive persistence to be overlapping with competence. Teachers/caregivers see even more overlap or commonality between persistence at object/cognitive tasks and competence (*r*s range from .68-.81 for the three age groups).

Most of the correlations, shown in Tables 24-31, between negative reactions to failure and the other six scales, especially object/cognitive persistence and competence, were negative correlations, as expected. Preschool and older children, their parents and teachers tended to see competence and persistence at cognitive tasks as inversely related to the negative reactions to failure scale. Perhaps this is like test anxiety or motivation to avoid failure in Atkinson's approach. However, parents of infants did not see any relationship between the mastery motivation and competence scales and negative reactions to failure.

Validity

Table 32 shows that the cross-rater correlations among school-aged children, their parents, and their teachers for the mastery motivation scales were positive and most were statistically significant. These child-parent, child-teacher, and parent-teacher ratings ranged from .04 to .59, with a median correlation of .28, which is a medium or typical effect size according to Cohen (1988) and provides a medium level of support for validity (Morgan, Gliner, & Harmon, 2006). For interrater correlations this suggests that perception does play an important role.

The median correlations were .35, .28, and .42 for child with parent, child with teacher, and parent with teacher ratings, respectively, for instrumental mastery motivation and the mastery pleasure scales. This indicates that two adults tend to rate the motivation of children more similarly than a child and parent or a child and teacher. These cross-rater correlations provide some support for the validity of these mastery motivation scales.

The cross rater correlations for the general competence scale shown in Table 29, indicate that two adults (even when seeing the child in different environments) have considerable agreement in their ratings. The correlations were .47 and .45 for a morning and afternoon teacher

and for parent-teacher ratings, respectively. However, there appears to be little relationship between child and teacher or child and parent ratings of competence.

Table 32 also shows that the interrater correlations of school-aged children for negative reactions to failure (such as gaze aversion, giving up, or getting upset) were essentially zero for child-parent and child-teacher ratings. Apparently children do not see themselves in the same way as adults in regard to such negative reactions. However, parents and teachers of school-aged children did rate the children somewhat similarly (r = .38) on negative reactions to failure.

Finally, the last column in Table 32 shows that for a morning preschool teacher and an afternoon teacher's ratings, of the same 10 children, the median correlation for the motivation and competence scales was r = .29, indicating some commonality as well as differences among ratings and a medium effect size. However, the two teachers rated the children's negative reactions to failure very differently (r = -.25). This may indicate that context or specific environment is important, perhaps especially for the expression of negative emotions.

There are several possible reasons for the low inter-rater correlations: different levels of self-awareness, different information access, social desirability issues, developmental issues, and reference groups used. Kids may not understand all the questions, may not have insight into reactions they don't display freely, and may be more affected by social desirability. In addition, the correlations may not be higher because these persons see the children (or themselves) in different contexts. The teachers see the children at school, the parents see them mainly at home, and the children see themselves in both these places and others.

Table 33 indicates that a principal components analysis provides strong, clear factorial evidence for the validity of the four instrumental mastery motivation scales and mastery pleasure rated by parents. Similarly, a principal components analysis of self-ratings by children and teens (see Table 34) provides good factorial evidence for validity because the items generally cluster in the ways that the scales were designed.

Table 35 shows that elementary school-aged child DMQ self-ratings were significantly related to child self-ratings of Harter's (1981 a, b) intrinsic motivation scales (r = .45), to child ratings of persistence at challenging tasks (r = .45), and to parents' (but not teachers') DMQ ratings (r = .30). Parents' and teachers' ratings of total mastery motivation on the DMQ were

also significantly related (r = .39). These findings provide additional evidence to support the validity of the DMQ scales.

Finally, parents and teachers rated six special needs (mostly Down syndrome) preschool children. The parents' and teachers' average ratings were quite similar for five of the scales (object, gross motor, and social persistence with peers, mastery pleasure, and negative reactions to failure) to the norm group. However, parents and, especially teachers, rated these special needs preschoolers as higher on social persistence with adults and lower on general competence. Thus, these data provide some additional evidence for the usefulness of the DMQ.

Summary and Conclusions Based on All Versions of the DMQ

The Dimensions of Mastery Questionnaire (DMQ), described in this manual, assesses several aspects of adults' and children's perceptions of children's mastery related behaviors. The DMQ is one of several measurement techniques, including challenging structured tasks and semi-structured play, which have been developed to assess mastery motivation.

We believe 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. Mastery motivation has two major aspects: instrumental and expressive. The instrumental aspect motivates a person to attempt, in a focused and persistent manner, to solve a problem or master a skill or task which is at least moderately challenging for him or her. The expressive aspect of mastery motivation produces affective feelings while the person is working at a task or just after completing it. Such affect may or may not be overtly expressed and may assume different forms as the child develops. This definition of mastery motivation evolved over the last 30 years from our research and is more circumscribed than those of earlier investigators.

As our conceptualization of mastery motivation evolved, expressive aspects of mastery motivation, (mastery pleasure and negative reactions to failure) were added to the initial questions intended to assess the instrumental aspect of persistence at object-oriented tasks such as the puzzles, cause and effect toys, and detour problems used in the infant and toddler behavioral observations of mastery motivation. A further expansion of the DMQ included other domains (e.g., social and gross motor) of the instrumental aspect (i.e., persistence) of mastery motivation. Finally, social mastery motivation was split to include two scales assessing social

persistence with children and social persistence with adults. More details about the evolution of the DMQ and a summary of findings about reliability, validity, and correlates of the DMQ up to that time were presented in review chapters by Morgan, et al. (1993) and MacTurk, et al. (1995).

The DMQ assesses mastery motivation by having a parent or teacher rate their perceptions of the child's (or for school-aged children and teens their own) motivations on 45 five-point scales from not at all typical to very typical of the child's behavior. In addition to the toddler/preschool version for 18 months-5 years, which had been the predominant age range for the earlier versions of the DMQ, new versions were developed and pilot tested for infants (6-18 months), elementary school-aged children (6-12 years), and teens (13-19 years). The school-aged and teen versions have a form for the child to rate him or herself. For infant, preschool, and school-aged children, we have forms for adults (parent or teacher) to rate the child.

The current DMQ or its predecessors have been used to rate over 9,000 6-month to 18-year-olds in over 50 samples, including normally developing, developmentally delayed, and premature children and children from a variety of ethnicities and countries. The samples listed in Tables 1, 2, and 3 include most of the children whose mastery motivation has been rated using the DMQ.

Although there have been substantial changes in the DMQ scales between its earliest version, the Mothers' Observations of Mastery Motivation (MOMM), in the 1980s, a number of the items, especially in the object/cognitive persistence scale are essentially unchanged. Furthermore, each succeeding version was more like the current version, finalized in 1997. Therefore, in this final section of the manual, we will discuss the evidence for reliability and validity of the DMQ using both the current data presented in the preceding section and applicable results from previous versions of the DMQ.

Reliability

Data from the current DMQ present evidence of good internal consistency (alphas $\geq$ .70) for the instrumental motivation scales and mastery pleasure for each age and type of rater, except for two-scales for self-ratings by elementary school children themselves, which had alphas in the .60s. The shorter general competence and negative reactions to failure scales had somewhat

lower alphas ranging from .60 to .90, indicating that internal consistency reliability ranged from marginally acceptable to good for them on the current DMQ.

Earlier versions of the object/cognitive persistence and mastery pleasure scales provided strong evidence (r = .70 to .91) for alternative forms reliability (old version correlated with a new one). Test-retest reliability for the current and earlier versions of the DMQ was above .70 for almost all scales.

Validity

Both the current version and earlier versions of the DMQ provide evidence to support validity as well as reliability. Such evidence includes differentiation of low- and high-risk populations on mastery-related behaviors. For example, mothers of Down syndrome, premature, and physically handicapped children (i.e., high risk) rated their children lower on the general mastery motivation factor than did mothers of low-risk children; questions on preference for challenge were especially likely to show significant differences between mothers of high and low-risk infants (Morgan et al., 1993). With the current DMQ, ratings of a small group of special needs children were rated higher on social mastery with adults and lower on general competence by parents and teachers than the normative group.

Another method used to assess the validity of the MOMM questionnaire was to examine the effects of an intervention program on maternal perceptions of mastery motivation, as well as on the child's behavior. Butterfield and Miller's (1984) intervention seemed to raise the children's mastery motivation on the behavioral tasks and raised the mothers' perceptions of their children's mastery motivation as measured by the MOMM (see Harmon et al., 1984).

There were also significant relationships between maternal perceptions of child motivation and tester ratings of those behaviors assessed in standardized testing situations. As predicted, the MOMM general mastery motivation score was significantly correlated (r = .37) with infants' actual persistence at tasks (Morgan et al., 1983). In another study, preschool teachers rated the usual behavior of 18 children who had also been tested with the mastery tasks (Morgan et al., 1983). There was a significant correlation (r =.41) between teacher ratings of the child's persistence and independently obtained tester ratings of the child's task orientation (i.e., persistence at the mastery tasks). Children's DMQ total mastery motivation score was

significantly correlated with observed mastery motivation during tasks (r = .28) (Morgan & Bartholomew, 1998).

Validity Checks for Individual Participant's Ratings

A problem with all self-administered questionnaires is that raters may not provide accurate responses. There are many possible reasons for such invalid ratings. Two seem to be especially problematic with evaluative parent and child self-ratings like those used with the DMQ, temperament scales, and personality inventories: inaccurate rater reading of the questionnaire and social desirability. Two methods of checking for these types of validity and, thus, the usefulness of individual participants' questionnaires are being considered for use when one needs to identify participants whose ratings are problematic.

First, we developed a technique to detect whether a rater was reading the items carefully and accurately or instead misreading them, due perhaps to reading too fast or to having a low level of reading ability. This validity checking technique compares the rating of the negatively worded item in each scale (after it was recoded) with the average of the non reversed items for that scale. If there is a substantial (e.g., $\geq$ 1 rating point) difference, we assume that the participant wasn't reading the reversed item carefully. For example, if the average of the ratings of the positively worded items on mastery pleasure was 4.1 but the negatively worded item (i.e., does not smile…) was rated 3 or less (after being reversed), we assume that the rating of at least the negatively worded item was invalid. Participants who have such invalid ratings on 3 or more out of 6 scales with a negatively worded item could be deleted from the sample or at least flagged as apparently having reading accuracy problems. Using this criterion, 10 out of 114 (9%) participants whose data were examined would have been deleted or flagged.

A second method, which could be used to identify participants who have too strong a tendency toward globally socially desirable ratings, would again utilize an examination of individual participants' data. Although the six mastery motivation scale scores and competence are related, this technique is based on the premise that any individual child would not be not highly motivated in all aspects of mastery. Thus, if a subject had on 4 or more of the 7 scales mean scores of 4.75 (out of 5) or above, we assume that the rater had a general halo or social desirability bias and was not adequately differentiating the child's areas of high and less high motivation. Children with such uniformly high ratings, could be flagged or deleted. In a sample of 20 records, 1 was found to have such consistently high ratings.

