

Changes in Self-Perceptions and Values at Early Adolescence

Jacquelynne Eccles, Allan Wigfield, David Reuman
The University of Michigan

Douglas Maclver
The University of California at Los Angeles

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Thus far, my colleagues have discussed changes in students attitudes toward mathematics and have linked these changes to changes in the nature of math classrooms. Their results show clear evidence of systematic changes in the classroom environments (Feldlaufer & Midgley, 1987) and quite suggestive evidence of the impact of these changes on students' achievement-related beliefs and attitudes (Reuman et al., 1987).

I am going to take a broader perspective on the junior high school transition and discuss changes in students' beliefs regarding four domains of activity: math, English, social relations, and athletics. I am also going to discuss these changes in terms of two environmental/cultural shifts: the transition to junior high school and the entry into what I'll call social puberty. Both of these transitions have the potential for inducing change in early adolescents' self perceptions, values, and goals.

The transition to junior high school typically involves several major changes in the nature of the children's social environment in addition to the specific classroom environmental changes already discussed by Harriet and David. Junior high schools are typically much larger, more formal, and less personal than neighborhood elementary schools. In addition, children's social networks are often disrupted as they move into the junior high school. For example, my daughter was virtually isolated from her friends

all day in the seventh grade, sharing neither classes nor lunch period with her closest friends. Tom Berndt has documented the impact of such changes on friendship patterns and self-esteem (Berndt, 1987) and Simmons and her colleagues have discussed the possible impact of such changes on self-esteem, school performance, and self-perceptions at length. These works suggest that we will find a general decline in students' self-perceptions and self-esteem between the sixth and seventh grade (Simmons et al., 1979). These self-perceptions may, however, rebound over the seventh grade year as the students' adjust to the changes. Furthermore, given that the social network is so important during this age group and often is so dramatically disrupted with the transition, we predict that the decline will be most marked for the social domain.

Entry into social puberty also involves changes in one's social culture, primarily regarding the salience of identity issues and the emergence of heterosociality and heterosexuality. Hill and others have discussed both of these changes in terms of gender-role intensification, suggesting that the salience or importance of sex-role congruent activities might increase during this transitional period (e.g. Eccles et al., 1986). We will assess this prediction in several ways in both the academic and non-academic domains.

General self-concept literature also suggests that patterns of change in one's self-perceptions and values should depend on those characteristics of children often associated with their competence in various domains. In order to maintain one's self-esteem, individuals may adjust their self-perceptions and values to reflect their relative competence levels across

domains. By doing so they will come to feel relatively more competence in precisely those areas where they are performing the best and will come to value most highly precisely those domains in which they feel most competent. To test this hypothesis we will compare changes in students beliefs and self-perceptions for students of differing math ability levels. We expect to find a compensatory effect such that low math ability children rate their social and athletic skills relatively higher than high math ability children and such that the value they attach to each domain comes to reflect these differential ability perceptions over the course of the four waves of this study.

Methods and measures.

The data are drawn from the same sample described by Feldlaufer & Midgely (1987) and by Reuman et al. (1987). The analyses reported here draw upon the students (approximately 1900) who made the junior high school transition after their sixth grade year and had complete data for the items we are reporting. The variables used in this paper are:

1. Harter's General Self-Esteem measure.
2. Self-Concept of Ability ratings for math, English, athletics, and social interactions.
3. Children's ratings of how much they enjoy math, English, social interactions, and athletics.
4. Children's ratings of the importance they attach to competence in each of these four domains.
5. Children's ratings of the amount of time they put into each of the four domains.
6. Children's ratings of the importance of friends, activities, sports, and "having to" as reasons for going to school.

All the variables were measured at each of the four waves using Likert-type scales anchored, typically, at the extremes. Wave, domain, sex, and math ability level effects were tested for each construct using MANOVA procedures.

Math ability level was measured using the sixth grade math teachers' rating of each child's natural math talent and relative performance. Three groups were formed from these ratings: a high ability group, an average ability group, and a low ability group. To keep the two extreme groups as meaningful as possible, we tried to achieve a 20-60-20% split. This was impossible given the distribution in our sample; instead, we created a 12-66-22% split for low-average-high ability children. Females are slightly overrepresented in the average and high ability groups (645 to 530 in the average group and 210 to 177 in the high ability group). Males are slightly overrepresented in the low ability group (111 to 102).

Results.

1. *Self-esteem.* (Show Figure 1). As predicted, there was a decline in self-esteem between sixth and seventh grade. But this decline appears to reflect a within year change as well as a transitional effect. In both the sixth and seventh grade, students report lower self-esteem in the fall than in the spring. In addition, they reported the lowest self-esteem in the fall of the seventh grade year. This pattern did not interact with math ability level or sex although boys reported higher self-esteem at all four waves and math ability level was positively and linearly related to self-esteem for both boys and girls.

2. *Self-Concept of Ability.* (Show Figure 2). Again, as predicted, we found a decline in self-concept of ability across the four waves and the pattern of the decline varied across the domains with social showing the most marked

transition effect, as predicted. Interestingly, both social and athletic self-concepts rebound slightly during the seventh grade while math and English self-concepts continue to decline over the year.

There was a significant domain by ability group by wave interaction. This effect is illustrated in Figures 3, 4, and 5. Consistent with the pattern reported by Reuman et al., 1987, the direction of change in math self-concept depends on one's math ability level (see Figure 3), with high ability students' concepts declining with the transition to junior high school and low ability students' concepts increasing. Neither of these effects, however, are very large.

Figures 4 and 5 put these changes into the context of the other three domains. While the effects are generally small, there is a clear difference in the pattern for high and low ability children. Figure 4 shows these differences for girls. In general high math-able girls' concepts either decline or remain stable over the four waves and they rate their academic self higher than their non-academic self at all waves. In contrast, low math ability girls show slight increases in their math and social self-concepts and declines in their English and athletic self-concepts. In addition, they come to rate their social self relatively more highly over the 4 waves.

Figure 5 illustrates similar effects of high and low math ability boys, except that low ability boys show declines in all domains except math and low ability boys rate their athletic ability, rather than their social ability, relatively higher than the other domains. Please note, however, the decline in the low ability boys' athletic self-concepts during the seventh grade. I'll come back to this effect at several points.

3. *Liking of each domain.* As was true for self-concepts, we found a decline in children's liking of math and sports. These declines are quite small, however, and there were no general declines for liking of either social or English (show Figure 6).

