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Innovative Data Mining Based Approaches for Life Course Analysis

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Abstracts

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The Links between Socioeconomic Status, Parenting, Future Orientation, and the Academic Achievement of Adolescents

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Aims of the study

What people strive for in life and how they go about attaining their goals are two of the forces driving development across the life span (Baltes & Baltes, 1990). The purpose of this study was to gain insight into the career expectations and academic success of German adolescents. We focused on the impact of parenting to explain the effect of parental socioeconomic status (SES) on these outcomes.

Adolescents' way of subjectively organizing the future, their expectations, and their academic success are important predictors of their occupational success as adults (e.g., Coleman, 1996; Dweck, 1991). On the other hand, longitudinal studies have shown that parental SES (e.g. parental educational and occupational levels, family income) and adolescents' academic success are the strongest predictors of later occupational attainment (e.g., Dubow et al., 2006). It is also widely accepted in the fields of psychology and the social sciences that the influence of parental SES on adolescent development is mediated by parenting style: compared to middle-class parents, parents with lower SES tend to be more authoritarian and show less warmth towards their children (e.g., Conger et al., 2002; McLoyd, 1998).

As for future orientation (FO), Seginer (2004) found a positive relationship between an authoritative, accepting parenting style and cognitive, motivational, and behavioral aspects of adolescents' career future orientation. However, the question concerning how SES is related to future orientation and which role parenting has for this relationship has not been thoroughly investigated.

Model and Method

Thus, an innovative aspect of this study was to test a multistep model representing the hypothesis that supportive parenting by mothers and fathers, as perceived by their adolescent children, mediates the effects of SES on adolescents' FO and on their academic success. We conceptualize FO as an interplay between control orientation and career expectations (Trommsdorff, 1994). This is also in line with findings from studies of expectancy-value theory (e.g., Carver & Scheier, 2001; Eccles & Whight, 2002), according to which internal control beliefs and optimistic expectations have a positive effect on goal attainment and coping behavior. Accordingly, we expected control beliefs and optimistic career expectations to have a motivating function and to be positively related to academic success.

We tested this mediational model using Structural Equation Modeling with AMOS and cross-sectional data from the German Socio-Economic Panel (waves 2001-2005). The sample consisted of 1190 German adolescents (17 years of age; only adolescents attending school) and their parents.

As a proxy for SES we used the International Socio-Economic Index of Occupational Status (ISEI) which takes level of education, occupation, and individual income into account. For each parent, supportive parenting, as perceived by their adolescent children, was measured using a 9-item Likert scale (Simons et al., 1992). Locus of control was measured using a 10-item instrument (Krampen, 1991) from which we retained 5 items after exploratory factor analysis. Adolescents' career expectations were assessed using 4 items concerning the likelihood with which adolescents believe they will succeed in implementing their career plans. The scales demonstrated high internal reliabilities, with alphas ranging from .64 to .86. Academic success was measured by self-reported school grades in German language and mathematics.

Results

First, we tested a model in which FO was the only dependent variable. This model showed a very good fit with a non-significant X^2 (X^2/DF= 1.23, RMSEA= .01) and confirmed our expectations: SES was positively associated with supportive parenting (ß=.22), while supportive parenting was positively related to adolescents' future orientation (more internal control beliefs, more optimistic career orientation). In a second step, we added the variable academic success to the model (see below).
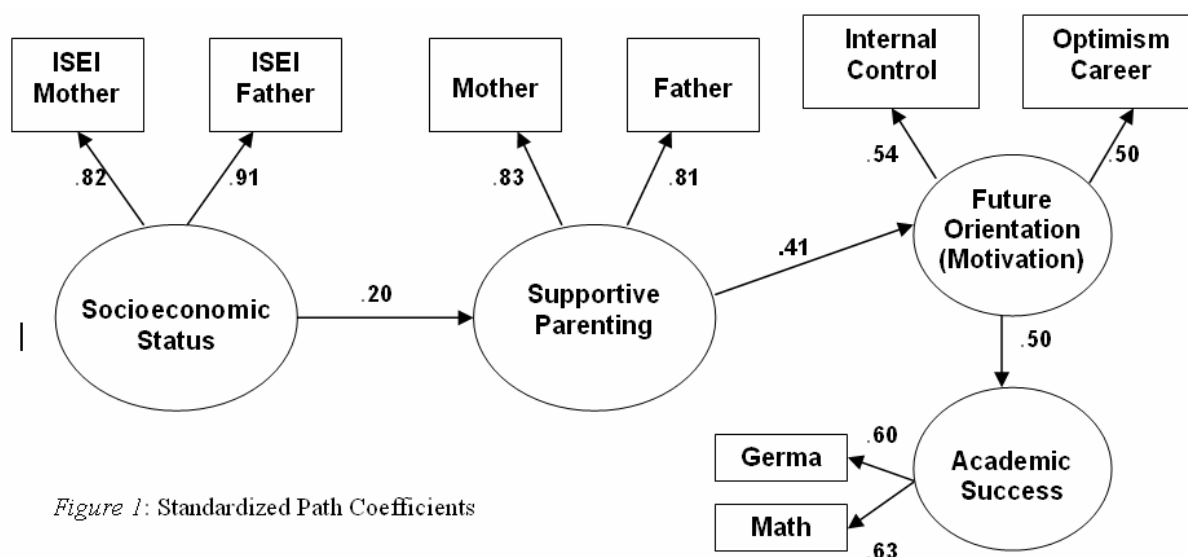
Figure 1: Standardized Path Coefficients

This model also showed a good fit to the data (X^2/Df = 1.91, RMSEA = .02) and was in line with our theoretical assumptions: the more internal the adolescents' control beliefs were and the more optimistic their career expectations, the greater their academic success (ß =.50). The model accounted for 29% of the explained variance in academic success. No direct effects of SES on future orientation or academic success were found. A multigroup analysis indicated that the model was invariant across gender.

Discussion

Our major findings revealed the importance of supportive parenting for linking socioeconomic status and career future orientation, on the one hand, and the importance of future orientation for predictions of adolescents' academic success, on the other hand. The results stress thereby the role of psychological variables (here control orientations and evaluation of expectations) when studying the relationship between distal factors (like SES) and adolescents' developmental outcomes.

Optimising Response Rates in Household Surveys – the Case of the European Social Survey (ESS)

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The European Social Survey (ESS) is a major cross-national survey, conducted as biennial cross-sections in more than 20 countries and first fielded in 2002 with the 3rd round currently underway. Next to the substantive aim of monitoring changing social and political attitudes in Europe, the primary objective of the ESS is to strive for high data quality and to ensure optimal comparability of survey estimates across countries. As part of this strive, achieving high response rates and preventing non-response bias play an important role.

In order to increase comparability of the survey estimates, one of the basic principles of the ESS is to avoid unnecessary variation across countries in all steps of the survey process and to find a good balance between standardisation and national adaptation of the research design and fieldwork procedures. Regarding the outcomes, for example, a minimum target response rate of 70% and a maximum target non-contact rate of 3% are specified for all countries. While these thresholds cannot be legislated, certain procedures for optimising contact and response are prescribed. Other procedures are recommended and implemented by countries according to their national settings. Incentives, for example are recommended and the types of incentives used are allowed to vary according to local effectiveness. A call schedule of at least four contact attempts, of which at least one in the evening and one at the weekend, however, is prescribed, though countries can carry out considerably more calls.

Countries face different kinds of challenges, when addressing non-response in their fieldwork. Even though the response enhancing strategies of the ESS bring the achieved response rates across countries closer together, considerable variation can still be observed (Figure 1). In round 2 of the ESS, for example, the response rates ranged from 44% in France to 80% in Estonia. At the same time, large improvements from round 1 to round 2 were achieved. While Switzerland, for example reached a response rate of 34% in round 1 only, they improved to 47% in round 2.

Table 1 illustrates that Switzerland faces special challenges in data collection, and yet, makes great efforts to improve their response. The table shows a number of recommended response enhancing measures recommended in the ESS, the amount of countries that implemented these measures in round 2, and whether Switzerland implemented the respective measures. What is striking is that, while Switzerland implemented all of the recommended response enhancing measures, their response rate was well below the mean response rate for all ESS countries.

Our presentation at the 4th International Conference of Panel Data Users in Switzerland gives insight to optimising response in household surveys, in particular the European Social Surveys. It sets out, why non-response it a threat to data quality, which measures are taken in the ESS and where the ESS still faces challenges.