Uses of the DMQ

A questionnaire completed by parents, teachers, or the child/teen themselves can augment observational measures of mastery motivation because parents and teachers have the opportunity to observe a child over a period of time. Thus, we recommend that practitioners and investigators interested in mastery motivation use the DMQ, which provides a quicker and easier measure of the above aspects of children's functioning than that gained from behavioral assessments. The evidence to support the validity of the DMQ measures presented in this manual, reinforces this advantage.

The DMQ can be used in a variety of applied settings and with clinical populations. The large amount of normative data collected and summarized in this manual can be compared with data collected from clinical samples, such as children at risk for development disorders, young children exposed to substances in utero, and children at psychiatric risk from either biological or environmental factors. Currently there are studies on clinical or at-risk populations that are using this questionnaire. We believe that mastery motivation is a fundamental developmental construct that should be used as part of a comprehensive clinical formulation for young children.

Additional Information

The following pages provide a reference list and tables of descriptive information about most of the samples that have used the current DMQ. The tables provide data about how participants have answered the several items and scales, and also include information about how the scales scores relate to other variables such as gender, age, and rater type.

The appendixes, attached as a separate document, provide information about how to score the DMQ and a copy of each of the six age and rater versions of the DMQ. These versions are for adults to rate (a) infants (6-18 months), (b) preschoolers (18 months-5 years), (c) elementary school-aged children (6-12 years), and (d) teens (13-19 years), and for self-ratings by elementary school-age children and teens.

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Table 1
Characteristics of Studies/Samples Utilizing the Mother's Observation of Mastery Motivation (MOMM) or the Dimensions of Mastery Questionnaire General Scales (DMQ-G)

Sample	Location	Types of sample(s)[a]	Respondent[b]	Age	*N*	Design[c]	DMQ references[d, e]
MOMM: (1981-83)							
1	Colorado	N	M	2-5 y	53	C	Morgan *et al*. 1983[d]
2	Colorado	D, N	M	2-5 y	32	C	Flagle 1982; Morgan *et al*. 1983
3	Denver	P, N	M	1 y	41	C	Butterfield and Miller 1984[e]; Harmon *et al*. 1982[d], 1984[d], Morgan *et al*. 1983, 1988[d]
4	Pittsburgh	MI, N	M, T	3½, 4½ y	77	L	Jennings *et al.* 1985[d], 1988, 1989[d]
DMQ-G: (1983-85)							
5	Colorado	N	M	18-25 m	38	L	Maslin-Cole *et al.*, 1993
6	Colorado	N	M	15-30 m	47	C	Barrett *et al*., 1993[e]
7	Denver	N	M	1-3 y	60	C	Redding *et al.* 1988[e]
8	Manitoba	N	M	18 m	38	C	Fung 1984[d]
9	Unknown	N, DD	M	8-36 m	65	C	Hupp and Abbeduto, 1988[d], 1992[d]
10	Minnesota	N, K	M	1 y	32	C	Hupp *et al.* 1992[d]
11	Germany	DD	M	2-7 y	35	C	Sarimski & Warndorf 1991[d]
12	Colorado	N	M	7m	26	C	Morrow & Camp, 1996 [d]

Notes: The raw MOMM or DMQ data from most of the studies were available to the authors and were used to do the composite analyses. Samples are listed in the approximate order in which they were collected. [a]N = Normally developing, mostly European-Americans; MI = Motor impaired; P = Premature; D = Down's syndrome; DD = Developmentally delayed; K = Korean. [b]M = Mother/parent; T = Teacher. [c]L = Longitudinal; C = Cross-sectional. [d]These citations refer to entries in the reference list which include DMQ results; the cited authors were often but not necessarily the principal investigators (see acknowledgements). [e]These citations refer to a publication of a study during which the DMQ was collected, but not reported in the publication.

Table 2

Characteristics of Studies/Samples Utilizing the Dimensions of Mastery Questionnaire Expanded Scales (DMQ-E)

Sample	Location	Types of Sample(s)[a]	Respondent[b]	Age	*N*	Design[c]	DMQ References[d, e, f]
DMQ-E: (1985-1995)							
1	Colorado	N	M	37 m	26	L	Bretherton and Ridgeway, 1986[f]
2	Colorado	N	M	18-24 m	76	L	Morgan *et al.* 1988[d]
3	Colorado	T	M	1-3 y	250	C	Morgan, Maslin-Cole *et al.* 1990[d]
4	Colorado	T	M	3-5 y	332	C	Morgan, Maslin-Cole *et al.* 1990[d]
5	Manitoba	N	T	3-5 y	49	C	Krenn, 1995 [d]
6	Manitoba	N	M	3-5 y	32	C	Krenn, 1995 [d]
7	Manitoba	N	F	3-5 y	30	C	Krenn, 1995 [d]
8	Colorado	T	M	1 y	34	C	Robinson 1987[f]
9	Colorado	N	M	3-5 y	39	L	Morgan *et al.* 1986[f]
10	Massachusetts	N	M	2-5 y	28	C	Hauser-Cram 1987[f]
11	Massachusetts	N	T	2-5 y	29	C	Hauser-Cram 1987[f]
12	Colorado	N	M	4 ½ y	26	L	Bretherton and Ridgeway, 1987[f]
13	Colorado	N	M	39 m	48	L	Biringen 1987[f]
14	Colorado	N	T	2-5 y	113	C	Morgan 1990 [f]
15	Colorado	N	M	2-5 y	87	C	Morgan 1990 [f]
16	New York	H	M	1-5 y	85	C	Busch-Rossnagel *et al.* 1993
17	Pittsburgh	N	M	15-35 m	57	C	Jennings 1992[e]
18	Massachusetts	DD, D, MI	M	1-2 y	105	C	Hauser-Cram 1992[f]
19	Massachusetts	DD, D, MI	M	3 y	169	L	Hauser-Cram 1992[f]
20	Hawaii	S	M, C	1-3 y	12	C	Stump 1992[f]
21	Colorado	HL				C	Pipp-Sigel et al. 2003

Notes: The raw DMQ data from most of the studies were available to the authors. Samples are listed in the approximate order in which the data were collected. [a]N = Normally developing, mostly European Americans; D = Down's syndrome; DD = Developmentally delayed; T = Twins; H =Hispanic, mostly low socio-economic status; HL = Hearing loss; S = Parent Substance Abuse. [b]M = Mother/parent; F = Father; T = Teacher; C= Care giver. [c]L = Longitudinal; C = Cross-sectional. [d]These citations refer to entries in the reference list which include DMQ results; the cited authors were often but not necessarily the principal investigators (see acknowledgements). [e]These citations refer to a publication of a study during which the DMQ was collected, but not reported in the publication. [f]These citations refer to data for which there is no publication or paper at this time; these data may have been collected specifically for inclusion in a DMQ manual. The year is when data collection was completed.

Table 3

Characteristics of Studies/Samples Utilizing the Dimensions of Mastery Questionnaire Expanded Social Scales (DMQ-ES) or Current DMQ (a.k.a DMQ-17)

Sample	Location	Types of sample(s)[a]	Respondent[b]	Age	*N*	Design[c]	DMQ References [d, e]
Current DMQ-ES – Preliminary Version (DMQ-ES 1995-96)							
1	Colorado & Wyoming	N	M	6 m–12 y	50	C	Morgan [e]
2	Pittsburgh	N, MD	M	17-27 m	53	C	Kelley & Jennings, 2003 [d]
3	New York	H	M	6-66 m	100	C	Knauf, et al., 1998 [d]
4	Denver	A	T	40-68 m	11	C	Harmon [e]
5	Liverpool, U.K.	D	M	12-86 m	40	C	Glenn [e]
6	Colorado	N	M, T	2-6 y	52	C	Morgan [e]
7	Colorado	N	M, T	6-9 y	30	C	Bartholomew, 1998 [d]
*8	Colorado	N	C	13-19 y	93	C	Aaragon [e]
Current DMQ (DMQ-17, 1997-present)							
*9	CO/WY/CA	N	M	5-24 m	66	C	Morgan [e]
*10	North Carolina	AA	M, T	12-18 m	54	C	Collins, 1998 [d]
*11	Israel	N	M	12 m	69	C	Auerbach [e]
*12	United Kingdom	N	M	4 y	36	C	Kim [e]
*13	Colorado	N	M, T	2-5 y	67	C	Morgan [e]
*14	New York	N	M	2-3.5 y	54	C	Dichter-Blancher, 1999 [d]
*15	Brisbane, AU	N	M, T	5 y	95	C	Gilmore et al., 2003 [d]
*16	Colorado	N	M	18 m–5 y	19	C	Morgan [e]
*17	Pennsylvania	N	T	4-7 y	55	C	Trieschock, 2000 [d]
*18	Colorado	N	M, T, C	7-10 y	64	C	Morgan & Bartholomew, 1998 [d]
*19	Colorado	N	M, C	5-16 y	16	C	Morgan [e]
20	Colorado	AD	M, C	7-14 y	8	C	Spaulding [e]
*21	Colorado	N	M, C	12-16 y	11	C	Morgan [e]
22	Hungary	N	C, M, T	4-12 y	900	L	Jozsa, 2003 [d]
23	Hungary	N	C, M, T	10-16 y	6000+	C	Jozsa, 2003 [d]
24	Montreal	CP	M, C	6-13y	74	C	Hall, et al., 2006 [d]
25	Denver	N, FP	M	6-20m	140	L	Backman, et al., 2006, 2007 [d]
26	Colorado	D	M	20-47m	8	C	Fidler [e]
27	Denver	MS	M	6-24m	50	L	Backman [e]
28	Denver	AU, DD	M	1-18y	125	C	Fritz, et al, 2008 [e]
29	China	N	M	2-4y	60	C	Wang, 2008 [d]
30	China	N	M	6-10y	80+	C	Wang, et al., 2009 [d]
31	Taiwan	DD	M	6-25m	78	C	Hwang [d]
32	Taiwan	N	M	8-10m	74	C	Huang [e]

Notes: The raw DMQ data from most of the studies were available to the authors. Samples are listed in the approximate order in which the data were collected. [a] A= Abused; AA = African American; AD = Attachment disorder; AU = Autistic; CP = Cerebral palsy; D = Down syndrome; DD = Developmental disability; FP = Family Psychosis; H =Hispanic, mostly low socio-economic status; MD = Mother depressed; MS = Maternal substance abuse; N = Typical/Normally developing, mostly European-Background; [b] M = Mother/parent; F = Father; T = Teacher/caregiver; C= child. [c] L = Longitudinal; C = Cross-sectional. [d] These citations refer to entries in the reference list which include DMQ results; [e] These citations refer to data for which there is no known publication or

paper at this time; these data may have been collected specifically for inclusion in the DMQ manual (see acknowledgements). * Included in the normative tables (5-36) in this manual.

Table 4

Common Mastery Motivation Items for All-Age versions of the Current DMQ

Object-Oriented (Cognitive) Persistence

9. If a task (or toy) is hard to do, stops trying after a short time.(R)
23. Works for along time trying to do something hard.

Gross Motor Persistence

3. Gives up easily if he or she cannot do physical skills well. (R)
12. Tries to do well in physical activities even when they are hard.

