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Encyclopedia of the Sciences of Learning

With 312 Figures and 68 Tables

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Failure Avoidant

- ▶ [Fear of Failure in Learning](#)

False Dilemma Fallacy

The false dilemma fallacy occurs when an argument offers a false range of choices and requires a person to pick one of them. The range is false because there may be other, unstated choices which would only serve to undermine the original argument. If a person concedes to pick one of these choices, he or she accepts the premise that they are indeed the only ones possible.

Familiarity Change

- ▶ [Revelation Effect](#)

Familiarization

- ▶ [Habituation](#)

Family

Is used in the literature to describe adults, parent, and children who live together as a caring unit.

Family Background and Effects on Learning

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Synonyms

Social and cultural resources at home; Social, cultural, and study resources at home; Socio-economic status of family

Definitions

In general, scientific literature treats the term “family background” a bit differently. Education research projects, monographs, and other literature sources apply the following related terms: family context – family background – socio-economic status of family – socio-economic status and home possessions of family – family configuration and processes. These terms are sometimes used as synonyms, but sometimes also as terms with different shades of meaning.

With respect to education, family background normally excludes factors such as climate in the family, interrelationships among family members, parent hopes and expectations regarding children’s education, and parenting style.

This entry treats ▶ [Family background](#) mainly as the set of social, economic, cultural, and welfare characteristics of a family, which has been proved by continuous multi-scale education research to be an influential factor in determining student achievement.

Theoretical Background

There are three main components characterizing family background:

- Material resources
- Cultural resources
- Social resources

▶ [Material resources](#) include family income and welfare, as well as different education resources available for a student, for instance, a separate room, a study desk, textbooks, a personal computer, software for instructional purposes, and Internet connection. The differences in material resources available for students can be easily noticed. Politicians are often aware of these differences as they can hardly equalize differences in cultural and social resources. The absence of material resources causes financial difficulties in obtaining education for low-income groups. It can be compensated by scholarships, tax incentives, reimbursement for textbooks, and other study materials.

▶ [Social resources](#) encompass social networks and inter- and intra-relationships among different social groups. The benefits provided by social resources can be numerous. Purely economic benefits are among them as social relations are used to find a job and pursuing one’s career. There can also be psychological

benefits because social relations contribute positively in maintaining self-confidence and satisfaction. There can even be medical benefits as people with closer social ties are healthier and they live longer. With respect to student education, social resources can be treated as parent interest and actual involvement in children's education expressed as cooperation with school, communication with child, and assistance in doing homework. One can explain the ability of some ethnic groups and strongly integrated society groups to decrease undesired student activities.

► **Cultural resources** are normally related to the parent level of education, the amount of books and different art objects at home, attitude toward education in general and the teachers and the school in particular. Well educated parents normally appreciate higher the importance of education, pay greater attention to children's education, and more actively involve in activities promoting educational achievement.

Large-scale international education research usually defines socio-economic status as the education and employment of parents and family welfare. For example, in the research cycles of OECD PISA in 2000, 2003, 2006, and 2009, the index of socio-economic and cultural status consisted of parent employment and education, as well as family's home possessions.

However, IEA TIMSS research on student "home background" included characteristics such as the number of parents in the family, the number of people living in the household, the language used at home, and the number of books at home.

Important Scientific Research and Open Questions

Measurements

One of the reasons for differences in education achievement is inequality in education opportunities that can be related to different "family background" characteristics. OECD, IEA, as well as earlier research on education achievement convincingly prove the relation between differences in student achievement and the characteristics of family and home. There are many methods applied for determining a family's economic, social, and cultural status and measuring corresponding indices. The following sections describe the composition and measurement of these indices within OECD PISA and IEA TIMSS research.

OECD PISA research composed the index of economic, social, and cultural status in order to give a broader view on student family status and condition at home in addition to parent employment. There were several variables combined in the index: father or mother's employment status indicator, the highest parent (father or mother's) education level index, condition at home index determined by asking students questions on the existence of a study desk at home, own room, a quiet study place, a personal computer for study purposes, software for study purposes, Internet connection, a calculator, classic literature, poems, art objects (paintings), useful books for studies, dictionaries, dish washer, and DVD player. Students were also questioned on the number of cell phones, TVs, and cars for the family. Moreover, each participating country could ask a question on three more country-specific objects in a family's possession. This approach is based on the assumption that the socio-economic status of a family is mainly determined by parent employment, education, and family welfare. As direct determination of parent income and international comparison is hardly possible, family's home possessions were used as an indirect proxy for welfare.

For each student, the value of this index is obtained as a standardized Principal Component Analysis result, where 0 equals OECD mean and standard deviation is 1. Principal Component Analysis was also used to define how universally different index components behave in different countries. The analysis of factor loadings showed that they are quite similar in different countries as their contributions to the index were similar. Profession component average factor weight was 0.81 (from 0.72 to 0.87 across countries). Education component average factor weight was 0.80 (from 0.73 to 0.86 across countries), whereas welfare component average factor weight was 0.73 (from 0.55 to 0.83). The reliability of the index was between 0.52 and 0.80. These results confirm the validity of OECD PISA economic, social, and cultural index across countries.

In different cycles of OECD PISA the index was composed in slightly different way, for example:

- In the cycle PISA 2000, result analysis used economic, social, and cultural index that was composed of parent employment, parent education, family welfare, cultural possessions, and indicators characterizing education resources at home.

- In the cycle PISA 2003 (OECD 2004), result analysis used economic, social, and cultural index that was composed of three variables: parent employment, parent education, and home possessions. Questions on cell phones, personal computers, cars, and TVs were not included in the index in this cycle.
- In the cycle PISA 2006, the economic, social, and cultural index was composed of home possessions, parent employment, and parent education variables with additional questions and country chosen. IRT method was used for making scales.

