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MEASUREMENT OF INFANT TEMPERAMENT

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Howard Bonem

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ABSTRACT

MEASUREMENT OF INFANT TEMPERAMENT

By

Howard Bonem

Attempting to develop a satisfactory measure of infant temperament, the present study analyzed the Carey Infant Temperament Scale; concluding it is not a reliable measure. An alternate instrument, the Michigan Infant Temperament Scale (M.I.T.S.) was devised. The M.I.T.S. was administered to 160 mothers of infants 3 to 12 months old with subsequent retest and inter-observer subsamples. Eight of 17 true-false items achieved acceptable internal consistency. A ninth scale, Persistence and Attention Span, did not meet appropriate internal consistency criteria; the existence of more than one factor was offerred as an explanation. Generally, inter-scale correlations were low to moderate, while ratings of temporal stability and inter-observer agreement were mostly moderate. Analysis of the M.I.T.S. with a larger sample to cross-validate scale reliability and to examine construct and scale validity was suggested. It was concluded that the present instrument is quite adequate, but still in the experimental stages of development.

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INTRODUCTION

After many years of dormancy, the concept of temperament has begun to re-emerge into psychological and personality theory. The return of this idea stems from the nature-nuture controversy--a debate over the relative contributions of genetic-organismic versus environmental factors to the development of human personality. For many years, behavior was thought to be a result of body type, humoral influences, etc. The concept of temperament easily fit into these theoretical constructions; the idea of inherited temperally stable character traits and behavioral styles are natural extensions of genetic-somatic-physiological explanations (Sheldon, 1942). As the search for causal and explanatory concepts switched to environmental-parental factors, the concept of temperamant lost favor among personality theorists. Specific behaviors as well as general personality traits were thought to develop from interactions with significant stimuli such as parents, traumatic events, etc.; (Freud, 1948; Erikson, 1950; Sullivan, 1953). Inherited tendencies, if existent, were viewed as only weak influences which might be easily shaped or changed by environmental experiences. However, some theorists continued to acknowledge the basic influence of temperament (Shirley, 1933; Gessell and Ames, 1937). Freud (1969) while committing himself to exploring intrapsychic contributions to personality development accepted the existence of genetic and somatic influences making use of "constitutional" factors to help explain human behavior.

In the late 1950's temperament began to re-emerge with the review of Diamond (1957), the writings of Allport (1961), and the work of Thomas and his colleagues (1963). While Thomas' work is undoubtedly

heavily responsible for the renewal of interest in inherited styles of functioning, their data collection methods (in-depth individual interviews with knowledgeable informants) have made it difficult for other researchers to attempt to replicate and/or expand upon their basic findings; interview and observational techniques are quite expensive, time consuming, and inefficient ways of collecting data. Such methods limit the range of investigation to an established few who are capable of investing large quantities of time and money. Other approaches which are more amenable to mass data collection techniques such as Q-sorts and self-administered scales have attracted considerable attention (Buss and Plomin, 1975; Carey, 1970)--if for no other reason than the greater ease and less expense of the investigative procedures.

Given such developments, the construction of a reliable and valid infant temperament measuring instrument through which Thomas' efforts might be furthered has become imperative. While there have been a few attempts to accomplish this, an acceptable scale has yet to emerge. It is the aim of this study to attempt to build upon some of these earlier efforts and to hopefully construct a reliable and valid instrument capable of measuring infant temperament attributes.

THE CONCEPT OF TEMPERAMENT

Behavior may be viewed as consisting of two aspects: the content of the actual sequence and the how or way in which the instrumental act is carried out (Thomas, Chess, Birth, Hertzig, & Korn, 1963). It is this latter "how" which the term temperament attempts to describe. Bronson (1971) refers to this same characteristicaas the "style of life". Such descriptors as the "underlying constant pattern" (Thomas, Chess, Birch, & Hertzig, 1960) and the "formal characteristics" of behavior

(Thomas, Chess, & Birch, 1968) have also been used. Thus temperament, in its broadest and most unelaborated form, refers to a set of underlying formal characteristics which influence or determine behavioral style. These may include attributes such as speed of response, quality of mood, regularity, and sociability.

Bronson (1971), who prefers the term "orientation", sets two basic criteria by which the decision to include a personality attribute under the rubric of temperament is made: temporal persistence and centrality. Temporal persistence refers to whether a characteristic remains intact and unchanged over a period of time. Temperamental variables are expected to be relatively enduring over the span of development. Central variables are those which evidence generality, i.e., apply to a wide range of behaviors in many situations. If a personality attribute fulfills these criteria, it is then said to be a central orientation, one which is central to the organism's functioning and stable over time.

Buss and Plomin (1973) elaborate upon these criteria setting forth three rules a temperamental characteristic must meet: 1) "The personality disposition should have an adaptive value and therefore an evolutionary history. Any inherited tendency must have survived natural selection which means that it must have been useful in individual survival, breeding, and the rearing of the next generation..." Such attributes would be central to the organism's style of functioning. 2) "The personality dispositions should be present early in the life and show some stability during childhood..." Although the environment will naturally modify and shape the content of the individual's behavior, the underlying style should, with some modifications, persist. 3) "There should be evidence that the dispositions be inherited" (p. 513). If

temperamental characteristics are unlearned (Diamond, 1957), personality dispositions will at least partly be determined by genetic inheritance. This suggests that there should be some continuity in behavioral style from generation to generation. However considerable variation in temperament among family members and between generations may occur due to genetic variations as well as such non-genetic influences as birth complications, cerebral injury, etc.

These authors (Buss & Plomin, 1975) added two further criteria: 4) "If a personality disposition is inherited and shows at least moderate stability during childhood, it should be present in adults" (p. 10). 5) "If a tendency has sufficient adaptive value to be passed on through the genes, it is likely to be present not only in man but in animals close to man" (p. 11). These latter two criteria, while of theoretical interest, do not appear to be essential to the definition and classification of temperamental characteristics. While a tendency that has persisted through generations of humans is likely to be present in animals, an absence of this characteristic may be due to differences in animal and human development, genetic characteristics, etc. Attributes influential in human functioning may not have an adaptive value for animals (and vice versa). In addition, a tendency once common to both animal and human, may, through many generations of environmental influence, have changed to such an extent that it does not readily relate back to the original temperamental style.

The second addition--presence in adults--is somewhat redundant being an extension of criterion #2. Whether temperaments, which are present at birth, continue into adulthood or slowly evolve (or mutate) at some point in development is an important theoretical question

subject to empirical investigation. To make this issue a prerequisite for inclusion of a trait under the heading of temperament seems unnecessary and unproductive.

The above criteria provide a structure from which infant personality attributes may be divided into temperamental and learned components of behavior. Only those traits which are present at birth, relatively stable over time, serve (or once served) an adaptive purpose, and have an inherited or genetic component can be classified as temperamental characteristics. Whether they are present in animals and in human adults, although of theoretical importance, is not considered vital. Our concern is directed at infants. Adequate investigation of the continuity of temperamental traits from animal to human adult first requires establishment of the existence and nature of the characteristics in the human infant. Then, research into the effects of maturity and environmental interchange become more meaningful and relevant.

The following is a review of those studies investigating the existence and nature of infant temperaments. The individual attributes discussed are assumed to fulfill the criteria listed above. This is but an assumption and remains an important subject of investigation. However, examination of the research to date will indicate those variables most commonly viewed as falling under the rubric of temperament. It is these characteristics for which we hope to establish a measuring instrument, and thereby re-evaluate our initial assumptions.

THEORY AND RESEARCH

Temperamental characteristics have been a frequent component in personality theories ranging from Sheldon (1942) to Freud (1969). However, until the last twenty years, only a few empirical studies have

been attempted. Shirley (1933) conducted a longitudinal study of 0 to 24 month old infants. Using parental records, direct observation, and physical measurements, she concluded that there "exists coherent patterns of personality based on factors which are not "ironed-out" by training, are often familial and are formed by age three months. One variable, described as the tendency towards irritability or placidity, appeared relatively stable over the two year period. Gessell and Ames (1937) observed significant individual differences in human infants. Their results suggested the existence of a social responsiveness trait in infants.

The Factoral Approach

A major portion of current theory and research centers around three or four temperamental factor structures. In a massive survey of over 100 biographies, Heymans (1908) hypothesizes three temperamental factors consisting of activity, emotionality, and primary versus secondary function (the latter referring to the tendency to be influenced by impressions of the moment versus a greater influence by residue of past experiences). On a sample of 29 ninth and tenth grade adolescents, a factor analysis of forty personality traits by Levandovskii (1970) yields a similar set of factors: general activity, interpersonal relations, and self-control. Bronson (1971) also correlated a large number of personality variables (34) and found seven bipolar variables to account for most of the variance: reserved-expressive, somber-gay, shy-socially easy, reactive-phlegmatic, explosive-calm, resistive-compliant, and passive-domineering. The first three of the above traits are grouped into a dimension called Expressiveness-Reserve while the second three fall in the Placidity-Explosiveness dimension. A third

dimension consisting of the variable passive-domineering was also found. However, Bronson reports this to be easily subject to organismic and psychosocial influences. Bronson (1969) indicates that the first two dimensions are relatively independent, unmodifiable, and enduring. Examination of their behavioral correlates does reveal one area of commonality: activity level.

Using an experimental procedure beginning at two or three days of age, Birns, Barten, and Bridger (1969) found the following infant characteristics as present at birth, and stable over the first four month period: irritability, tension, and sensitivity. Activity level, although showing some variance over time, also appeared to be a consistent trait. The authors do not contend that the four traits are necessarily independent.

Finally, Buss, Plomin, and Willerman (1973) and Buss and Plomin (1975) who attempt an integrated theory of temperament, also arrive at four factors: emotionality, activity, sociability and impulsivity. While these four variables evidence factoral independence (low intercorrelations) the authors have questions regarding the heritability of the impulsivity trait. This stems from mixed data where the studies are evenly divided between support and non-support for this hypothesis.

Allowing for "poetic license" (the vageries in labelling factors derived from factor analysis) there appears to be some similarity in the factors yielded by these studies. Activity level consistently emerges as one of the three or four factors found by the above authors. This is in spite of the variations in the operationalizations of this variable and the different methods used to measure it. The fact that this factor emerged so clearly that "activity level" is almost

universally used as the descriptor provides additional support for the existence of this trait.

Described as involving the expenditure of energy, activity level may be evidenced as the amount, vigor, and vitality of a person's behavior. It is very much how the individual acts and may refer to the amplitude of a response as well as the tempo of a person's actions. As such it tends to be influential in almost all behavioral occurrences.

An attempt to find a second common factor involves more problems. Emotionality appears to be the most frequent descriptor used (Heymans, 1908; Buss and Plomin, 1975). This term does seem to include Bronson's (1971) Dimension 1 (reserved-expressive, somber-gay, and shy-socially easy) and may be similar to the sensitivity and tension characteristics of Birns et al. (1969).

Unlike activity level, a relatively unitary descriptor, emotionality is used to represent more than one stylistic component of behavior. Buss and Plomin (1975) define this trait in terms of arousal, reactivity, and excitability. They suggest significant intercorrelations between these three characteristics and treat them as aspects of a single factor. Similarly, Bronson (1971) and Levandovskii (1970) view this category as being composed of a number of interrelated variables. This is in contrast to Thomas, Chess and Birch (1968) who identify three similar attributes (intensity of reaction, quality of mood, and threshold of responsiveness) as separate formal categories of behavior.

Although the above characteristics evidence enough similarities to justify a grouping into common factors, this becomes a questionable procedure with the remaining traits. Heyman's (1908) primary versus secondary function, Buss and Plomin's (1975) impulsivity, Birns et al.'s

(1969) irritability, Levandovskii's (1970) self-control appear to have some commonalities. The atrributes of distractibility, attention span, and persistence (Thomas et al., 1963) also fall into this category. While no one term completely describes these characteristics, impulsivity (Buss & Plomin, 1975) does come the closest. As such, it is characterized as involving the dimension of behavioral expression-inhibition, as well as the variables of attention, persistence, response latencies, etc.

The Correlated Attribute Approach

A second approach to the investigation and conceptualization of temperament involves two major diversions from the factoral approach. These differences, which have both methodological as well as conceptual implications, center around: 1) How the temperamental categories are formed; and 2) Assumptions regarding the statistical independence of the temperamental traits. Whereas the factor studies started with either a derivation of factors from other personality variables or an a priori listing of hypothesized factors, the second approach begins with an empirical analysis of infant behavior in an effort to extract temperamental categories. These have been subject to further evaluation for "fit" into the formal definition of temperament traits (see pages 3 to 6).

Secondly, no assumptions are made regarding the independence of the attributes under study. The categories are seen as describing the direct expressions of temperament. That is, they apply to the style by which individual behaviors are effected as opposed to a more abstract generalized description of behavioral style. The attributes are likely to share significant interrelationships and thus not be factorally

independent. While this is theoretically and conceptually more cumbersome, it can be more readily operationalized. Whereas temperamental factors are seen as the "irreducable units" of temperament, this second approach primarily centers around the end product of these "units".

As the New York Longitudinal Study (N.Y.L.S., Thomas et al., 1963; Thomas et al., 1968) is the first in-depth empirical investigation of temperamental characteristics, examination of the "trait" approach to temperament shall begin with a fairly detailed description of their findings.

The authors' interest in temperament evolved from a concern that the organismic contribution to infant development had been ignored and neglected. Personality development is conceptualized as consisting of the "interaction of a baby endowed with characteristics of initial reactivity and an environmental complex including familial and extra-familial factors" (Thomas et al., 1963, p. ix). The authors set out to identify those characteristics of individuality present in the first months of life. The researchers then attempted to examine the degree of persistence of these traits and how they influenced individual psychological development.