Social Persistence with Adults

8. Enjoys talking with adults, and tries to keep them interested.
22. Tries very hard to get adults to understand.

Social Persistence with Children

32. Tries to get included when other children are playing.
39. Avoids getting involved with other children. (R)

Mastery Pleasure

18. Gets excited when he or she figures something out.
41. Smiles when he or she makes something happen.

Negative Reactions to Failure

44. Gets upset if cannot do something after trying hard.

General Competence

6. Is a little slow understanding things. (R)
13. Has some difficulty doing things as well as other children his or her age. (R)
20. Does things that are hard for children his or her age.

Note. An R notes that this item is reverse-scored.

Table 5
Parent's Ratings of Infants

Means, Standard Deviations, and Internal Consistency of Parent's Ratings of Infants on the Scales of the Dimensions of Mastery Questionnaire (DMQ 17)
N = 289

Item	Scale and Items	Mean (*SD*)	Item Total Correlation	Unstand-ardized Alpha
Object-Oriented (Cognitive) Persistence				
1.	Repeats a new skill until he or she can do it well.	3.87 (0.95)	.43	
7.	Likes to try hard things instead of easy ones.	3.28 (1.06)	.44	
*9.	If a toy or task is hard to do, stops trying after a short time.	3.32 (0.98)	.44	
14.	Tries to do things, even if it takes a long time.	3.56 (0.99)	.59	
17.	Explores all parts of an object or toy with many parts…	3.70 (1.09)	.48	
23.	Works for a long time trying to do something hard.	3.34 (1.00)	.68	
24.	Tries hard to do cause and effect toys such as a busy box.	3.64 (1.07)	.42	
29.	Will work for a long time trying to get something open...	3.71 (1.11)	.58	
31.	Explores all new objects.	4.24 (0.87)	.36	
	Total Persistence	3.61 (0.64)	.31 [a]	.80
Gross Motor Persistence				
*3.	Gives up if he or she cannot do physical skills well.	3.73 (0.98)	.41	
12.	Tries to do well in physical activities even when they are hard.	3.73 (1.03)	.60	
16.	Likes physical activities and tries to do them well.	4.00 (0.87)	.72	
26.	Repeats skills related to moving around until he or she can do them well.	3.99 (0.91)	.70	
27.	Tries hard to throw or roll balls to do it well.	3.66 (1.23)	.48	
36.	Repeats motor skills in order to do them well.	4.01 (1.12)	.68	
40.	Tries to do well at physical activities.	3.93 (0.93)	.74	
45.	Gets involved trying to retrieve objects.	4.18 (0.97)	.39	
	Total Gross Motor	3.90 (0.69)	.42 [a]	.84
Social Persistence with Adults				
8.	Enjoys "talking" to adults, and tries to keep them interested.	4.00 (1.03)	.42	
15.	Tries hard to interest adults in playing with him or her.	3.88 (1.05)	.64	
19.	Likes to play actively with me or other adults.	4.35 (0.95)	.46	
22.	Tries very hard to get adults to understand him or her.	3.74 (1.16)	.62	
*33.	Gives up quickly when playing with adults.	4.00 (1.00)	.29	
37.	Enjoys playing peek-a-boo with adults.	4.52 (0.84)	.20	
	Total Social with Adults	4.08 (0.64)	.28 [a]	.71

Social Persistence with Children				
25.	Gets very involved looking at other children.	4.19 (1.00)	.45	
28.	Tries hard to touch other children when near them.	3.78 (1.16)	.53	
30.	Likes to "talk" to other children.	3.83 (1.06)	.69	
32.	Tries to get included when other children are playing.	3.54 (1.13)	.63	
35.	Tries to start play with other kids.	3.30 (1.20)	.66	
*39.	Avoids getting involved with other children.	4.52 (0.79)	.46	
	Total Social with Children	3.85 (0.80)	.41 [a]	.81
Mastery Pleasure				
2.	Smiles broadly after finishing something.	4.22 (1.00)	.64	
*11.	Does not smile after he or she makes something happen.	4.42 (0.96)	.53	
18.	Gets excited when he or she figures something out.	4.23 (0.87)	.57	
21.	While playing with a toy, he or she smiles or gets excited.	4.05 (0.97)	.55	
41.	Smiles when he or she makes something happen.	4.26 (0.91)	.74	
43.	Claps hands or shows excitement when he or she is successful.	3.82 (1.25)	.52	
	Total Mastery Pleasure	4.16(0.73)	.44 [a]	.82
Negative Reactions to Failure				
5.	Gives up easily if cannot do something.	2.19 (0.97)	.54	
34.	Looks down or away when tries but cannot do something.	1.95 (1.00)	.23	
38.	Gets frustrated when does not do well at something.	3.00 (1.14)	.47	
42.	Cries or screams after failing something tried hard to do.	2.63 (1.23)	.57	
44.	Gets upset if cannot do something after trying hard.	2.99 (1.15)	.54	
	Total Negative Reactions to Failure	2.55 (0.69)	.22 [a]	.61
	Total without Q5 and Q34	2.87 (0.98)	.53	.77
General Competence				
4.	Learns new things quickly.	3.86 (0.90)	.61	
*6.	Is a little slow understanding things.	4.20 (0.97)	.35	
10.	Is good at doing things.	3.98 (0.85)	.54	
*13.	Has some difficulty doing things as well as other children his or her age.	4.12 (1.05)	.41	
20.	Does things that are hard for children his or her age.	3.21 (1.20)	.40	
	Total Competence	3.87 (0.67)	.33[a]	.69

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 6
Teacher/Caregiver Ratings of Infants

Means, Standard Deviations, and Internal Consistency of Parent's Ratings of Infants on the Scales of the Dimensions of Mastery Questionnaire (DMQ 17)
N = 49

Item	Scale and Items	Mean (*SD*)	Item Total Correlation	Unstand-ardized Alpha
Object-Oriented (Cognitive) Persistence				
1.	Repeats a new skill until he or she can do it well.	3.10 (0.72)	.68	
7.	Likes to try hard things instead of easy ones.	2.83 (0.86)	.40	
*9.	If a toy or task is hard to do, stops trying after a short time.	3.21 (0.97)	.63	
14.	Tries to do things, even if it takes a long time.	3.23 (0.91)	.59	
17.	Explores all parts of an object or toy with many parts…	3.31 (0.85)	.68	
23.	Works for a long time trying to do something hard.	3.00 (0.83)	.69	
24.	Tries hard to do cause and effect toys such as a busy box.	3.42 (0.80)	.69	
29.	Will work for a long time trying to get something open...	3.31 (0.85)	.75	
31.	Explores all new objects.	3.63 (0.79)	.69	
	Total Persistence	3.23 (0.61)	.47 [a]	.89
Gross Motor Persistence				
*3.	Gives up if he or she cannot do physical skills well.	3.26 (0.87)	.40	
12.	Tries to do well in physical activities even when they are hard.	3.30 (0.88)	.47	
16.	Likes physical activities and tries to do them well.	3.40 (0.90)	.67	
26.	Repeats skills related to moving around until he or she can do them well.	3.43 (0.72)	.69	
27.	Tries hard to throw or roll balls to do it well.	3.55 (0.90)	.71	
36.	Repeats motor skills in order to do them well.	3.47 (0.86)	.67	
40.	Tries to do well at physical activities.	3.34 (0.76)	.66	
45.	Gets involved trying to retrieve objects.	3.43 (0.80)	.63	
	Total Gross Motor	3.40 (0.59)	.43 [a]	.86
Social Persistence with Adults				
8.	Enjoys "talking" to adults, and tries to keep them interested.	3.23 (1.05)	.60	
15.	Tries hard to interest adults in playing with him or her.	3.47 (0.96)	.59	
19.	Likes to play actively with me or other adults.	3.80 (0.96)	.74	
22.	Tries very hard to get adults to understand him or her.	3.49 (0.96)	.71	
*33.	Gives up quickly when playing with adults.	3.63 (0.93)	.49	
37.	Enjoys playing peek-a-boo with adults.	3.98 (0.75)	.61	
	Total Social with Adults	3.60 (0.70)	.47 [a]	.84

Social Persistence with Children				
25.	Gets very involved looking at other children.	3.46 (0.87)	.34	
28.	Tries hard to touch other children when near them.	3.52 (1.05)	.79	
30.	Likes to "talk" to other children.	3.31 (0.97)	.67	
32.	Tries to get included when other children are playing.	3.50 (0.97)	.69	
35.	Tries to start play with other kids.	3.44 (0.94)	.79	
*39.	Avoids getting involved with other children.	3.77 (1.12)	.64	
	Total Social with Children	3.50 (0.76)	.50 [a]	.86
Mastery Pleasure				
2.	Smiles broadly after finishing something.	3.82 (0.91)	.62	
*11.	Does not smile after he or she makes something happen.	4.12 (0.81)	.39	
18.	Gets excited when he or she figures something out.	3.76 (0.83)	.71	
21.	While playing with a toy, he or she smiles or gets excited.	3.74 (0.79)	.62	
41.	Smiles when he or she makes something happen.	3.88 (0.86)	.78	
43.	Claps hands or shows excitement when he or she is successful.	3.96 (0.84)	.65	
	Total Mastery Pleasure	3.88 (0.63)	.48 [a]	.85
Negative Reactions to Failure				
5.	Gives up easily if cannot do something.	2.63 (0.81)	.19	
34.	Looks down or away when tries but cannot do something.	2.57 (0.79)	.25	
38.	Gets frustrated when does not do well at something.	2.94 (0.80)	.48	
42.	Cries or screams after failing something tried hard to do.	2.69 (0.94)	.42	
44.	Gets upset if cannot do something after trying hard.	2.82 (0.78)	.38	
	Total Negative Reactions to Failure	2.73 (0.51)	.22 [a]	.58
	Total without Q5 and Q34	2.82 (0.65)	.40 [a]	.66
General Competence				
4.	Learns new things quickly.	3.27 (0.79)	.72	
*6.	Is a little slow understanding things.	3.59 (0.91)	.49	
10.	Is good at doing things.	3.45 (0.84)	.57	
*13.	Has some difficulty doing things as well as other children his or her age.	3.53 (0.96)	.42	
20.	Does things that are hard for children his or her age.	2.84 (1.01)	.53	
	Total Competence	3.34 (0.65)	.41 [a]	.77

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 7
Parent's Ratings of Preschoolers

Means, Standard Deviations, and Internal Consistency of Parent's Ratings of Preschool Children on the Scales of the Dimensions of Mastery Questionnaire (DMQ 17)
N = 244

