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AUTHOR Erickson, Martha Farrell; Farber, Ellen A.
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ABSTRACT

Part of a prospective longitudinal study examining factors that account for developmental outcomes for high-risk children, this investigation focused on how successful adaptation at 12 and 18 months is related to adaptation at 24 months, 42 months, and 4.5 to 5 years of age. Assessments at each age were designed to indicate how the child was resolving salient developmental issues. To determine adaptation at 12 and 18 months, the quality of mother/child attachment was assessed. At 24 months, the children were videotaped with their mothers while performing tool-using/problem-solving tasks of increasing difficulty. At 42 months, children were observed with their mothers in four learning tasks requiring mothers to use teaching strategies. Finally, preschool children were rated on several dimensions, including agency, ego control, dependency on teachers for support and nurturance, social skills in the peer group, positive affect, negative emotional tone, and compliance with teachers' directions and suggestions. In addition, teachers were asked to complete the Preschool Behavior Questionnaire and a problem behavior scale. Children securely attached at 12 and 18 months were judged to deal more effectively with important developmental issues at later stages than were anxious-resistant and anxious-avoidant children. Results were also interpreted to provide some evidence for continuity of adaptation in high-risk children. (RH)

Infancy to Preschool: Continuity of Adaptation in High Risk Children

Martha Farrell Erickson and Ellen A. Farber

University of Minnesota

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Mother-Child Project
c/o Byron Egeland
N517 Elliott Hall
University of Minnesota
Minneapolis, Minnesota 55455

A classic question in the field of developmental research is how well early functioning predicts subsequent behavior, or to what extent continuity in development can be demonstrated. The findings presented in this paper are based on a study which has followed the social and emotional development of high risk children from birth through the preschool years. This research is guided by developmental/organizational theory (Sroufe, 1979) which assumes that while individuals change with development, there is continuity in the quality of adaptation from one stage to another. Successful adaptation at one age lays the groundwork for adaptation at a later stage of development.

In accord with this theory, our assessments at each age were designed to determine how the child is resolving salient issues at that stage of development. We define healthy adaptation in terms of successful negotiation at a given stage. For example, the first year of life, a major issue is to establish a sense of trust and security. This is accomplished by forming a secure relationship (attachment) with the caregiver (the mother in the case of our subjects). Thus, at 12 and 18 months of age we assessed the quality of the mother-child attachment, with the well-adapted or competent child being defined as one who demonstrates a secure attachment. A secure attachment promotes proximity seeking, enables the child to be comforted when stressed, and also facilitates exploration by providing a secure base from which the child can explore and learn from the environment. We believe that this relationship serves as a prototype for later relationships and helps determine the child's expectations of how others will respond to him/her and the child's expectations of how successful his/her efforts to cope with stress will be. Problems in this early attachment relationship often result in later social and emotional problems.

At two years of age a major issue is the child's emerging autonomy. We would expect the competent two-year-old to be flexible, resourceful, and be able to use mother for help in solving difficult problems without being unduly dependent on her. Thus, we have assessed the 24-month-old child by observing the toddler in a problem-solving task with mother, looking at healthy adaptation in terms of the child's autonomous efforts at problem-solving. When the children were 3 1/2 years of age, we were interested in the child's socialization, particularly in the development of self-control and self-esteem. We observed the child in a learning situation with the mother and assessed such things as the child's self-esteem, presistence, enthusiasm, and frustration tolerance in dealing with a variety of tasks. More recently, when the children were four to five years of age and in preschool, we assessed the child's social and emotional adaptation as demonstrated in positive interaction with peers, acceptance of adult guidance, and a confident, assertive approach to classroom activities.

This developmental/organizational approach to the assessment of social and emotional adaptation is unique in at least two ways. First, this approach dictates that we look not so much at individual behaviors, but rather at patterns of behavior, how the child organizes his/her behavior around these salient developmental issues. Secondly, this approach assumes that similar behaviors have different meanings at different ages. For example, non-compliance in a two-year-old might be viewed as a normal part of the child's struggle for autonomy, whereas that same degree of non-compliance might be cause for concern in a four-year-old who one would expect to have settled into a more accepting, compliant pattern of interaction with adults.