Also consistent with the self-concept findings, the pattern of decline in liking for the various domains depended on ability level. Figure 7 shows this for the math domain. As was true for self-concept, high and average ability children showed the largest declines and low ability children showed no decline (show Figure 7).

Figures 8 and 9 put these changes into the context of the other domains. Contrary to what one might expect, the high math-able children decline the most for math while the low math-able children decline the most for sports. As was true for self-concepts, the low math-able boys' liking of sports declines particularly during the seventh grade year.

As one would expect, boys reported liking sports more than girls did and girls reported liking social interactions and English more than boys. These sex effects did not interact with ability level, however. And, again not surprisingly, all the children reported liking the non-academic domains more than the academic domains.

Importance of Each Domain. Contrast these effects with the pattern for the children's ratings of the importance of each domain (Show Figure 10). Although there is a decline in the perceived importance of math, it is still seen as one of two most important domains, social being the other. And, contrary to what we had predicted, this pattern characterizes the responses of children of all three math ability levels.

As one would expect these patterns vary by sex as can be seen in Figure 11 with girls rating English, and social interactions as more important than the boys and boys rating sports as more important than the girls.

Time Spent on Each Domain. Another way to assess the importance that children attach to various activities is to look at the time they devote to each domain. Figure 12 illustrates these times. In general, we found an increase in time spent on one's appearance, on English-related activities, and on sports. Increases in both English and sports appear to be related to the junior high school transition. In contrast, the increase in time spent on appearance appears to reflect transition into "social" puberty.

As one would expect, both the sex of the child and the child's ability level influence the pattern of these changes. But contrary to what one might expect sex and ability do not interact in their influence. The main effects are illustrated in Figures 13 and 14. Consistent with notions of gender-role intensification, girls, in both math ability groups, increase the time they spend on their appearance to a greater extent than boys. But contrary to what one might expect given gender-role intensification, boys do not increase the time they spent on athletics to a greater extent than girls, perhaps because they are already devoting more time to this domain than any others.

There is also an interesting math ability effect on the pattern of time use for mathematics. High math-able children either increase or keep stable the time they devote to math while low math-able children report a decrease in the time they spend on math following the transition to junior high school. Interestingly, however, this decline essentially brings their time more in line with the lower amount of time being reported by high math-able students. Presumably these shifts reflect the types of math

classes these children are being assigned to with high math children being assigned to more demanding classes and low math children being assigned to less demanding classes. Other evidence consistent with this interpretation was discussed by Reuman et al., 1987.

Reasons for Coming to School. The last set of constructs I'm going to discuss are the importance children attach to various reasons for coming to school. I am focusing in these analyses on the non-academic reasons. Figure 15 summarizes the general effects. Both friends and sports increase in their importance with the transition to junior high school. In addition, "having to" increases in importance over the course of the seventh grade year.

As one would expect, these patterns vary depending on the child's sex. Figure 16 illustrates these differences for average math ability children. The importance of friends is the single most salient sex difference both in level and in the pattern of change across the waves. Friends are a more important reason for girls and this difference widens with the transition to junior high school.

Figure 17 illustrates one of the few sex by ability level by domain by wave interactions we obtained. I'd like to focus your attention on the low ability boys response to sports as a reason for coming to school. In contrast to almost all of the other groups, sports declines in importance for these boys over the junior high school year. This seemed quite counter-intuitive to me. Both self-concept maintenance theories and gender-role intensification theories would lead one to believe that sports might increase in importance for these boys. Yet as we have seen on their self-concepts and liking, these boys show a decline in the importance they attach to sports. Why might this be? It is possible that they had very high

expectations of sports involvement, as evidenced by the increase in their responses between wave 2 and 3, that were upset by the increasing competitiveness of sports' participation in the junior high school. Alternatively, it is possible that the movement to tie sports participation to academic grades has inadvertently undermined these boys interest in and confidence in their athletic abilities.

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Table 1**Summary of Significant MANOVA Results**

Self-Esteem		
Year	F=15.63	p<.001
Semester	F=13.29	p<.001
Ability	F=25.98	p<.001
Sex	F=31.69	p<.001
Self-Concept of Ability		
Sex by Wave by Domain	F=2.6	p<.01
Ability by Wave by Domain	F=3.38	p<.001
Math	F=3.04	p<.001
Math.Linear Effect	F=9.42	p<.001
Math.Cubic Effect	F=13.79	p<.001
Domain by Wave	F= 5.13	p<.001
Math.Linear	F=5.19	p<.05
Math.Quadratic	F=5.04	p<.05
English.Linear	F=25.26	p<.01
Social.Linear	F=10.21	p<.01
Social.Cubic	F=25.49	p<.001
Sex within Domain		
Math	F=17.84	p<.001
English	F=21.68	p<.001
Athletic	F=145.29	p<.001
Ability within Domain		
Math	F=232.82	p<.001
English	F=62.82	p<.001

Liking

Ability by Wave by Domain	F=2.87	p<.001
Math.Linear	F=9.22	p<.001
Athletic.Quadratic	F=16.88	p<.001
Domain by Wave	F=5.75	p<.001
Math.Linear	F=32.07	p<.001
Math.Quadratic	F=21.94	p<.001
English.Cubic	F=15.9	p<.001
Athletic.Linear	F=55.77	p<.001
Athletic.Quadratic	F=11.39	p<.001
Social.Linear	F=7.39	p<.01
Social.Quadratic	F=12.32	p<.001
Social.Cubic	F=13.8	p<.001
Domain by Ability		
Math	F=45.53	p<.001
Social	F=74.07	p<.001
Sex by Domain		
English	F=57.38	p<.001
Social	F=49.08	p<.001
Athletic	F=69.34	p<.001

Importance

Sex by Wave by Domain	F=2.73	p<.01
English.Cubic	F=7.8	p<.01
Athletic.Cubic	F=4.21	p<.05
Domain by Wave	F=12.15	p<.001
Math.Linear	F=150.55	p<.001
Math.Quadratic	F=7.41	p>.01
English.Cubic	F=22.66	p<.001
Athletic.Linear	F=29.19	p<.001
Athletic.Quadratic	F=7.38	p<.01
Athletic.Cubic	F=7.59	p<.01
Social.Linear	F=34.96	p<.001
Ability by Domain		
Math	F=36.56	p<.001
English	F=3.16	p<.05
Social	F=11.18	p<.001
Sex by Domain		
English	F=31.52	p<.001
Athletic	F=68.12	p<.001
Social	F=35.31	p<.001