Item	Scale and Items	Mean (*SD*)	Item Total Correlation	Unstand-ardized Alpha
Object-Oriented (Cognitive) Persistence				
1.	Repeats a new skill until he or she can do it well.	3.60 (0.95)	.59	
7.	Likes to try hard problems instead of easy ones.	3.24 (0.92)	.37	
*9.	If a toy or task is hard to do, stops trying after a short time.	3.25 (0.98)	.37	
14.	Tries to complete things, even if it takes a long time to finish.	3.43 (1.03)	.63	
17.	Explores all parts of an object or toy with many parts…	3.50 (1.01)	.42	
23.	Works for a long time trying to do something hard.	3.23 (0.93)	.76	
24.	Tries to do hard cause and effect toys…	3.52 (0.96)	.52	
29.	Will work for a long time trying to put something together.	3.58 (0.94)	.63	
31.	Tries to complete toys like puzzles even if they are hard.	3.75 (1.03)	.50	
	Total Persistence	3.50 (0.63)	.35 [a]	.83
Gross Motor Persistence				
*3.	Gives up easily if he or she cannot do physical skills well.	3.38 (1.02)	.33	
12.	Tries to do well in physical activities even when they are hard.	3.86 (0.96)	.60	
16.	Likes physical games and tries to do them very well.	3.82 (1.00)	.68	
26.	Repeats skills like jumping or running until he or she can do them well.	4.02 (0.88)	.67	
27.	Tries hard to throw balls so he or she can do it well.	3.98 (0.92)	.74	
36.	Repeats motor skills, such as climbing, to do them well.	4.01 (0.89)	.65	
40.	Tries to do well at athletic activities like exercising or "dancing."	4. 03 (0.96)	.60	
45.	Tries hard to get better at catching or retrieving things.	3.83 (0.91)	.61	
	Total Gross Motor	3.86 (0.67)	.44 [a]	.86
Social Persistence with Adults				
8.	Enjoys talking with adults, and tries to keep them interested.	4.03 (1.03)	.49	
15.	Tries hard to interest adults in playing with him or her.	3.94 (1.00)	.59	
19.	Likes to play actively with me or other adults.	4.35 (0.82)	.54	
22.	Tries hard to get adults to understand.	4.10 (1.00)	.39	
*33.	Gives up quickly when playing with adults.	4.00 (0.97)	.28	
37.	Enjoys playing make-believe with adults.	3.93 (1.09)	.36	
	Total Social with Adults	4.05 (0.63)	.29 [a]	.70

Social Persistence with Children				
25.	Gets very involved in pretend play with friends.	4.11 (1.02)	.31	
28.	Tries hard to make friends with other kids.	3.67 (1.09)	.61	
30.	Likes to "talk" with other children.	4.03 (1.00)	.74	
32.	Tries to get included when other children are playing.	3.83 (1.03)	.69	
35.	Tries to keep play going for a long time when around other kids.	3.80 (0.96)	.50	
*39.	Avoids getting involved with other children.	4.40 (0.89)	.56	
	Total Social with Children	3.98 (0.71)	.41 [a]	.81
Mastery Pleasure				
2.	Smiles broadly after finishing something.	4.35 (0.83)	.63	
*11.	Does not smile when he or she makes something happen.	4.34 (1.02)	.44	
18.	Gets excited when he or she figures something out.	4.38 (0.73)	.68	
21.	Is pleased when solves a hard problem.	4.26 (0.83)	.55	
41.	Smiles when he or she makes something happen.	4.43 (0.78)	.76	
43.	Shows excitement when he or she is successful.	4.50 (0.72)	.75	
	Total Mastery Pleasure	4.38 (0.61)	.49 [a]	.84
Negative Reactions to Failure				
5.	Gives up easily if cannot do something.	2.70 (1.08)	.37	
34.	Looks down or away when tries but cannot do something.	2.40 (1.08)	.64	
38.	Gets frustrated when does not do well at something.	2.57 (1.20)	.64	
42.	Cries or screams after failing something tried hard to do.	2.38 (1.08)	.64	
44.	Gets upset if cannot do something after trying hard.	3.56 (1.04)	.33	
	Total Negative Reactions to Failure	2.70 (0.78)	.37 [a]	.75
General Competence				
4.	Solves problem quickly.	3.44 (0.88)	.54	
*6.	Is a little slow understanding things.	4.04 (1.14)	.53	
10.	Is very good at doing things.	3.87 (0.85)	.55	
*13.	Has some difficulty doing things as well as other children his or her age.	3.85 (1.15)	.41	
20.	Does things that are hard for children his or her age.	3.60 (0.94)	.57	
	Total Competence	3.75 (0.71)	.39[a]	.75

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 8
Teacher's Ratings of Preschool Children

Means, Standard Deviations, and Internal Consistency of Teacher's Ratings of Preschool Children on the Scales of the Dimensions of Mastery Questionnaire (DMQ 17)
N = 117

Item	Scale and Items	Mean (*SD*)	Item Total Correlation	Unstand-ardized Alpha
Object-Oriented (Cognitive) Persistence				
1.	Repeats a new skill until he or she can do it well.	3.54 (1.06)	.79	
7.	Likes to try hard problems instead of easy ones.	3.21 (1.02)	.75	
*9.	If a toy or task is hard to do, stops trying after a short time.	3.56 (1.09)	.60	
14.	Tries to complete things, even if it takes a long time to finish.	3.52 (1.15)	.85	
17.	Explores all parts of an object or toy with many parts…	3.35 (1.00)	.71	
23.	Works for a long time trying to do something hard.	3.36 (1.11)	.87	
24.	Tries to do hard cause and effect toys…	3.26 (1.02)	.74	
29.	Will work for a long time trying to put something together.	3.47 (1.02)	.88	
31.	Tries to complete toys like puzzles even if they are hard.	3.38 (0.99)	.84	
	Total Persistence	3.41(0.86)	.65 [a]	.94
Gross Motor Persistence				
*3.	Gives up easily if he or she cannot do physical skills well.	3.68 (1.14)	.54	
12.	Tries to do well in physical activities even when they are hard.	3.51 (0.98)	.84	
16.	Likes physical games and tries to do them very well.	3.50 (0.95)	.80	
26.	Repeats skills like jumping or running until he or she can do them well.	3.47 (1.01)	.88	
27.	Tries hard to throw balls so he or she can do it well.	3.40 (0.97)	.84	
36.	Repeats motor skills such as climbing, to do them well.	3.39 (1.00)	.87	
40.	Tries to do well at athletic activities like exercising or "dancing."	3.48 (1.03)	.77	
45.	Tries hard to get better at catching or retrieving things.	3.34 (0.92)	.81	
	Total Gross Motor	3.47 (0.84)	.67[a]	.94
Social Persistence with Adults				
8.	Enjoys talking with adults, and tries to keep them interested.	3.68 (1.11)	.73	
15.	Tries hard to interest adults in playing with him or her.	3.21 (1.01)	.79	
19.	Likes to play actively with me or other adults.	3.45 (0.99)	.75	
22.	Tries hard to get adults to understand.	3.62 (1.05)	.68	
*33.	Gives up quickly when playing with adults.	3.87 (0.82)	.50	
37.	Enjoys playing make-believe with adults.	3.38 (1.14)	.70	
	Total Social with Adults	3.53 (0.82)	.55[a]	.88

Social Persistence with Children				
25.	Gets very involved in pretend play with friends.	3.76 (1.21)	.76	
28.	Tries hard to make friends with other kids.	3.62 (1.08)	.85	
30.	Likes to "talk" with other children.	3.91 (1.09)	.85	
32.	Tries to get included when other children are playing.	3.85 (1.03)	.81	
35.	Tries to keep play going for a long time when around other kids.	3.57 (1.15)	.86	
*39.	Avoids getting involved with other children.	4.33 (0.94)	.69	
	Total Social with Children	3.84 (.94)	.70 [a]	.93
Mastery Pleasure				
2.	Smiles broadly after finishing something.	4.02 (0.89)	.65	
*11.	Does not smile when he or she makes something happen.	4.22 (0.96)	.50	
18.	Gets excited when he or she figures something out.	3.99 (0.78)	.76	
21.	Is pleased when solves a hard problem.	3.86 (0.79)	.68	
41.	Smiles when he or she makes something happen.	4.04 (0.79)	.79	
43.	Shows excitement when he or she is successful.	4.02 (0.85)	.74	
	Total Mastery Pleasure	4.03 (0.66)	.55 [a]	.87
Negative Reactions to Failure				
5.	Gives up easily if cannot do something.	2.30 (1.16)	.56	
34.	Looks down or away when tries but cannot do something.	2.74 (1.09)	.69	
38.	Gets frustrated when does not do well at something.	2.68 (1.18)	.80	
42.	Cries or screams after failing something tried hard to do.	2.67 (1.09)	.80	
44.	Gets upset if cannot do something after trying hard.	2.84 (0.99)	.44	
	Total Negative Reactions to Failure	2.67 (0.87)	.52 [a]	.85
General Competence				
4.	Solves problem quickly.	3.38 (0.90)	.71	
*6.	Is a little slow understanding things.	3.93 (1.00)	.70	
10.	Is very good at doing things.	3.50 (1.00)	.83	
*13.	Has some difficulty doing things as well as other children his or her age.	3.74 (1.20)	.66	
20.	Does things that are hard for children his or her age.	3.13 (1.02)	.74	
	Total Competence	3.54 (0.85)	.61 [a]	.88

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 9
Parent's Ratings of School-Aged Children

Means, Standard Deviations, and Internal Consistency of Parent's Ratings of School Aged Children on the Scales of the Dimensions of Mastery Questionnaire (DMQ 17)
N = 83

Item	Scale and Item	Mean (*SD*)	Item Total Correlation	Unstand-ardized Alpha
Persistence at Cognitive Tasks				
1.	Repeats a new problem until he or she can do it well.	3.42 (0.90)	.65	
7.	Likes to try hard problems instead of easy ones.	3.30 (1.12)	.49	
*9.	If a task is hard to do, stops trying after a short time.	3.43 (1.03)	.61	
14.	Completes school work, even if it takes a long time to finish.	3.94 (1.07)	.53	
17.	Explores all ways to solve a problem with many parts…	3.24 (0.97)	.53	
23.	Works for a long time trying to do something hard.	3.41 (0.95)	.75	
24.	Tries to do well on cause and effect activities like video games...	4.20 (0.92)	.36	
29.	Will work for a long time trying to solve a problem for school.	3.48 (1.00)	.73	
31.	Tries to complete games like puzzles even if they are hard.	3.98 (0.91)	.54	
	Total Persistence	3.60 (0.68)	.41 [a]	.86
Gross Motor Persistence				
*3.	Gives up easily if he or she cannot do physical skills well.	3.45 (1.08)	.54	
12.	Tries to do well in physical activities even when they are hard.	3.84 (1.01)	.71	
16.	Likes sports and tries to do them very well.	3.85 (1.15)	.81	
26.	Repeats sports skills until he or she can do them very well.	3.54 (1.10)	.89	
27.	Tries hard to throw balls so he or she can do it well.	3.62 (1.20)	.83	
36.	Repeats motor skills, such as climbing or gymnastics, to do them well.	3.91 (0.96)	.61	
40.	Tries to do well at athletic games.	3.93 (1.07)	.82	
45.	Tries hard to get better at catching things.	3.71 (1.04)	.78	
	Total Gross Motor	3.73 (0.87)	.60 [a]	.92
Social Persistence with Adults				
8.	Enjoys talking with adults, and tries to keep them interested.	3.92 (1.05)	.69	
15.	Tries hard to interest adults in doing activities with him or her.	4.01 (1.02)	.72	
19.	Likes to play actively with me or other adults.	4.46 (0.86)	.61	
22.	Tries hard to get adults to understand things.	4.11 (0.94)	.73	
*33.	Gives up quickly when playing with adults.	4.16 (0.85)	.29	
37.	Enjoys discussing things with adults.	4.23 (0.94)	.67	
	Total Social with Adults	4.14 (0.71)	.46 [a]	.84