Thomas et al. performed a content analysis of twenty-two parent-interview protocols which sampled the behavior of the informants' three month old infants. Nine categories were found that scored continuously and differentiated among individuals within each category. They were: activity level, regularity, approach or withdrawal, adaptibility, intensity of reaction, threshold of responsiveness, quality of mood, distractibility, and attention span and persistence. Utilizing a three point nominal scale, eighty infants were rated on the above categories.

Assessment was conducted by performing semi-structured open-ended interview (approximately 1½ hours in length) and then scoring the interview protocol on the nine attributes. Stability among the categories over the first two years varied from a low of 27.5% for activity to a high of 92.5% in mood. The authors state that these variations may be partly attributable to the developmental characteristics of the individual temperamental categories. Each attribute may have its own developmental sequence, with the process of individuation and differentiation occurring at different times and rates in the life of the infant.

Despite these variations, the temporal stability of Thomas et al.'s temperamental ratings are quite good. Eight of the nine categories show consistency over a two year period at the $p < .001$ level with only activity level evidencing any significant change. This only occurred in the last six months of the testing period. These results, while derived from one fairly homogeneous sample, strongly suggest the existence of a number of temperamental attributes.

Later research (Thomas et al., 1968) extended the investigation of these temperamental attributes. Factor analysis of the nine categories yielded a Factor A loading heavily in mood, intensity, approach/withdrawal, and adaptability. This factor was found to be relatively consistent over a five year time span. Scores on this factor were able to differentiate normal and "clinical" groups of subjects. Two other factoral trends also emerged from the analysis: a factor B is composed primarily of threshold, rhythmicity, intensity, and adaptability; and a factor C primarily loading in activity and intensity.

Attempts at replication of the N.Y.L.S. findings have been conducted

with mixed success. Graham, Rutter, and George (1973) rated a group of British children on seven categories of behavior: mood, intensity of emotional expression, activity, regularity, malleability, fastidiousness, and approach/withdrawal to new people. While some of these categories do differ from those of the N.Y.L.S. (malleability and fastidiousness) and fail to include three other attributes (distractibility, attention span and persistence, and threshold of response) their findings provide some support for the N.Y.L.S. categories. The fact that the categories could be reliably identified (inter-rater reliability = 80% for all except regularity, 64%) adds some validity to the hypothesized existence of the five attributes common to both studies.

Inconsistencies in the above study as well as in the N.Y.L.S. led Birns et al. (1969) to the following criticisms of the parent interview non-experimental approach: 1) Thomas et al. rated their subjects at age three months. Although the nine attributes found in these subjects are viewed as being constitutional in nature, the extent to which behavior may have been modified by environmental factors in the first three months of life is unknown. 2) The data used in the N.Y.L.S. came from maternal report. Given reliable maternal reporting, the ratings may be based upon different stimulus conditions, rater judgements, etc. Birns et al. avoid these difficulties by rating the infants shortly after birth. Subjects were exposed to a uniform set of stimuli in a neonatal laboratory setting. The stimulus battery included presentation of a moving picture, application of a cold disk to the infant's abdomen, and other such procedures. Behavior was rated by three or four observers who, along with the mother, were out of sight of the infant subject. This solves the second criticism by exposing all children to the same

experimental conditions with their behavior being rated by neutral judges.

The temperamental attributes being examined in this study were irritability, soothability, activity level, alertness, vigor of response, sensitivity, tension, and maturity level. At three or four months of age, social responsiveness was added to the behavior ratings. It was found that irritability, sensitivity, tension, and soothability showed consistency from birth to four months. This suggests that certain temperamental attributes are evident at birth and remain consistent through age four months. The similarity of the variables being measured provide support for the attributes used by the N.Y.L.S. The fact that some of the traits were not found to be consistent may be as much attributable to the rating procedures and the behaviors chosen to be rated as to actual instability of the behavior characteristics. Problems in the measurement of alertness and activity level, and in rating maturity level are suggested as important contributing factors to the negative findings. Such difficulties also highlight the problems of using a "controlled" laboratory setting to evaluate infant temperament. Naturalistic observation may not only be more practical but also more sensitive to expressions of temperamental characteristics.

A Proposed Integration

Discussion of temperament research has been conducted by dividing the studies into two groups. The first was composed of those, who through a variety of means, arrived at a three or four factor description of temperament. A major assumption was the relative independence of the factors from one another. The second group included studies which have attempted to investigate temperament through the

identification of attributes present at an early age and then traced these behaviors for possible consistencies over time. Intercorrelation of the attributes, rather than being avoided, was assumed. Emphasis was upon uncovering the various components of unlearned behavioral styles rather than a superstructure under which all the components might be organized. It is suggested that Thomas et al.'s (1968) nine temperamental attributes and Buss and Plomin's (1975) four temperamental factors may both be valid ways of categorizing temperament. Temperament may consist of three or four independent dimensions, each consisting of a number of related attributes. These attributes are capable of direct translation into operational definitions, and therefore into behavioral description. A dimension such as emotionality may be viewed as a grouping of attributes such as mood, intensity of response, etc. While the dimensional approach might be more useful for research and theoretical purposes, the attributes remains descriptive of an observable behavioral style and may be more suited for clinical usage.

Support for this conceptualization is provided by Thomas et al. (1968), Scholom (1975) and McDevitt and Fox (1976). Each conducted factor analyses of the nine N.Y.L.S. categories. The data for the former were based on ratings of parental interviews while the two latter studies utilized a questionnaire format (Carey, 1970). A listing of the factors yielded by these three studies is found in Table 1. Examination of the distribution of the attributes among the factors suggests a basic similarity. Certain attributes are consistently associated with each other. Given different measuring and scoring techniques, as well as differing subject samples (subjects were evaluated over a ten year period in three different parts of the United States) the achievement of

Table 1

Summary of Factor Analyses of the N.Y.L.S. Categories

Thomas et al.	Scholom	McDevitt & Fox
Factor A	Mood	Sociability
Mood	Mood	Distractibility
Intensity	Threshold	Adaptability
Approach/Withdrawal	Approach/Withdrawal	Approach/Withdrawal
Adaptability	Adaptability	
Factor B	Consistency	Rhythmicity
Rhythmicity	Regularity	Rhythmicity
Threshold	Persistence	
Factor C	Energy	Vigor
Activity	Activity	Activity
Distractibility	Distractibility	Intensity
Persistence	Intensity	
		Irritability
		Threshold
		Mood

partial replicability can be interpreted as reflecting some basic commonalities.

When Scholom's three factors are compared with those previously discussed (see pp. 7-10) commonalities do emerge.[1] Certainly the authors' choice of terms: Energy-Activity, Impulsivity-Consistency, and (to a lesser extent) Mood-Emotionality and Sociobility suggest the description of a similar group of traits. In fact, the formal definitions of the terms that are supplied by the authors are also quite close. Buss and Plomin (1975, p. 30) describe "activity level" as dealing with energy output while Scholom (1975) also refers to "energy" as the level or amount of expended energy. The same relationship is seen in "impulsivity", defined as dealing with the dimension of control as well as such variables as decision times, boredom, and persistence. It appears to have some relationship to "consistency" which is described in terms of constant versus cyclic styles of behavior. Scholom's "mood" seems to encompass both "emotionality" and "sociability". It is defined as approach, adaptivility, mood, and threshold and can be compared to arousal, reactivity, and excitability (Emotionality) and preference for and response to other people (Sociobility).

Examination of the content of the Buss and Plomin factors indicates an omission of some of the N.Y.L.S. attributes and a duplication of others. This author rated the items of the EASI-I Temperament Survey

[1]Scholom's results are probably the most complete and clear of the three studies; the second and third factors of Thomas et al. were not clearly delineated while McDevitt and Fox failed to include the attribute "persistence" in their analysis. For purpose of the discussion, Scholom's data will be considered representative of all three studies.

(Buss & Plomin, 1975) according to the N.Y.L.S. rating system.[2] Each item was scored for the attribute category it most resembled. Table 2 lists the result of this procedure. It can be seen that, with some overlap, seven of the nine N.Y.L.S. attributes score on the EASI-I categories. The two omissions are regularity and adaptability. While there are definite differences in the two systems, it does appear that the Buss and Plomin factors are readily translatable into the N.Y.L.S. nine attribute categories. This is added support for the proportion regarding the complementarity of these two descriptive systems.

Finally, if one assumes that these two approaches are both describing a similar if not the same phenomenon, i.e., styles of behavior that are adaptive, inherited, and stable over time, then the differences may be no more than different ways of cutting the same pie. There is the more persimonious though somewhat behaviorally removed factorial organization versus a collection of attributes that are by definition directly related to observable behavior but possessing unknown interrelationships.

In the final analysis, the question of the validity of either theory y or their comparability becomes a basic issue of the utility or power of the approach for the particular research or clinical question under study. While factors may prove to be conceptually more useful, the N.Y.L.S. attributes yield more direct and detailed information regarding

[2]Although the Buss and Plomin factors are used for illustrative purposes, these comments also apply to the other factoral approaches to temperament. The EASI-I was chosen due to the clarity and comprehensiveness of the Buss and Plomin system.

Table 2

The Conceptual Relationship of the
Buss & Plomin Factors (EASI-I)
and the N.Y.L.S. Attributes

Buss & Plomin Factors	N.Y.L.S. Dimensions
Emotionality	Threshold Mood (Intensity)*
Sociability	Approach/Withdrawal Mood
Activity	Activity Level Intensity
Impulsivity	Attention Span & Persistence Threshold (Distractibility)

*An attribute listed within parentheses scored marginally on the factor.

subject behavior. As such they may be of greater clinical utility.

Measurement of Temperament

Most efforts to investigate temperament have utilized a semi-structured interview to gather information (Thomas et al., 1963; Thomas et al., 1968; Graham et al., 1973). Birns et al. (1969) go to the other extreme, attempting to evaluate temperamental characteristics in the laboratory. Although this method allows the experimenter to control the stimulus conditions and directly observe the behavioral responses, such a procedure typically does not easily translate to field research or clinical applications because the number of situations observed is limited.

The interview approach is best typified by the N.Y.L.S. Thomas et al. gathered data from semi-structured interviews with mothers of the infants under study. The one to two hour interviews were tape recorded and later replayed for scoring. This procedure is not only quite time consuming but also raises questions regarding reliability of the interviewer, data source (mother), and the rater. Thomas et al. found high inter-judge and intra-scorer agreement (90%). While the authors appeared to achieve a satisfactory level of reliability, whether this could be maintained across studies by different investigators and raters is questionable. The extensive training and years of experience available to Thomas and his colleagues is not available to others. This potential lack of consistency in scoring interview data may be partially responsible for some of the inconsistencies found in the N.Y.L.S. and other similar studies (Graham et al., 1973; Birns et al., 1969).

Infants cannot be directly interviewed. Thus a knowledgeable observer must serve as a reporter of these subjects' behavior. Although

a mother (or father) may be a most knowledgeable source, the accuracy and consistency of their reporting remains questionable. There is no way to completely objectify parental ratings. However, the N.Y.L.S. procedure involving open-ended unstructured interviews appears to add extra "noise" to a potentially unreliable technique. Although the interviewer(s) may be highly trained, it is likely that there will be variations in the rapport established with the maternal reporter, the types and amount of stimulus questions needed to elicit the required information, and the clarity of the reporter's responses. A highly structured interview schedule or questionnaire will not increase the parent's objectivity in relation to their infant's behavior. However, it is a more consistent stimulus, relatively free of interviewer differences, clarity of parental responses, etc. A questionnaire would also be much shorter and more readily available for clinical applications.

Attempts to gather temperamental data through a questionnaire have been made by Buss and Plomin (1975), Carey (1970), Scarr and Salapatek (1970), Peterson, Anderson, and Cain (1976) and Feiring and Taylor (1976). Buss and Plomin devised a 20 item scale (EASI-I) containing four subscales, each measuring one of the four temperaments under study (emotionality, impulsivity, sociability, and activity). A revision of the scale (EASI-II) resulted in a scale of high reliability (.83) and factoral consistency.

In the N.Y.L.S., reliance was exclusively placed upon direct observation and parental report. Carey (1970), feeling the need for a quicker, standardized method of obtaining temperamental information of infants in his pediatric practice, devised the Carey Infant Temperament Scale (C.I.T.S.). Seventy statements were constructed, each allowing

three possible responses. The individual items generally described situation-specific behaviors. For example, item 42: (a) If bath by different person or in different place, readily accepts change first or second time, (b) May or may not accept, (c) Objects consistently to such changes. The parent/rater is requested to only report actual infant responses and may omit an item if the three behavioral choices are not suitable. Seventy-six ratings are derived from the seventy items (six items are scored on two scales) yielding nine average reactivity scores (see Appendix I for questionnaire and detailed scoring procedures).

Statistical evaluation of the C.I.T.S. has not been extensive. The individual items appear to have good face validity--the items seem to directly relate to the scale under which they have been included. However, Carey (1976) reports internal consistency for a 200 subject test administration of only 0.76 for the total instrument. McDevitt and Fox (1976) report alpha coefficients for internal consistency on the individual scales as ranging from .27 to .72 with a median of .47. Their findings raise questions concerning the interrelationships of the particular C.I.T.S. items. There may be some extraneous factor(s) which account for the high total test alpha. The appropriateness and placement of the individual items definitely needs further evaluation. Additionally, the low number of items per scale may also contribute to the low reliability scores.