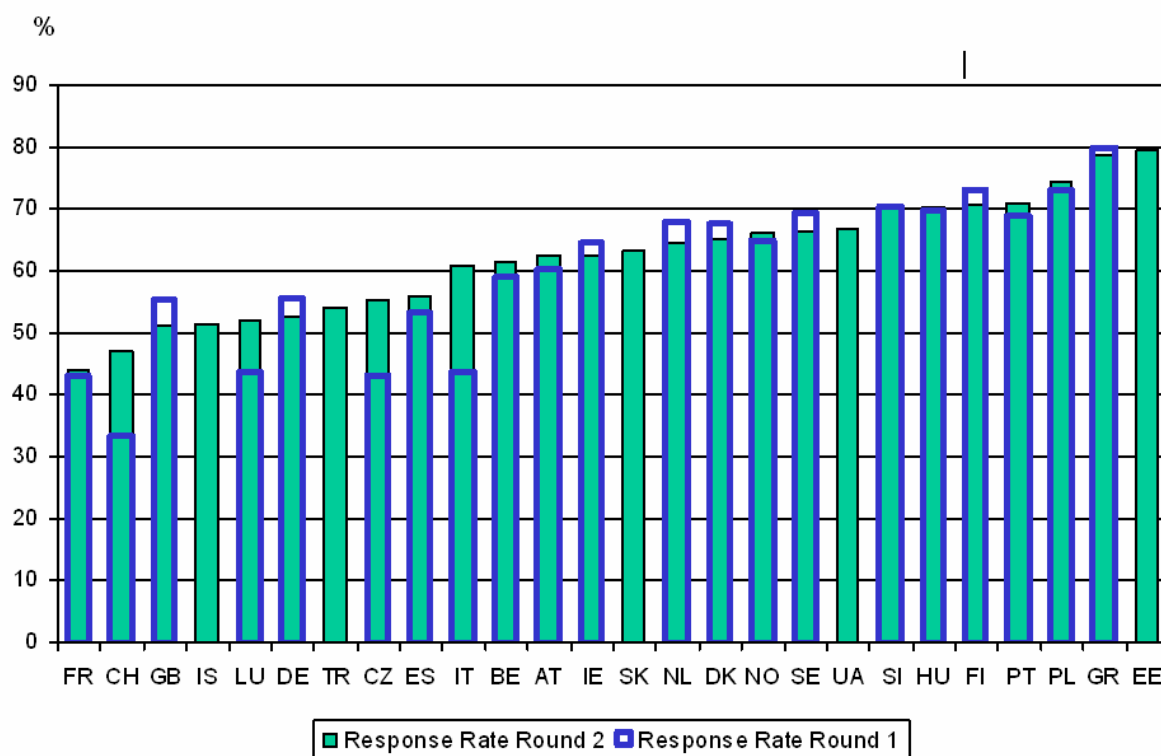Figure 1: Response rates in ESS rounds 1 and 2

Table 1:   Response enhancing measures in all ESS countries vs. Switzerland in ESS round 2

Measure	ESS implementation (countries)	Switzerland
Training of interviewers in refusal conversion	19 out of 26	Yes
Bonus for interviewers for good response rates	9 out of 26	Yes
Advance letter	21 out of 26	Yes
Respondent incentives	14 out of 26	Yes
Refusal conversion strategies	16 out of 25	Yes
Response rate	Mean: 62.3%	47.1%

Impact of Separation, Divorce and Repartnering on Material Wellbeing in Switzerland

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As in other counties, the formation of families has changed substantially in the past forty years. Marriage and birthrates are decreasing, separation and divorce as well as non conventional living arrangements are increasing. In addition women are better educated than formerly and their participation in the labor market has increased. The aim of our research is to understand what consequences some of these changes, in particular those concerning partnership or family dissolution and subsequent repartnering or family formation have on the economic situation of the respective men and women and what role labor market participation, education and family trajectory have thereon. We use six waves of the Swiss Household Panel data for the analysis covering a period of time from 1999-2004. The analysis is unique for Switzerland and reveals substantial change in material living conditions for both men and women, yet at different points in their trajectory.

Results for Switzerland confirm international results that women fare economically worse after separation or divorce than men (measured by equivalized income). The main factors identified by regression models explaining the decrease in equivalized income are the educational level, percentage of employment, whether women are employed or not, and whether there are children in the household or not. By contrast men's equivalized income increases slightly one year after divorce or separation to decrease slightly again two years there after.

Results for repartnering provide evidence that entry into a new live-in partnership is a strategy to cope with income loss for women. By contrast men's equivalized income decreases when repartnering. Interestingly, men who repartner have a lower percentage of employment than men a year before their divorce that are married and than men who have recently divorced, although their equivalized income is not substantially lower one year before repartnering than that of married men. However repartnering men's equivalized income is lower than divorced men's income at the time of divorce and one year thereafter.

In conclusion, important factors determining equivalized income are education and percentage of employment. Gender differences in equivalized income as consequences of divorce or separation are explained to a small extent by education, and to a greater by percentage of employment and whether there are children in the household or not.

When repartnering, gender differences are equalized; women gain and men loose on equivalized income. Unequal chances exist according to the percentage of employment and whether there are children in the household or not. Labor market oriented women without children are the "winners" regarding equivalized income when repartnering.

Health and the division of labor among couples

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Previous research – including our analysis of the Swiss Household Panel (SHP) data -highlights that, at the individual level, paid work is more favorable to men's health status than to women's. The traditional division of labor between men and women is nowadays challenged. Women are more often occupying a paid job, even when they have young children; men are supposed to be more often involved in domestic labor. Here we examine the relationships existing between the division of labor – including paid work and domestic tasks - among both partners of a couple and their respective health status.

This analysis aims at filling 2 gaps in social epidemiology research. First, even though domestic labor is a central component of daily life, especially for women's, it has been little considered as a health determinant. Second, health inequalities research typically focuses on individuals whereas life conditions are mostly determined through household settings. Therefore, in terms of gender health inequalities, it seems important to include domestic labor and to consider the couple as the unit of analysis.

Our objectives are: to measure the division of labor and assess the trend towards more equalization between men and women; to measure the impact of paid and domestic labor on the health status of men and women.

Methods
The analysis is conducted on the wave 2004 of the Swiss Household Panel data. We selected only couples where both partners (a) had filled the individual questionnaire and (b) were both aged between 25 and 64 years old, which represent 1478 couples.

Results
Domestic labor remains unequally distributed: women report providing three quarters of the total amount of domestic work in the household. When the wife is more educated, the share of hours if less unequal and the satisfaction of both partners is higher. When there are children, the share of hours is more unequal and the

satisfaction of both men and women is lower. Regarding paid labor, the typical situation (half of the couples) consists of the man working full time and the woman working part time. Women work more frequently part time when there are children whereas men's part time is not influenced by children.

In regressions analysis integrating paid work and domestic work indicators, and controlling for income, presence of children, education level and age, division of labor is not having a strong impact on health status. The amount of domestic labor provided is only associated with the woman's health status: those reporting more hours declare being in bad health. Women and men's anxiety and men's health status are less good when they are dissatisfied with the way housework is shared. In couple where both are working part time, men's health status is worse and their anxiety is higher.

Discussion

The division of labor is still mostly traditional among Swiss couples. In cases where it can be considered as more egalitarian, one cannot observe an improvement on women's health, but rather a degradation of men's health. Is this the result of difficulties for these to come to terms with their atypical status ? Or are they in an atypical situation because of a health selection effect ? As for women, these inconclusive results could be a consequence of contradictory influences of domestic labor on health, on one hand providing a sense of self through fulfilling the needs of the members of the household, on the other hand representing a daily demand that can be in conflict with their working aspirations.

Direct Democracy and Property Crime

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Recent research has shown the institutions of direct legislation exert a spending restraint influence on budget component relating to policing. This paper tests empirically whether this influence leads to more experienced criminal activity. Using a panel of household-level data from Swiss Household Panel (SHP) from 2000 - 2002, I find no relation between stronger popular rights and self-reported occurrences of experienced burglary or observed vandalism in the immediate neighborhood. This result can be viewed as supportive of efficiency gains in the provision of public safety.

Representative wealth data for Germany:The impact of item-non-response and imputation

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The definition and operationalization of wealth information in population surveys and the corresponding microdata relies on a wide range of more or less normative assumptions. However, such decisions may interfere considerably with the substantive research question as is known for example from the research on the impact of imputation of missing income data on income inequality and mobility (see Frick & Grabka 2003, Biewen 2001). Looking at wealth data from the German SOEP this paper focuses on the impact of "imputation and editing" as a means of dealing with measurement error in the post-data collection stage. Missing data due to item-non-response is a major problem in any micro-data – and more prominent in economic outcome variables such as income and wealth. It is not only the decision *pro* imputation as an alternative to weighting (or assuming missing at random by not doing anything about missing data), but even more so, the choice of the imputation procedure may be influential as well. Using micro panel data on annual income from the UK-BHPS, the Australian HILDA survey and the German SOEP Frick & Grabka (2006) provide empirical evidence that incorporating longitudinal information significantly improves the quality of the imputation results. Those surveys make use of single imputation techniques (for income variables) which may be criticized for not sufficiently considering the uncertainty imbedded in the imputation process. This phenomenon is taken into account by Kennickell (1998) who uses data from the US-Survey of Consumer Finances (SCF) to show the relevance of applying multiple imputation techniques.

This paper contributes to this strand of empirical research on the basis of SOEP wealth data collected in 2002. After briefly describing the way this wealth data was collected we apply appropriate Heckman selection models to consider (potential) selectivity embedded in the non-response behaviour. We then describe the editing and multiple imputation techniques applied to correct for missing wealth data before analysing scope and impact this treatment has on the overall wealth aggregate (in comparison to national aggregate statistics) as well as on the wealth distribution.