Social Persistence with Children				
25.	Gets very involved in pretend play with friends.	4.16 (1.15)	.41	
28.	Tries hard to make friends with other kids.	3.88 (1.00)	.67	
30.	Likes to talk with other kids and does it often.	4.31 (0.92)	.79	
32.	Tries to get included when other children are playing.	3.98 (0.95)	.65	
35.	Tries to keep play going for a long time when playing with kids.	4.07 (0.96)	.69	
*39.	Avoids getting involved with other children.	4.64 (0.71)	.58	
	Total Social with Children	4.17 (0.71)	.49 [a]	.84
Mastery Pleasure				
2.	Smiles broadly after finishing something.	4.33 (0.88)	.79	
*11.	Does not smile after he or she makes something happen.	4.45 (0.89)	.62	
18.	Gets excited when he or she figures something out.	4.63 (0.56)	.70	
21.	Is pleased when solves a hard problem.	4.64 (0.55)	.50	
41.	Smiles when he or she makes something happen.	4.57 (0.68)	.81	
43.	Gets excited when he or she is successful.	4.64 (0.58)	.64	
	Total Mastery Pleasure	4.54 (0.54)	.53 [a]	.86
Negative Reactions to Failure				
5.	Gives up easily if cannot do something.	2.55 (1.10)	.35	
34.	Looks down or away when tries but cannot do something.	2.33 (1.11)	.65	
38.	Gets frustrated when does not do well at something.	2.58 (1.22)	.71	
42.	Cries or screams after failing something tried hard to do.	2.43 (1.15)	.73	
44.	Gets upset if cannot do something after trying hard.	3.58 (1.10)	.38	
	Total Negative Reactions to Failure	2.70 (0.83)	.41 [a]	.78
General Competence				
4.	Solves problem quickly.	3.69 (0.90)	.59	
*6.	Is a little slow understanding things.	4.20 (1.02)	.61	
10.	Is very good at things..	4.13 (0.87)	.66	
*13.	Has some difficulty doing things as well as other children his or her age.	3.86 (1.20)	.46	
20.	Does things that are hard for children his or her age.	3.71 (0.93)	.58	
	Total Competence	3.92 (0.73)	.45 [a]	.79

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 10
Teacher's Ratings of School-Aged Children

Means, Standard Deviations, and Internal Consistency of Teacher's Ratings of School Aged Children on the Scales of the Dimensions of Mastery Questionnaire (DMQ 17?)
N = 43

Item	Scale and Items	Mean (*SD*)	Item Total Correlation	Unstand-ardized Alpha
Persistence at Cognitive Tasks				
1.	Repeats a new problem until he or she can do it well.	3.49 (0.93)	.67	
7.	Likes to try hard problems instead of easy ones.	3.35 (1.13)	.70	
*9.	If a task is hard to do, stops trying after a short time.	3.88 (1.05)	.65	
14.	Completes school work, even if it takes a long time to finish.	4.16 (0.95)	.66	
17.	Explores all ways to solve a problem with many parts…	3.12 (0.82)	.59	
23.	Works for a long time trying to do something hard.	3.60 (0.98)	.76	
24.	Tries to do well on cause and effect activities like video games…	3.16 (0.48)	.45	
29.	Will work for a long time trying to solve a problem for school.	3.72 (1.01)	.86	
31.	Tries to complete games like puzzles even if they are hard.	3.67 (0.87)	.78	
	Total Persistence	3.62 (0.71)	.51 [a]	.90
Gross Motor Persistence				
*3.	Gives up easily if he or she cannot do physical skills well.	3.49 (1.00)	.28	
12.	Tries to do well in physical activities even when they are hard.	3.62 (0.85)	.56	
16.	Likes sports and tries to do them very well.	3.49 (0.94)	.84	
26.	Repeats sports skills until can do them well.	3.23 (0.78)	.86	
27.	Tries hard to throw balls so he or she can do it well.	3.26 (0.79)	.81	
36.	Repeats motor skills, such as climbing or gymnastics, to do them well.	3.28 (0.83)	82	
40.	Tries to do well at athletic games.	3.64 (0.93)	.85	
45.	Tries hard to get better at catching things.	3.28 (0.69)	.77	
	Total Gross Motor	3.51 (0.68)	.57 [a]	.91
Social Persistence with Adults				
8.	Enjoys talking with adults, and tries to keep them interested.	3.93 (1.02)	.79	
15.	Tries hard to interest adults in doing activities with him or her.	3.34 (0.94)	.57	
19.	Likes to play actively with me or other adults.	3.45 (0.93)	.50	
22.	Tries hard to get adults to understand.	3.59 (0.92)	.77	
*33.	Gives up quickly when playing with adults.	3.89 (0.87)	.31	
37.	Enjoys discussing things with adults.	4.18 (0.92)	.77	
	Total Social with Adults	3.65 (0.75)	.46 [a]	.84

Social Persistence with Children				
25.	Gets very involved in pretend play with friends.	3.29 (0.78)	.23	
28.	Tries hard to make friends with other kids.	3.68 (1.01)	.71	
30.	Likes to talk with other children and does it often.	3.98 (0.94)	.67	
32.	Tries to get included when other children are playing.	3.71 (0.96)	.74	
35.	Tries to keep play going for a long time when playing with kids.	3.34 (0.91)	.65	
*39.	Avoids getting involved with other children.	4.46 (0.81)	.53	
	Total Social with Children	3.78 (0.63)	.42 [a]	.82
Mastery Pleasure				
2.	Smiles broadly after finishing something.	4.23 (0.88)	.78	
*11.	Does not smile after he or she makes something happen.	4.52 (0.71)	.70	
18.	Gets excited when he or she figures something out.	4.17 (0.78)	.77	
21.	Is pleased when solves a hard problem.	4.25 (0.69)	.45	
41.	Smiles when he or she makes something happen.	4.21 (0.80)	.82	
43.	Shows excitement when he or she is successful.	4.17 (0.81)	.77	
	Total Mastery Pleasure	4.27 (0.63)	.57 [a]	.89
Negative Reactions to Failure				
5.	Gives up easily if cannot do something.	2.14 (1.00)	.55	
34.	Looks down or away when tries but cannot do something.	2.20 (0.96)	.68	
38.	Gets frustrated when does not do well at something.	2.25 (1.11)	.80	
42.	Cries or screams after failing something tried hard to do.	2.37 (1.17)	.81	
44.	Gets upset if cannot do something after trying hard.	2.49 (1.12)	.76	
	Total Negative Reactions to Failure	2.28 (0.89)	.60 [a]	.88
General Competence				
4.	Solves problem quickly.	3.51 (0.95)	.78	
*6.	Is a little slow understanding things.	4.10 (1.08)	.73	
10.	Is very good at things.	3.86 (0.89)	.83	
*13.	Has some difficulty doing things as well as other children his or her age.	3.71 (1.17)	.71	
20.	Does things that are hard for children his or her age.	3.39 (1.12)	.78	
	Total Competence	3.68 (0.89)	.66 [a]	.90

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 11
School Aged Child Ratings of Self

Means, Standard Deviations, and Internal Consistency of Self Ratings of School Aged Children on the Scales of the Dimensions of Mastery Questionnaire (DMQ 17)
N = 71

Item	Scale and Items	Mean (*SD*)	Item Total Correlation	Unstand-ardized Alpha
Persistence at Cognitive Tasks				
1.	I repeat a new problem until I can do it well.	3.65 (1.16)	.32	
7.	I like to try hard problems instead of easy ones.	4.14 (1.16)	.46	
*9.	If a toy or a task is hard to do, I stop trying after a short time.	4.08 (1.09)	.21	
14.	I complete my school work, even if it takes a long time to finish.	4.51 (0.94)	.45	
17.	I explore all ways to solve a problem with a lot of parts…	3.93 (1.03)	.50	
23.	I work for a long time trying to do something hard.	4.08 (1.00)	.45	
24.	I try to do well on cause and effect activities like video games.	4.18 (1.26)	.10	
29.	I will work for a long time trying to solve a problem for school.	4.18 (1.00)	.53	
31.	I try to complete games like puzzles even if they are hard.	4.61 (0.78)	.42	
	Total Persistence	4.04 (0.69)	.22 [a]	.69
Gross Motor Persistence				
*3.	I give up if I cannot do physical skills well.	4.51 (0.91)	.63	
12.	I try to do well in physical activities even when they are hard…	4.59 (0.75)	.51	
16.	I like sports and try to do them very well.	4.54 (1.01)	.57	
26.	I repeat sports skills until I can do them very well.	4.32 (1.04)	.55	
27.	I try hard to throw balls so I can do it well.	4.32 (1.08)	.48	
36.	I repeat motor skills such as climbing and gymnastics, so I can do them well.	4.32 (1.00)	.33	
40.	I try to do well in athletic games.	4.56 (0.82)	.72	
45.	I try hard to get better at catching things.	4.51 (0.94)	.46	
	Total Gross Motor	4.36 (0.68)	.36 [a]	.81
Social Persistence with Adults				
8.	I enjoy talking with adults, and try to keep them interested.	3.13 (1.38)	.61	
15.	I try hard to interest adults in doing activities with me.	3.63 (1.28)	.50	
19.	I like to play actively with adults.	3.68 (1.33)	.64	
22.	I try hard to get adults to understand things.	3.97 (1.08)	.38	
*33.	I give up quickly when I play with adults.	4.10 (1.10)	-.04	
37.	I enjoy discussing things with adults.	3.31 (1.44)	.49	
	Total Social with Adults	3.60 (0.78)	.26 [a]	.70