Temporal stability of the questionnaire uas initially evaluated by conducting a retesting of four subjects, two weeks after their initial rating (Carey, 1970). "...there was agreement without exception in the five major categories for these three who were all between 6 and 7

months of age" (p. 191). A later test-retest reliability evaluation of 20 subjects sested two weeks apart yielded a range from 0.72 for persistence to 0.94 for rhythmicity. A correlation of 0.84 is reported for the whole instrument (Carey, 1976). This second reliability test allows some confidence in the instrument's short-term temporal stability. However, the range of scores for the individual scales is somewhat large and further examination of these scales should be conducted.

The existence of temperamental attributes remains a subject of empirical investigation. As such, the issue of the external validity of a temperament scale becomes one of hypothesis testing as well as scale validation. To date, validation efforts have centered around various comparisons of the C.I.T.S. with results obtained by the N.Y.L.S. This includes comparing the mean scores of 101 subjects (age 3½ to 8½ months) with normative data collected by Thomas et al. (1968). Although there are some differences in the scores, for example, activity yielded a mean score of 0.52 $\pm$ 0.32 on the C.I.T.S. versus 0.80 in the N.Y.L.S. interview (Period I). Carey (1970) suggests that these differences are of no practical importance.

When the same criteria for the determination of "difficult children" is used, both techniques yield similar percentages of this category (10% on the C.I.T.S. and 8% for the N.Y.L.S.). Finally, Carey reports that four infants were evaluated both by the C.I.T.S. and by an interviewer familiar with the N.Y.L.S. interview technique. For three of the four children, there was a high level of agreement.

A number of similar measurement scales have also been constructed. Fairing and Taylor (1976) revised the C.I.T.S. using only five attribute categories (rhythmicity, adaptability, approach, intensity, and mood),

eliminating the six dual-scored items, and moving to a three-point numeric scoring system (0, 1, 2). Two forms of this instrument were used in their study of infant and secondary parent influence upon maternal behavior: Form I for infants age 2-0 to 7-30 months and Form II for children 8-0 to 19-30 months. No validity or reliability data are reported.

Similarly, Scarr and Salapatek (1970) also constructed a nine scale temperament survey. They report internal consistency among the nine scales as having median correlations ranging from .15 to .55 and a median item-total correlation of .25.

A second approach is reported by Pederson, Anderson, and Cain, Jr. (1976). Reviewing the above scales, the authors suggest that these instruments all seem vulnerable to response sets such as social desirability or acquiescent tendencies. In an attempt at further refinement of the N.Y.L.S. approach, the authors designed the Perception of Baby Temperament Scale (PBT). This instrument has nine attribute scales with each scale containing six items. Administration is in a Q-sort format with statements appearing on 3x5 cards. Items are sorted into three response categories: "Very much like my baby"; Sometimes or occasionally like my baby"; and "Not at all like my baby". Data on 26 families resulted in corrected split-half reliabilities for five of the scales (activity, rhythmicity, adaptability, approach, and mood) ranging from .54 to .69. Reliabilities of the other four scales are not reported. Partly attributing the moderateness of the scores to the low number of items per scale, the authors view the PBT as a potentially useful instrument. However, the use of the Q-sort format may prove to be a hindrance in large-scale applications.

Given the above data regarding reliability and stability, the results of studies employing the C.I.T.S. must be viewed with considerable caution (Carey, 1970, 1972a, 1972b; Carey, Lipton, & Myers, 1974; Carey, 1974; Scholom, 1975). Although Carey (1976) concludes that the C.I.T.S. is "more-or-less accurate," the scale contains many weaknesses. Test-retest reliability is within acceptable limits. However, a determination of both the accuracy and construct validity of the measuring instrument has yet to be clearly established. The C.I.T.S. seems to tap similar material as that investigated by the N.Y.L.S., but it is unknown whether difference in the results of these two studies is due to variations in the subject sample or measurement discrepancies. Additional problems involve: 1) scoring of some items on two attribute scales; and 2) the use of a three point scoring system. Scholom (1975) suggests that a utilization of a 5 or 7 point scale might eliminate some scoring bias through greater differentiation of response options, and allow assessment of the relative magnitude of the effects of the variables by providing more within item variability. On the other hand, there is the question of whether a three, five, or seven point scaling is appropriate. The respondent's ability to accurately judge "variability" in their infant's behavior remains an untested assumption. A change to a different format that avoids such difficult discriminations may be more appropriate.

Statement of the Problem

Further investigation of infant temperament depends upon accurate statistically valid systems of measurement. While the N.Y.L.S. has gained wide popularity in both the literature and in clinical practice, there is no established method for measuring the nine attribute

constructs. Though the C.I.T.S. has the potential for filling this gap, at present it is of questionable utility. The purpose of the present study is to evaluate, revise, and statistically validate the C.I.T.S. with goal of establishing an instrument capable of being used for researching the temperament concepts of Thomas et al. (1963). The present study is divided into two parts: 1) an evaluation of the present version of the C.I.T.S. Special attention will be given to the issues of item relatedness and item variability, length of the individual attribute scales, and the sensitivity of the three point response scale 2) revisions will be made in response to any weakness uncovered during the above evaluation. The revised instrument will then be tested for temporal stability, internal consistency and external validity.

METHOD

Study 1

Subjects

The sample for Study 1 consisted of 180 parents of children, two to three years of age, who have been enrolled in day care centers and nursery schools in and around the Michigan State University community. The families were largely university affiliated (students and faculty), and from a fairly high socio-economic background. All were subjects in Scholom's (1975) study of infant and parent temperament as possible predictors of child adjustment. Initially, 395 families were contacted for participation in the study, and 292 agreed to fill out the forms with 180 ultimately returning completed questionnaires.

Instruments

Study I utilized the Carey Infant Temperament Scale, a 70 item forced choice instrument which yields scores on the nine temperament categories found in the New York Longitudinal Study (see Appendix A).

The following is the description of the categories used to assess infant temperament as given by Scholom (1975):

1. Activity Level

The motor component present in a given child's functioning, and the diurnal proportion of active and inactive periods, plus protocol data on mobility during bathing, eating, playing, dressing, and handling, as well as information concerning the sleep-wake cycle, reaching, crawling, and walking were used in scoring the category.

2. Regularity

The predictability and/or the unpredictability in time of any function was analyzed in relation to the sleep-wake cycle, hunger,

feeding pattern, and elimination schedule.

3. Approach or withdrawal

The nature of the response to a new stimulus, be it a new food, new toy, or new person, provided information relevant to this category.

4. Adaptability

Responses to new or altered situations. One is not concerned with the nature of the initial responses, but with the frequency with which they were successfully modified in desired directions.

5. Intensity of reaction

The energy level of response, irrespective of its quality or direction.

6. Threshold of responsiveness

The intensity level of stimulation that was necessary to evoke a discernible response, irrespective of the specific form that the response might take or the sensory modality affected. The behaviors utilized were those concerning reactions to sensory stimuli, environmental objects, and social contact.

7. Quality of mood

The amount of pleasant, joyful, and friendly behavior, as contrasted with unpleasant, crying, and unfriendly behavior.

8. Distractibility

The effectiveness of extraneous environmental stimuli in interfering with, or in altering the direction of, the ongoing behavior.

9. Attention span and persistence

These two categories are related. Attention span is the length of time a particular activity is pursued by the child. Persistence refers to the continuation of an activity direction (pp. 28-30).

The number of items in the C.I.T.S. categories varies from five to sixteen. The items are scored on a three point scale with one being assigned to responses reflecting positive, high intensity, or adaptive behaviors and a three to negative, low intensity or unadaptive behaviors.

Procedures

A sample of completed C.I.T.S. forms was obtained by utilizing all the available data of Scholom (1975). He first contacted parents by letter. This was followed by a phone call to make more personalized contact and to answer questions about the study. The C.I.T.S. was then mailed to these parents as part of an infant and parent temperament battery.

Parents were instructed to answer the C.I.T.S. based on their child as an infant (2 to 3 years in the past). Although this procedure runs the risk of faulty parent memory and halo effects, given that the primary goal of this study was to examine the internal consistency of the scale (and not to either examine issues of validity or to obtain temperament ratings for hypothesis testing) the effects of this data collection method should, if anything, inflate both internal consistencies and inter-scale correlations.

Study II

Subjects

The Study II sample consisted of 160 three to twelve month old infants and their parents. Names of potential subjects were obtained by sampling at regular intervals from birth certificates of children in the specified age range that are on public file at the local county clerk's office. Names and addresses of the parents were recorded. Each mother

was then contacted by phone, given a brief description of the study, and asked if she would be willing to participate.

Initially, 205 mothers were contacted. Of this number, 192 agreed to participate, and 160 ultimately returned data (83.3%). The sample contained 51% female and 49% male infants. The average age of the infants was 224 days or 34.5 weeks (SD=85.9 days).

Other relevant characteristics of the sample include: average birth weight of the infant, $\bar{X}$=7.42 pounds (SD=1.66); number of children in the family, $\bar{X}$=1.80 (SD=1.12); percentage of children receiving care by a day care center, 1.2; by an "alternate caretaker", 30.4. The data suggest that children in the sample had a normal birth weight, are on the average the younger of two children, do not attend day care centers, but may be taken care of for more than three hours per week by someone other than an immediate family member.

Instruments

The Michigan Infant Temperament Scale (M.I.T.S.) was developed to assess infant temperament as part of Study II. The M.I.T.S. is a revised and elaborated version of the C.I.T.S. To achieve an acceptable level of internal consistency on the attribute scales, new items were written and old ones revised so that each scale consisted of 25 to 30 true-false items with the complete instrument totaling 243 items. The change to a true-false format (as opposed to a three point response scale) was made in an attempt to provide test respondents with as simple and unambiguous response options as possible. The items were balanced to control for possible acquiescence sets. The items were also randomly ordered to avoid possible response sets arising from the organization of sample infant behaviors around content areas (e.g., bathing, feeding, dressing).

Procedures

The M.I.T.S. was administered in a way similar to Scholom's procedure. Contacted by phone, the study was briefly explained to the parents and answers to any questions were provided. Feedback on questionnaire results was offered to interested parents. Once consent was obtained, the M.I.T.S. was mailed; the parent was asked to complete it and accompanying demographic information sheets. Protocols were returned in prestamped envelopes (see Appendix B for sample protocols and instruction forms).

Two subsamples of the above parents were recontacted shortly before either a two (n_1=60) or eight (n_2=60) week interlude. They were again asked to complete the M.I.T.S. The parents were reassured that this retesting was to be "...for us to see whether your infant's behavior has changed in any way, or remained pretty much the same..." Forms were sent to the mothers three to five days before the two or eight week period lapsed (see Appendix C for parent letter and instructions). Twenty-seven parents in the two week retest sample (45%) and 32 mothers in the eight week group (53.3%) returned completed questionnaires. The actual interval between administrations for the two and eight week retest groups was 21.6 days and 59.3 days, respectively.

In order to begin an assessment of inter-observer agreement and scale validity, two additional subsamples were also obtained: 1) 100 fathers were sent the M.I.T.S. They were told that although they were under no obligation to participate in the study, it was important to see how fathers judge their infant's behavior as well as mothers (Appendix D contains the father's letter and instructions); 2) Twenty-six parents of children who either attended a day care facility or were cared for by

someone other than an immediate family member were asked for permission to administer the M.I.T.S. to a teacher or caretaker familiar with their infant. These individuals were sent a descriptive letter, instructions, a copy of the parent's permission form (page 2 of Supplementary Form), a consent form for themselves and the M.I.T.S. (see Appendix E). Given parent permission, they were offerred feedback on the scores obtained on the instrument. Thirty-seven fathers returned completed questionnaires (37%) as did 14 caretakers (53.8%).

RESULTS AND DISCUSSION

Study I

Reliability characteristics of the nine C.I.T.S. attribute scales are given in Table 3. The coefficient alphas, a measure of item relatedness (internal consistency) range from .30 to .68. There is a great range in the corrected item-total correlations. This indicates that the internal consistency of the C.I.T.S. attribute scales is not high. Variables other than those targeted for measurement are likely to have had a large influence upon scale scores. On the basis of this analysis, it appears that the Carey instrument does not reliably measure the nine temperamental variables.

Study II - Sample Characteristics

Study II involved the administration of the M.I.T.S. to a sample of the local population. The study employed a sampling of subjects by regular intervals of age and had a quite adequate, but less than complete return rate. Before analyzing the individual attribute scales, it is important to first look at the characteristics of the final sample and to assess its representativeness in terms of the mid-Michigan population of infants and their families.

The social class distribution of the sample is presented in Table 4. Social class was calculated using Hollingshead's Two Factor Index of Social Position (1957). The data indicate that all social classes are represented with social classes 2, 3, and 4 representing 75.7% of the sample. Thus the sample appears to be fairly heterogenous with respect to social class.

Even so, an analysis of the sample's representativeness in comparison with the Tri-County population (Ingham, Eaton, and Clinton

Table 3

Carey Infant Temperament Scale Attribute Scales (N=180)

Attribute	Number of Items	Coefficient Alpha	Range of Item-total Correlation
Activity	5	.468	.03 - .24
Rhythmicity	5	.557	.03 - .38
Approach	6	.425	.06 - .22
Adaptability	12	.606	.08 - .28
Threshold	7	.464	.08 - .34
Intensity	12	.611	.09 - .27
Mood	16	.681	.07 - .35
Distractability	7	.301	.05 - .11
Persistence	5	.467	.07 - .21

Table 4

Social Class Distribution of Study II Sample and Two and Eight-Week Subsamples

Social Class	Main Sample (N=160)	Two Week[a] (N=27)	Eight Week[b] (N=32)
I (Major professionals, executives)	16.6%	18.5%	18.8%
II (Lesser professionals, upper level business personnel)	17.8%	18.5%	9.4%
III (Minor professionals, clerical)	31.8%	25.9%	34.4%
IV (Semiskilled and skilled laborers)	26.1%	33.3%	28.1%
V (Unskilled laborers)	7.6%	3.7%	9.1%

[a]Comparison of main sample and two week retest sample on SES; $\chi^2=3.55$ df=4; N.S.