In this paper we focus on how successful adaptation at 12 and 18 months, as demonstrated in a secure attachment relationship with the caregiver, relates to adaptation at 24 months, 42 months, and in the preschool at 4 1/2 to 5 years of age. A number of researchers have found secure attachment to relate to competence or healthy adaptation at later ages, providing support for the notion of continuity of adaptation. Securely attached infants have been found to be more cooperative at 22 months with mother and another adult (Main, 1973), more enthusiastic, persistent, affectively positive, and compliant in problem solving at age two (Matas, Arend, & Sroufe, 1978), more socially competent with peers at age 3 1/2 (Waters, Wippman, & Sroufe, 1979), and more ego resilient at age five (Arend, Gove, & Sroufe, 1979). These studies have used middle-class families in which relationships and life circumstances tend to be stable and continuity of functioning is found with relative ease. We were interested in determining whether continuity of adaptation also could be demonstrated in children from high risk families for whom life circumstances are less stable. We address two specific questions: 1) Were there differences among attachment groups (anxious avoidant, securely attached, anxious resistant) on the developmentally salient behaviors assessed at 24 months, 42 months, and in the preschool? and 2) How many children from each attachment group were judged to be competent or well-adapted across all three subsequent assessments?

Method

Subjects

The present study is part of the Mother-Child Interaction Project at the University of Minnesota, a prospective longitudinal study designed to examine the infant, parental, interactional, and environmental factors that account for developmental outcomes for a sample of high risk children. Principal investigators are Byron Egeland, Alan Sroufe, and Amos Deinard. A sample of 267 mothers was selected from primiparous pregnant women considered to be at risk for later caretaking problems. Risk factors included low socioeconomic status, age ($\bar{X}$ = 20.5, range = 12-34), lack of support (62% single at time of baby's birth), chaotic living conditions and a high degree of life stress. The children were considered to be at risk for later social and emotional problems for a number of reasons: higher incidence of pregnancy and birth complications among such a sample; a higher incidence of disturbance in the child-caregiver relationship; and generally unstable and stressful living environments. Data collection began with assessment of maternal personality and attitudes during the 36th week of pregnancy and has included observation of the neonate, interviews with mother every six months, detailed assessments of the child, observations of the mother-child interaction in a variety of natural and laboratory situations, and observations of the children in preschool and daycare settings. Currently the children are six to seven years of age, and information is being collected on their school adjustment.

Procedure

Assessment of mother-infant attachment. At 12 and 18 months, the quality of mother-infant attachment was assessed by means of the Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978). This is a 20 minute videotaped procedure consisting of eight episodes in which the infant is observed in an unfamiliar room filled with toys, with an unfamiliar adult

female in the room, both with the mother present and absent.

Infants are classified into three major groups (A, B, C), primarily on the basis of their behavior during the reunion episodes following separation with the mother. Securely attached infants (Group B) greet their mothers positively, actively seek proximity or interaction with the mother, accept comfort from the mother if distressed, and display few if any negative behaviors toward her. These infants typically explore and play during the preseparation episodes, evidence that the mother provides security in the unfamiliar environment.

Infants who exhibit substantial negative behavior toward the mother during the reunion episodes are classified as anxiously attached (Groups A and C). Infants are classified in Group A when they avoid the mother by turning away, looking away or ignoring her. Group C infants show angry resistance to their mothers upon reunion. They often exhibit a high level of distress during separation or even when the mother is present. Upon reunion they often appear ambivalent, actively seeking proximity with the mother, yet angrily pushing her away.

24 month tool using task. At 24 months of age the children and their mothers were videotaped in a series of tool using/problem solving tasks of increasing difficulty. In each task, a small toy or candy was visible inside a clear plexiglass container but was accessible to the child only if s/he used a tool in a specific way to retrieve the prize. The last two tasks were too difficult for a two-year-old to solve without help. The mother was instructed to help her child when she felt she needed to. These tasks were designed to tax the children in order to assess how the mother and child work together, how the child makes autonomous efforts to solve the problem, as well as how the child uses the mother for support and guidance in a potentially frustrating situation. Assessments of the mother focused on the emotional support and the clarity and quality of assistance she offered the child. Children were rated on five- to seven-point scales on the following variables: dependency on mother, non-compliance with maternal directions and suggestions, anger and frustration (toward the mother and toward the environment in general), persistence, strategies for coping with the challenges and frustrations of the situation, and enthusiasm for the tasks.