Time Spent on Each Activity

Ability by Wave by Domain	F=2.68	p<.001
Math.Linear	F=8.16	p<.001
Math.Cubic	F=8.02	p<.001
English.Linear	F=4.99	p<.01
Athletic.Cubic	F=3.66	p<.05
Sex by Wave by Domain	F=3.56	p<.001
Athletic.Linear	F=11.45	p<.01
Appearance.Linear	F=26.3	p<.001
Appearance.Cubic	F=8.15	p<.01
Domain by Wave	F=35.17	p<.001
Math.Linear	F=22.37	p<.001
Math.Cubic	F=12.28	p<.001
English.Linear	F=27.3	p<.001
English.Cubic	F=53.59	p<.001
Athletic.Linear	F=9.7	p<.01
Athletic.Quadratic	F=19.87	p<.001
Appearance.Linear	F=256.05	p<.001
Ability by Domain		
Math	F=15.01	p<.001
English	F=8.42	p<.001
Sex by Domain		
Math	F=20.89	p<.001
English	F=19.92	p<.001
Athletics	F=116.42	p<.001
Appearance	F=259.51	p<.001

Reasons to Attend School

Sex by Wave by Domain	F=3.05	p<.01
Friends.Linear	F=20.72	p<.001
Domain by Wave	F=12.37	p<.001
Friends.Linear	F=79.22	p<.001
Friends.Cubic	F=16.05	p<.001
Athletics.Linear	F=10.47	p<.01
Athletics.Quadratic	F=10.33	p<.01
Activities.Quadratic	F=11.68	p<.01
Activities.Cubic	F=15.53	p<.001
Have to.Quadratic	F=21.28	p<.001
Sex by Domain		
Athletics	F=66.17	p<.001
Have to	F=10.57	p<.01