Social Persistence with Children				
25.	I get very involved in pretend play with friends.	3.86 (1.31)	.30	
28.	I try hard to make friends with other kids.	4.41 (0.90)	.24	
30.	I like to talk with other kids and do it often.	4.27 (1.06)	.44	
32.	I try to get included when other children are playing.	4.13 (0.98)	.34	
35.	I try to keep play going for a long time when around other kids.	4.48 (0.73)	.41	
*39.	I avoid getting involved with other children.	4.24 (1.10)	.37	
	Total Social with Children	4.14 (0.68)	.21 [a]	.61
Mastery Pleasure				
2.	I smile broadly after finishing something.	3.87 (1.24)	.42	
*11.	I do not smile after I make something happen.	4.28 (1.10)	.46	
18.	I get excited when I figure something out.	4.18 (1.07)	.62	
21.	I am pleased or get excited when I solve a hard problem.	4.03 (1.15)	.39	
41.	I smile when I make something happen.	4.24 (1.05)	.47	
43.	I get excited when I am successful.	4.45 (0.81)	.52	
	Total Mastery Pleasure	4.15 (0.71)	.33 [a]	.74
Negative Reactions to Failure				
5.	I give up easily if I cannot do something.	1.79 (1.03)	.23	
34.	I look down or away when I try but cannot do something.	2.14 (1.29)	.39	
38.	I get upset when I don't do well on something.	2.73 (1.51)	.53	
42.	I avoid looking at others after failing something tried hard to do.	2.49 (1.35)	.41	
44.	I get upset if I cannot do something after trying hard.	2.74 (1.38)	.54	
	Total Negative Reactions to Failure	2.38 (0.86)	.28 [a]	.67
	Total without Q5	2.52 (0.99)	.35 [a]	.68
General Competence				
4.	I solve problems quickly.	3.90 (1.12)	.40	
*6.	I am a little slow understanding things.	3.52 (1.26)	.37	
10.	I am very good at things.	4.37 (0.78)	.30	
*13.	I have some difficulty doing things as well as other children my age.	3.13 (1.40)	.38	
20.	I do things that are hard for children my age.	3.86 (1.23)	.34	
	Total Competence	3.68 (0.82)	.23 [a]	.60

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 12
High School Aged Student's Ratings of Self

Means, Standard Deviations, and Internal Consistency of Self Ratings of High School Aged Students on the Scales of the Dimensions of Mastery Questionnaire (DMQ)
N = 98

Item	Scale and Items	Mean (*SD*)	Total Item Correlation	Unstand-ardized Alpha
Persistence at Cognitive Tasks				
1.	I work a new problem until I can do it well.	3.44 (0.96)	.45	
7.	I like to try hard problems instead of easy ones.	3.18 (1.08)	.43	
*9.	If a task is hard to do, I stop trying after a short time.	3.67 (1.03)	.14	
14.	I complete my school work, even if it takes a long time to finish.	3.42 (1.27)	.39	
17.	I explore all of the ways to solve a problem with lots of parts…	3.27 (1.00)	.55	
23.	I work for a long time trying to do something hard.	3.42 (0.95)	.67	
24.	I try to do well on cause and effect activities like computer games.	3.40 (1.21)	.18	
29.	I will work for a long time trying to solve a problem for school.	3.11 (1.06)	.60	
31.	I try to complete games like puzzles even if they are hard.	3.54 (1.20)	.48	
	Total Persistence	3.41 (0.63)	. [a]	.74
Gross Motor Persistence				
*3.	I give up easily if I cannot do physical skills well.	3.80 (1.12)	.35	
12.	I try to do well in physical activities even when they are hard…	4.21 (0.87)	.51	
16.	I like sports and try to do them very well.	3.89 (1.39)	.78	
26.	I repeat sports skills until I can do them well.	3.55 (1.41)	.83	
27.	I try hard to improve my throwing accuracy.	3.15 (1.37)	.66	
36.	I practice skills such as climbing and aerobics so I can do them well.	3.01 (1.38)	.40	
40.	I try to do well at athletic games.	3.97 (1.30)	.74	
45.	I try hard to get better at catching balls or Frisbees.	3.60 (1.26)	.58	
	Total Gross Motor	3.62 (0.89)	. [a]	.86
Social Persistence with Adults				
8.	I enjoy talking with adults, and try to keep them interested.	3.60 (1.16)	.60	
15.	I try hard to interest adults in my activities.	2.95 (1.13)	.59	
19.	I try to get adults to see my point of view.	3.00 (1.15)	.56	
22.	I try hard to get adults to understand things.	3.60 (1.12)	.53	
*33.	I give up quickly when adults do not understand me.	3.80 (1.16)	.15	
37.	I enjoy discussing things with adults.	3.36 (1.17)	.48	
	Total Social with Adults	3.39 (0.75)	. [a]	.74

Social Persistence with Children				
25.	I get very involved with friends in pretend or fantasy games.	2.16 (1.28)	.32	
28.	I try hard to make friends with other kids.	3.77 (1.07)	.58	
30.	I like to talk with other kids and do it often.	4.22 (0.96)	.43	
32.	I try to get included with other kids when they are doing something.	3.53 (1.15)	.55	
35.	I try to keep activities going when I am in a group with other kids.	3.33 (1.22)	.50	
*39.	I avoid getting involved with other kids.	4.19 (0.89)	.31	
	Total Social with Children	3.55 (0.69)	. [a]	.71
Mastery Pleasure				
2.	I am pleased with myself when I finish something hard.	3.55 (1.18)	.64	
*11.	I do not smile after I finally solve a problem.	3.87 (1.13)	.56	
18.	I get excited when I figure something out.	3.82 (1.03)	.60	
21.	I am pleased or get excited when I solve a hard problem.	3.91 (1.05)	.73	
41.	I smile when I make something happen.	3.82 (1.17)	.81	
43.	I get excited when I am successful.	3.96 (1.02)	.71	
	Total Mastery Pleasure	3.83 (0.85)	. [a]	.87
Negative Reactions to Failure				
5.	I give up easily if I cannot do something.	1.97 (1.05)	.07	
34.	I look down or away when I try but cannot do something.	2.49 (1.18)	.39	
38.	I get upset when I don't do well on something.	3.48 91.26)	.40	
42.	I avoid looking at others after failing something I tried hard to do.	2.71 (1.15)	.44	
44.	I get upset if cannot do something after trying hard.	3.51 (1.22)	.49	
	Total Negative Reactions to Failure	2.84 (0.73)	.22 [a]	.60
	Total without Q5	3.05 (0.85)	.34 [a]	.67
General Competence				
4.	I solve problems quickly.	3.39 (0.93)	.46	
*6.	I am a little slow in understanding things.	3.56 (1.21)	.32	
10.	I am very good at doing things.	3.90 (0.83)	.45	
*13.	I have some difficulty doing things as well as other kids my age.	3.53 (1.10)	.30	
20.	I do things that are hard for kids my age.	3.70 (0.98)	.39	
	Total Competence	3.60 (0.64)	. [a]	.62

*Reversed item (means are with the item reversed)

[a] Mean inter-item correlation

Table 13
Means and Standard Deviations Separately
for Infant Boys and Girls for each of the DMQ 17 Scales

DMQ Scales	Parent Ratings				Teacher Ratings			
	Boys (*N* =146)		Girls (*N*=140)		Boys (*N* =26)		Girls (*N* =23)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Object Persistence	3.60	.67	3.60	.60	3.27	.61	3.18	.61
Gross Motor Persistence	3.93	.68	3.85	.71	3.34	.57	3.47	.59
Social Persistence with Adults	4.05	.64	4.08	.64	3.48	.72	3.73	.66
Social Persistence with Children	3.82	.85	3.84	.73	3.55	.74	3.47	.79
Mastery Pleasure	4.19	.68	4.11	.79	3.84	.67	3.92	.59
Negative Reactions to Failure	2.84	.95	2.90	1.01	2.80	.63	2.83	.69
General Competence	3.82	.71	3.91	.62	3.30	.71	3.37	.59

Table 14
Means and Standard Deviations Separately
for Preschool Boys and Girls for each of the DMQ 17 Scales

DMQ Scales	Parent Ratings				Teacher Ratings			
	Boys (*N*=122)		Girls (*N* =125)		Boys (*N* =57)		Girls (*N* =60)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Object Persistence	3.45	.62	3.47	.64	3.22	.82	3.59	.87
Gross Motor Persistence	3.95	.65	3.77	.67	3.56	.84	3.39	.84
Social Persistence with Adults	4.03	.67	4.07	.59	3.32	.79	3.73	.81
Social Persistence with Children	3.89	.75	4.05	.67	3.65	.88	4.02	.96
Mastery Pleasure	4.38	.65	4.37	.58	3.89	.66	4.15	.64
Negative Reactions to Failure	2.70	.83	2.70	.72	2.66	.89	2.67	.86
General Competence	3.72	.71	3.79	.72	3.33	.74	3.73	.91

Table 15
Means and Standard Deviations Separately for Adult Ratings of School Age Boys and Girls for each of the DMQ 17 Scales

DMQ Scales	Parent Ratings				Teacher Ratings			
	Boys (*N* =43)		Girls (*N* =41)		Boys (*N* =22)		Girls (*N* =29)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Cognitive Persistence	3.52	.69	3.67	.67	3.45	.68	3.79	.70
Gross Motor Persistence	3.74	.92	3.72	.81	3.49	.72	3.54	.65
Social Persistence with Adults	4.07	.71	4.22	.70	3.60	.57	3.75	.87
Social Persistence with Children	3.98	.71	4.34	.70	3.50	.60	4.01	.57
Mastery Pleasure	4.47	.56	4.57	.57	4.12	.71	4.41	.52
Negative Reactions to Failure	2.62	.84	2.77	.82	2.37	.90	2.21	.89
General Competence	3.86	.74	3.99	.71	3.46	.90	3.90	.85

Table 16
Means and Standard Deviations Separately for Self-Ratings of Elementary and High School Aged Boys and Girls for each of the DMQ 17 Scales

DMQ Scales	Elementary School				High School			
	Boys (*N* =41)		Girls (*N* =39)		Boys (*N* =40)		Girls (*N* =55)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Cognitive Persistence	3.99	.68	4.09	.69	3.47	.66	3.37	.65
Gross Motor Persistence	4.25	.79	4.47	.53	3.86	.90	3.46	.89
Social Persistence with Adults	3.51	.81	3.68	.74	3.29	.83	3.43	.73
Social Persistence with Children	3.96	.71	4.33	.60	3.43	.74	3.63	.69
Mastery Pleasure	4.02	.77	4.29	.62	3.51	.85	4.02	.81
Negative Reactions to Failure	2.45	.79	2.30	.94	2.76	.69	2.85	.76
General Competence	3.70	.69	3.66	.94	3.77	.72	3.50	.58

Table 17
Age Group Comparisons of Parents' DMQ 17 Scale Scores

DMQ Scales	6-18 mos. N=168		19-36 mos. N=46		37-72 mos. N=200		6-8 yrs. N=44		9-12 yrs. N=36		12+ yrs. N=9*	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Object/Cognitive Persistence	3.57	.59	3.51	.55	3.45	.65	3.54	.67	3.73	.65	3.93	.67
Gross Motor Persistence	3.95	.64	3.97	.62	3.84	.68	3.74	.86	3.74	.84	3.17	1.10
Social Persistence with Adults	3.97	.66	4.12	.60	4.04	.63	4.28	.59	4.01	.82	3.91	.57
Social Persistence with Children	3.76	.78	3.75	.64	4.03	.72	4.30	.61	4.10	.77	3.78	.78
Mastery Pleasure	4.10	.78	4.45	.50	4.37	.64	4.62	.47	4.46	.62	3.91	.87
Negative Reactions to Failure	2.53	.74	2.36	.65	2.78	.78	2.70	.89	2.77	.77	2.56	1.11
General Competence	3.88	.63	4.00	.55	3.71	.73	3.94	.72	3.89	.76	4.20	.44