[b]Comparison of main sample and eight week retest sample on SES; $\chi^2=1.33$ df=4; N.S.

counties) is desirable. A rough comparison of the sample and population in terms of educational level can be made by combining the educational categories of Hollingshead (1957) into four groups: less than four years of high school, high school completion, some college, and four or more years of college. Table 5 lists percentages for each grouping in the M.I.T.S. sample and that of fathers under the age of 35 who live in the Tri-County area (U.S. Bureau of the Census, 1972). It can be seen that the percentage of fathers with at least some college education is much higher than that of the Tri-County's father population. Thus the fathers of the infants in our study are likely to be more highly educated than the average father in the Tri-County area. This is probably due to the greater likelihood of families with higher levels of education to be interested in and willing to fill out a questionnaire on infant behavior.

Analysis of the two test-retest subsamples for representativeness of the main sample in terms of SES level was also done (see Table 4). These data indicate that the distribution of SES in the fathers of the two and eight-week groups resembles the main sample. Thus the retest groups may be considered as representative of the overall Study II sampling, allowing the use of these samples for analysis of temporal stability.

Reliability

Each of the nine attribute scales of the M.I.T.S. were subjected to reliability analysis. This involved the calculation of coefficient alpha and item-total correlations, and a factor analysis of any scale that appeared to be heterogeneous with respect to infant behavior and temperament. For example, persistence, which had a low coefficient

Table 5

Educational Levels of Tri-County Fathers and M.I.T.S. Fathers

Level of education	Percent in population[a]	Percent in sample[b]
Less than four years of High School	21.3	5.1
High School	42.1	24.2
Some College	17.3	27.38
Four or more years of College	19.2	43.3

Note. Population figures are for husband-wife families in which the head of the household is under 35 years of age and children are less than 6 years of age.

a_n = 18,336

b_n = 157

χ^2 = 87.2 df=3; $p < .001$

alpha (.290) and many items with low item-total correlations, was subjected to a factor analysis.

The goal of these analyses was to construct, from the pool of items, nine internally consistent scales of infant temperament. A coefficient alpha of .70 was set as the minimum acceptable value for internal consistency. This level was chosen so that measurement error would be kept at or below the 50 percent level. In addition, a .20 corrected item-total correlation was considered the minimal level acceptable for inclusion in a final form of a scale.[3] After the scales were revised to meet these criteria, the number of items per attribute scale was set at 17. This number was chosen as the lowest number of items that could fulfill the following criteria: 1) achieve a minimum .70 coefficient alpha for each scale; 2) result in a revised instrument that could be completed in 30 minutes or less; and 3) that would sample a complete range of behaviors that are theoretically influenced by the proposed temperamental variables.

It proved possible to meet the above criteria for eight of the nine temperamental attribute scales. Coefficient alpha for these eight scales ranged from .705 to .859 with a median of .737. Table 6 contains the coefficient alpha and the range of corrected item-total correlations for these eight scales. The ninth scale, persistence, was deleted due to lack of item homogeneity.

Inter-correlations of the eight adequate attribute scales was done

[3]This criterion was at times relaxed in order to insure complete sampling of an attribute. No more than two items per scale were permitted to be below the .20 level.

Table 6

Scale Homogeneity and Item Heterogeneity of M.I.T.S. Attribute Scales

Scale	Coefficient Alpha	Corrected Item-total Correlations[a]	
		Range	Median r
Activity	.80	.21 - .60	.41
Adaptability	.74	.18 - .49	.31
Intensity	.71	.12 - .42	.33
Threshold	.78	.14 - .63	.26
Mood	.72	.08 - .42	.33
Approach	.74	.15 - .50	.33
Distractibility	.71	.11 - .44	.31
Rhythmicity	.86	.23 - .68	.47

[a]Correlations listed are ranges for the 17 items of each scale. For some scales, although the range extends down to below .15, the central tendency of the correlations is much higher with only one or two items being low.

in order to assess the degree of interrelationship of these scales (see Table 7). Correlations ranged from .61 to -.33. With the exception of the Adaptability-Approach and Adaptability-Mood and Mood-Approach relationship, the intercorrelations fall within the $\pm$ .35 range. This may be interpreted as indicating low to moderate degrees of relationship between most of the attribute scales and suggests that the scales do measure substantially different domains and are not redundant. Yet, they are clearly not orthogonal. This follows the assumption of Thomas, Chess and Birch (1968) that it is "highly probable that they (the nine temperamental characteristics) are correlated with each other to some degree" (p. 62). The three higher correlations indicate some overlapping of content. Whether this is due to invalid items or reflects a true relationship between the hypothesized attributes requires further research.

The persistence scale did not approach the .70 coefficient alpha criterion. In order to assess why this level of internal consistency could not be reached, a factor analysis employing a varimax rotation was conducted (see Appendix 4 for a complete listing of the items and their loadings on the factors, as well as coefficient alpha and the range of item-total correlations for each factor). This yielded six factors with eigenvalues greater than 1.0 (see Table 8).

The inability to attain an acceptable level of internal consistency as well as the presence of six factors clearly indicates a lack of homogeneity within the scale. This could be accounted for in two ways: 1) Persistence is a unitary construct that was not properly measured by the M.I.T.S. persistence scale; or 2) The attribute of persistence-attention span as proposed by Thomas and his colleagues is multi-dimensional. The first explanation is difficult to test out. The

Table 7

Intercorrelations of Eight Attribute Scales of the Michigan Infant Temperament Scale (N=160)

	Adaptability	Activity	Intensity	Threshold	Mood	Approach	Distractibility	Rhythmicity
Adaptability								
Activity	-.1223							
Intensity	-.3314**	.3275**						
Threshold	.2278**	-.1355**	-.2846**					
Mood	.4993**	-.0132	-.2783**	.0221				
Approach	.6116**	-.1619*	-.2346**	.1239	.3806**			
Distractibility	.0199	.2548**	.0840	-.1185	.0805	.0844		
Rhythmicity	.0209	.0860	.1577*	-.0677	.1662*	-.0185	-.0175	

*$p < .05$

**$p < .01$

Table 8

Factor Analysis of Persistence and Attention Span Scale[a]

Factor	Proportion of Variance	Cumulative Percentage	Factor Label	Number of Items Defining Factor
1	22.4	22.4	seeking of objects	7
2	15.7	38.1	stillness	5
3	11.4	49.4	tendency to cry	3
4	11.0	60.5	cooperativeness	4
5	10.1	70.5	perseverance	3
6	8.4	78.9	flexibility with foods	2

Note. Factor analysis based on 30 items; N=160.

[a]See Appendix F for items and their loadings on each Persistence Scale factor and coefficient alpha and item-total correlations for each factor.

persistence scale had face validity. Given its large number of items (30) it should have been possible to extract the true persistence items and construct an internally consistent scale.

It should be noted that other investigators have also encountered difficulties with this scale. Their data suggest that our second explanation is more appropriate. Thomas et al. (1968) reported some difficulty with the temporal stability of their persistence scale. Bailey (1977) also reported some problems in assessing persistence with the Carey scale. Wilson and Lewis (1977) concluded that it was not a viable concept due to poor definition and lack of stability over time.

The second possibility is that persistence, as an attribute, is composed of more than one temperamental component. This explanation may account for the poor temporal stability that has been reported. Rothbart, Furby, Kelly, and Hamilton (1977) endorse this idea, proposing two persistence attributes: undisturbed persistence which refers to visual or behavioral interaction with an object where no sudden change in stimulation occurs, and obstacle persistence which describes an infant's seeking of an object after it has been prohibited or moved out of the way. The latter construct seems to describe the items in Factor 1 of the M.I.T.S. persistence scale, "seeking of objects". Undisturbed persistence may correspond to Factor 2 ("stillness"). The remaining four factors of the persistence scale may be situational or behavior-specific variables, or error factors. Statistical criteria for factor analytic solutions suggests the latter explanation is most appropriate. That is, employing Cattell's (1966) scree test, only factors 1 and 2 would be considered "non-trivial factors" as the next four factors, when plotted, compose a relatively straight scree line.

Insofar as there is any meaningful variance, the following explanations make some sense: Examination of the items that make up factors 3-6 suggests some additional similarities with two other attributes proposed by Rothbart et al.: soothability and anger/frustration. Factor 3 ("tendency to cry") can be described as persistence or duration of affect. This may correspond to Rothbart's soothability which also seems to describe the length and modifiability of an infant's feelings. The last three factors while each seeming to tap specific temperamental aspects ("cooperativeness," "perseverance," and "flexibiltty with foods" may in fact interrelate along the dimension of anger/frustration. Many of the items in Factors 4, 5, and 6 deal with reactions to frustrations in feeding or motor activity. Therefore, these factors may group together as a second order factor tapping anger/frustration.

The weight of the evidence questions the viability of the persistence-attention span attribute as suggested by Thomas et al. It is proposed that this construct might be better explained and measured by breaking it up into its component parts. While Thomas et al. describe a single construct as tapping selectivity of attention, frustration tolerance, and persistence, Rothbart et al. suggest two separate attributes. It may also be possible to explain this behavioral style employing combinations of the other eight attributes, i.e., the interaction of activity level and distractibility may describe selectivity of attention and persistence while mood might account for frustration tolerance.

The original M.I.T.S. persistence scale is not an internally consistent measure and thus will be excluded from the revised form of the M.I.T.S. However, it is clear that further investigation is necessary to explore the behavioral characteristics commonly termed persistence.

In summary, drawing from the 243 item pool of the M.I.T.S., a revised instrument, (M.I.T.S.-2) containing 136 items tapping eight temperamental attributes (17 items each) was constructed. Each attribute scale achieved at least a minimum level of internal consistency (.705 coefficient alpha) and was judged by the author to contain a broad range of infant behaviors and situations. It should be noted that further samplings involving analysis of internal consistency is necessary to establish the accuracy of the above reliability levels.

Temporal Stability

Test-retest correlations for the "two-week" and "eight-week" intervals using the revised 136 item measure are listed in Table 9. The two-week retest correlations range from r= .62 to .89 indicating a high degree of short-term stability in the attribute scores. The eight-week retest yielded more moderate relationships with the correlations ranging from .41 to .64. This indicates that there is some change in scale scores over an eight week period; yet a basic consistency in subjects' scores does appear to exist.

The levels of the above retest correlations approximate those obtained by Rothbart, Furby, Kelly, and Hamilton (1977), Birns, Barten and Bridger (1969), and Thomas, Chess, Birch, Hertzig, and Korn (1963). The loss in some predictability over an eight week period may in fact be due to instability in the actual behavior characteristics. However, it seems likely that the changes in scores on the M.I.T.S. are affected by other factors such as the large number of items which may have induced fatigue of inattention in the respondents. Also, some of the items may be too age-specific to gain repeated endorsement during the period of rapid behavior change characterized by infancy.

Table 9

Two and Eight-Week Test-Retest Correlations of M.I.T.S. Attribute Scales

Scale	Two-week group (N=27)	Eight-week group (N=32)
Threshold	.886	.644
Activity	.871	.518
Approach	.870	.499
Rhythmicity	.789	.438
Adaptability	.759	.405
Intensity	.687	.520
Distractibility	.657	.467
Mood	.619	.430

Note: All correlations are significant at $p=.02$ or better.

Validity

Inter-rater comparisons were employed as crude indicators of construct and scale validity. In Chapter I, it was stated that temperament "refers to a set of underlying formal characteristics which influences or determine behavioral style" (p. 3). This definition implies a consistency in style across situations and with different people. Thus it would be predicted that there would be a significant relationship between mother's ratings and that of father or an alternate caretaker. While a low or negative correlation would leave the issue of concept validity unclear (the scale may be measuring characteristics less stable than temperament), a significant positive relationship would suggest a cross-situational or inter-observer consistency in the rated characteristics.

Before an inter-observer comparison can be done, the informant's knowledgeability about the infant must be assessed. Throughout this study, it has been assumed that the mother is quite well informed about her child. If the mother is the primary caretaker, it is possible that the father may have less contact with and information about his child. A babysitter or alternate caretaker is likely to have only intermittent contact with the infant. Although caretaker knowledge could not be assessed, three hours of infant care per week was set as a minimum amount of contact necessary for informed caretaker rating. Fathers' and mothers' time with their infants was assessed and is shown in Table 10. Mothers clearly spend more time with their infants than fathers both during the week and on the weekend. However, it does appear that on the average the fathers do spend a significant amount of time with their infants on weekdays and weekends (X=3.39 and 4.88,

Table 10

Percentage of Fathers and Mothers Spending 0 to 6 or more Hours per day with their Infants

Hours per day	Weekdays		Weekend days	
	Father	Mother	Father	Mother
	(Percent)		(Percent)	
0	3.2	1.9	4.4	1.9
.5 to 1.0	12.6	0	3.8	0
1.5 to 3.0	34.1	.6	8.2	.6
3.5 to 5.0	31.0	8.9	22.1	3.8
5.5	3.2	3.2	2.5	4.4
6.0 or more	15.8	85.4	58.9	89.2
	$\bar{X}$=3.39	$\bar{X}$=5.73	$\bar{X}$=4.88	$\bar{X}$=5.78

respectively . Therefore, most fathers as well as mothers are likely to be well informed about their child's behavior and temperamental style.