FIGURE 1

Self-Esteem Ratings by Sex and Ability Level

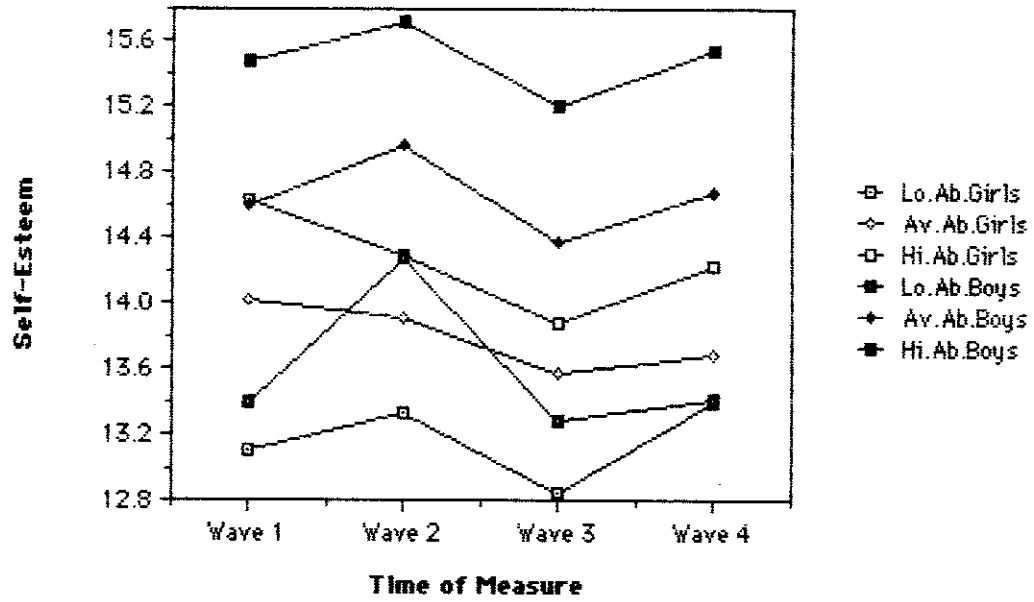


FIGURE 2

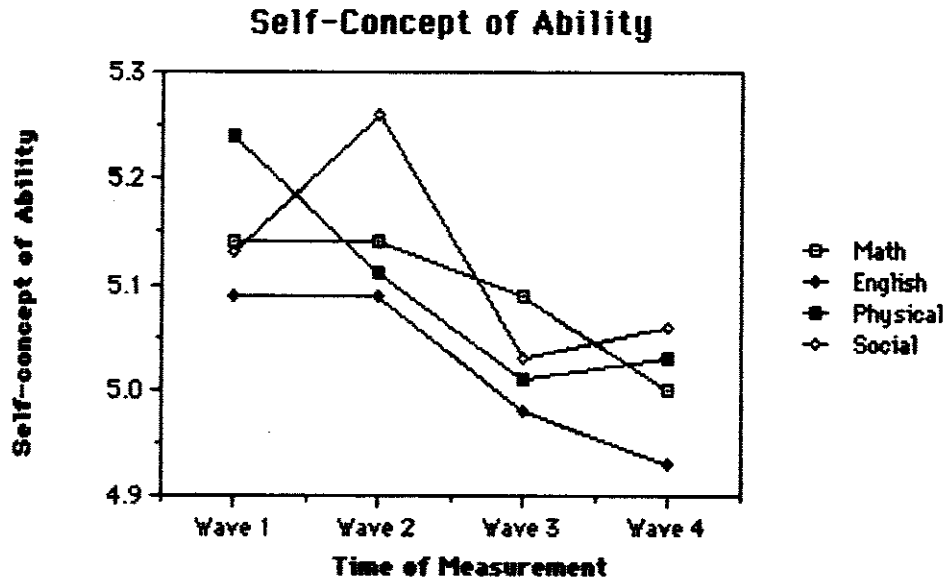


FIGURE 3

Self-Concepts in Math by Ability Level