Forty-two month teaching tasks. When the children were 42 months of age, they were observed with their mothers in four learning tasks which were difficult enough to require that the mother use some teaching strategies to enable the child to complete the tasks. In the first task, the child was asked to construct copies of a large wooden block, using smaller blocks of various shapes. In the second task, the mother asked the child to name as many things with wheels as s/he could think of. The third task was a color and shape matching task, and the final task required the child to use a Etch-A-Sketch to trace a maze drawn on the screen of the Etch-A-Sketch.

Children were rated on the following dimensions: persistence in attempting to complete the tasks, enthusiasm for the tasks, anger/negativity (toward mother and/or the environment in general), compliance with maternal suggestions and directions, general quality of experience in the situation, reliance on mother for help and support, affection for mother, and avoidance of mother. (Mother's behavior also was rated, but those ratings are not included in the analyses presented here.) All ratings were done by two independent observers whose scores were added together, yielding scores ranging from two to fourteen. In cases where observers disagreed by two or more points, ratings were decided by conference and/or a third observer.

Preschool assessment. When the children were 4 1/2 to 5 years of age, they were observed extensively in their preschool or daycare setting. Using seven-point scales, observers rated the children on the following dimensions: agency (how confidently and assertively the child deals with the environment), ego control (how the child monitors impulses and modulates his/her responses to the preschool environment), dependency on teachers for support and nurturance, social skills in the peer group, positive affect, negative emotional tone, and compliance with teachers directions and suggestions. In addition, teachers were asked to complete the Preschool Behavior Questionnaire (Behar & Stringfield, 1974). This measure consists of the items often associated with social and emotional problems in young children. The teacher was asked to check for each item: 1) does not apply (scored one point); 2) applies sometimes (two points); or 3) certainly applies (three points). Teachers also completed the thirty-item Problem Behavior Scale written by our staff (Erickson & Egeland, 1981), using the same format as for the Behar and Stringfield measure.

Results and Discussion

The Preschool Behavior Questionnaire and the Behavior Problem Scale were factor analyzed separately using principal axis analysis with varimax rotation. These analyses yielded five major factors for each measure. Factor loadings for the items for both measures are presented in Tables 1 and 2.

At each age (24 months, 42 months, and in the preschool) a hierarchical cluster analysis was performed on all children assessed, using their scores on the child behavior ratings, and, in the case of the preschool assessment, also using the first three factors from the Preschool Behavior Questionnaire and the first two factors from the Behavior Problem Scale. At each age a four group solution was chosen. For the analyses presented here, we have collapsed the less competent cluster groups and have looked only at competent or well-adapted children versus children who were functioning poorly. (See Early Maladaptation: A Prospective Transactional Study, Final Report for a complete description of cluster groups.)

Comparison of Attachment Groups on Behaviors Assessed at Subsequent Ages

One-way analyses of variance with Student Newman-Keul's post hoc contrast were used to compare means for anxious avoidant, securely attached, and anxious resistant infants on behavior ratings at 24 months, 42 months, and in the preschool. These analyses included only those children whose attachment classification was the same at both 12 and 18 months. Results are presented in Table 3 and are described here. At 24 months of age there were highly significant differences among attachment groups on all variables, reflecting much greater competence on the part of children who had been securely attached at 12 and 18 months. Securely attached children were more persistent in their efforts to solve the difficult problems, and had better coping strategies than did anxious resistant children. Securely attached children were more compliant with their mothers, expressed less anger and less frustration, and were more enthusiastic in their approach to the tasks than were either anxious avoidant or anxious resistant children. Anxious resistant children were significantly more dependent on their mothers for help and support than were either anxious avoidant or securely attached children in the tool using situation at 24 months.