Table 11 contains the correlation between maternal ratings and those of father and caretaker. Many of the scales show significant correlations in both the mother-father and the mother-caretaker comparisons. The insignificance of some of the correlations as well as the low relationship of Activity and Approach in the mother-father comparison are likely to have been influenced by the low number of observations. However, the lower correlations may also be due to characteristics of the observer and his/her opportunities to observe the infant. The low relationship in the mother-father and mother-caretaker comparison on Activity may reflect demand characteristics of these two "alternate caretakers" as well as a skewed sampling of the child's behavior. Having a more limited amount of time with the child and not being involved in the full range of infant-care duties would make father and caretaker ratings less reliable with respect to mother ratings. Similar factors may be operating in the mother-father correlations for Approach and mother-caretaker comparison of the Rhythmicity scale. An alternate caretaker (babysitter or day care teacher) will not be exposed to the full range of infant behaviors centering around feeding, toileting, and sleeping. Similarly, fathers are less likely to observe their infants during initial exposures to new stimuli; bathes, doctors, new foods, etc. are often presented to a child when the father is at work. However, the above explanations remain speculative. Explorations of these low relationships requires more detailed information about father and caretaker activities with the infants, work schedules, mother

Table 11

Inter-observer Correlations for Eight Attribute Scales of the M.I.T.S.

Attribute	Mother-Father (N=37)		Mother-Caretaker (N=14)	
Adaptability	.366**	(.568)[a]	.468*	(1.15)
Activity	.091	(.176)	.117	(.226)
Intensity	.221	(.425)	.513**	(.986)
Threshold	.512****	(1.214)	.423*	(.657)
Mood	.522****	(1.214)	.440*	(1.023)
Approach	.069	(.138)	.570**	(1.142)
Distractibility	.317**	(.679)	.325	(.696)
Rhythmicity	.365**	(.833)	.145	(.331)

[a]Corrected for attenuation using eight-week retest correlations in denominator. It should be noted that the nature of the correction for attenuation procedure allows for corrected correlations to be greater than 1.00.

*$p < .10$
**$p < .05$
***$p < .01$
****$p < .001$

and father parenting roles, etc.

As described above, the mean time spent by fathers with their infants is lower than that spent by mothers. In order to investigate whether the time spent by fathers had an effect upon the agreement of father and mother scores on the M.I.T.S., comparison of the means for each attribute scale and correlations of difference scores with father's time spent with the infant were conducted. Table 12 contains these data. It can be seen that the means of most of the attribute scales are not significantly different for the two sets of raters. There is also little relationship between time spent by the father with his infant and the level of agreement between fathers and mothers. Only the intensity scale has a significant correlation ($r=-.36$). This suggests that as a father spends more time with his child, his rating of the strength of the infant's response goes down. This may be a result of sensory adaptation. That is, fathers who spend more time with their infants become used to the intensity of his/her reactions. It is also possible that as the time spent by father increases, the infant's strength of response decreases. This might be due to greater familiarization and comfort with the father. Finally, it is possible that this correlation is spurious and non-replicable. Evaluation of the effects of time upon both mother and father's ratings should be conducted on future samples.

Temperament theory postulates cross-situational and inter-observer behavioral consistency. The above results are a beginning step in suggesting that this basic consistency exists, at least for some of the attribute scales. However, more in-depth assessment of inter-observer similarities and differences is clearly necessary.

Table 12

Comparisons of Father and Mother Ratings in Terms of M.I.T.S. Scale Means and Correlation of Scale Difference Socres with Time Spent by Father with his Infant

Scale	Mean Score Father	Mother	T value	Correlation of difference scores with time
Adaptability	.813	.873	1.97	.10
Activity	.789	.735	-1.46	-.16
Intensity	.466	.382	-2.3*	-.36*
Threshold	.614	.694	2.28*	.01
Mood	.721	.747	.39	-.07
Approach	.851	.833	-.51	-.10
Distractibility	.635	.683	1.43	.01
Rhythmicity	.750	.662	-1.94	-.14

*$p < .05$

Further Considerations

The purpose of this study has been to construct an instrument for the measurement of infant temperament. Initial data indicate that the eight attribute scales of the M.I.T.S. are internally consistent. Their short-term temporal stability (two and eight-week) is relatively high. This suggests that the instrument does measure certain behavioral characteristics well.[4] However, this is based upon one sample which served the dual role of: 1) providing item inter-correlations for test construction; and 2) establishing levels of internal consistency in the final versions of the scales. The necessary "playing around" with the test items to achieve acceptable levels of test length and internal consistency involves a certain amount of taking advantage of chance (Nunnally, 1967). A re-analysis utilizing a new sample of respondents is necessary to clearly establish the extent to which the initial item analysis capitalized on sampling errors. It remains to be seen whether this will demonstrate small sampling error and continual high levels of scale homogeneity.

A second issue in scale reliability is that of temporal stability. The study suggests that attribute scores are relatively stable over short periods of time. However, the subsample sizes were small. Further test-retest analyses would allow greater confidence in the consistency of the M.I.T.S. scores. In fact, temporal stability is also an issue of construct validity (see page 4). More extensive evaluation of

[4]It is assumed that these characteristics parallel the temperamental attributes proposed by Thomas, Chess, Birch, Hentzig and Korn (1963) although the question of scale validity has been formally pursued.

the stability of attribute scale scores over greater lengths of time would yield information regarding the permanence or consistency of behavioral styles. Theory would suggest at least moderate correlations of scale scores for a retest period of one year or more; although developmental change would also appropriately be expected. Failure to obtain such a relationship would cast doubt upon the utility and validity of the temperament construct.

Finally, the issue of validity needs to be further explored both through the use of larger samples of mother-father and mother-caretaker comparisons, as well as through the use of known-groups, convergent, and divergent validation techniques. The present data was obtained from samples too small to allow much weight to be given to the resulting correlations. Viewed as trends, the inter-observer comparisons indicate some consistency of ratings by different well-informed raters. Larger samples are necessary to establish whether or not all eight scales share this cross-situational and inter-observer stability of behavioral style.

In summary, the M.I.T.S. appears to hold promise as an instrument for measuring eight temperamental attributes. However, at this time the scale must be viewed as an experimental instrument whose characteristics need to be further investigated. Scale reliability needs to be confirmed while construct and scale validity remains to be examined.

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APPENDICES

APPENDIX A

APPENDIX A

Carey Infant Temperament Survey

Age of Child _____

Number _____

The purpose of the enclosed questionnaire is to determine the general pattern of your baby's reaction to his or her environment by getting specific information about many areas of functioning. You will also be asked some questions about that environment and about your general impressions of the baby.

The temperament questionnaire itself consists of 70 statements about the baby, each with three choices. Please circle the letter "a", "b", or "c" before the choice that best describes the baby. There are no good and bad or right and wrong answers, only descriptions of what your baby is like.

Survey of Temperamental Characteristics

Sleep

1. (a) Generally goes to sleep at about same time (within half an hour) night and naps.
   (b) Partly the same times, partly not.
   (c) No regular pattern at all. Times vary 1-2 hours or more.

2. (a) Generally wakes up at about same time, night and naps.
   (b) Partly the same times, partly not.
   (c) No regular pattern at all. Times vary 1-2 hours or more.

3. (a) Generally happy (smiling, etc.) on waking up and going to sleep.
   (b) Variable mood at these times.
   (c) Generally fussy on waking up and going to sleep.

4. (a) Moves about crib much (such as from one end to other) during sleep.
   (b) Moves a little (a few inches).
   (c) Lies fairly still. Usually in same position when awakens.

5. With change in time, place or state of health:
   (a) Adjusts easily and sleeps fairly well within 1-2 days.
   (b) Variable pattern.
   (c) Bothered considerably. Takes at least 3 days to readjust sleeping routine.

Feeding

6. (a) Generally takes milk at about same time. Not over 1 hour variation.
   (b) Sometimes same, sometimes different times.
   (c) Hungry times quite unpredictable.

7. (a) Generally takes about same amount of milk, not over 2 oz. difference.
   (b) Sometimes same, sometimes different times.
   (c) Amounts taken quite unpredictable.

8. (a) Easily distracted from milk feedings by noises, changes in place or routine.
   (b) Sometimes distracted, sometimes not.
   (c) Usually goes right on sucking in spite of distractions.

9. (a) Easily adjusts to parents' efforts to change feeding schedule within 1-2 tries.
   (b) Slowly (after several tries) or variable.
   (c) Adjusts not at all to such changes after several tries.

10. (a) If hungry and wants milk, will keeping refusing substitutes (solids, water, pacifier) for many minutes.
    (b) Intermediate or variable.
    (c) Gives up within a few minutes and takes what is offerred.

11. (a) With interruptions of milk or solid feedings, as for burping, is generally happy, smiles.
    (b) Variable response.
    (c) Generally cries with these interruptions.

12. (a) Always notices (and reacts to) change in temperature or type of milk or substitution of juice or water.
    (b) Variable.
    (c) Rarely seems to notice (and react to) such changes.

13. (a) Suck generally vigorous.
    (b) Intermediate.
    (c) Suck generally mild and intermittent.

14. (a) Activity during feedings--constant squirming, kicking, etc.
    (b) Some motion: Intermediate.
    (c) Lies quietly throughout.

15. (a) Always cries loudly when hungry.
    (b) Cries somewhat but only occasionally hard or for many minutes.
    (c) Usually just whimpers when hungry, but doesn't cry loudly.

16. (a) Hunger cry usually stopped for at least a minute by picking up, pacifier, putting on bib, etc.
    (b) Sometimes can be distracted when hungry.
    (c) Nothing stops hunger cry.

17. (a) After feeding baby smiles and laughs.
    (b) Content but not usually happy (smiles, etc.) or fussy.
    (c) Fussy and wants to be left alone.

18. (a) When full, clamps mouth closed, spits out food or milk, bats at spoon, etc.
    (b) Variable.
    (c) Just turns head away or lets food drool out of mouth.

19. (a) Initial reaction to new foods (solids, juices, vitamins) acceptance. Swallows them promptly without fussing.
    (b) Variable response.
    (c) Usually rejects new foods. Makes face, spits out, etc.

20. (a) Initial reaction to new foods pleasant (smiles, etc.), whether accepts or not.
    (b) Variable or intermediate.
    (c) Response unpleasant (cries, etc.), whether accepts or not.

21. (a) This response is dramatic whether accepting (smacks lips, laughs, squeals) or not (cries).
    (b) Variable.
    (c) This response mild whether accepting or not. Just smiles, makes face or nothing.

22. (a) After several feedings of any new food, accepts it.
    (b) Accepts some, not others.
    (c) Continues to reject most new foods after several tries.

23. (a) With changes in amounts, kinds, taming of solids, does not seem to mind.
    (b) Variable response. Sometimes accepts, sometimes not.
    (c) Does not accept these changes readily.

24. (a) Easily notices and reacts to differences in taste and consistency.
    (b) Variable.
    (c) Seems seldom to notice or react to these differences.

25. (a) If does not get type of solid food desired, keeps crying till gets it.
    (b) Variable.
    (c) May fuss briefly but soon gives up and takes what offerred.

Soiling and Wetting

26. (a) When having bowel movement, generally cries.
    (b) Sometimes cries.
    (c) Rarely cries though may get red in face. Generally happy (smiles, etc.).

27. (a) Bowel movements generally at same time of day (usually within 1 hour of same time).
    (b) Sometimes at same time, sometimes not.
    (c) No real pattern. Usually not same time.

28. (a) Generally indicated somehow that is soiled with b.m.
    (b) Sometimes indicates.
    (c) Seldom or never indicates.

29. (a) Usually fusses when diaper soiled with b.m.
    (b) Sometimes fusses.
    (c) Usually does not fuss.

30. (a) Generally indicates somehow that is wet (no b.m.).
    (b) Sometimes indicates.
    (c) Seldom or never indicates.

31. (a) Usually fusses when diaper wet (no b.m.).
    (b) Sometimes fusses.
    (c) Usually does not fuss.

32. (a) When fussing about diaper, does so loudly. A real cry.
(b) Variable.
(c) Usually just a little whimpering.

33. (a) If fussing about diaper, can easily be distracted for at least a few minutes by being picked up, etc.
(b) Variable.
(c) Nothing distracts baby from fussing.

Diapering and dressing

34. (a) Squirms and kicks such at these times,
(b) Moves some.
(c) Generally lies still during these procedures.

35. (a) Generally pleasant (smiles, etc.) during diapering and dressing.
(b) Varied.
(c) Generally fussy during these times.

36. (a) These feelings usually intense: vigorous laughing or crying.
(b) Varied.
(c) Mildly expressed usually. Little smiling or fussing.

Bathing

37. (a) Usual reaction to bath--smiles or laughs.
(b) Variable or neutral.
(c) Usually cries or fusses.

38. (a) Like or dislike of bath is intense. Excited.
(b) Variable or intermediate.
(c) Like or dislike is mild. Not very excited.

39. (a) Kicks, splashes and wiggles throughout.
(b) Intermediate--moves moderate amount.
(c) Lies quietly or moves little.

40. (a) Reaction to very first tub (or basin) bath. Seemed to accept it right away.
(b) At first protested against bath.

41. (a) If protested at first, accepted it after 2 or 3 times.
(b) Sometimes accepted, sometimes not.
(c) Continued to object even after two weeks.

42. (a) If bath by different person or in different place, readily accepts change first or second time.
(b) May or may not accept.
(c) Objects consistently to such changes.