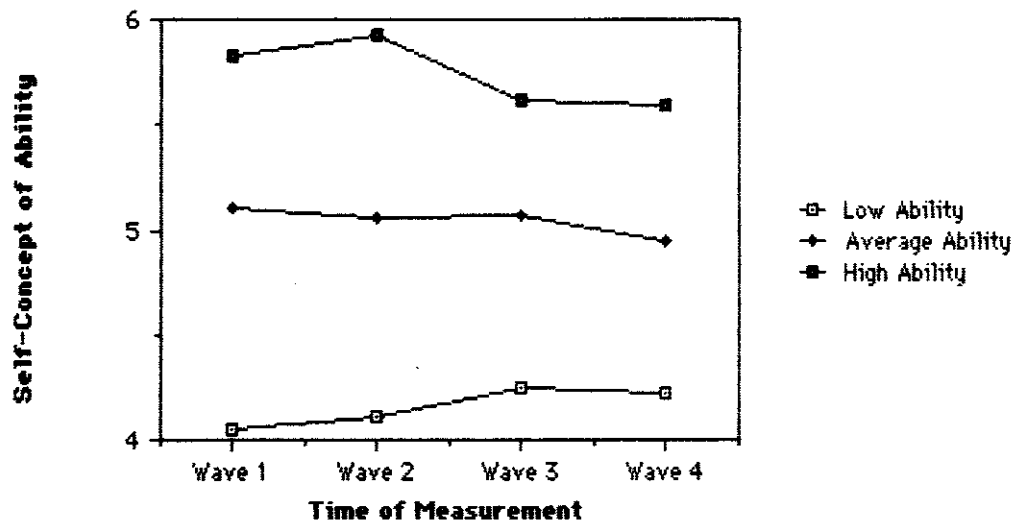


FIGURE 4

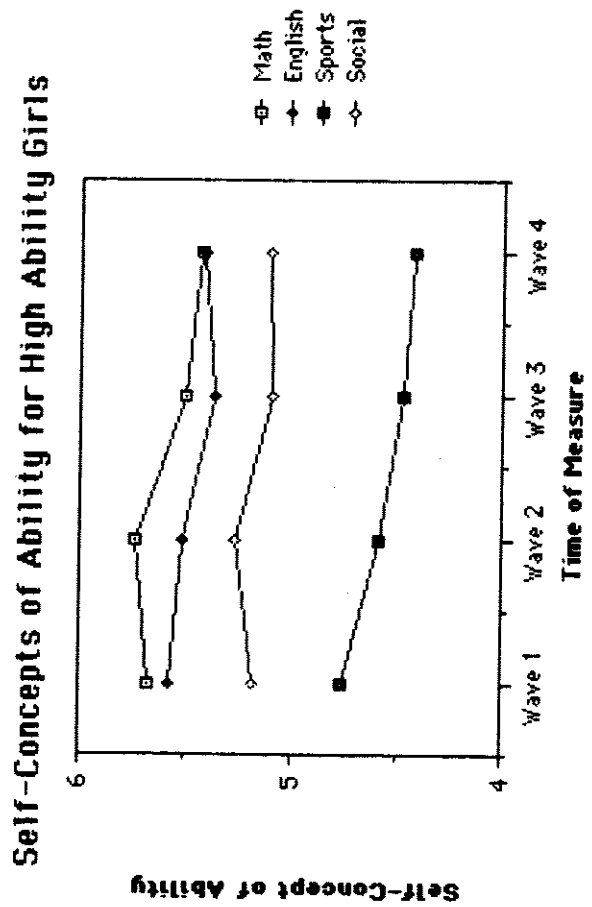
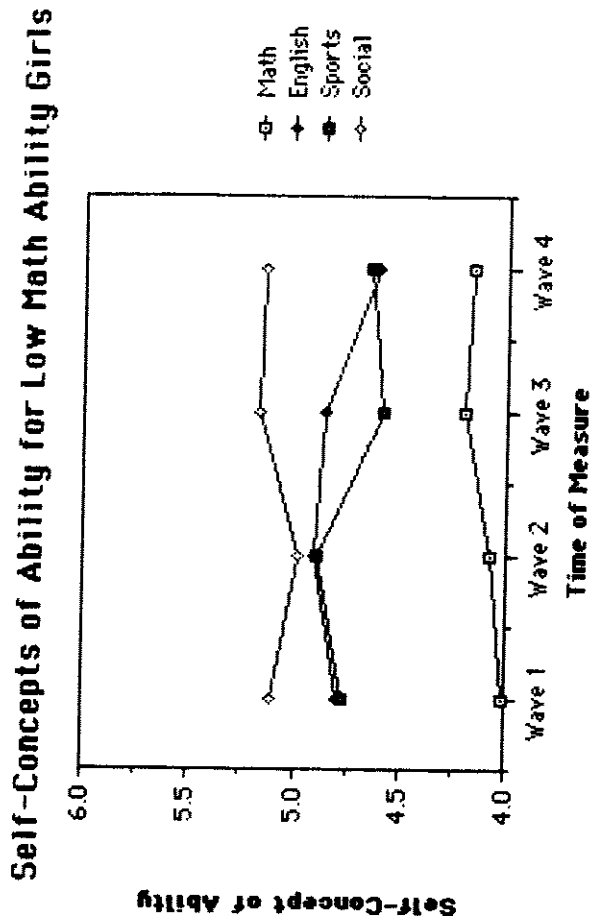
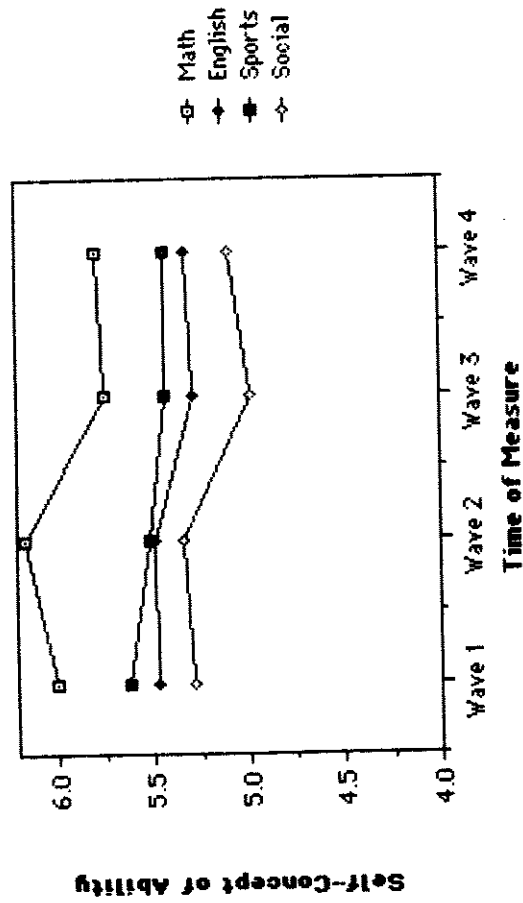