Interestingly, at 42 months of age in the teaching tasks with their mothers, anxious avoidant and securely attached children looked quite similar, with anxious resistant children differing significantly from both groups on several variables. Children who had anxious resistant attachments as

infants were now less persistent, less enthusiastic, less compliant, and more reliant on their mothers for help and support than were children who had been in either the anxious avoidant or securely attached groups. However, by age 4 1/2 to 5 in the preschool situation, anxious avoidant children were also different from the securely attached children. They were rated by observers as being more dependent on their teachers and having poorer social skills than securely attached children. Even though the post hoc comparisons were not significant, the anxious avoidant children also tended to be less compliant with teachers' instructions and rules in the classroom than either anxious resistant or securely attached children. Children who had been anxious resistant as infants were rated by observers in preschool as being less agentic (i.e. less confident and assertive) and as having poorer social skills than securely attached children. The analyses based on the teacher's responses to the Preschool Behavior Questionnaire and the Behavior Problem Scale indicated that anxious avoidant children were more withdrawn and gave up more easily than securely attached children. These children also were viewed by their teachers as more exhibitionistic and impulsive than children in the other attachment groups and as more hostile than anxious resistant children. Anxious avoidant children received higher total scores on both the Preschool Behavior Questionnaire and the Behavior Problem Scale than either anxious resistant or securely attached children, suggesting more and varied behavior problems in that group.

As predicted, children who were securely attached at 12 and 18 months were judged to be dealing more effectively with important developmental issues at later stages. While both anxious avoidant and anxious resistant children were functioning less effectively at subsequent ages, their problems were manifest in different ways and in different contexts. For example, in the 42 month teaching task situation, anxious avoidant children looked quite similar to the securely attached children and the anxious resistant were the least competent, whereas in the preschool situation quite the reverse was true: anxious resistant children were more similar to the securely attached children and anxious avoidant children differed in notable ways from both groups. It was particularly interesting that anxious avoidant children looked similar to securely attached children at both 24 and 42 months in terms of dependency or reliance on mother. However, in the preschool situation, anxious avoidant children were rated as being far more dependent on their preschool teachers than were either securely attached or anxious resistant children. The issue of the dependency needs that remain in children who had been anxiously attached as infants and the differing manifestation of those needs depending on anxious avoidant or resistant status is dealt with in detail elsewhere (Sroufe, Fox & Pancake, in press).

Attachment and Continuity of Adaptation Over Three Subsequent Assessments

Due to the limited number of infants for whom attachment classification was stable at 12 and 18 months and for whom we had no missing data at each successive assessment, for the following analyses we grouped infants according to the 18 month classification only. Chi square analyses were used to examine the distribution fo eighteen month attachment groups within later competency groups. Results, summarized here, are presented in Tables 4, 5, and 6. Competency groups were based on cluster analyses, as described before, with the poorly functioning group being formed by collapsing the less competent cluster groups at each age.

At 24 months of age, over half (about 57%) of the children who had been securely attached at 18 months were classified as competent in the tool using situation with their mothers. Of 37 anxious avoidant children, 15 (approximately 40%) were competent. However, only five of the 27 anxious resistant children (about 19%) were in the competent group at 24 months.

Table 5 shows the distribution of 18 month attachment groups among children who were competent at both 24 and 42 months, children who were functioning poorly at both 24 and 42 months, and children who were judged to be competent at one time but not at the other (mixed). For both anxious avoidant and securely attached children, we see a mixed pattern of competence, although a larger proportion of securely attached children (24 children or approximately 27%) were competent at both assessments than were anxious avoidant children (only five children or approximately 14%). For anxious resistant children, the results are more dramatic. Two-thirds of the anxious resistant children were functioning poorly at both 24 and 42 months of age (16 children) and only one child (approximately 4%) was judged to be competent at both 24 and 42 months.

Table 6 shows the distribution of 18 month attachment groups among children who were competent at 24, 42 months and in the preschool; children who were poorly functioning at all three times; and children who showed a mixed pattern of competence across those three points in time. (Note: The total N for this table is smaller, as not all of the children from the total sample attended preschool.) By preschool, none of the children in either the anxious avoidant or the anxious resistant groups had been judged to be competent at all three later assessments. Eighty percent of the anxious avoidant children showed a mixed pattern of competence, while a majority (approximately 58%) of the anxious resistant children were functioning poorly at all three times. Even for securely attached children, only 10 (27%) were competent at all three points in time, with the majority (21 children or approximately 57%) presenting a mixed pattern of competence across the three points in time. Sixteen percent of the securely attached were imcompetent at all three subsequent assessments.