We find multiple imputation to be an effective means in coping with selective non-response. There is a significant impact of imputation on the share of wealth holders by component (increasing on average by 15%) and also on aggregate wealth (plus 30%). However, with respect to inequality we find ambiguous results.

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The Gini and HSCV for all wealth components considered in the SOEP data are reduced when analyzing the entire population. For those holding a specific wealth component, however, there is variation in the effect on the two inequality measures. Looking at the major outcome variable for the whole population, *net* worth, the Gini decreases whereas the top sensitive HSCV doubles. The non-random selectivity build in the missing process and the consideration of this selectivity in the imputation process clearly contribute to this finding.

Obviously, the post-data collection treatment of measurement errors, especially with respect to imputation of missing values, will impact on cross-national comparability and thus may require some cross-national harmonization of the imputation strategies applied to national datasets.

Relative deprivation – the Swiss experience

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Christian Suter, Institut de Sociologie, Université de Neuchâtel

Swiss residents enjoy very high levels of both, objective and subjective well-being. At the same time, Switzerland knows a relatively high level of social inequalities and deep transformations of its social structures. Hypotheses of impoverishment of the middle class or other groups of the population are often put forward in the political and social debates.

Considering the different approaches of poverty and the difficulty of measuring impoverishment phenomena through income based measures, we focused on an alternative indicator – Proportional Deprivation Index (PDI) in Hallröd's conception - as measure of direct poverty. This index combines the deprivation in a set of items with the social importance given to each items. Therefore, it takes into account the relativity of poverty by cultural context.

Previous own work with this index focused on comparative analyses over countries and on the impact of relative deprivation on general well-being (s. Suter and Iglesias 2005). As the used dataset (The Euromodule survey (EM)) had no longitudinal part, we used the longitudinal sample of the Swiss Household Panel survey (SHP) to carry on our work on direct and indirect measures of poverty, to validate our previous empirical findings on the negative impact of deprivation on well-being and to test hypotheses of impoverishment. Since both of these surveys were carried out in the same year (EM: 1999/2000; SHP: first wave 1999) and share a major part of deprivation items, a comparative analysis is possible and provides important insights into the validity of the measure of proportional deprivation in Switzerland and on the usability of SHP for our purpose. As SHP doesn't contain informations on the social importance given to each deprivation item, we used the values issued of the EM, where this information was collected.

The results of this first analysis are provided in *Figure 1* and show a rather high level of reliability of PDI over surveys but only when considering the same list of items (e.g. no difference at all between Euromodule11 and SHP11 but some interesting variations between Euromodule19 and SHP11/Euromodule11).

After this first step, the longitudinal part of the SHP was used to measure the stability of PDI *over time*. As can be noted from Figure 2, this stability is very high again (distribution and mean over years, 1999-2003); there are, however, variations if the items list changes (2 items where not available anymore in wave 6 / 2004). This finding confirms the importance of maintaining the items list and the need to take into account this aspect in the surveys designs.

Considering changes on the *individual level*, the evolution of PDI reveal a much greater variability. Thus, figure 3 shows that roughly half of the population knew no change in its deprivation score over years (mostly persons who are not deprived), whereas the other half knew minor or substantial changes, including transitions between deprivation and no deprivation.

Bibliography:
Suter Christian and Katia Iglesias (2005), "Relative Deprivation and Well-being: Switzerland in a Comparative Perspective," pp. 9–37 in: Hanspeter Kriesi, Peter Farago, Martin Kohli and Milad Zarin-Nejadan (eds.), Contemporary Switzerland: Revisiting the Special Case. Houndmills: Pal-grave Macmillan.

Figure 1: PDI standardized with 19 or 11 items, Euromodule 1999/2000 and SHP 1999
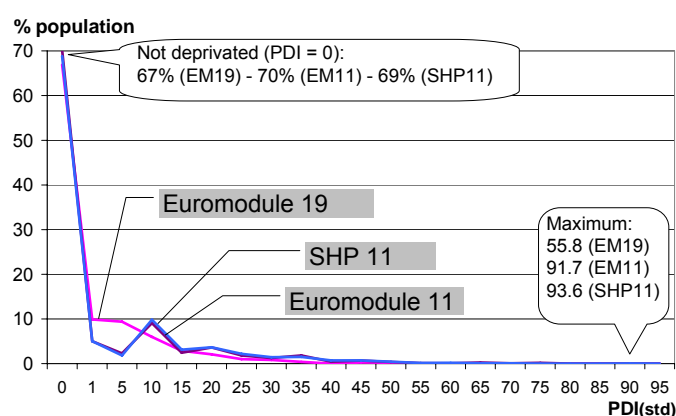

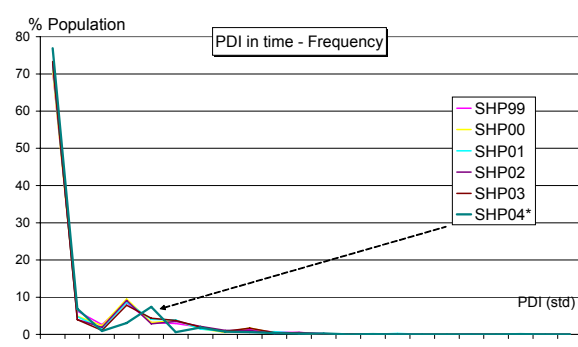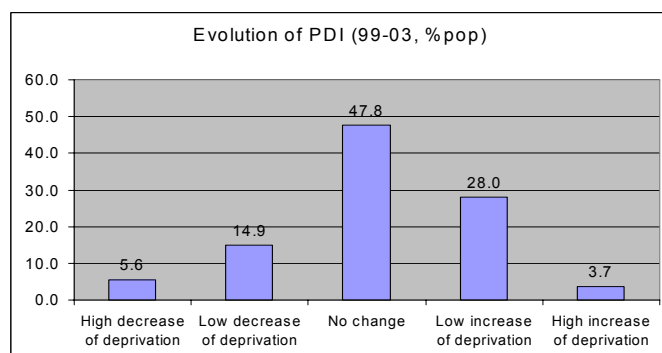**Figure 2: PDI distribution 99 to 04, SHP 99-04**

Figure 3: Evolution of individual PDI 99 to 03, SHP 99-03

Life courses of women and men in Switzerland as shaped by institutional and domestic constraints

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This study analyzes occupational trajectories in Switzerland on the basis of hypotheses about standardization, individualization and gendering of life courses which are often related to the increasing and later decreasing influence of the welfare state that accompanies the reinforced influence of neoliberal policies. It is based on the retrospective data of the Swiss household panel collected in 2002. Sequence analyses show that female trajectories are at a time more varied and more sensitive to factors such as education, number of children, and birth cohort, than male trajectories which are comparatively more stable and homogenous. The standardization, individualization, and gendering hypotheses can only partially account for the existence of the differentiated trajectories we find and should be completed by the principle of gendered master statuses that is informed by the perspective of linked lives and the feminist critique of life-course sociology.

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How to define response rates for a panel study? Illustration with the Swiss Household Panel

Eric Graf, Swiss Household Panel, University of Neuchâtel

A response rate is a ratio and, rigorously, it is up to each one to define its numerator clearly as well as its denominator when it is published. Without that, the risk of an abusive or incorrect interpretation is enormous and can lead to not easily retrievable controversies.
For a panel study, the number of definable response rates goes growing with the waves of the panel. The structure of the study considered must be taken into account in the definition of the aforesaid response rates. The Swiss Household Panel will be taken as example to illustrate the problematic.
The presentation aims more at creating an awakening of the problematic than to impose solutions.

Time-use and the household division of labour

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Abstract: Household tasks are still unequally distributed whereby most of the work is frontloaded to women. Microeconomic models explain the household division of labor referring either to time costs or to the bargaining power of the partners. In the first model, the partner with the higher wages reduces his/her household time in order to maximize market income. The spouse focuses on the household chores instead. We thus expect a stronger division of household labor with rising wage differences. In the second model the partners bargain on the division of domestic tasks. For household chores are assumed to be inferior to wage labor and leisure, the partner with more bargaining power, here: monthly income, forces the other to do the lion share of the household tasks.
Sociological models, however, focus on social norms, e.g. gender norms, instead. Time-use is thus not only a matter of costs and benefits or power. It is also conceived of as a means to express the gendered identity. Women are expected to run the household, whereas men take over the role of the male bread winner. If we look at economic explanations only women may reduce their household time when earning more money. And, men take over a larger share of the household chores, when the woman contributes a larger amount to the household income and partly takes over the man's role as the main wage earner. However, taking social norms into account, e.g the gender display approach, we end up with the opposite conclusion. Women earning more than their male partner increase their household time in order to compensate for the violation of the male bread winner-norm by emphasizing the female part in the household. Men however decrease their share of the household work to fulfill their male role.
The paper is aimed to explain this unequal distribution of household chores by both, using to microeconomic models and referring to gender norms. The household production-, the household bargaining- and the gender display-approach are empirically tested using the data from the German Time Budget Survey 2001/2002 and Random Effects-Models. Economic determinants are major predictors of the household division of labor. However, their influence is inextricably bound to social norms and institutions. Women for instance refer in their allocation of time not only to their financial situation but also to gender norms and the household composition. Consistent with the gender display approach, women increase their household time, when taking over the bread winner role. They thus compensate at home for their violation of gender norms in the labor market-sphere. In contrary, men's behavior is more dependent on the allocation of financial resources between the partners. They increase their household time when losing their financial bargaining resource instead of displaying their male role by doing less homework. Thus, the domestic division of labor is not only a matter of economic resources. As a mediator of the economic predictors, social norms also play a crucial role for the allocation of time.