FIGURE 5

Self-Concepts of Ability for High Ability Boys



Self-Concepts of Ability for Low Ability Boys

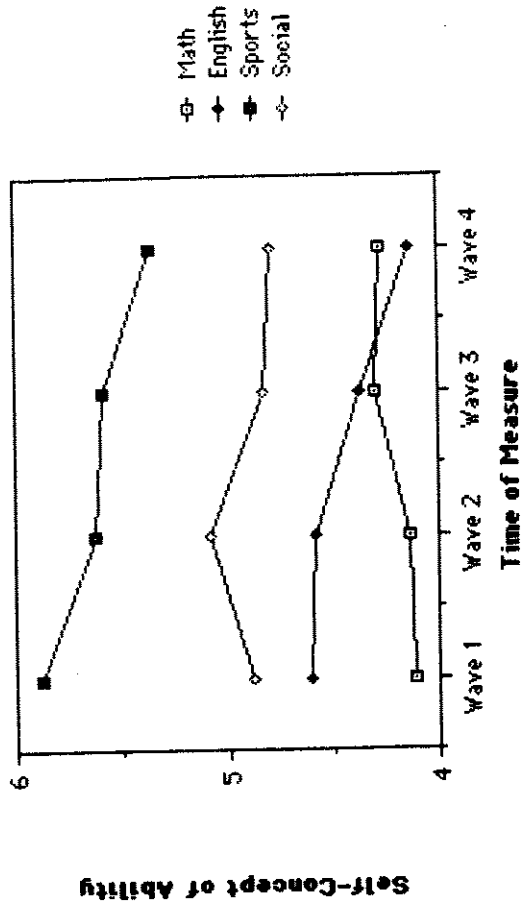


FIGURE 6

Children's Liking of Each Domain

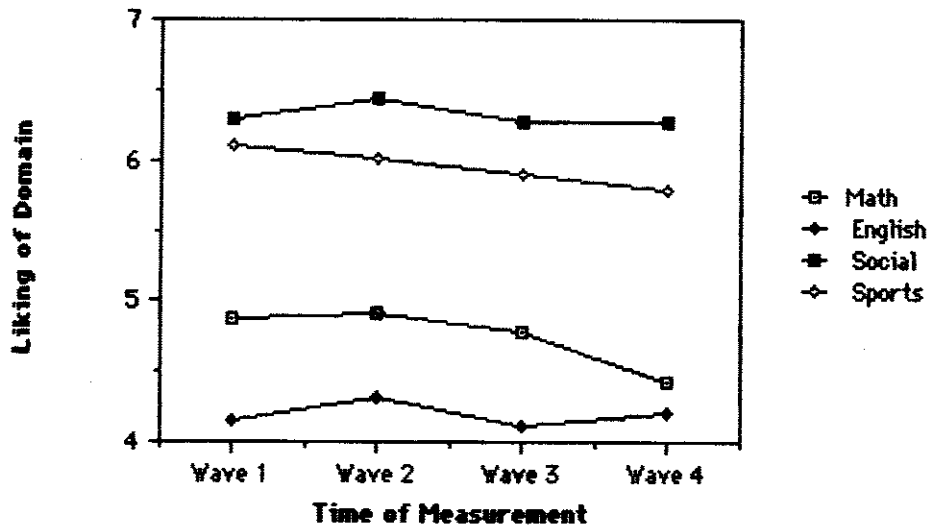


FIGURE 7

Liking of Math by Math Ability Level

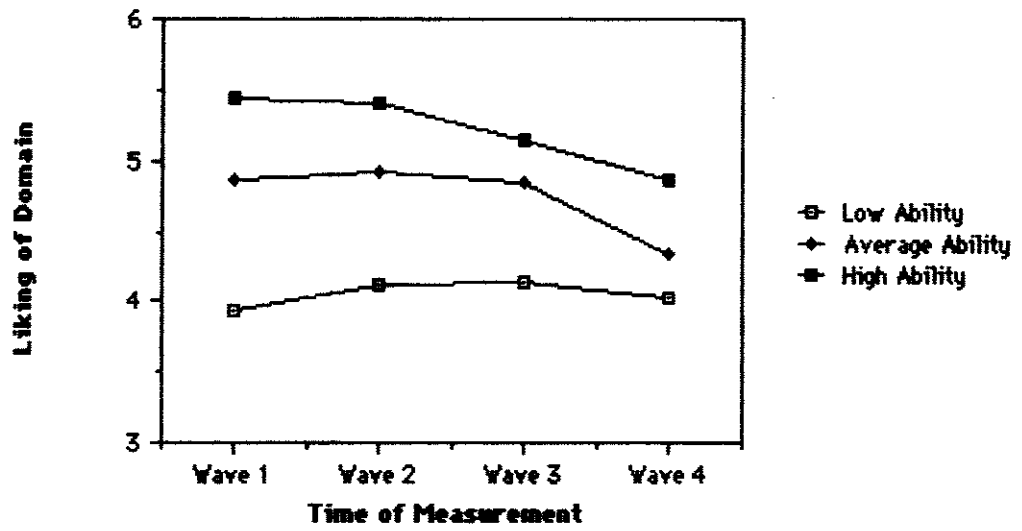


FIGURE 8

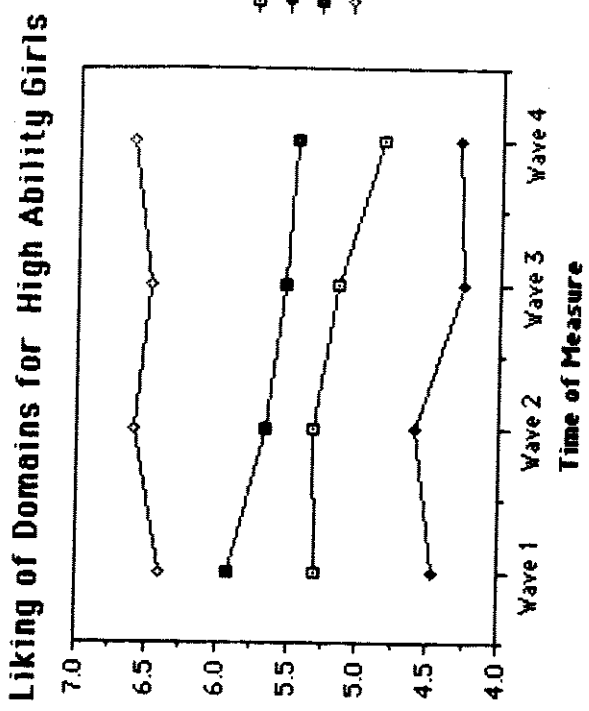
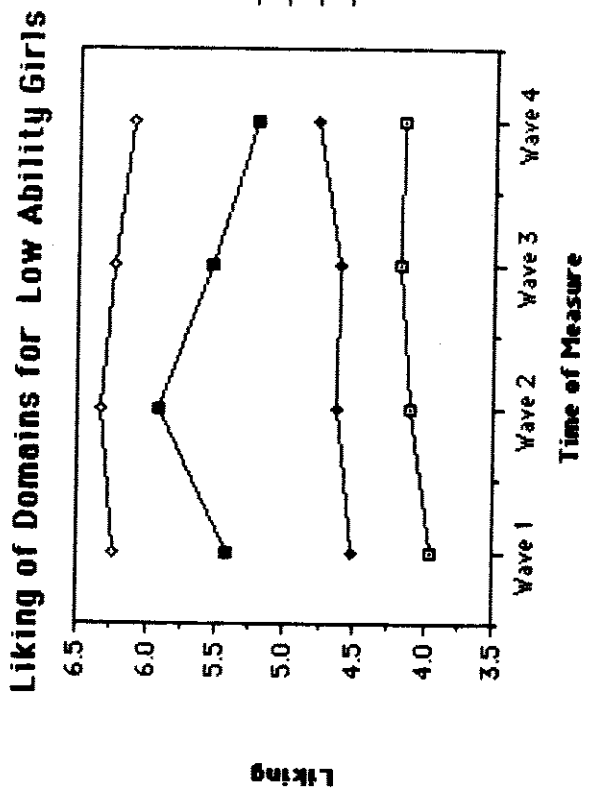