One has to note that the correlation between PISA 2003 and PISA 2006 indices was very high ($R = 0.96$). It shows that different methods applied for composing indices have not substantially affected the results.

Relationship between student performance in science and socio-economic background for the OECD area as a whole is depicted on Fig. 1.

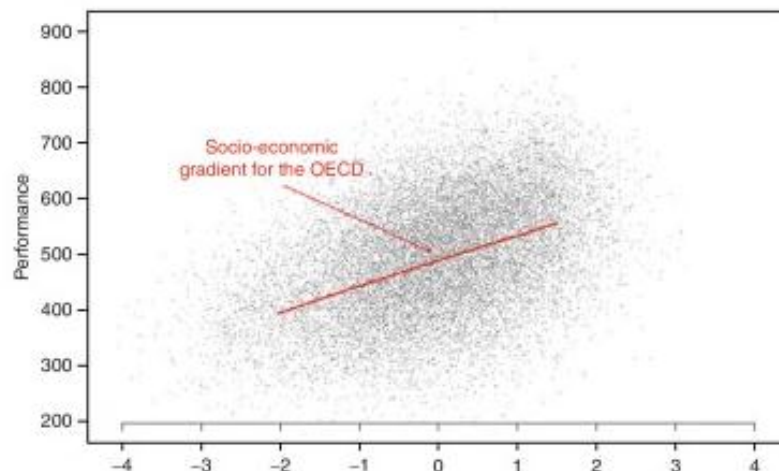
IEA TIMSS research of 2007 focused on several variables: parent education level, the use of testing language at home, if student parents were born in the participating country; books, computers, and Internet connection at home; the use of computer at home and elsewhere.

In almost all countries participating in the research, higher parent education was related to higher student

average achievement in science. Eight-graders with parents having university education had 499 points on average in the science test, which is 85 points more than students whose parents did not have primary education. In some countries with high student achievement, however, students with low-education parents still had comparatively high achievement (higher than students from other countries with university-education parents).

Earlier IEA TIMSS and PIRLS research cycles concluded that students having rich literature resources at home on average achieved higher results in mathematics, science, and reading than students from less equipped homes. Student responses on the number of books at home show that this situation remains both fourth grade and eighth grade.

In IEA TIMSS 2007 research, fourth-graders with more than 100 books at home on average had higher achievement in science than students with fewer books at home. Average achievement for students that have more than 200 books at home (502 points on average at the test) and 101–200 books at home (500 points) are higher than for students that have 26–100 books (490 points), 11–25 books (469 points), and 0–10 books at home (437 points). Similar relation between achievement and the number of books at home was observed for eight-graders: if there are more than 200 books at home, the average result in natural sciences



Family Background and Effects on Learning. Fig. 1 Relationship between student performance in science and socio-economic background for the OECD area as a whole (Source: OECD PISA 2006 database, <http://dx.doi.org/10.1787/141848881750> (OECD 2007))

test was 500 points, 101–200 books – 496 points, 26–100 books – 479 points, 11–25 books – 452 points, 10 or less books – 426 points.

Taking into account the wide range of opportunities to continuously access information on science in the virtual world, students with a computer at home, and a computer with Internet connection in particular, have better study opportunities in comparison to students that do not have such facilities. On average, fourth-graders with a computer at home had 40 points higher achievement in science (487 points) than achievement for students having no computer (447 points). If students had a computer with Internet connection at home, their average achievement in science (487 points) was almost 30 points higher than achievement for students that had no Internet connection at home (459 points) (TIMSS 2007 science report, 2008 (Martin et al. 2008)). This difference in student achievement at least in part reflects socio-economic differences since a computer and Internet connection require substantial investments in many countries.

IEA TIMSS 2007 research analyzed average student achievement at school depending on the proportion of students coming from economically disadvantaged homes at school. Within research, school directors responded on questions on the socio-economic status of student families. At the fourth-grader and eighth-grader level, there was a positive relation between student achievement in science and studies at school with a lower proportion of students coming from economically disadvantaged families. The highest average achievement was reported for students studying at schools with low proportion of economically disadvantaged students. While the lowest achievement was reported for students studying at schools with high proportion of economically disadvantaged students. The differences in results for these two groups amounted to 50 points that is more than a half of standard deviation.

What Do We Get from This?

By analyzing family background characteristics and student achievement, it is possible to:

- Obtain important information on differences among schools and countries caused by family background
- Assess differences in achievement at school level taking into account the SES of students and school level
- Research and assess the influence of school composition on student achievement
- Assess differences in school resources depending on urbanization factor
- Compare educational systems to different levels of socio-economic segregation and how this factor affects achievement

Open Questions (Problems)

One can divide problems related to family background in two directions: academic research and practical solutions (politics). In academics, further research on measuring family background is important: what are the components it should consist of and is there a necessity and possibility to unify it. For scientific research, it is equally important to improve the methodology of measuring the importance of family background on student study achievement. This area widely applies hierarchical linear regressions (HLM), index, and different modeling methods. For instance, systemic HLM research is going on to determine the relation between different family and socio-economic status parameters and student achievement.

The other part of the problem is related to practical solutions in education policies to decrease the comparatively large differences in education achievement among students with different family background. This is the provision of education quality and equality taking into account possible socio-economic segregation at inter- and intra school level.

Cross-References

- ▶ [Family Learning](#)
- ▶ [Mediators of Learning](#)
- ▶ [Social Construction of Learning](#)
- ▶ [Social Influences and the Emergence of Cultural Norms](#)
- ▶ [Socialization-Related Learning](#)

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