The data presented here provide some evidence of continuity of adaptation in high risk children throughout the preschool years in particular the relationship between quality of attachment in the first 1 1/2 years of life and the child's behavior at subsequent stages of development. However, our predictions clearly are far from perfect. In general, we have seen a decreasing number of competent children among our entire sample from infancy through the preschool years. Children with an anxious attachment are highly unlikely to function competently throughout the preschool years. Securely attached children are somewhat more likely to function competently despite the many risk factors in their home environments. But a secure attachment does not insure that the child will continue to function competently throughout the preschool years. We must look at other factors which account for changes in competence across time.

Quality of attachment to a large extent reflects the quality of the early caretaking environment (Egeland & Farber, in press). Early caretaking is predictive of later caretaking. But among these high risk mothers life circumstances are frequently changing. Such factors as unstable personal relationships, economic stress, and birth of additional children may influence parent-child interaction and the general quality of the caretaking environment. Furthermore, stress inherent in trying to meet the demands of the child at subsequent stages (e.g. coping with the emerging automony of the two-year-old) may result in a change in the caretaking environment. Perhaps some caregivers effectively meet the needs of the infant, but lack the skill, knowledge, understanding, or patience necessary to adapt their parenting strategies to the changing needs of the toddler.

We would expect that when children who were securely attached as infants look incompetent at subsequent ages, this might be accounted for by a decline in the quality of the caretaking environment. While we would contend that a secure attachment facilitates the child's coping with later stress, we would not suggest that the securely attached child is completely invulnerable to later insult. We would predict that even a child who was securely attached as an infant but later was subjected to a less than adequate caretaking environment, or whose caregiver failed to meet his/her needs at later ages would show some decline in social-emotional functioning. Similarly, a child who was anxiously attached but experienced a significant positive change in the quality of his/her environment might move toward a higher quality of adaptation. There is continuity as well as predictable discontinuity in development.

Table 1

Factor Analysis of Preschool Behavior Questionnaire

Items	Factor I Hostility	Factor II Hyperactivity/ Distractibility	Factor III Gives up, Cries	Factor IV Nervous Habits	Factor V Worried, Unhappy
1. Restless	.46	.56	.13	.04	.06
2. Squirming	.37	.72	.14	.17	.14
3. Destructive	.49	.24	-.10	.004	.19
4. Fights	.83	.21	.003	.09	.06
5. Disliked	.46	.18	.04	.26	.29
6. Worries	.008	.26	.01	.20	.72
7. Solitary	-.03	.02	.12	.08	.27
8. Irritable	.75	.07	.17	.15	.31
9. Unhappy	.35	.11	.18	-.005	.60
10. Twitches	.16	.17	.11	.77	.06
11. Bites Nails	.02	.02	.09	.61	.22
12. Disobedient	.58	.29	-.12	-.02	-.06
13. Poor Concentration	.17	.63	.22	.12	.17
14. Fearful	-.10	.16	.36	.31	.19
15. Fussy	.26	-.15	.25	.17	.44
16. Lies	.41	.10	.08	.02	.03
17. Soils Self	.15	.15	.07	.38	-.08
18. Stutters	.09	.12	.34	.13	.02
19. Other Speech Difficulty	.05	.13	.11	.01	-.02
20. Bullies	.78	.10	-.09	.13	.13
21. Inattentive	.23	.71	.16	.12	.08
22. Does Not Share	.55	.07	.23	.01	-.05
23. Cries Easily	.50	.04	.56	-.12	.34
24. Blames Others	.67	.07	.28	-.17	.07
25. Gives Up	.04	.19	.76	.11	.06
26. Inconsiderate	.67	.18	.09	.06	.05
27. Sexual Problems	.12	.14	.14	.22	-.06
28. Kicks, Hits	.72	.25	.06	.12	-.07
29. Stares Into Space	-.05	.11	.36	.37	-.06
30. Behavior Problems	.52	.27	.09	.17	.25