FIGURE 9

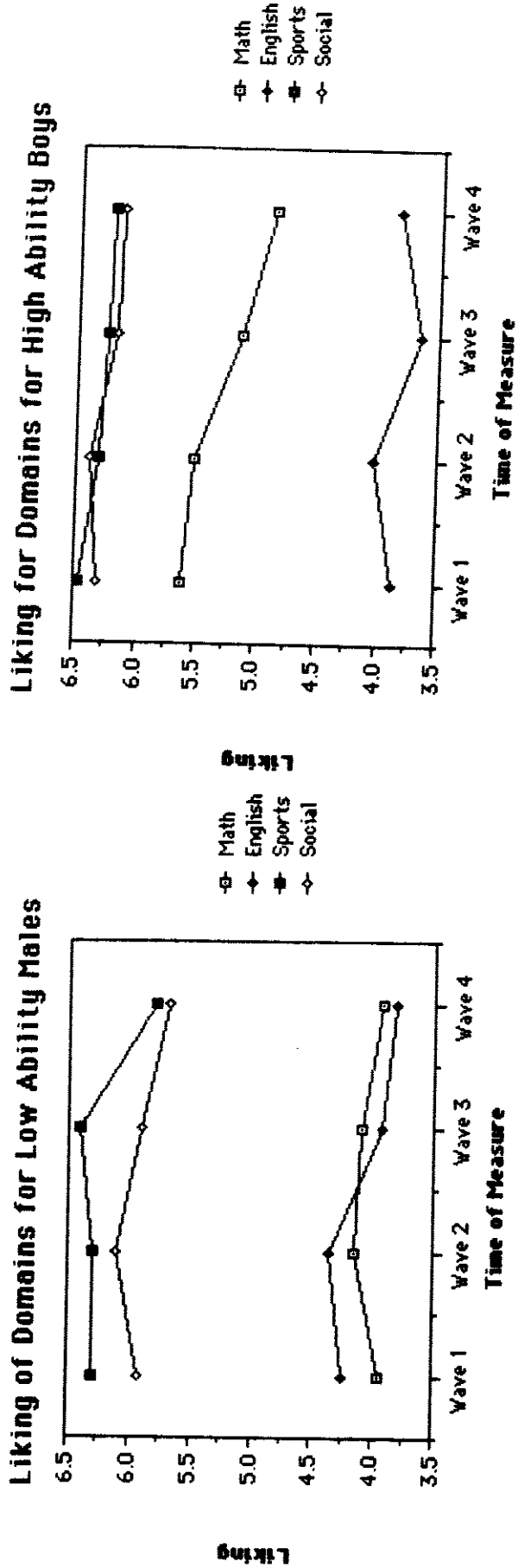


FIGURE 10

Importance of Each Domain to Children

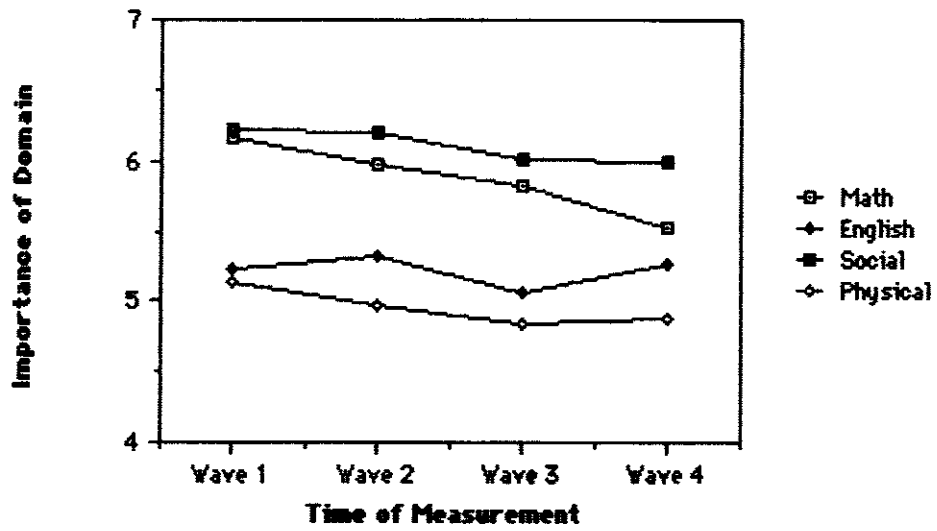


FIGURE 11

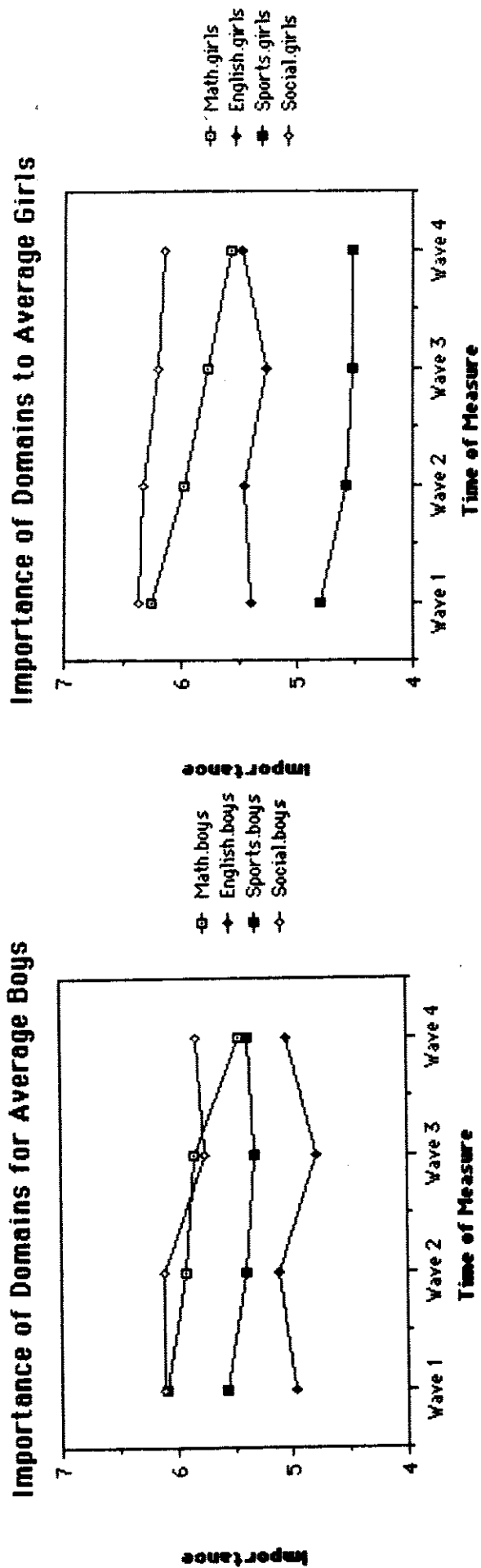


FIGURE 12

Time Spent on Each Domain

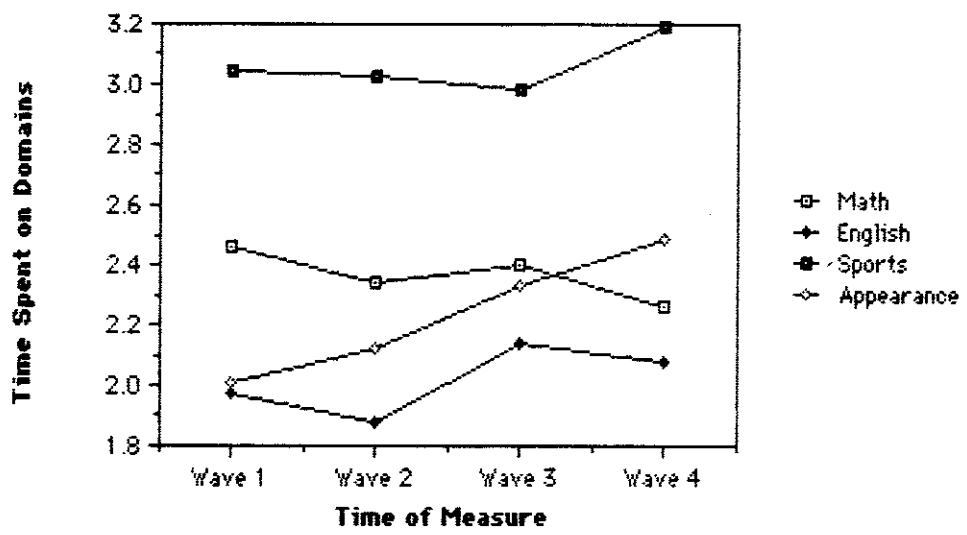
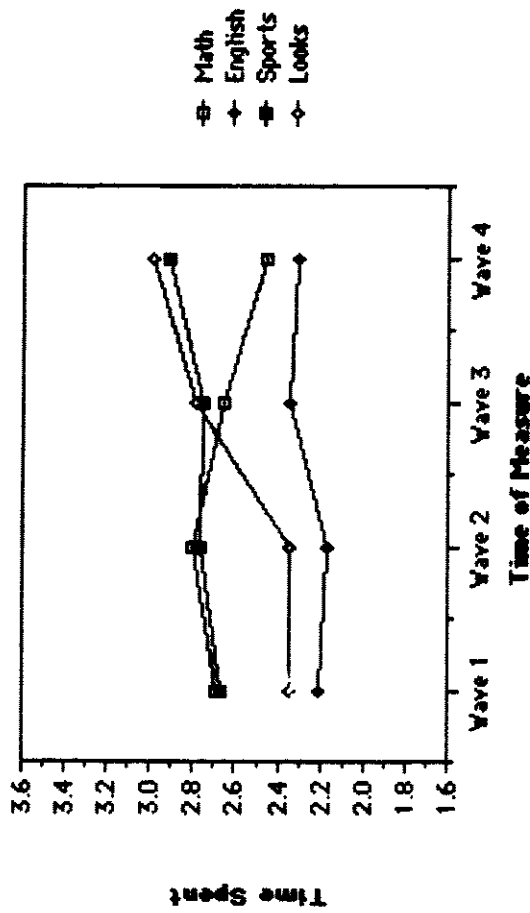