Does Origin Matter? Implications of the Status Attainment Theory in Germany and the Switzerland for Educational Success and Wages

Bettina Isengard, University of Zurich, Department of Sociology

Human Capital Theory is the predominant approach used to explain income differences, and it has been tested thoroughly. According to Müller and Shavit (1998:1) "education is the single most important determinant of occupational success". If this is the case, labour income differences can be justified due to job performance differences, based on educational qualifications. On the other hand, the status attainment theory by Blau and Duncan (1967) postulates a close relationship between social background indicators, education and labour market success. Because status attainment theory assumes that the social status of parents affects the educational level achieved by the children, which in turn affects the occupational level and status and this influences the

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income. From sociological research on elites (e.g. Hoffmann-Lange 1992) we can deduce four different possibilities how social origin, educational outcome and income are correlated (see figure 1).

Figure 1: Potential Correlations between Social Origin, Education and Income

a.) **model 1**   b.) **model 2**

c.) **model 3**   d.) **model 4**
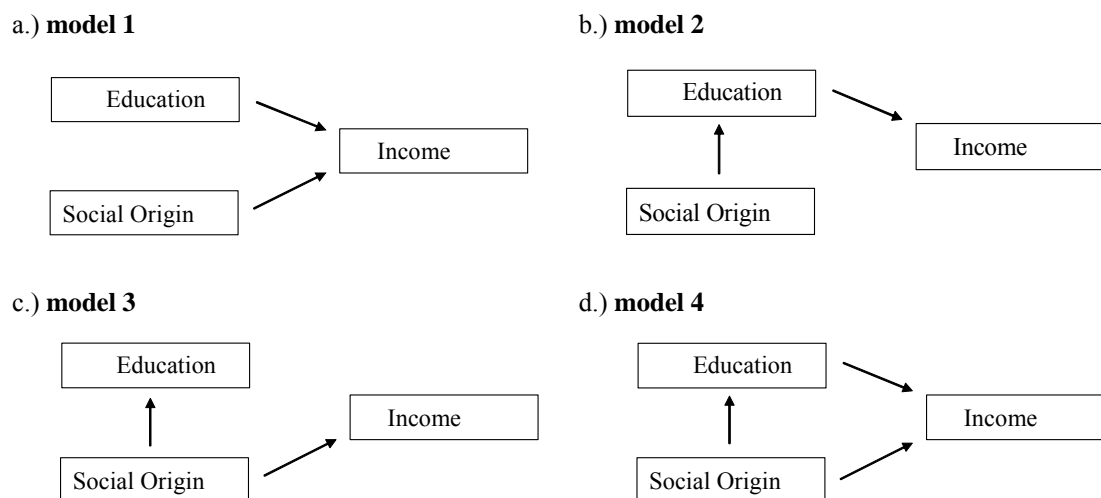
The first model assumes that origin and education influences wages independently of each other. The second approach implies that origin has an effect on education, and education in turn determinates income. But there is no direct effect observable between social origin and income. According to model 3 wages are the result of social origin, but not of educational outcome, which is a result of social origin too. The fourth approach implies that origin has direct influence on education as well as on wages, and also an indirect effect on wages connected through education.

In the following paper, which is organised as follows, we test which model fits best for Germany and the Switzerland. First we regard the influences of social origin on educational attainment. Than we analyse the determinants of labour market incomes, controlling for individual differences and also for structural indicators. The two countries are selected because of their same similar structure of educational systems and simultaneously they differ in terms of labour market organisation. The Swiss labour market is organised more liberal than the German. Due to this differences which are caused through different welfare system traditions, in Switzerland individual performance should be more important as selection criterion at the labour market than in Germany.

Main hypotheses are that first in both nations the educational success is still strongly connected to the social origin. The higher the educational level of parents and occupational status the better are the chances to get a higher educational degree. Second we assume that due to Human Capital Theory individual education is an important determinant of labour market incomes in Germany and the Switzerland. But according to the more liberal working structures at the Swiss labour market we assume, that the educational effect is stronger than in Germany. Third, next to the indirectly influence of social origin on income, which will be mediated through education there should be an independent influence of origin on labour market income. But fourth we assume that this influence is stronger in Germany than in the Switzerland.

To investigate the influence of social origin on educational attainment and labour market outcome we use data from the German Socio-Economic Panel Study (SOEP) and the Swiss Household Panel (SHP). Both datasets contain a variety of social background information. Using ordered logit models to analyse the relationship between social origin and educational attainment, we can observe, that social origin matters and that effects on educational attainment stay relatively stable over time. To analyse the determinants of labour market income inequality we use linear regression models. Concerning the labour market outcomes the findings support the assumption that education is a very important determinant of labour market success. One interesting outcome concerns the influence of social origin on labour market success. While for Germany we can observe that social origin has in indirect and direct influence on wages, in the Switzerland there is only the indirect effect observable. It seems that family background has an important influence on (children's) educational success, but if someone had reached once a certain educational level, than origin is unimportant in later life. While we can observe for Germany that the fourth theoretical models fits best, in the Switzerland the second approach seems to reflect the connections between origin, education and income.

Stability and change in party preferences

Ursina Kuhn und Boris Wernli, Swiss Household Panel, University of Neuchâtel

Little is known about changes in party preference on the individual level in Switzerland. We investigate such changes between 1999 and 2005 using data from the Swiss Household Panel. Party preference is measured by the party one would vote for if there was an election for the National Council tomorrow. About 65 percent of respondents usually indicate a party preference. Considering only Swiss citizens above 18 years, there are 2949 respondents who participated in all waves and between 4,446 and 6,740 in the single waves.

First we discuss the quality of the data, theoretical concepts and past research. Second we describe changing patterns of party preference in Switzerland. Third we explain differences in changing patterns using multiple logistic regression. We look at the differences between stable voters, mobilised and demobilised voters one the one hand and the difference between stable and occasional voters (new voters and lost voters) for each of the government parties and the Green party on the other hand. In order to avoid too small response categories, we grouped those parties together, who form a "fraction" in the national parliament.

Changing patterns of party preference

Taking into account all waves of the Swiss Household-Panel, we observe the following patterns of change (in maximum 7 years): 21 – 26 % indicate the same party preference in all waves they participated, 22 – 32 % change preference between one particular party and no preference (mobilisation and demobilisation), 20 – 32 % changed between different parties, 14 – 23 % never indicated a party preference. The stability is overestimated due to truncated data and attrition. Assuming that those respondents who never indicated a party preference wouldn't participate in elections, at least 27 % of the voters change their preference from one party to another. This is remarkably high considering the relative stability of the aggregate electoral outcomes.

Respondents are more likely to indicate a party preference in election years than in other years. Looking at transitions between waves, we can observe campaign-effects. While the Christian Democratic party managed to decrease its losses during the campaign, the Liberal Party suffered the biggest losses compared to the situation one year before the elections. We also looked at stability, mobilisation, demobilisation and changes between parties respective to each party.

Explaining stability and change in party preference

We analyze change since the last Federal elections by looking at transitions between 2003 and 2005. First we compare respondents with stable preference for any party with those who change between having and not having a party preference (mobilisation and demobilisation). Second we compare those who have a stable preference for a particular party with new and lost voters for that party. In all models, the dependent variable has three outcomes: stable voters (0), mobilised voters (1) and demobilised voters (2) or stable voters (0), new voters (1) and lost voters (2) for each party. We test several logistic regression models with demographic, economic and political variable.

For the analysis on stability, mobilisation and demobilisation, we have 1841 cases. Respondents who change their preference from one party to another are not considered. There are no significant differences between mobilised and demobilised voters. Stable voters however are more interested in politics and favour more often Switzerland joining the European Union than mobilised and demobilised voters. Stable voters have a higher income and participate more in federal votes than mobilised voters. Stable voters are more satisfied with their income, are better educated and more satisfied with the working of Swiss democracy than demobilised voters.

For the party-specific analyses, in general occasional voters for a party (new and lost voters) have more moderate opinions and ideological positions than those of stable voters. For example are stable voters for the Swiss Peoples Party and the Liberal party ideologically further to the right than new and lost voters. Stable voters for the Socialist party are ideologically further to the left than occasional voters for the Socialist party. However, there are some exceptions.