Procedures - nail cutting, hair brushing, washing face and hair, medicines

43. (a) Initial reaction to any new procedure--generally acceptance.
(b) Variable.
(c) Generally objects; fusses or cries.

44. (a) If initial reaction to any new procedure--generally acceptance.
(b) Variable.
(c) Continues to object even after several times.

45. (a) Generally pleasant during procedures once established--smiles, etc.
(b) Neutral or variable.
(c) Continues to object even after several times.

46. (a) If fussy with procedures, easily distracted by game, toy, singing, etc.--and stops fussing.
(b) Variable response to distractions.
(c) Not distracted. Goes on fussing.

Visits to doctor

47. (a) With physical exam, when well, generally friendly and smiles.
(b) Both smiles and fusses: variable.
(c) Fusses most of the time.

48. (a) With shots cries loudly for several minutes or more.
(b) Variable.
(c) Cry over in less than a minute.

49. (a) When crying from shot, easily distracted by milk, pacifier, etc.
(b) Sometimes distracted, sometimes not.
(c) Goes right on crying no matter what is done.

Response to illness

50. (a) With any kind of illness much crying and fussing.
(b) Variable.
(c) Not much crying with illnesses. Just whimpering sometimes. Generally his usual self.

Sensory - reactions to sounds, light, touch

51. (a) Reacts little or not at all to unusual loud sound or bright light.
(b) Intermediate or variable.
(c) Reacts to almost any change in sound or light.

52. (a) This reaction to light or sound is intense--startles or cries loudly.
(b) Intermediate--sometimes does, sometimes not.
(c) Mild reaction--little or no crying.

53. (a) On repeated exposure to these same lights or sounds, does not react to much any more.
    (b) Variable.
    (c) No change from initial negative reaction.

54. (a) If already crying about something else, light or sound makes crying stop briefly at least.
    (b) Variable response.
    (c) Makes no difference.

Response to people

55. (a) Definitely notices and reacts to differences in people: age, sex, glasses, hats, other physical differences.
    (b) Variable reaction to differences.
    (c) Similar reactions to most people unless strangers.

56. (a) Initial reaction to approach by strangers positive, friendly (smiles, etc.).
    (b) Variable reaction.
    (c) Initial rejection or withdrawal.

57. (a) This initial reaction to strangers is intense: crying or laughing.
    (b) Variable.
    (c) Mild--frown or smile.

58. (a) General reaction to familiar people is friendly--smiles, laughs.
    (b) Variable reaction.
    (c) Generally glum or unfriendly. Little smiling.

59. (a) This reaction to familiar people is intense--crying or laughing.
    (b) Variable.
    (c) Mild--frown or smile.

Reaction to new places and situations

60. (a) Initial reaction acceptance--tolerates or enjoys them within a few minutes.
    (b) Variable.
    (c) Initial reaction rejection--does not tolerate or enjoy them within a few minutes.

61. (a) After continued exposure (several minutes) accepts these changes easily.
    (b) Variable.
    (c) Even after continued exposure, accepts changes poorly.

Play

62. (a) In crib or play pen can amuse self for half hour or more looking at mobile, hands, etc.
(b) Amuses self for variable length of time.
(c) Indicates need for attention or new occupation after several minutes.

63. (a) Takes new toy right away and plays with it.
(b) Variable.
(c) Rejects new toy when first presented.

64. (a) If rejects at first, after short while (several minutes) accepts new toy.
(b) Variable.
(c) Adjusts slowly to new toy.

65. (a) Play activity involves much movement--kicking, waving,arms, etc. Much exploring.
(b) Intermediate.
(c) Generally lies quietly while playing. Explores little.

66. (a) If reaching for toy out of reach, keeps trying at it for 2 minutes or more.
(b) Variable.
(c) Stops trying in less than 1/2 minute.

67. (a) When given a toy, plays with it for many minutes.
(b) Variable.
(c) Plays with one toy for only short time (only 1-2 minutes).

68. (a) When playing with one toy, easily distracted by another.
(b) Variable.
(c) Not easily distracted by another toy.

69. (a) Play usually accompanied by laughing, smiling, etc.
(b) Variable or intermediate.
(c) Generally fussy during play.

70. (a) Play is intense: much activity, vocalization or laughing.
(b) Variable or intermediate.
(c) Plays quietly and calmly.

Table 13

Scoring Key for Carey Infant Temperament Scale

Scale	Items
Activity	4, 13, 14, 34, 39
Rhythmicity	1, 2, 6, 7, 27
Approach	19, 40[1], 43, 56, 60, 63
Adatability	5, 9, 22, 23, 35, 41, 42, 44, 47, 53, 61, 64
Threshold	12*, 24*, 28*, 30*, 42, 51, 55*
Intensity	15, 18, 21, 26*, 32, 36, 38, 48, 52, 57, 59, 70
Mood	3, 11, 17, 20, 26, 29[2], 31[2], 35, 37, 45, 47, 50*, 56, 58, 60, 69
Distractibility	8, 16, 33, 46, 49, 54, 68
Persistence	10, 25, 62, 66, 67

Scoring Instructions:

a=1
b=2
c=3

(1) Do not score "b"

(2) Do not score "c"

* Reverse "a" and "c": c=1 a=3

APPENDIX B

APPENDIX B

GENERAL INSTRUCTIONS

Dear Parents:

Thank you for participating in our study of infant behavior. As you know, we are interested in the way infants 3 to 12 months of age behave. Enclosed you will find a questionnaire packet designed to gather information from you, the person most knowledgeable about your infant's behavior.

The questionnaire should take you no more than 1 hour to complete. In fact, most individuals require 45 minutes or less. It is extremely important that you do the questionnaire in one sitting. In other words, wait until you have 45 minutes of time where you are unlikely to have many distractions or responsibilities that would compete with completing the forms. Many parents find that naptime or after the children are in bed to be convenient times for this. Please do the questionnaire alone, without consulting others on the answers to any of the items.

You should have four (4) separate forms and an addressed, stamped envelope in the packet sent to you. These forms are: Departmental Research Consent Form; Home Information Sheet; M.I.T.S. questionnaire; and Supplementary Information Form. Please complete these forms in the following order and in exact accordance with the instructions:

GO TO THE DEPARTMENTAL RESEARCH CONSENT FORM

1. Completely read the consent form. Please read and sign your name and record the date at the bottom of this page. All identifying information will be removed from the forms and the results will be held completely confidential. By doing this work now, you are under no obligation to participate in the follow-up aspects of the study.

2 NOW GO TO THE HOME INFORMATION SHEET (next page)

2. On the Home Information Sheet, record your infant's first name, your relationship to your infant (mother or father), your child's date of birth, and his or her sex.

NOW TURN TO THE QUESTIONNAIRE (M.I.T.S.)

3. Put the above two forms in the stamped addressed return envelope and set aside. Now, carefully read the instructions on the front of the M.I.T.S. questionnaire. When you have finished reading the instructions, begin the questionnaire. Read each item and put your answer (T or F) to the left of the item number. When you finish the questionnaire, put it in the return envelope.

GO TO THE M.I.T.S. SUPPLEMENTARY INFORMATION FORM

4. Finally, complete the M.I.T.S. Supplementary Information Form. When you are done put the form in the return packet, and mail it back to us. The envelope is pre-addressed and stamped so you need only place it in a local mailbox. If you have requested information about the study and/or expressed interest in participating in a follow-up questionnaire, we will contact you within the next 3 months. However, if you have any questions, contact us at any time at the address above, or by phone (Mr. Bonem) at 355-9564 (8 to 5) or evenings at 332-2486. Again, thanks for your cooperation.

Sincerely,

Howard Bonem

Robert Zucker, Ph.D.

HB/RZ:sh

Michigan State University
Department of Psychology

DEPARTMENTAL RESEARCH CONSENT FORM

1. I have freely consented to take part in a scientific study being conducted by: Howard Bonem under the supervision of: Dr. Robert A. Zucker, Academic Title: Professor.

2. The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

3. I understand that I am free to discontinue my participation in the study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

5. I understand that my participation in the study does not guarantee any beneficial results to me.

6. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

Signed_____

Date_____

HOME INFORMATION SHEET

Please provide us with the information requested below.

First name of infant _____

Your relationship to infant: Mother Father (circle)

Infant's date of birth _____
Month - Day - Year

Sex of infant: Male Female (circle)

M.I.T.S.

This questionnaire is designed to find out how your infant behaves in a variety of everyday situations. Read each item carefully and decide whether it is true or mostly true, or false or mostly false for your child. Mark your answer by putting a T (true) or F (false) beside the item.

Example: 1A. Infant often plays with his/her food.

If your infant often plays with his or her food, then you would mark your answer like this:

T 1A. Infant often plays with his/her food.

Should your child not play with food while eating, then you would put an F beside the question like this:

F 1A. Infant often plays with his/her food.

Please read and try to answer all items. If a question is completely inappropriate, then you may omit it (be sure to skip the space on the questionnaire). If your child has outgrown an activity or behavior mentioned in an item, answer the item according to how he/she used to act. That is, if your child drinks only from a cup, answer items regarding breast and bottle-feeding from your memory of his/her feeding habits.

We have worked very hard to make all items equally applicable to infants of both sexes and to those who have been breast or bottle-fed. Please do the best you can in answering as accurately as possible.

All information on this questionnaire is confidential, and will only be handled by the research staff, with no names attached. If you have any questions, please contact one of the examiners.

REMEMBER, ANSWER ALL QUESTIONS.

1G. If child fusses from loss of a toy, he/she does not do so for very long.

2G. Child generally reacts to familiar persons in an unfriendly manner--does not smile.

3G. Baby does not persist in attempts at turning over, crawling, or walking. Gives up easily.

4G. The infant usually rejects a new toy when it is first presented.

5G. Baby is irritable or cranky after sleep.

6G. When baby is being fed, he grabs for the food when it comes near.

7G. There is a great deal of fussing and crying with any illness.

8G. When waiting to be fed, baby is generally still.

9G. After several feedings of a new food, child accepts it.

10G. Infant generally exhibits exploratory behavior on his/her own.

11G. Responses to diapering and dressing are usually intense with much laughing or crying.

12G. When lights are turned on in the room, infant is usually not awakened.

13G. When lying in crib, child is usually looking all around.

14G. Child does lots of squirming or kicking while being diapered or dressed.

15G. Stops eating if hears noise such as yell, radio, etc.

16G. Child wakes up most mornings at about the same time--within half an hour.

18G. During play the infant is usually very active and vocal.

19G. When playing with one toy, the infant is easily distracted by another.

20G. Baby does not react to physical differences in familiar people.

21G. Child kicks, splashes or giggles throughout bath.

22G. Child usually fusses during diapering and dressing.

23G. Infant responds to any small change in surrounding environment.

24G. There is no clearly evident pattern in the time for child's bowel movement, it varies from day to day.

25G. Child's initial reaction to most new foods, solids, liquids or vitamins is to accept them without much fussing.

26G. Child is usually willing to be held and cuddled by strangers.

27G. Infant generally appears happy upon waking up.

28G. If playing with one toy, the infant does not usually become distracted by others.

29G. Infant's times for liquid feeding are unpredictable--vary more than 1 hour.

30G. Baby usually sits or lies quietly throughout the feeding interval.

31G. Child's reaction to bath, whether she likes or dislikes it, is mild and not very excited.

32G. Child has no regular waking time from naps--varies more than 1/2 hour.

33G. Usually infant readily accepts new activity like swinging or using a jumper.

34G. When child is with one person, she/he will easily go to another person.

35G. During diapering and dressing, child's expressions are mild--little smiling or fussing.

36G. The infant shows discomfort with changes of place and situation even after continued exposure.

37G. Child will not crawl across room to another toy if there are other toys nearer to him/her.

38G. Child is generally happy when left alone in a room; she will occupy herself.

39G. The infant often continues playing no matter what does on around him.

40G. The infant usually whimpers or fusses slightly when hungry, but does not cry loudly.

41G. Child is a heavy sleeper; it takes a loud noise to wake him/her.

42G. Child usually enjoys company.

43G. Baby reacts to an undesired food in a mild way.

44G. Child notices and reacts to small amounts of urine in diaper.

45G. When crying from getting a shot, infant can easily be calmed by milk, pacifier, etc.

46G. If bath is given in new place, infant readily accepts change.

47G. Child has a negative reaction to all new foods, whether he/she eventually accepts them or not.

48G. Child protested when put into bath for the first time.

49G. Child will fall asleep at about the same time each night.

50G. During feeding, the child will continue to suck even if there is much activity around him/her.

51G. If left on the floor, infant will usually move to another area.

52G. When napping, baby almost always sleeps through without waking.

53G. Infant is active or playful on a fairly regular schedule.

54G. Within a short period of time, the infant generally accepts and plays with a new toy.

55G. Before going to sleep, child is often fussy.

56G. When food is offered the infant does not attempt to reach for it.

57G. Infant's general reaction to familiar people is intense--crying or laughing.

58G. Child will not persist in activities that have previously upset him.

59G. Child can be left on couch or chair for periods of time without moving very much.

60G. Child cries for a long time after a frightening event is over.

61G. Baby usually does not accept company (visitors).

62G. Child liked his/her first tub bath.

63G. During diapering and dressing, child is generally pleasant and smiling.

64G. During milk feedings child is not easily distracted and continues to suck undisturbed.

65G. Light or sound will at least temporarily stop the child's crying.

66G. Child does not seem to mind changes in amounts, kinds, or tastes of solid foods.

67G. Baby often consumes close to the same amount of food during a feeding.

68G. Infant's general reaction to familiar people is mild--frown or smile.