FIGURE 13

Time Low Ability Girls Spend on Each Domain



Time Low Ability Boys Spend on Each Domain

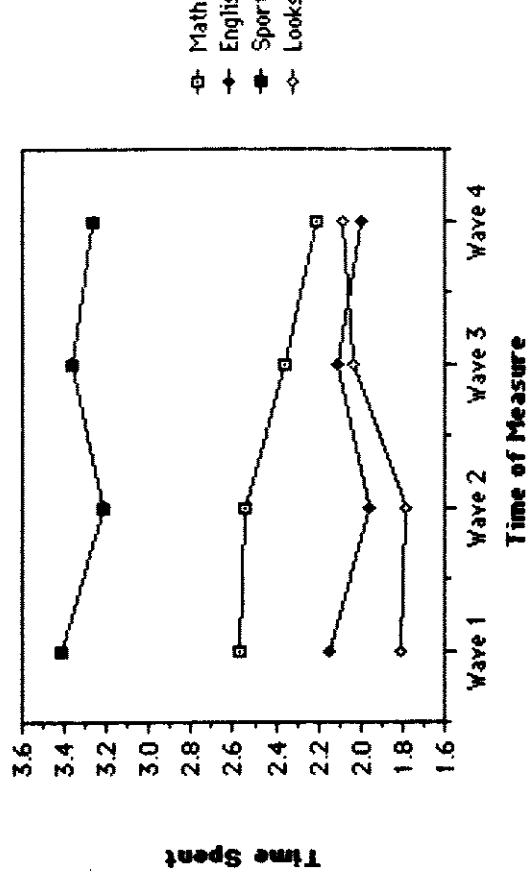
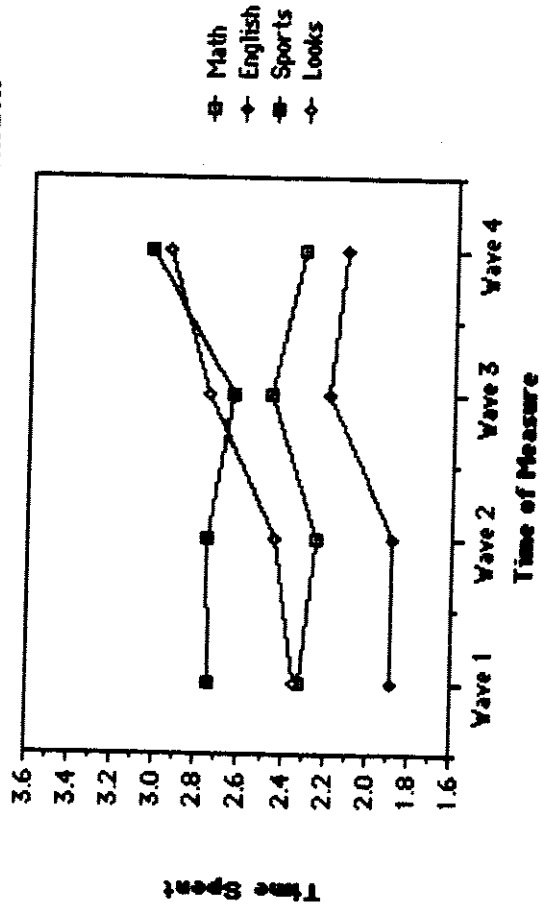


FIGURE 14

Time High Ability Girls Spend on Each Domain



Time High Ability Boys Spend on Each Domain

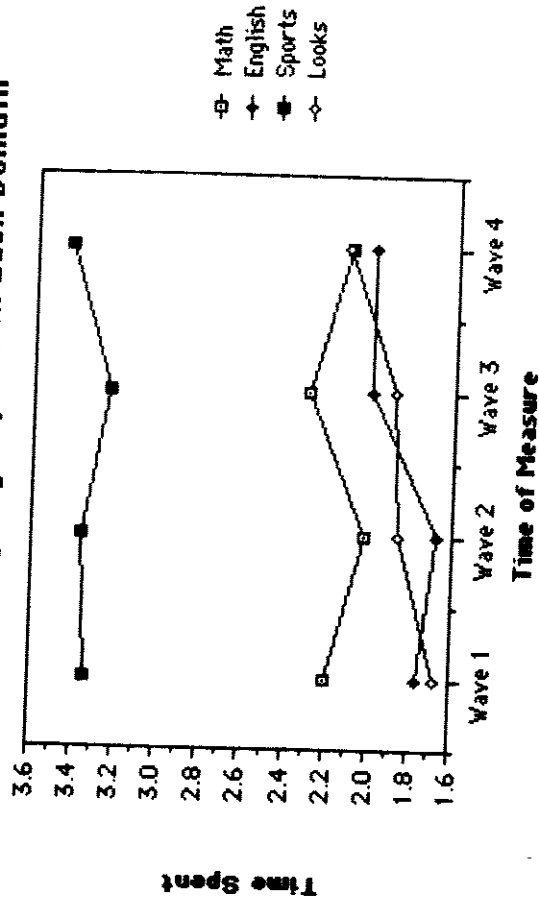


FIGURE 15

Reasons to Attend School

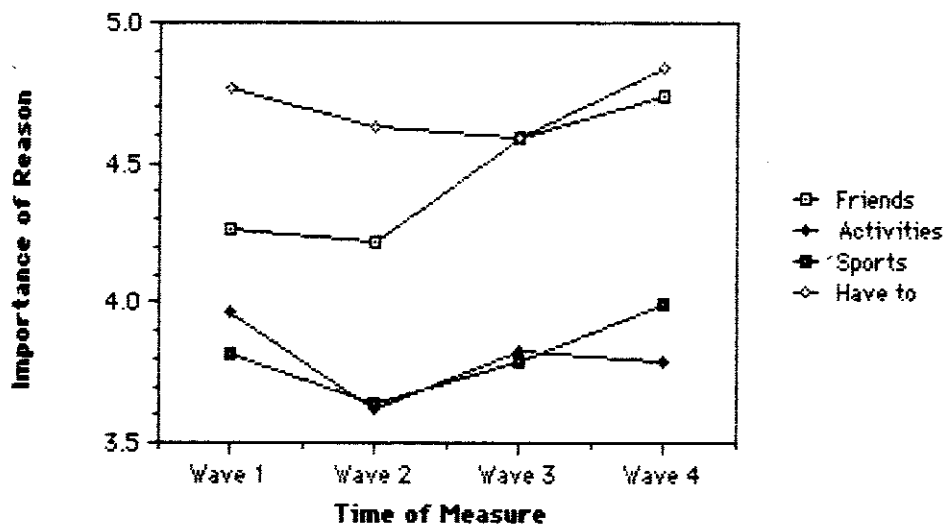


FIGURE 16