The **Swiss people's party** (n= 396) lost voters since 2003 because they are more preoccupied by environmental issues than stable voters. New voters are more likely to be women and are more in favour of economic redistribution than lost voters (in addition to giving less importance to the environment). The **Liberal party** (n = 473) lost voters with lower education. New voters want to decrease social expenses more than stable voters. The **Christian Democratic Party** (n= 289) lost voters who are less interested in politics. Practicing Catholics are more likely to be stable voters than new and lost voters. Lost voters are more friendly toward foreigners than new voters. The stable voters of the **Socialist party** (n= 846) are more likely to work for the government than the occasional voters. The lost voters of the **Green party** (n=281) are less opposed to nuclear energy than its stable voters. In addition lost voters are more likely to be men than new voters.

Using panel data we are able to address research questions of fundamental interest in political science that couldn't be treated so far in Switzerland. We are able to see how often changes in party preferences occur, what types of changes are most frequent and why they occur.

Cross-sectional and longitudinal interviewer and respondent effects in a centralised CATI panel survey

Oliver Lipps, Swiss Household Panel, University of Neuchâtel

Especially in panel surveys, respondent and interviewer experience and burden play a role with respect to reported data quality. We examine three interview survey quality indicators in the Swiss Household Panel (SHP) survey: giving socially desired answers, satisficing, and not reporting income. We analyse effects from respondents and interviewers on these measures both in a cross sectional in a longitudinal way.

In the cross sectional analysis, respondent and interviewer effects are calculated, in addition to effects stemming from attrition effects. The latter is possible, because in 2004, a refreshment sample, equally representative of the Swiss population, has been asked for the first time. We pool the mature (1999) and the refreshment (2004) sample, and compare the quality indicators in both samples, using data from 2004. In addition, an interviewer survey was conducted in this wave, collecting attitudes on their socio demography, survey attitudes and burden measures, and allowing for the analysis of interviewer characteristics. With respect to the longitudinal analysis, we use data from the 2nd (2000) through the 7th (2005) wave of the SHP, only keeping the individuals who validly responded to all of these waves. The longitudinal analysis mainly attempts to explore whether the quality indicators are fixed personality traits or vary between waves.

The SHP is a non-experimental telephone household panel survey. Thus it yields an ideal modelling database: the interviewer – respondent assignment is random, within and across waves. This design avoids possible confusion with other effects stemming from a non-random assignment of interviewers, e.g. area effects or effects from assigning the best interviewers to the hard cases. In the following figure, we depict a schematised pattern of the random interviewer – respondent assignment in the SHP:
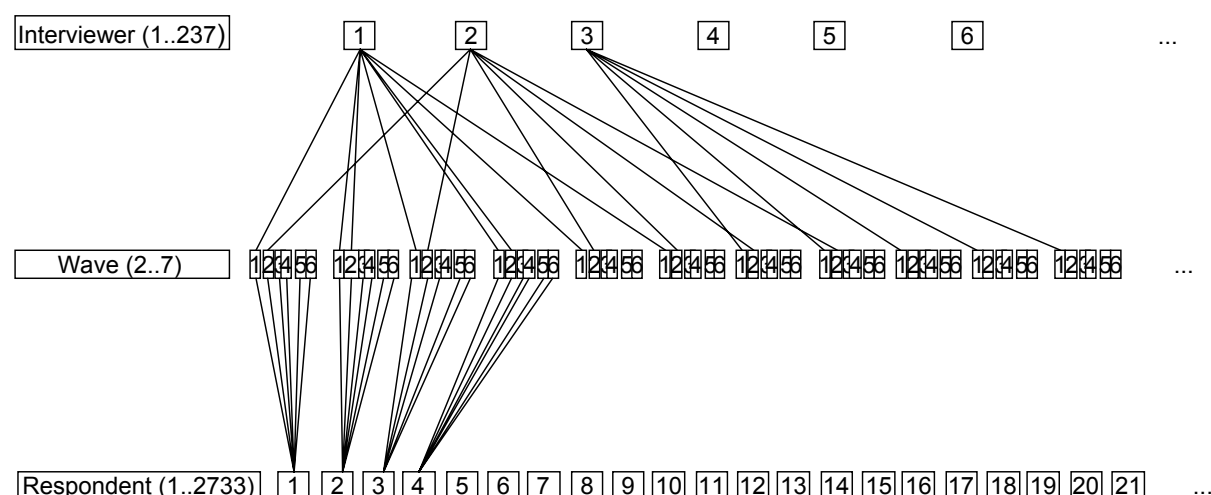
Pattern of interviewer-wave-respondent association in the Swiss Household Panel

In order to separate interviewer, respondent and wave effects, we build cross-classified multilevel models. This is necessary, because there is no purely hierarchical structure: although respondents are clustered in interviewers and waves are clustered in respondents, waves are not clustered in interviewers. Thus we can e.g. identify the wave effect, controlled for interviewer and respondent effect.

In the cross-sectional two-level models, we find interviewer effects for social desirability and satisficing which amount to around 4%. We obtain interviewer effects on income reporting of about 10%. We are especially curious about the differences between the original sample, then in their 6th wave, and the refreshment sample. We find a higher level of socially desired answers by "old" panel members, and lower levels for satisficing. The main part of these effects can be supposed to be due to attrition. However, income nonresponse in the mature and the refreshment samples is not different.

Only few interviewer characteristics are significant, in particular satisfaction or trust in data protection do not improve data quality. The interviewer workload seems to have some negative effects, as well as the position of the interview in the wave: it can be assumed that the more difficult respondents are interviewed later in the fieldwork period. On the other hand, interviewer experience has positive effects on reporting income.

In the longitudinal models, we find an interviewer variance share of 5% for income nonresponse, 4% for the satisficing measure and of 2% for the social desirability measure. Supposedly both the interviewer and the respondent samples are more homogenous.

The wave variance amounts to about 30% for social desirability and satisficing measures, and to 14% for the income reporting measure. This between-wave variation shows that all three indicators are *not completely fixed respondent personality traits*, but vary in the course of time, possibly also due to measurement error. Socially desired answers increase, and income nonresponse decrease after five waves. Five waves are the panel duration initially communicated to the respondents. This shows that those respondents remain in the panel due to this announcement, who show a "*better*" answering behaviour. Satisficing decreases with the third wave, and remains rather stable thereafter. Incidental interviewing the same respondent by an interviewer after one wave has no effect.

Household and Individual Attrition in the Swiss Household Panel – Roles of the Reference Person, Other Persons, and the Interviewer in the Course of Time

Oliver Lipps, Swiss Household Panel, University of Neuchâtel

The Swiss Household Panel (SHP) faces comparatively high attrition over the waves conducted so far. Even worse, the attrition rate does not decrease after some waves. As to the portion of respondents in the first wave who validly answered in all of the first five waves, the British Household Panel Survey (BHPS) has a response rate of 71% compared with a response rate of 59% in the SHP. Regarding bias, apart from the underrepresentation of foreigners already interviewed in the first wave, especially young people seem to drop out of the SHP to a high extent. However, with respect to *content* related (potential dependent variables) like health, attitudes, or income, attrition bias is surprisingly small in the SHP.

In this article we analyse dropping out in the different stages of the SHP, both within households and over waves. In the SHP, the "household reference person" has to complete the household grid questionnaire, which takes around 5 minutes, the household main questionnaire (10 min.), and her own individual questionnaire (35 min.). In addition, each household member aged 14 years or older in the household has to fill out her individual questionnaire. Based on the participants of the preceding wave, we first analyse completion of the respective household grid. Next, we investigate whether the individual questionnaires of all eligible household members are filled, given a completed household grid. In addition we analyse the role of the interviewers conducting the contacts until cooperation or nonresponse with the responding unit (grid or individual questionnaire) is established. The latter is done for the 2005 wave, using call (process)data.

As to response, there is a strong difference between the former reference person concerning the household grid, the household main questionnaire, her own individual questionnaire, and the "other" interview eligible person as to her individual questionnaire. The response rates in the SHP for the different actors over the waves conducted so far is depicted in the following figure.
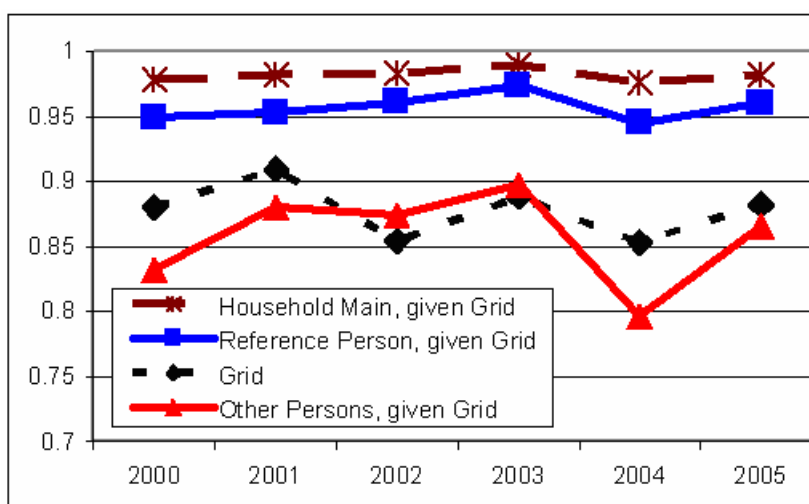
Development of household grid, household main (conditional on grid), reference person (conditional on grid), and other person (conditional on grid) response rates in the SHP.