69G. When infant is full, he/she shuts mouth, spits out food, or will accept nothing else.

70G. Child generally indicates that he/she has soiled.

71G. When given a toy, the infant plays with it for many minutes.

72G. Infant's play involves much movement and exploration.

73G. After getting a shot, child cries for less than 1 minute.

74G. Infant is easily distracted during breast or bottle-feeding.

75G. Baby usually seems happy during bath.

76G. Infant does not like to be bathed by different people.

77G. Child will continue to engage in activities which have previously caused an upset.

78G. If baby's initial reaction to new procedure (nail cutting, hair brushing, washing, etc.) is negative, acceptance usually takes place after 2 or 3 times.

79G. Baby drinks an unpredictable amount of milk; (if bottle fed, varies more than 2 oz.; if breast fed, time sucking varies greatly).

80G. Child is not very active during play. He displays few movements and makes few sounds.

81G. Infant has high tolerance for pain.

82G. While playing with one toy, child can easily be distracted by another.

83G. Infant explores very little; needs help to find play objects.

84G. Child is uninterested in eating at the same time each day.

85G. He/she definitely notices and reacts to physical differences in familiar people such as glasses, hats, etc.

86G. Child will rarely allow strangers to hold or cuddle him.

87G. If child wants a toy that is on the other side of the room, he will crawl until she reaches it; or if unable to crawl, child will continue to show an interest in it for quite a while.

88G. During feeding time, child quickly pulls away from nipple when milk is gone.

89G. Child protested considerably to first bath.

90G. When going to sleep, infant is usually happy.

91G. While playing, the infant is easily distracted by everyday occurrences like the ringing phone or doorbell.

92G. When seeing a new animal, child's initial reaction is one of interest and attraction.

93G. Infant reacts to slight temperature changes (in room or outside).

94G. When given a food which he does not want, he reacts in a strong manner--response is intense or powerful.

95G. Infant exhibits regular, easily identifiable actions around meal time.

96G. Infant falls asleep at about the same time most nights--within half an hour.

97G. When being tickled, child laughs and seems to enjoy it.

98G. When lying in crib, infant moves around a great deal.

99G. Does not readily accept changes in types or characteristics of foods.

100G. Child continues to object to grooming procedures (combing, washing, nail cutting, etc.) even after experiencing them several times.

101G. Infant is usually fussy after feeding.

102G. When in carriage or stroller, baby is usually quiet and still.

103G. Infant's general reaction to familiar people is friendly with laughing and smiling.

104G. Changes in lighting will not stop the baby's crying.

105G. Whether he likes or dislikes bathing, the infant's reaction is usually intense or energetic.

106G. When asleep, child actively moves around the crib.

107G. When crying, child will persist until he/she is picked up.

108G. When being washed or dressed, baby is generally pleasant, smiling, etc.

109G. Infant cannot occupy himself in crib or playpen for more than a few minutes.

110G. Until he gets the food he wants, baby will usually cry.

111G. Infant initially accepts new foods.

112G. When infant is full, he/she simply turns head away and lets food drool out of mouth.

113G. While waiting to be fed, baby is very active and vocal.

114G. If left on the floor, child rarely moves from spot.

115G. If baby is hungry for milk, he will persistently refuse substitutes such as pacifier, or water or juice.

116G. Diapers must be heavily soiled before infant reacts.

117G. Baby often wakes during naps.

118G. When introduced to new activity like swinging or using a jumper, child is usually apprehensive.

119G. Baby only reacts to large changes in room or outside temperatures.

120G. At first, infant may reject a new toy but takes or plays with it after several minutes.

121G. When playing, baby will respond to hearing his/her name called.

122G. After a number of tries, the infant accepts changes of place or situation.

123G. When child stops eating, playing a game or singing will get him to resume eating a little longer.

124G. Child is a light sleeper. It takes only the slightest noise to wake him/her.

125G. Infant shows a mild reaction to light or sound with little or no crying.

126G. Child has a loud response to a wet or soiled diaper.

127G. Child initially does not accept most new procedures; usually cries, fusses or does not cooperate.

128G. Baby usually fusses during bath.

129G. After a fall or bump infant cries for a long time.

130G. Infant takes nap at approximately the same time each day--within a half hour.

131G. Infant is generally fussy during play.

132G. Infant plays with one toy for only about 1-2 minutes.

133G. Infant does not notice or react to changes in voice quality or level.

134G. When left alone for more than 5 minutes, child generally fusses or cries.

135G. After receiving a shot, it is difficult to stop baby's crying.

136G. In playpen or on floor, infant is active; gets into things, pulls at objects, or puts nearby objects in mouth.

137G. When the lights are turned on in his/her room, child is easily awakened.

138G. When infant cries because of hunger, she will usually stop for at least a minute if she is picked up, given a pacifier, etc.

139G. Diapering is often a battle.

140G. Even after first 2 weeks of bath, child continued to protest.

141G. Does not follow a regular nightly sleeping pattern.

142G. If there is any activity around him, child stops sucking during feeding.

143G. Infant can be fed at same time each day.

144G. When she is hungry, almost nothing can make infant stop crying.

145G. Child notices and reacts to changes in voice quality or level.

146G. Infant notices and reacts to slightly soiled diapers.

147G. When there are interruptions in solid or milk feedings, the child generally remains happy.

148G. Diapers are usually very wet before baby shows any reaction.

149G. Even after several trials, infant continues to reject most new foods.

150G. The baby will eat his meals at varying times during the week.

151G. When receiving a shot, baby cries for several minutes or more.

152G. Baby drinks a predictable amount of milk; (if bottle-fed, varies less than 2 oz.; if breast fed, time sucking does not greatly vary).

153G. Infant usually lies still while being diapered or dressed.

154G. Child cheerfully tries new foods whether he/she ultimately likes them.

155G. Initial reaction to strangers is relatively mild such as a frown or smile.

156G. When diaper is wet or soiled, it is difficult to distract baby from fussing.

157G. Child generally takes milk around the same time of day; does not vary more than 1 hour.

158G. Child still exhibits strong reactions even after repeated contacts with bright light or loud sound.

159G. Child will usually stop crying on his/her own without picking him/her up.

160G. Infant usually plays quietly and calmly.

161G. Infant does not become easily accustomed to changes in caretakers --babysitters, grandparents, etc.

162G. When sick, baby is usually himself with some whimpering but not much crying.

163G. Whether liking or disliking a food, baby's response to it is dramatic.

164G. If an object is out of reach, infant continues to reach for it for several minutes.

165G. If child is fussing about a soiled or wet diaper, he/she can easily be distracted for a few minutes.

166G. Infant initially accepts any new procedure.

167G. Sudden appearances of strangers will cause crying and/or a turning away.

168G. Even when given a substitute infants will cry when something is taken from her reach.

1P. When being washed or dressed, infant generally cries or fusses.

2P. Although child initially protested bath, she accepted it after 2 or 3 times.

3P. For at least 3-5 minutes, child will lie and watch a hanging mobile.

4P. Infant is usually cheerful during play; laughing, smiling, etc.

5P. When hurt, he/she usually cries loudly for long periods of time.

6P. Infant generally cries when solid or milk feedings are interrupted.

7P. In a crib or play pen, infant can amuse him/herself for quite a while.

8P. If child fusses during washing and grooming activities, he/she is easily distracted by games, toys, etc.

9P. Baby fusses or cries when he/she is tickled.

10P. Baby often cries loudly when hungry.

11P. In her stroller, infant is usually quite active or noisy.

12P. If child falls, he/she does not cry for a long time.

13P. Child makes himself at home most anywhere; appears comfortable in new situations.

14P. After infant has been fed, he/she usually smiles and laughs.

15P. It is difficult to predict infant's activity or play time.

16P. Child resists going to different persons.

17P. Easily notices and reacts to differences in taste and consistency of food.

18P. Within a few days, child adjusts to changes in familiar routines.

19P. When brought to the doctor for a well baby check-up, child is usually fussy.

20P. Infant fusses when held down for diapering but he/she can usually be diverted with a pacifier or toy.

21P. Baby adjusts easily to different care-takers.

22P. If bath is given in new place, infant generally fusses and cries.

23P. Child usually has a bowel movement at the same time of day, with less than one hour variance.

24P. When left lying in crib, infant usually lies quite still.

25P. If toy is taken from baby, he/she will fuss until it is returned.

26P. Infant's reaction to animals is intense with much laughing or crying.

27P. While playing child does not notice or react to his/her name being called.

28P. Baby readily accepts bathing by a new or different person on the first or second time.

29P. When diaper is wet or soiled, child makes no fuss or whimpers slightly.

30P. Infant cannot be left for very long on couch or bed because he might wiggle off.

31P. Sucks actively on breats, bottle, or pacifier.

32P. The baby will resist being fed at varying times each day.

33P. He/she frequently squirms or kicks during feedings.

34P. Child wakes up from napping at approximately the same time every day (within half an hour).

35P. Baby persists in attempts to crawl or walk until a few steps are taken.

36P. Baby shows little reaction to animals (dogs, cats, etc.).

37P. After 1-2 tries baby adjusts easily to changes in feeding schedule.

38P. The infant initially tolerates or enjoys new places and situations.

39P. Infant will not fall asleep at the same time each night.

40P. In response to pain, infant whimpers or cries, for only a short time.

41P. Child stops resisting milk substitutes such as water, juice, or pacifier within a few minutes and accepts what is offered.

42P. Even after several minutes, infant continues to reject a new toy.

43P. Child seemed to enjoy his first car ride.

44P. When lying in crib, child tends to focus on one object for about 5 minutes at a time.

45P. Infant does not adjust easily to efforts at changing feeding schedule.

46P. Baby shows little reaction to bright lights or loud noises.

47P. If fussy during grooming procedures (nail cutting, hair brushing, etc.), baby is not easily distracted.

48P. Child initially reacts to strangers with much laughing or crying.

49P. Infant will readily accept bathing by a different person or in a different place.

50P. Child seldom seems to notice or react to differences in the taste, consistency, or temperature of foods.

51P. Changes in sound (voices, TV, radio) will not stop baby's crying.

52P. Child usually rejects new foods.

53P. When trying to turn over or crawl, child tries for a minute or two, then gives up.

54P. Infant takes 3 or more days to adjust to changes in daily schedule.

55P. Baby's first reaction to a new animal is often accompanied by hesitation or fear.

56P. Infant's time of waking is not consistent from day to day (times vary more than half an hour).

57P. Child will usually lie and watch a hanging mobile for just a short period ot time (30 seconds or less).

58P. After repeated exposure to bright light on a short period of time or loud sound, child's reaction lessens.

59P. At the doctor's for a well baby check-up infant is usually friendly and smiling.

60P. Baby smiles, gurgles, or plays with new people.

61P. Baby shows no easily identifiable sign of hunger when meal time arrives.

62P. Child seemed to dislike his/her first car ride.

63P. Infant does not readily tolerate or enjoy new places and situations.

64P. He/she mildly smiles or coos when served a desired food.

65P. Child has low tolerance for pain.

66P. Baby lies fairly still while he/she sleeps.

67P. Child seldom or never indicates that diaper is wet.

68P. Child continues to suck even after milk is gone.

69P. Baby strongly reacts to light or sound.

70P. Infant has no regular time pattern for napping each day (varies more than 1/2 hour).

71P. While playing, infant generally does more quiet observing than active exploring.

72P. When engaged in play, baby is usually actively moving and making sounds.

73P. Child usually indicates that diaper is wet.

74P. When given a food, he/she does not like, infant protests briefly but soon takes it anyway.

75P. Infant usually stops trying for a toy out of reach in less than 1 minute.

76P. Child seldom or never indicates that he/she has soiled (b.m.).

Table 14

Scoring Key for Michigan Infant Temperament Scale

Scale	Items
Activity	6, 8*, 14, 21, 30*, 51, 56*, 59*, 72, 80*, 98, 102*, 106, 113, 114*, 136, 153*, 179, 192*, 198, 199, 201, 234, 239*, 240
Adaptability	9, 34, 36*, 46, 66, 76*, 78, 99*, 100*, 120, 122, 139*, 140*, 149*, 158*, 161*, 170, 184*, 186, 189, 190*, 196, 205, 210*, 213*, 217, 222*, 226*
Intensity	11, 18, 31*, 35*, 40*, 43*, 57, 68*, 69, 73, 94*, 105, 112*, 125*, 126, 151, 155*, 160*, 173, 178, 194, 197*, 204*, 208*, 216, 232, 237*
Threshold	12, 20, 23*, 41, 44*, 70*, 81, 85*, 93*, 116*, 119, 124*, 133*, 137*, 145*, 146*, 148, 181, 185*, 214, 218, 233*, 235, 241*, 245
Persistence	1*, 3*, 37*, 39, 58*, 60, 71, 77, 87, 88*, 106, 110, 115, 129, 132*, 159*, 162, 164, 169*, 171, 175, 180*, 193*, 203, 209*, 221*, 225*, 236, 242*, 243*
Mood	2*, 5*, 7*, 22*, 27, 38, 47*, 55*, 63, 75, 90, 97, 101*, 103, 108, 128*, 131*, 134*, 147, 154, 172, 174*, 177*, 182, 187*, 227
Approach	4*, 10, 25, 26, 33, 42, 48*, 54, 61*, 62, 83*, 86*, 89*, 92, 111, 118*, 127*, 166, 167*, 206, 211, 220*, 223*, 228, 230*, 231*
Distractibility	13, 15, 19, 28*, 45, 50*, 64*, 65, 74, 82, 91, 104*, 121, 123, 135*, 138, 142, 144*, 156*, 165, 168*, 176, 188, 195*, 212*, 215*, 219
Rhythmicity	16, 24*, 29*, 32*, 49, 52, 53, 67, 79*, 84*, 95, 96, 117*, 130, 141*, 143, 150*, 152, 157, 183*, 191, 200*, 202, 207*, 224*, 229*, 238*

Scoring: Items marked 'T' are to be scored 1 and items endorsed 'F' scored 0. Starred items (*) are to be scored in reverse, i.e., F = 0 and T = 0.