* Caution small sample

Table 18
Age Group Comparisons of Teachers' DMQ 17 Scale Scores

DMQ Scales	6-18 mos. N=49		19-36 mos. N=9*		37-72 mos. N=108		6-8 yrs. N=27		9-12 yrs. N=24	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Object/Cognitive Persistence	3.23	.61	3.59	.93	3.39	.86	3.51	.73	3.80	.66
Gross Motor Persistence	3.40	.58	3.54	.51	3.47	.86	3.54	.61	3.49	.76
Social Persistence with Adults	3.60	.70	3.39	.87	3.54	.82	3.62	.70	3.76	.82
Social Persistence with Children	3.51	.76	3.26	1.16	3.89	.91	3.86	.59	3.72	.69
Mastery Pleasure	3.88	.63	4.02	.40	4.03	.68	4.34	.66	4.22	.58
Negative Reactions to Failure	2.73	.51	2.27	.77	2.70	.87	2.41	.96	2.13	.80
General Competence	3.33	.65	3.40	1.03	3.55	.84	3.50	.88	3.96	.85

* Caution small sample

Table 19
Age Group Comparisons of DMQ 17 Child Self-Rating Scale Scores

DMQ Scales	6-8 yrs. N=39		9-12 yrs. N=38		12+ yrs. N=92	
	M	*SD*	*M*	*SD*	*M*	*SD*
Object/Cognitive Persistence	4.16	.57	3.94	.79	3.42	.66
Gross Motor Persistence	4.41	.69	4.33	.67	3.61	.92
Social Persistence with Adults	3.49	.87	3.72	.68	3.38	.79
Social Persistence with Children	4.12	.68	4.25	.59	3.53	.70
Mastery Pleasure	4.26	.68	4.04	.74	3.80	.85
Negative Reactions to Failure	2.39	1.03	2. 63	.93	2.82	.73
General Competence	3.63	.86	3.69	.78	3.63	.66

Table 20
Comparisons of Parents' and Teachers' DMQ 17 Scale Scores for Infants and Preschoolers

DMQ Scales	Infants				Preschoolers			
	Parent N=168		Teachers N=49		Parent N=248		Teachers N=117	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Object-Oriented Persistence	3.61	.64	3.23	.61	3.46	.63	3.41	.86
Gross Motor Persistence	3.90	.69	3.40	.58	3.86	.67	3.47	.84
Social Persistence with Adults	4.08	.64	3.60	.70	4.05	.63	3.53	.82
Social Persistence with Children	3.85	.80	3.51	.76	3.98	.71	3.84	.94
Mastery Pleasure	4.16	.73	3.88	.63	4.38	.61	4.03	.66
Negative Reactions to Failure	2.87	.98	2.73	.51	2.70	.78	2.67	.87
General Competence	3.87	.67	3.33	.65	3.75	.71	3.54	.85

Table 21
Comparisons of Parents', Teachers', and Self-Ratings of DMQ 17 Scale Scores For Elementary School-age Children

DMQ Scales	6–to–12 Year Old Children					
	Parents N=84		Teachers N=51		Child-Self N=80	
	M	*SD*	*M*	*SD*	*M*	*SD*
Persistence at Cognitive Tasks	3.60	.68	3.64	.71	4.04	.69
Gross Motor Persistence	3.73	.86	3.52	.67	4.36	.68
Social Persistence with Adults	4.14	.70	3.68	.75	3.59	.78
Social Persistence with Children	4.16	.73	3.80	.63	4.14	.68
Mastery Pleasure	4.52	.56	4.28	.62	4.15	.71
Negative Reactions to Failure	2.70	.83	2.28	.89	2.38	.86
General Competence	3.92	.72	3.71	.89	3.68	.82

Table 22
Internal Consistency of the Dimensions of Mastery Questionnaire (DMQ 17) Scales

DMQ Scales	Items in Scale	Parent Ratings			Child Ratings		Teacher Ratings		
		Infant	Pre School	Elem School	Elem School	High School	Infant	Pre School	Elem School
N =	-	177	248	84	80	98	49	118	51
Objective Persistence	9	.80	.83	.86	.69	.74	.89	.94	.90
Gross Motor Persistence	8	.84	.86	.92	.81	.86	.86	.94	.91
Social Persistence with Adults	6	.71	.70	.84	.70	.74	.84	.88	.84
Social Persistence with Children	6	.81	.81	.84	.61	.71	.86	.93	.82
Mastery Pleasure	6	.82	.84	.86	.74	.87	.85	.87	.89
Negative Reaction to Failure	5	.77	.75	.78	.68	.67	.66	.85	.88
General Competence	5	.69	.75	.79	.60	.62	.77	.88	.90

Table 23
Test-Retest Reliability for a Preschool Teacher (*N*=12)

DMQ Scales	Items in Scale	Teacher-Teacher
Objective Persistence	9	.77
Gross Motor Persistence	8	.86
Social Persistence with Adults	6	.70
Social Persistence with Children	6	.89
Mastery Pleasure	6	.85
Negative Reactions to Failure	5	.68
General Competence	5	.88

Table 24
Intercorrelations of the DMQ 17 Scales (*N*= 291 Parents of Infants)

	Gross Motor	Soc. Per. – Adult	Soc. Per. - Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.63	.28	.28	.42	-.02	.59
Gross Motor Persistence	-	.34	.35	.40	.01	.53
Social Persistence - Adults		-	.34	.38	.04	.32
Social Persistence - Children			-	.32	.03	.28
Mastery Pleasure				-	.05	.44
Negative Reactions - Failure					-	.03
General Competence						-

Table 25
Intercorrelations of the DMQ Scales (*N* = 49 Infant Caregivers)

	Gross Motor	Soc. Per. – Adult	Soc. Per. - Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.76	.39	.59	.41	-.30	.68
Gross Motor Persistence	-	.54	.68	.56	.16	-.18
Social Persistence - Adults		-	.55	.73	.09	-.02
Social Persistence - Children			-	.54	.20	.48
Mastery Pleasure				-	.09	.51
Negative Reactions - Failure					-	-.25
General Competence						-

Table 26
Intercorrelations of the DMQ Scales (*N* = 248 Parents of Preschoolers)

	Gross Motor	Soc. Per. – Adult	Soc. Per. - Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.43	.31	.24	.42	-.33	.58
Gross Motor Persistence	-	.36	.41	.50	-.29	.40
Social Persistence - Adults		-	.41	.53	-.13	.42
Social Persistence - Children			-	.45	-.13	.28
Mastery Pleasure				-	-.52	.46
Negative Reactions - Failure					-	-.57
General Competence						-

Table 27
Intercorrelations of the DMQ Scales (*N* = 117 Preschool Teachers)

	Gross Motor	Soc. Per. – Adult	Soc. Per. - Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.61	.67	.56	.51	-.66	.81
Gross Motor Persistence	-	.53	.48	.42	-.55	.56
Social Persistence - Adults		-	.62	.61	-.50	.63
Social Persistence - Children			-	.50	-.49	.61
Mastery Pleasure				-	-.37	.36
Negative Reactions - Failure					-	-.35
General Competence						-

Table 28
Intercorrelations of the DMQ 17 Scales (*N*= 64 Parents of 7- and 10-Year Olds)

	Gross Motor	Soc. Per. – Adult	Soc. Per. – Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.37	-.02	-.01	.09	-.54	.61
Gross Motor Persistence	-	.07	.08	.32	-.15	.19
Social Persistence - Adults		-	.31	.39	.06	.13
Social Persistence - Children			-	.42	-.18	.24
Mastery Pleasure				-	.03	.03
Negative Reactions - Failure					-	-.53
General Competence						-

Table 29
Intercorrelations of the DMQ 17 Scales (*N*= 64 7- and 10-Year Old Children)

	Gross Motor	Soc. Per. – Adult	Soc. Per. – Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.56	.35	.49	.28	-.40	.45
Gross Motor Persistence	-	.20	.49	.35	-.36	.23
Social Persistence - Adults		-	.59	.42	-.18	.06
Social Persistence - Children			-	.39	-.27	.07
Mastery Pleasure				-	-.19	-.02
General Competence					-	-.42
Negative Reactions - Failure						-

Table 30
Intercorrelations of the DMQ 17 Scales (*N*= 50 Teachers of 7- and 10-Year Olds)

	Gross Motor	Soc. Per. – Adult	Soc. Per. - Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.41	.31	.32	.27	-.67	.77
Gross Motor Persistence	-	.06	.55	.18	-.38	.21
Social Persistence - Adults		-	.44	.52	-.25	.40
Social Persistence - Children			-	.58	-.25	.32
Mastery Pleasure				-	-.15	.21
General Competence					-	-.56
Negative Reactions - Failure						-

Table 31
Intercorrelations of the DMQ 16 Scales (*N*= 106 Teens)

	Gross Motor	Soc. Per. – Adult	Soc. Per. – Child	M. Pleas.	Neg. to Fail.	Gen Comp
Object Persistence	.42	.48	.48	.40	.13	.40
Gross Motor Persistence	-	.28	.42	.32	.14	.06
Social Persistence - Adults		-	.44	.36	-.02	.27
Social Persistence - Children			-	.48	-.30	.15
Mastery Pleasure				-	-.26	.07
Negative Reactions - Failure					-	-.15
General Competence						-

Table 32
Correlations Between Raters on the Dimensions of Mastery (DMQ 17) Scales

		School-Aged Children			Preschool
DMQ Scales	Items in Scale	Child-Parent	Child-Teacher	Parent-Teacher	Teacher-Teacher
N =	-	71	50	50	10
Objective Persistence	9	.06	.14	.59*	.61*
Gross Motor Persistence	8	.41*	.39*	.30*	.29
Social Persistence with Adults	6	.19	.04	.20	.26
Social Persistence with Children	6	.35*	.28*	.42*	.18
Mastery Pleasure	6	.43*	.30*	.43*	.34
Negative Reactions to Failure	5	-.01	-.04	.38*	-.25
General Competence	5	.17	.10	.45*	.47

* $p < .05$

Table 33
Principal Components Analysis of the DMQ (Without Competence and Negative Reactions to Failure Items) (*N*= 254 Parents)

		Gross Motor Persist	Object Persistence	Mastery Pleasure	Social Persist Child	Social Persist Adults
Item	***Gross Motor Persistence***					
26	Repeats jumping or running skills to do well	.811				
16	Likes sports and tries to do well	.801				
40	Tries to do well at athletics	.773				
27	Tries hard to throw well	.765				
36	Repeats motor skills, such as climbing	.672				
45	Gets involved trying to catch objects	.671				
12	Tries hard to do well in physical play	.660				
3R	Gives up easily if can't master physical skills	-.473				
	Cognitive/Object Persistence					
23	Works a long time putting things together		.837			
14	Tries to complete things		.709			
29	Will work a long time to get something open		.695			
9R	Stops quickly if toy challenging		-.661			
7	Likes to try hard problems		.529			
17	Explores all parts of objects		.528			
31	Tries to finish puzzles even if hard		.524			
1	Repeats a new skill until does it well		.467			
24	Attempts to master cause & effect toys		.441			
	Mastery Pleasure					
41	Smiles when makes something happen			.788		
2	Smiles after finishing something			.736		
18	Gets excited when figures something out			.706		
21	Is pleased when solves a hard problem			.674		
43	Claps when succeeds			.660		
11R	Smiles only a little			-.569		
	Social Persistence w/children					
30	Likes pretend w/children				.842	
28	Tries to make friends w/children				.761	
32	Tries to get children to play				.757	
35	Tries to keep play w/child going				.736	
39R	Avoids games w/children				-.731	
25	Involved in pretend w/children				.456	
	Social Persistence – Adults					
15	Tries to get adults to continue					.829
22	Tries to get adults to play					.768
8	Enjoys talking with adults					.695
19	Likes to play with adults					.628
37	Enjoys pretend w/adults					.550
33R	Dislikes make believe w/adults					-.453

Note. Principal components analysis with Varimax rotation. Eigenvalues = 8.05, 3.57, 2.72, 2.41, and 1.85. These five factors account for 53.1% of the variance. Items marked with an R were reversed. Loadings less than .40 are omitted.