We notice at first a strong response decrease in 2002 and especially in 2004. In both waves, single SHP specific events play a role: first, in 2002, half a year before the CATI 2002 survey started, a P&P biographical survey has been conducted among all age eligible panel respondents. Second, at the beginning of the panel survey in 1999 the respondents were told that the funding for the survey is guaranteed for the first five waves. Obviously, in 2004 a lot of respondents thought about the end of the panel survey and refused to further participate.

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In order to examine possible bias from attrition, we perform wave separated regression analyses with respect to grid and individual questionnaire response as dependent variables, and characteristics reported in the former wave as explaining variables. We find that the "social exclusion" theory is confirmed as to panel attrition, both on the grid and the individual level: drop-outs are rather the young, unmarried, those living in small households, and those who are neither socially nor politically active. In addition, exhibiting a bad answering behaviour, i.e. income nonresponse and/or a high number of extreme categories answers, is correlated with attrition. This finding is in line with nonresponse and attrition analysis results from other European Panel surveys. Also, while for the grid response household size plays a role, with respect to the individual questionnaire attitudes and health are more important determinants. Nevertheless, overall the (non)response mechanism of both the grid and the individual questionnaire is *cumulative* over waves. I.e., the characteristics of the dropping-out households, measured by the characteristic of the previous year's reference persons, is very similar to that of the dropping out individuals. With respect to individuals this is surprising, because the grid completion is controlled. In this way, the nonresponse mechanism which is responsible for the first (household) stage continues to work on the second (individual) stage, once the household is completed.

Finally, we find high *effects of the interviewers* on the *contact performance,* for the 2005 surveys on grid and individual questionnaire response. The interviewer intraclass correlation amounts to 5% for the *first grid related* contact, but only between 1% and 3% for contact performance with respect to individual questionnaire response, or second or higher contacts. The higher the number of the contact, the worse its performance on the grid interview, but the higher the performance on individual response. In addition, negative experiences made by the interviewer (refusals) seem to have negative effects on her future contact performance, while positive experiences (completion of grid or individual interview) does not have any effect.

We conclude that the interviewer workload should not be too high, in order to keep the number of "frustration" experiences low. Moreover, "maintaining interaction", especially with individually as to the completion of their individual questionnaire is highly recommended. However much more importantly, a better tracing of young respondents, and eventually the introduction of (cash) incentives are possibly able to increase response rates in the SHP.

Poverty Dynamics and the Welfare State: A Comparison of the US and the UK

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Our paper offers new insights into comparative poverty dynamics in the US and the UK. Drawing on a life course approach, we argue that individual poverty trajectories are shaped, in part, by welfare state policies and programs. From the comparative welfare states literature we know that the relevant policies and programs vary from one nation to another. We use innovative modeling strategies to shed light on poverty dynamics, comparing the risks for certain kinds of pathways in the US and the UK, and measuring how effective each government's transfer programs are at protecting those most at risk.

Emerging comparative work on poverty dynamics suggests that trajectories conform broadly to predictions derived from Esping-Andersen's well-known typology of welfare states: the rates and duration of poverty are lowest in social democratic regimes, highest in liberal regimes, and moderate in conservative/corporatist regimes. However, real-world divergence from these ideal types is also evident. For instance, poverty was more persistent in the US during the 1990s than in Germany or the UK, even though the latter is often classed with the US, as a liberal welfare regime. Moreover, government tax-and-transfer policies were more effective in reducing poverty persistence in Germany and the UK than in the US.

Although existing research on poverty dynamics yields important insights, a key problem is the use of subjective criteria, such as the number of years in poverty, to assign individuals to groups. This strategy limits the characterization of poverty experiences. It also precludes testing whether the groups actually represent true variation in the population, or evaluating the precision with which individuals are assigned to groups.

We take account of these issues in our analysis by using latent variable modeling techniques. Thus, we examine poverty trajectories by determining: (1) an optimal number of underlying latent poverty classes; (2) whether distinctive clusters of latent poverty trajectories exist in the populations (e.g., a stable non-poor trajectory, a stable poor trajectory, and a trajectory that moves between poor and non-poor status); (3) how individual characteristics predict membership in each of the clusters; and (4) whether state transfers change the distribution of poverty trajectories, and/or the characteristics of individuals who comprise them. These analyses are conducted separately for the US and UK.

Our data come from nationally-representative ongoing panel studies: the Panel Study of Income Dynamics (PSID) and the British Household Panel Study (BHPS). Because of differences in the poverty experiences of children and older and younger adults, the analysis is restricted to working age adults (i.e., 25–59 years). Collection periods differ across the surveys; hence, we use biennial waves from 1992 to 2000 for the BHPS, and from 1993 to 2001 for PSID.

Poverty is measured in two ways, to enable us to capture the effects of government transfers: (1) as an adjusted household income before tax and benefits (AHIBT) that is less than 60 percent of the national median AHIBT for each country; and (2) as an adjusted household income after tax and benefits (AHIAT) that is less than 60 percent of the national median AHIAT for each country.

Preliminary results based on latent transition mixture models suggest that there are two latent poverty classes in each country: a poor class and a non-poor class. Further, we find distinctive clusters of latent poverty trajectories in the populations that are best captured by a "mover-stayer" model. Two subgroups (poor stayers and non-poor stayers) have an almost zero probability of changing their poverty status over time (moving from a poor to non-poor state, or from a non-poor to a poor state), while a third "mover" group is likely to move into and/or out of poverty. The size of these groups is different for the two countries. A larger proportion of the US population falls into the non-poor stayer group, while a larger proportion of the UK population is in the "mover" class. Finally, some interesting differences between the two countries appear with respect to who is and who is not protected by government transfers.

The Effect of Retirement on Health: A Panel Analysis using Data from the Swiss Household Panel

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In older literature retirement was traditionally regarded as a stressful event with a potentially negative effect on health. More recent studies indicate that withdrawal from the labour force has no adverse effect on most people's health but only a limited amount of empirical research has addressed this issue.

The aim of this study is to assess whether early or regular retirement or work after the official retirement age have a short-term effect on self-report measures of physical and mental health and to estimate the influence of socio-demographic factors on changes in health status.

Material and methods

For our study, we analysed SHP-data from the first 5 waves (1999-2003) for all individuals aged 55 through 75 years who were working in 1999 and either continued working (**W**) or retired (**R**) between 1999 and 2003. The individuals who answered the health section of the questionnaire (80% of eligible individuals) are divided into:

ER: early retired persons (19 men, 7 women),

RR: regularly and late-retired persons (28 men, 29 women),

RW: regularly working persons (243 men and 193 women), and

WARA: persons working after the official retirement age (16 men, 22 women).

Self-report health measures at baseline and follow-up include

general health status,

self-stated changes in general health,

satisfaction with general health status

the frequency of negative feelings such as depression or anxiety

the extent to which health impedes everyday activities like housework or leisure activities, and

the degree to which medication is needed to function in everyday life.

The change in health status for the six health measures was reduced into three categories: improved, unchanged and worsened health and was drawn for retired persons from the questionnaires administered the year before and the year following retirement and for working persons from questionnaires administered during a randomly selected year and the year following.

The socio-economic explanatory variables include age, sex, survey year, highest level of education achieved, job class and cohabitant status.

Statistical analysis

The influence of the explanatory variables retirement (early and regular) and other socio-economic factors on changes of the six health measures (target variables) is assessed using ordinal regressions. For each of the six health measures, three ordinal regressions are performed including:

W and R,

ER and RW, and

RR and WARA.

A fourth set of ordinal regressions performed for retirees (ER and RR) identifies the factors influencing changes after retirement.

Results

Regardless of gender, over half the respondents experienced no effect of retirement on general health.

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Ordinal regressions including all workers and retirees show a positive effect of retirement on self-stated changes in health (p=0.059), on calculated changes of self-rated health status (p=0.033), on the frequency of depression and anxiety (p=0.078), and on the extent to which health impedes daily activities (p=0.004).

Ordinal regressions conducted for ER and RR indicate that early retirement does impact satisfaction with health status (p=0.053) and self-stated (p=0.002) but not calculated changes in health status.

Ordinal regressions for RR as compared to WARA suggest that retirement could lower the probability of depression and anxiety (p=0.066).

Ordinal regressions with ER and RR indicate that few factors influenced changes in health after retirement. A high level of education lowered the probability of depression (p=0.019) and the amount of medication needed (p=0.084) after retirement. Holding an unqualified job prior to retirement resulted in a negative impact (p=0.047), while being married or cohabiting with a partner had a positive influence (p=0.033) on the calculated change in health.

Discussion

The primary results of this study indicate that retirement in general has no strong short-term influence on health but that if an effect occurs, it is primarily positive. Retirement lead to an improvement in health status, to a reduced frequency of anxiety and depression, and particularly to a reduction of the extent to which health was an impediment in everyday activities. This improvement may be due to a change in the activities performed, to the greater amount of time available, to the relief from work stress and to the feeling of having fulfilled society's expectations.