M.I.T.S. Supplementary Information Form

First Name of Infant_____

What was the birth weight of your child? _____lbs. _____oz.

What was the expected delivery date for him/her? _____ _____ _____
(What your obstetrician told you) month day year

List all the children in your family (including the infant listed above) in order of age.

1. ___yrs ___mos. M F (circle) Sex
2. ___yrs ___mos. M F (circle) Sex
3. ___yrs ___mos. M F (circle) Sex
4. ___yrs ___mos. M F (circle) Sex
5. ___yrs ___mos. M F (circle) Sex
6. ___yrs ___mos. M F (circle) Sex

What kind of job does the father in the family have? (Please list job title and give a brief description) _____
job title

Description: _____

_____

Highest school grade completed by father:

1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 Some graduate training Graduate degree
College

What kind of job do you do? (if housewife, please list) _____
job title

Description: _____

_____

Highest school grade completed by mother:

1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 Some graduate training Graduate degree
College

What is the average amount of time per week day each parent spends with the infant (the child you filled out the questionnaire on)?

Father: ½ 1 1½ 2 2½ 3 3½ 4 4½ 5 5½ 6 hours or greater

Mother: ½ 1 1½ 2 2½ 3 3½ 4 4½ 5 5½ 6 hours or greater

What is the average amount of time per weekend day each parent spends with the infant?

Father: ½ 1 1½ 2 2½ 3 3½ 4 4½ 5 5½ 6 hours or greater

Mother: ½ 1 1½ 2 2½ 3 3½ 4 4½ 5 5½ 6 hours or greater

The following questions ask for somewhat more detailed information, but we hope you will answer them. All information will be kept completely confidential; no one other than the researchers will have access to any of it. In addition, all identifying names are deleted before we work on it.

1. Does your child attend a day-care center? yes no (circle)

2. Is your child cared for by someone other than an immediate family member (father, mother, or sibling) for three (3) or more hours per week?
   yes no

3. If your answer was yes to questions 1 or 2, may we contact the caretaker or teacher to ask them to fill out a questionnaire like the one you just completed? No results or information will be given to this person other than that you have been participating in this study and have consented to our contacting them.
   yes no

4. If yes to #3, list the name of the caretaker or day-care center that takes care of your child. _____

5. Would you be willing to be recontacted for a follow-up to this questionnaire? yes no

6. Are you interested in learning more about this study? yes no
   If yes, we will send to you within the next 3 to 4 months a summary of the purpose and the overall (group) results of the study.

   Comments:

7. ALTHOUGH IT IS OPTIONAL, IF YOU HAVE ANSWERED YES TO ANY QUESTION ON THIS PAGE, PLEASE LIST YOUR NAME AND ADDRESS BELOW. (As noted above, we need this so that we can recontact you at a later date.)

   _____
   Name

   _____
   Number and Street

   _____
   City State Zip

   _____
   Telephone Number

APPENDIX C

APPENDIX C

GENERAL INFORMATION:

Dear Parents:

Thank you for participating in our study of infant behavior. Enclosed you will find a questionnaire packet designed to gather information from you, a knowledgeable informant on your infant's behavior.

The questionnaire should take you no more than 1 hour to complete. In fact, most individuals require 45 minutes or less. It is extremely important that you do the questionnaire in one sitting. In other words, wait until you have 45 minutes of time where you are unlikely to have many distractions or responsibilities that would compete with completing the forms. Many parents find that naptime or after the children are in bed to be convenient times for this. Please do the questionnaire alone, without consulting others on the answers to any of the items.

You should have two separate forms and an addressed, stamped envelope in the packet sent to you. These forms are: Departmental Research Consent Form, and M.I.T.S. questionnaire. Please complete these forms in the following order and in exact accordance with the instructions.

GO TO THE DEPARTMENTAL RESEARCH CONSENT FORM

1. Completely read the consent form. This form indicates that you are voluntarily participating in the study. Please read and sign your name and record the date at the bottom of this page. All identifying information will be removed from the forms and the results will be held completely confidential. By doing this work now, you are under no obligation to participate in the follow-up aspects of the study.

NOW TURN TO THE QUESTIONNAIRE (M.I.T.S.)

2. Now, carefully read the instructions on the front of the M.I.T.S. questionnaire. When you have finished reading the instructions, begin the questionnaire. Read each item and put your answer (T or F) to the left of the item number. Remember, do the questionnaire alone. Do not seek any help. When you finish the questionnaire, put it in the return envelope.

When you are done, put the forms in the return packet, and mail it back to us. The envelope is pre-addressed and stamped so you need only place it in a local mailbox. If you have requested information about the study and/or expressed interest in participating in a follow-up questionnaire, we will contact you within the next 3 months. However, if you have any questions, contact us at any time at the address above, or by phone (Mr. Bonem) at 355-9564 (8 to 5) or evenings at 332-2486. Again, thanks for your cooperation.

APPENDIX C
GENERAL INFORMATION letter
Page 2

Sincerely,

Howard Bonem

Robert Zucker, Ph.D.

HB/RZ:sh

INSTRUCTIONS

You should have the M.I.T.S. questionnaire and an addressed, stamped envelope.

1. Put today's date on the top of the M.I.T.S. questionnaire. This is very important as we need to know the length of time since you last took the instrument.

2. Carefully read the instructions on the front of the M.I.T.S. questionnaire. When you have finished reading the instructions, begin the questionnaire. Read each item and put your answer (T or F) to the left of the item number. When you finish the questionnaire, put it in the return envelope.

3. Please mail the completed form back to us. If you have any questions, give us a call.

Thank you for your help.

APPENDIX D

APPENDIX D

MICHIGAN STATE UNIVERSITY
Department of Psychology
Snyder Hall
East Lansing, Michigan 48824

Dear Father:

Your wife has already taken part in a research project directed towards studying the behavior of infants 3 to 12 months of age. Our interest is in the area of styles or patterns of infant behavior. We are contacting you now to request your participation in the study also by filling out a questionnaire. This questionnaire has true-false questions about things an infant does and takes about 30 to 40 minutes to complete. It is important for us to see how fathers judge their infant's behavior as well as mothers. In order to do this, we would like you to complete the enclosed questionnaire according to the attached instructions.

Please note that your wife's participation in this project in no way obligates you to participate in this study. However, we hope you will choose to do so. Your answers will remain completely confidential: all identifying information will be removed from the forms before they are analyzed. Your answers will be quite helpful to us and will help give us a better understanding of styles of infant behavior.

If you have any questions, feel free to contact us at the address above, or by phone (Mr. Bonem) at 355-9564 (8 to 5) or evenings at 332-2486. Thank you for your cooperation.

Sincerely,

Howard Bonem

Robert A. Zucker, Ph.D.

HB/RAZ:sh

GENERAL INFORMATION:

Dear Parents:

Thank you for participating in our study of infant behavior. Enclosed you will find a questionnaire packet designed to gather information from you, a knowledgeable informant on your infant's behavior.

The questionnaire should take you no more than 1 hour to complete. In fact, most individuals require 45 minutes or less. It is extremely important that you do the questionnaire in one sitting. In other words, wait until you have 45 minutes of time where you are unlikely to have many distractions or responsibilities that would compete with completing the forms. Many parents find that naptime or after the children are in bed to be convenient times for this. Please do the questionnaire alone, without consulting others on the answers to any of the items.

You should have two separate forms and an addressed, stamped envelope in the packet sent to you. These forms are: Departmental Research Consent From, and M.I.T.S. questionnaire. Please complete these forms in the following order and in exact accordance with the instructions.

GO TO THE DEPARTMENTAL RESEARCH CONSENT FORM

1. Completely read the consent form. This form indicates that you are voluntarily participating in the study. Please read and sign your name and record the date at the bottom of this page. All identifying information will be removed from the forms and the results will be held completely confidential. By doing this work now, you are under no obligation to participate in the follow-up aspects of the study.

NOW TURN TO THE QUESTIONNAIRE (M.I.T.S.)

2. Now, carefully read the instructions on the front of the M.I.T.S. questionnaire. When you have finished reading the instructions, begin the questionnaire. Read each item and put your answer (T or F) to the left of the item number. Remember, do the questionnaire alone. Do not seek any help. When you finish the questionnaire, put it in the return envelope.

When you are done, put the forms in the return packet, and mail it back to us. The envelope is pre-addressed and stamped so you need only place it in a local mailbox. If you have requested information about the study and/or expressed interest in participating in a follow-up questionnaire, we will contact you within the next 3 months. However, if you have any questions, contact us at any time at 332-2486. Again, thanks for your cooperation.

Sincerely,

Howard Bonem Robert Zucker, Ph.D.

APPENDIX E

APPENDIX E

MICHIGAN STATE UNIVERSITY
Department of Psychology
Snyder Hall
East Lansing, Michigan 48824

Dear

We are presently engaged in a study of infant behavior. Our interest is in the area of patterns or styles of infant behavior. In order to measure this, we have devised the enclosed questionnaire (a 244 item, true-false scale).

has been involved with our study and has already filled out a questionnaire on her child. She has told us that you often care for this child and therefore are knowledgeable about this child's behavior.

She has also given us permission to contact you to see if you would also fill out this questionnaire on This will allow us to compare the ratings of two knowledgeable informants, one a mother and the other a more neutral caregiver. Although you are under no obligation to participate, we hope you will choose to do so. Your answers will remain completely confidential with all names and identifying information being removed from the forms before the answers are analyzed.

We hope you will be able to cooperate. Please carefully read the enclosed instruction sheets before completing the forms. If you have any questions, feel free to contact us. You may call Mr. Bonem at 355-9564 (8:00 - 5:00) or in the evening at 332-2486.

Thank you for your help.

Sincerely,

Howard Bonem

Robert A. Zucker, Ph.D.

P.S. A photocopy of Mrs. release form is enclosed for your inspection.

MICHIGAN STATE UNIVERSITY
Department of Psychology
Snyder Hall
East Lansing, Michigan 48824

GENERAL INFORMATION:

Dear Caregiver:

Thank you for participating in our study of infant behavior. Enclosed you will find a questionnaire packet designed to gather information from you, a knowledgeable informant on behavior.

The questionnaire should take you no more than 1 hour to complete. In fact, most individuals require 45 minutes or less. It is extremely important that you do the questionnaire in one sitting. In other words, wait until you have 45 minutes of time where you are unlikely to have many distractions or responsibilities that would compete with completing the forms. Many parents find that naptime or after the children are in bed to be convenient times for this. Please do the questionnaire alone, without consulting others on the answers to any of the items.

You should have two separate forms and an addressed, stamped envelope in the packet sent to you. These forms are: Departmental Research Consent Form, and M.I.T.S. questionnaire. Please complete these forms in the following order and in exact accordance with the instructions.

GO TO THE DEPARTMENTAL RESEARCH CONSENT FORM

1. Completely read the consent form. This form indicates that you are voluntarily participating in the study. Please read and sign your name and record the date at the bottom of this page. All identifying information will be removed from the forms and the results will be held completely confidential. By doing this work now, you are under no obligation to participate in the follow-up aspects of the study.

NOW TURN TO THE QUESTIONNAIRE (M.I.T.S.)

2. Now, carefully read the instructions on the front of the M.I.T.S. questionnaire. When you have finished reading the instructions, begin the questionnaire. Read each item and put your answer (T or F) to the left of the item number. Remember, do the questionnaire alone. Do not seek any help. When you finish the questionnaire, put it in the return envelope.

When you are done, put the forms in the return packet, and mail it back to us. The envelope is pre-addressed and stamped so you need only place it in a local mailbox. If you have any questions, contact us at any time at the address above, or by phone (Mr. Bonem) at 355-9564 (8 to 5) or evenings at 332-2486. Again, thanks for your cooperation.

Sincerely,

Howard Bonem

Robert Zucker, Ph.D.

HB/RZ:sh

Michigan State University
Department of Psychology

DEPARTMENTAL RESEARCH CONSENT FORM

1. I have freely consented to take part in a scientific study being conducted by: Howard Bonem under the supervision of: Dr. Robert A. Zucker, Academic Title: Professor .

2. The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

3. I understand that I am free to discontinue my participation in the study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

5. I understand that my participation in the study does not guarantee any beneficial results to me.

6. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

Signed_____

Date_____

APPENDIX F

APPENDIX F

Table 15

Items and their Loadings on each Persistence Scale Factor, and Coefficient Alpha and Item-total Correlations for each Factor

Factor		Loadings	Coefficient Alpha	Range of Item-total Correlations
Factor 1			.72	.25 - .54
Items:	3	.61		
	37	.21		
	87	.42		
	164	.49		
	203	.45		
	221	.65		
	243	.55		
Factor 2			.66	.19 - .52
Items:	132	.29		
	169	.21		
	171	.69		
	175	.52		
	225	.69		
Factor 3			.64	.24 - .64
Items:	107	.71		
	59	.89		
	162	.21		
Factor 4			.28	.02 - .35
Items:	88	.69		
	221	.20		
	236	.83		
	242	-.31		
Factor 5			.56	.03 - .35
Items:	58	.73		
	77	.82		
	110	.25		
Factor 6			.65	.48
Items:	115	.70		
	209	.76		