Table 34
Principal Components Analysis of the DMQ (Without Competence and Negative Reactions to Failure Items)
(*N*= 175 Child and Teen Self-Ratings)

		Cognitive Object Persistence	Social Persist Child	Gross Motor Persist	Mastery Pleasure	Social Persist Adults
Item	***Cognitive/Object Persistence***					
23	Works a long time	.758				
29	Will work a long time to solve school problem	.732				
17	Explores all ways to solve a problem	.652				
14	Tries to complete school work	.641				
7	Likes to try hard problems	.632				
31	Tries to complete puzzles even if hard	.508				
1	Repeats a new problem until does it well	.424				
	Social w/children + Some Gross Motor					
28	Tries hard to make friends		.694			
36	Repeats motor skills, such as climbing		.671#			
35	Tries to keep play w/kids going		.605			
45	Tries to get better at catching		.549#			
32	Tries to get included in play with kids		.508			
25	Involved in pretend w/children		.480			
	Gross Motor Persistence					
16	Likes sports and tries to do well			.736		
40	Tries to do well at athletics		.408	.703		
3R	Gives up easily if can't do physical skills well			-.689		
26	Repeats sports skills to do well			.635		
12	Tries hard to do well in physical activities			.626		
27	Tries hard to throw well		.468	.534		
9R	Stops quickly if tasks challenging			-.506#		
39R	Avoids getting involved w/children			-.406#		
	Mastery Pleasure					
2	Smiles after finishing something				.773	
41	Smiles when makes something happen				.730	
11	Smiles only a little				-.698	
43	Gets excited when succeeds	.415			.664	
18	Gets excited when figures something out				.606	
21	Is pleased when solves problem	.408			.600	
	Social Persistence – Adults					
8	Enjoys talking with adults					.749
37	Enjoys discussing things w/adults					.720
19	Likes to play with adults					.671
15	Tries to interest adults in joint activity					.554
22	Tries to get adults to understand					.522

Note. Principal components analysis with Varimax rotation. Eigenvalues = 9.75, 2.83, 2.23, 1.76, and 1.63. These five factors account for 52.0% of the variance. Items marked with an R were reversed. Loadings less than .40 are omitted. Number sign (#) indicates that item loads on incorrect factor.

Table 35
Correlations Among Measures of Total Mastery Motivation in 7-10 Year-Old Children

	Child DMQ Mastery Motivation	Parent DMQ Mastery Motivation	Teacher DMQ Mastery Motivation
Child Measures: (N = 64)			
D- Mastery Motivation (DMQ 17)	---	.30*	.19
H- Intrinsic Motivation	.45**	.21	.07
T- Total Mastery Motivation	.28*	.18	.03
T- Choice for Challenge	.26*	.11	.03
Parent Measures: (N = 64)			
D- Mastery Motivation (DMQ 17)	.30*	---	.39**
Teacher-Measures: (N = 50)			
D- Mastery Motivation (DMQ 17)	.19	.39**	---
HC- Intrinsic Motivation	-.19	-.03	.48**

Note. D = Dimensions of Mastery Questionnaire, H = Harter Self-Perception of Competence Scale, HC = Harter Intrinsic vs. Extrinsic Orientation in the Classroom, T = Task Scores or behavioral ratings

Table 36
6-12 Year-Old Children with Cerebral Palsy:
Comparisons of Parent and Child DMQ 17 Scale Scores
(Hall, Majnemer, et. al, 2006 data)

DMQ scales	Parent *N*=74		Child *N*=18		Parent-child *N*=17	
	M	*SD*	*M*	*SD*	*r*	*t*
Object/Cognitive Persistence	2.58	.87	3.49	.76	.57	-2.84*
Gross Motor Persistence	2.79	.85	3.72	.81	.32	-3.06*
Social Persistence with Adults	3.42	.87	3.62	.86	.64	.29
Social Persistence with Children	3.11	.86	3.69	.66	.58	-2.01
TOTAL PERSISTENCE	2.98	.67	3.63	.60	.67	-3.38*
Mastery Pleasure	3.84	.90	3.88	.57	.23	.51
Negative Reactions to Failure	2.89	.99	2.86	1.04	.52	.40
General Competence	2.60	.94	3.11	.82	.35	-.56

* $p < .05$

Table 37
Age Comparisons of 34 6-Month and 12-Month Old Infants
(Backman et al., 2006)

DMQ Scales	6 mos.		12 mos.		Reliability		Difference
	M	*SD*	*M*	*SD*	α at 6 [a]	$r_{6 \cdot 12}$	*t*
Object-Oriented Persistence	3.59	.57	4.04	.53	.82	.49	-4.78**
Gross Motor Persistence	3.54	.58	4.09	.63	.83	.50	-5.19**
Social Persistence with Adults	4.26	.57	4.17	.70	.74	.62	1.02
Social Persistence with Children	4.00	.71	4.13	.77	.81	.39	-.91
Mastery Pleasure	4.06	.58	4.47	.59	.65	.30	-3.39**
Negative Reaction to Failure	2.65	.65	2.51	.64	.65	.46	1.25
General Competence	3.79	.73	3.96	.70	.79	.38	-1.17

*$p < .05$, **$p < .01$
[a]$N = 86$

Table 38
Age Comparisons of 20 12-Month and 18-Month Old Infants
(Backman et al., 2006)

DMQ Scales	12 mos.		18 mos.		Reliability		Difference
	M	*SD*	*M*	*SD*	α at 12 [a]	$r_{12 \cdot 18}$	*t*
Object-Oriented Persistence	3.88	.62	3.71	.79	.81	.73	1.38
Gross Motor Persistence	4.14	.69	4.18	.67	.87	.69	-.31
Social Persistence with Adults	4.32	.68	4.18	.82	.78	.72	1.10
Social Persistence with Children	4.20	.90	4.04	.93	.90	.47	.74
Mastery Pleasure	4.50	.61	4.69	.49	.81	.87	-2.79*
Negative Reaction to Failure	2.43	.60	2.72	.82	.68	.77	-2.45*
General Competence	3.84	.78	4.00	.74	.79	.80	-1.47

*$p < .05$, **$p < .01$
[a]$N = 54$

Table 39
Age Comparisons of 27 6-Month and 18-Month Old Infants
(Backman et al., 2006)

DMQ Scales	6 mos.		18 mos.		Reliability		Difference
	M	*SD*	*M*	*SD*	α at 18 [a]	$r_{6\cdot18}$	*t*
Object-Oriented Persistence	3.48	.72	3.78	.65	.88	.33	-1.91
Gross Motor Persistence	3.38	.78	4.19	.67	.91	.50	-5.74**
Social Persistence with Adults	4.23	.62	4.19	.74	.86	.48	.32
Social Persistence with Children	3.86	.80	3.90	.99	.92	.67	-.26
Mastery Pleasure	4.13	.68	4.62	.58	.89	.58	-4.41**
Negative Reaction to Failure	2.56	.61	2.67	.77	.78	.41	-.80
General Competence	3.76	.82	3.96	.70	.68	.62	-1.54

*$p < .05$, **$p < .01$
[a]$N = 36$

Table 40
Mother's DMQ Ratings for 6- and 12- Month Prenatally Drug Exposed Infants (Backman & Harmon, unpublished data)

	6 mos. (*N* = 42)			12 mos. (*N* = 26)			*N* = 21	
DMQ scales	M	SD	α	M	SD	α	*r* (6&12)	*t*
Object Persistence	3.09	.66	.79	3.67	.49	.74	.24	-3.81**
Gross Motor Persistence	2.99	.80	.85	3.90	.44	.58	.20	-4.76**
Social Persistence with Adults	3.61	.77	.70	3.92	.62	.67	.42	.26
Social Persistence with Children	3.63	.81	.77	4.15	.62	.70	.51	-3.26**
Mastery Pleasure	3.75	.66	.67	4.46	.49	.64	.16	-3.46**
Negative Reaction to Failure (5 vars.)	2.54	.84	.71	2.62	.63	.60	.15	-.57
Negative Reaction to Failure (3 vars.)	2.63	1.18	.89	2.78	.86	.70	.11	-.60
Competence	3.32	.74	.75	3.79	.61	.71	.76	-3.60**

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

Table 41

Means, Standard Deviations (in parentheses), and Comparisons of Typically Developing Children With Five Groups of Children With Specific Disabilities (Fritz, et al., 2008)

	Typically Developing *n* = 42	Autism Spectrum *n* = 57	Down Syndrome *n* = 15	Other Genetic and Developmental Disabilities *n* = 28	*F*	Significant Group Difference
Object Persistence	3.38 (.75)	2.49 (.81)	2.4 (.67)	2.44 (.63)	14.49	T > D,A,O
Gross Motor Persistence	3.58 (.91)	2.38 (.94)	2.86 (.81)	2.8 (.9)	14.23	T > D,A,O
Social Persistence – Adults	4.01 (..75)	3.18 (.90)	3.57 (.83)	3.55 (.94)	7.54	T > A
Social Persistence – Children	4.15 (.69)	2.60 (1.13)	3.21 (1.12)	2.97 (1.11)	19.39	T > D,A,O
Mastery Pleasure	4.38 (.63)	3.56 (.95)	4.00 (.78)	3.99 (.92)	7.77	T > A
Negative Reaction to Failure	2.92 (.84)	3.39 (.83)	2.91 (.76)	3.05 (.90)	3.06	A > T
General Competence	3.81 (.71)	2.46 (.78)	1.76 (.68)	2.01 (.72)	50.02	T > D,A,O A>D,O

Table 42
Parents' DMQ 17 Scale Scores for Toddlers with Down Syndrome
(Fidler, unpublished data)

DMQ scales	1-4 Year Old DS Children	
	Parent *N*=8	
	M	*SD*
Object-Oriented Persistence	2.90	.61
Gross Motor Persistence	3.22	.54
Social Persistence with Adults	3.48	.65
Social Persistence with Children	3.15	.71
Mastery Pleasure	3.98	1.02
Negative Reactions to Failure	2.33	.69
Negative Reactions to Failure (3 variables)	2.21	.99
General Competence	2.75	.68