Early retirement seems to have a positive effect on the self-perceived change in health status and on satisfaction with health. However, these subjective feelings of health are not confirmed by changes in health status calculated with the aid of the panel. This result may be explained by a positive attitude towards retirement, which could influence the perception of personal health.

The frequency of negative feelings, anxiety or depression was lower among regularly retired persons than among persons working after retirement age, a finding that could also be explained by the lower level of stress.

This study finds no socio-demographic factors that clearly influence the change in health after retirement. We also found no optimal age or time for retirement.

Bioinformatics as applied to life course data: new perspectives

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Data representation in longitudinal studies shows strong similarities with biology. In both disciplines, complex objects (genes in biology, life trajectories in social sciences) can be coded using simple linear strings. In biology, the wealth of data generated this last decade through large scale sequencing projects has prompted the development of many sophisticated algorithmic techniques meant to deal with these sequences. Theses algorithms are mostly meant to accurately compare the sequences through alignments, cluster them and look for the regularities often associated with biological functions. The potential use of these methods in the scope of social sciences was recognized in the 90s by Abott who introduced the bioinformatics optimal matching algorithm into the field of sociological longitudinal studies. Given a life course where each year is coded according to its state (e.g. single, married, divorced…), the optimal matching algorithm makes it possible to align two strings optimally. In this context, optimality is defined as the minimization of the cost associated with matching all the symbols contained in one sequence with their counterpart in the other sequence. The definition of these costs is an open issue: a-priori values (based on a-priori knowledge) can be used as well as very simple schemes (identity). Yet, no objective reason supports the use of one scheme or another. We addressed this specific problem by borrowing further from biology and applying to social sciences the methodology used to train so-called substitution matrices in biology. This method makes it possible to objectively design costs, by simply quantifying the natural tendency of the data to tolerate or avoid certain types of mismatches during the optimal matching process. These costs have numerous applications: they can help improving existing classification of social trajectories, through better alignments, and therefore better classification and clustering. Objective costs may also allow the determination of the relative social costs of various states. The methodology associated with these costs is integrated in the SALTT package, a freeware opensource software that runs on most Unix platforms and can be downloaded for free (www.tcoffee.org/salt). These methods may significantly improve the state of the art in social science research using panel and restrospective designs.

Innovative Data Mining Based Approaches for Life Course Analysis

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This communication presents a just starting research project aiming at exploring the possibilities of resorting to data-mining-based methods in personal life course analysis. The project has also a socio-demographic goal, namely to gain new insights on how socio-demographic, familial, educational and professional events are entwined, on what are the characteristics of typical Swiss life trajectories and on changes in these characteristics over time.

Methods for analyzing personal event histories can be categorized in two broad classes: 1) Survival methods that focus on a given event (e.g. first union, being married, birth of first child, first job, end of job, moving) and analyze the hazard of experiencing the event after a duration t, or more or less equivalently the duration until the event occurs. 2) Sequential methods that consider for each case the whole sequence of monthly or annual states of the variables of interest (education level, marital status, professional status, number and age of children, …) and attempt to discover regularities and differences in these sequences among individuals. The former approach requires mainly data in time stamped event form, while the latter needs them in the form of sequences.

As for the first approach, where classical tools are survival curves and regression like risk models such as the widely used proportional hazard Cox model, we will discuss the advantages of survival trees. Their principle consists in recursively partitioning the data at hand by means of explanatory variables so as to get groups with survival curves or hazard functions that differ as much as possible from one group to the other. This tree approach advantageously complements classical regression like models by their ability to automatically detect the most significant interaction effects.

Sequential data analysis is less popular though it is best suited for analyzing whole trajectories in a holistic way. Discrete Markov models are sometimes used, especially in mobility analysis for analyzing the transition rates between states. Clustering of sequences using optimal matching is also a very powerful descriptive analysis tool. In this framework, we are mainly interested in:

1. Mobility trees, which are just classification trees where the present state serves as target class variable and the previous states belong to the set of predictors, and

2. In exploiting algorithms developed in the data mining area for finding frequent subsequences and associations between subsequences in for instance web logs or DNA sequences. We expect such tools to be helpful for discovering relevant relationships between for example characteristic family life subsequences and professional subsequences.

Even though the project started only at the beginning of February 2007, we are able to present our very first results.

Using data from the SHP panel data we present mobility trees for the working status (full time active, part time active, unemployed, non active). This exhibits interesting interactions between previous states and the education level. For instance, women with lower education (less than full time vocational school) have much higher chances to leave the labor force after having been active occupied than those with higher education.

Using the 2002 biographical SHP survey, we present a first attempt of survival tree for analyzing marriage duration until divorce. One important result that follows from this analysis is how the role of the child as a moderator of the divorce hazard depends upon the birth cohort: the child seems to become cement for the marriage only for those born after 1940.

Regarding the association between frequent subsequences, we will investigate, using among others implication graphs, the relationship between selected event subsequences.

The joint dynamics of poverty and health: a multiple process latent transition analysis

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The association between health and poverty is well established in social research: those from economically disadvantaged households have shorter lives and more illnesses than their better-off counterparts. Despite the fact that this link has been replicated in many studies in different nations, the relationship between health and poverty remains poorly understood. One problem with existing research is its failure to conceptualize and examine health and poverty as processes unfolding over time. The current study uses data from two countries with contrasting welfare policies – the US and the UK. The US and UK are both considered liberal welfare states according to Esping-Andersen's "three worlds of welfare" typology. However, within this typology, the US has

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the least generous pension, unemployment and sickness benefits, and the UK has the most generous. According to Esping-Andersen, the UK with its greater decommodification should have weaker income inequalities and better health than the US.

The current work investigates systematically individual health and poverty processes over an 8 year period. It examines the stability and change in health and poverty over time, as well as their dynamic interrelationship, across the two divergent policy contexts. The data come from two nationally-representative ongoing panel studies: the US Panel Study of Income Dynamics (PSID) and the British Household Panel Study (BHPS). Because of the differences in the poverty experiences of children and older and younger adults, the analysis is restricted to working age adults (i.e., 25–59 years). The collection period differs across surveys; hence, biennial waves from 1992 to 200 are used for BHPS and 1993 to 2001 for PSID. Health was measured by a single self-rated questionnaire item recorded in both surveys, as "excellent," "very good," "good," "fair," and "poor."

Poverty is defined as an adjusted household income after tax and benefits that is less than 60 percent of the national median adjusted income for each country.

A multiple process latent transition analysis or hidden Markov model is described. It models change over time in good and poor latent health states and poor versus non-poor latent poverty states. The transition of latent health or latent poverty at time t depends on both health and poverty states at t-1. A matrix summarising the proportion of the sample that follow each of the distinct transition patterns is produced. The probability of moving from poor to good health is greater in the UK than the US. Poverty over time is more stable in the US than the UK. The multiple process models show that not only does poor health increase the likelihood of poverty in the short term but also that poverty undermines the possibility of recovery from poor health. The results support the hypothesis that population health is poorer in countries with less decommodifying welfare systems. The reciprocal effects between poverty and health are also stronger in a country with less decommodification.

A Cluster Analysis of Multidimensional Poverty in Switzerland

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The measurement of poverty has often been criticized for relying solely on measures of financial deprivation. Poverty being a multidimensional state, related to health, schooling, living environment, psychological state as well as social tides, care should be taken to integrate these various components to have a proper picture of poverty. This is especially true for rich countries where poor financial conditions are often alleviated by social policies like minimum income, unemployment or housing benefits. Social exclusion and poor health can therefore dominate the poverty feeling.

This paper illustrates how some descriptive statistical tools can offer new insights in the context of multidimensional poverty.

Factor analysis is used in a first step. The latter is a statistical tool primarily used for data reduction and summarization. Assuming that measured variables are interrelated, it is indeed possible to reduce their number to a smaller number of derived variables (known as factors) without loosing much information. Factor analysis can thus be applied to the Swiss Household Panel data, which contains many questions concerned with potential underlying dimensions of poverty. We retained 32 variables from the SHP related to different aspects of poverty: financial deprivation, health status, housing conditions, environment, and variables pertaining to social life. These original variables were then combined to produce common factors, each of which conveys some aspect of multidimensional poverty.

Using data of the first 5 waves (1999-2003) of the SHP, factor analysis enabled us to reduce the 32 original variables to only four factors underlying poverty. According to the factor loadings obtained, these four poverty dimensions could be labeled: "*Financial deprivation*", "*Poor health*", "*Bad neighborhood*" and "*Social exclusion*".

Factor analysis eventually allows to ascribe a score to every individual on each factor. These scores inform us on how each individual "performs" on each dimension of poverty. As all variables have been (re-)designed such that a higher value corresponds to a worse situation, individuals with negative scores fare better than the average on these dimensions, while the opposite is true for positive scores.

We then used cluster analysis to determine population's subgroups that are unevenly affected by the various dimensions of poverty. Cluster analysis is a technique which allows the classification of similar objects into different groups, or more precisely, the partitioning of an original population into subsets (clusters), so that the data in each subset share some common trait. The goal is to bring together individuals having relatively similar characteristics, while individuals belonging to different groups being as disparate as possible.