Table 2

Factor Analysis of Behavior Problem Scale

Items	Factor I Exhibitionist, Impulsive	Factor II Withdrawal	Factor III Repetitive Movements, Self-Abuse	Factor IV Shy, Anxious	Factor V Sulks, Tantrums
1. Boisterous	.55	-.19	.19	-.25	.11
2. Shows Off	.70	-.15	.13	-.19	.05
3. Verbally Aggressive w/Peers	.76	-.16	-.04	-.05	.22
4. Steals	.48	.11	.00	.05	.13
5. Doesn't Play	.27	.62	.18	.18	.03
6. Impulsive	.64	-.05	.21	-.18	.06
7. Tantrums	.48	-.00	.29	.03	.56
8. Doesn't Accept Criticism	.44	.04	.12	.07	.60
9. Upset by Failure	.45	.14	.15	.32	.27
10. Sucks Thumb	.03	.24	.22	.14	.10
11. Handles Genitals	.11	.31	.42	.10	-.08
12. Verbally Aggressive w/Adults	.58	-.13	.14	-.09	.49
13. Shy	-.28	.23	.10	.75	-.19
14. Hypersensitive	.20	.13	-.17	.34	.28
15. Clings	.04	.16	.03	.53	.13
16. Poor Appetite	-.03	.29	-.03	.52	.16
17. Excessive Appetite	.16	.10	.44	-.16	.14
18. Overly Fearful	-.05	.41	.19	.57	-.08
19. Sulks	.17	.20	.05	.11	.63
20. Tense	.58	.31	.20	.15	.01
21. Physical Complaint	.05	.16	-.02	.16	.12
22. Physical/Emotional Condition	.002	-.04	-.03	-.07	-.01
23. Flat Affect	-.11	.36	.36	.09	-.09
24. Tired	-.02	.62	-.08	.28	.07
25. Little Interest	-.13	.85	.06	.12	.17
26. Passive	-.20	.71	.08	.32	-.02
27. Lacks Perseverence	.50	.42	.09	.22	.01
28. Daydreams	.13	.58	.08	.15	.05
29. Repetitive Movements	.36	.13	.57	.26	-.17
30. Repetitive Whole Body	.11	.11	.86	-.04	.19
31. Self-Punishing	.26	-.12	.74	.08	.23

Table 3

Means for Attachment Groups* on Child Variables At 24 Months, 42 Months and in Preschool

	A Anxious/Avoidant	B Secure	C Anxious/Resistant	P	Contrast (SNK Post Hoc)
24-Month Variables:					
Dependency	2.89	2.87	4.46	.004	C A,B
Noncompliance	3.94	3.08	4.23	.005	A,C B
Frustration	3.72	2.51	4.31	.0005	A,C B
Persistence	2.78	3.21	2.23	.01	B C
Coping	3.33	4.06	2.46	.002	B C
Enthusiasm	7.06	8.87	7.08	.005	B A,C
Anger	3.22	2.27	3.85	.004	A,C B
42-Month Variables:					
Persistence	9.18	9.42	6.75	.02	A,B C
Enthusiasm	8.41	8.64	6.08	.03	A,B C
Negativism	3.29	3.74	3.67	.82	
Compliance	9.76	9.81	7.33	.05	A,B C
Reliance on Mother	6.59	6.22	9.00	.009	C A,B
Affection for Mother	7.06	7.97	7.00	.35	
Avoidance of Mother	3.18	3.50	4.92	.18	
Experience in Session	8.53	9.08	7.42	.19	
Preschool Variables:					
Agency	3.90	4.50	3.20	.04	B C
Ego Control	3.90	4.35	4.50	.52	
Dependency	4.10	2.70	2.90	.03	A B
Social Skills	3.20	4.05	3.10	.03	
Positive Affect	4.20	4.73	4.20	.42	
Negative Emotional Tone	3.60	2.53	2.10	.11	
Compliance	4.30	5.58	5.60	.04	

*Includes only those children whose attachment classification was the same at 12 and 18 months

Distribution of 18-Month Attachment Classes within Competency Groups over Three Subsequent Points in Time

	A Anxious/Avoidant	B Secure	C Anxious/Resistant	Total
24-Month Groups				
Competent	15	54	5	74
Poorly Functioning	22	41	22	85
Total	37	95	27	159

$X^2 = 13.11$ $p = .001$

	A Anxious/Avoidant	B Secure	C Anxious/Resistant	Total
24-42 Months				
Competent both Times	5	24	1	30
Poorly Functioning Both Times	10	23	16	49
Mixed	20	42	7	69
Total	35	89	24	148

$X^2 = 17.86$ $p = .001$

	A Anxious/Avoidant	B Secure	C Anxious/Resistant	Total
24, 42 Months and Preschool				
Competent All 3 Times	0	10	0	10
Poorly Functioning All 3 Times	4	6	7	17
Mixed	16	21	5	42
Total	20	37	12	69

$= 17.45$ $p = .002$

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