Clustering the individuals on the basis of their scores, we found similar results for each year. Typically, a first very large cluster contains most of the sample, and can undoubtedly be defined as the "non poor" cluster.

The mean scores are found to be negative on all dimensions of poverty, indicating that most persons are not deprived in any direction. A smaller second cluster is then found to have positive mean scores on every dimension. The individuals belonging to this cluster can thus be called the "multidimensional poor", since they suffer from multiple deprivations. The further groups can be considered as outliers, as very few individuals compose them. We obtained the following proportions of poor: 4.38% in 1999, 1.42% in 2000, 1.48% in 2001, 2.88% in 2002 and 2.98% in 2003, which is rather low in comparison with the other usual poverty indices. In fact, our measure is between 3% and 6% lower than the headcount ratio (with poverty line is set at half the median equivalized income), depending of the year. However, the evolution of the traditional poverty indices (poverty gap ratio, income gap ratio, FGT index, Sen index, Watts index, …) is almost parallel with the development of our measure.

The final step of our study is to assess the determinants of poverty. The clusters we found enable us to build a dichotomous variable stating whether a person belongs to a group of poor or non-poor, for each year. Our dependent variable being binary, we will use a limited-dependent-variable model. Indeed, what we want to explain is the state of being poor, which can only be either true (1) or false (0). Several binary response models are available, such as logit, probit or complementary log-log. The latter is the most appropriate to analyze our data, since unlike the two others, it is asymmetric, and is typically used when the positive outcome is rare, which is obviously our case with around 3% of poor.

In order to have a broad picture of what explains poverty, we ran successively the same model on our measure of multidimensional poverty and on a simple headcount ratio, measuring poverty in a strictly financial way. Both estimations give, broadly speaking, similar results for most of the variables: single parents, unemployed, retired, foreigners and less educated people are found to have more risks of being poor, be it in the multidimensional or in the financial way. Still, we found some important differences, the most interesting one concerning the effect of children on poverty. Having children (especially young ones) increases the probability of being financially poor. On the other hand, children seem to play a mitigating effect on multidimensional poverty. It could be that the social exclusion factor is strongly reduced when households have children, therefore compensating for the increased risk of financial poverty.

Even if it does clearly have some drawbacks, our approach allows to address some well-known problems in the measurement of multidimensional poverty. First, the number of dimensions as well as their relative importance is not determined *ex ante* but chosen on the basis of empirical regularities in the data, via factor analysis. Secondly, no poverty threshold needs to be set, since the population of multiply deprived persons is identified by looking at their similarities with respect to their scores on the various dimensions through cluster analysis.

Cumulative effects and the life course : conceptualizations and operationalizations in panel data

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One promising way in which the life course paradigm analyses social processes stems from the concept of cumulative effect. For instance, challenging the view that social inequalities are mainly a function of socialization processes occurring in early childhood, one may hypothesize that life transitions are instances during which various types of social resources and social status create unequal access to successful pathways. Life transitions are periods of swift change concerning various resources. They produce further inequalities because they are dealt with differently by individuals as a function of their past experiences and accumulated resources throughout their life history. Small differences, when piling up in several transitions, may lead to large discrepancies in life trajectories. As John Clausen puts it: "early advantages become cumulative advantages; early behaviors that are self-defeating lead to cumulative disadvantages" (1993). This principle has proven to be fruitful in research on specific careers, such as scientific trajectories (Zukerman, 1977). But researchers have seldom systematically considered how cumulative disadvantages and advantages play out in the shaping of social trajectories using panels and retrospective questionnaires. This paper proposes several conceptual distinctions that may prove useful as well as empirical propositions about the way to operationalize them using data from the Swiss household Panel.

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Determinants of individual changes in physical activity over 6 years of follow-up among a Swiss young population aged 14 - 25 years in 1999. The Swiss Household Panel (SHP) 1999-2004.

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Introduction

Regular physical activity (PA) is an important prerequisite for health and development in children and adolescents. In addition, PA among the young population has been shown to be associated with sedentary behaviour in adulthood.[1] The monitoring of PA in the adult Swiss population started in 1992[2-3]. Repeated cross-sectional population surveys have shown a marked stability in the prevalence of physical inactivity. Data relating to current recommendations for health-enhancing physical activity (HEPA) is available since the Swiss Health Survey (SHS) 2002[4], indicating that 64% of the adult population is insufficiently active. Although transversal surveys are mostly valuable in assessing potential determinants of physical activity, they don't allow the quantification of shifts within activity levels, they only describe net changes. The Swiss Household Panel (SHP), a longitudinal population survey based on an accelerated cohort design followed up yearly since 1999, offers a unique opportunity to assess social patterns and life changes that can potentially influence physical activity. Young adults aged 14 to 25 years are of primary interest when considering choices in the life course. Professional orientation, sport participation and leisure preferences are of major concern. Our primary questions here is whether changes in the educational track influence participation in sport clubs and then induce a decrease in PA. Knowing when and why changes occur can be useful in targeting prevention strategies focused on reducing the current epidemic of sedentary habits and obesity.

The present study describes results associating the decrease in physical activity with specific events related to educational orientation and to sport participation among adolescents and young adults.

Method and analysis

PA reported as the number of days a week with at least 30 minutes of moderate intensity activities ("activities that get you at least slightly out of breath") was assessed since the second wave in 2000 (days/week of 30 min of breathless activities=DWBA). According to the current HEPA recommendations[5], 30 minutes of moderate intensity physical activity on most days of the week (5-7 days/week) is considered as sufficient in maintaining good health. Less than one day a week is considered as inactive and one to four days is insufficient. More intense PA was assessed as a frequency ranging from every day to never practicing an individual or team sport on a 5 levels score (results on more intense PA as well as comparisons of DWBA with the SHS 2002 are strikingly similar but are not presented here).

Statistical analysis was carried out using SAS 9.01. Multilevel models were taking into account intra-individual correlations structures due to repeated measures. *Time-invariant* and *time-variant* predictors were introduced as fixed or random effects following a systematic taxonomy starting by the unconditional mean model and the unconditional growth model in order to explain inter- and intra-individual initial status and rate of change in DWBA over 5 years of age. Generalized linear models (GLM) using the Genmod and Mixed SAS procedures were applied. Odds Ratios (OR) and their 95% CI, as well as intercepts, slopes and level-1/level-2 variances are reported, predicted graphical trends are displayed [6-7-8].

Results

7799 participants (44% men, 56% females) aged 14 years and over entered the SHP in 1999. In 2004, 4413 of them (56% from the 1999 sample) were still in the Panel, and a new sample including 3647 participants was added. The present analysis included young boys and girls aged 14 to 25 years in 1999 reaching 27 to 30 years in 2004, as well as some participants joining the Panel later for at least 3 waves but not turning more than 30 years in 2004.

This design permitted to follow-up three birth cohort : 1) 1989-1982 aged 14 to 17 in 1999, 2) 1981-1978 aged 18-21 and 3) 1977-1974 aged 22-25 in 1999. The number of adolescents and young adults included are respectively for each of the 6 waves from 1999 to 2004 : 1273, 1258, 1240, 1138, 1091 and 1691.

The mean prevalence of inactivity over the 6 waves was 26% for boys and 31% for girls. About one third of boys and girls decreased DWBA at least once during the 5 years of follow-up.

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Major changes in the life occur between ages 14 and 17 years. About 37% of boys and girls in the youngest cohort are changing once their educational track, in the 1981-1978 cohort this number falls to 11% and to 2-6% in the oldest cohort. Changes from studies towards work are most frequent in the 1981-1978 cohort (23-26%), in the oldest cohort about 80% remain stable. Most of changes in sport's club membership occur as well in the youngest cohort with about 14% quitting membership in a sport's club. In the youngest cohort about 16% of those quitting are also changing studies tracks, whereas in the two oldest cohorts this proportion falls to 12% and to 7%. The risk of becoming inactive (decreasing PA from sufficient-insufficient towards inactive) is about 4 times higher when quitting a sport's club, the OR and 95%CI are: 4.0 (2.8-5.8) in boys and 4.5 (2.9-7.0) in girls, staying non-member is better than quitting: 2.5 (1.8-3.4) in boys and 3.5 (2.4-5.2) in girls.

The unconditional mean and growth models estimated a predicted initial DWBA significantly higher in boys (2.08) than in girls (1.8) and a significant decrease with age in DWBA of -0.05 days a year (d/yr) in boys and -0.03 d/yr in girls. The decrease of DWBA is partly overestimated by a confounding cohort effect, particularly in boys, younger birth boys cohorts are more active than their peers of the same age issued from older cohorts. In the youngest boys cohort, where most life changes occur, the rate of change is significantly decreasing by -0.05 d/yr but increases significantly by +0.09 d/yr in the 1981-1978 cohort, the increase of +0.06 d/yr in the oldest cohort is not significant. The distribution of DWBA by age and cohort (fig. 1) and the predicted fitted trajectories of the model including the unconditional effect of cohort (fig. 2) are shown below for boys only.

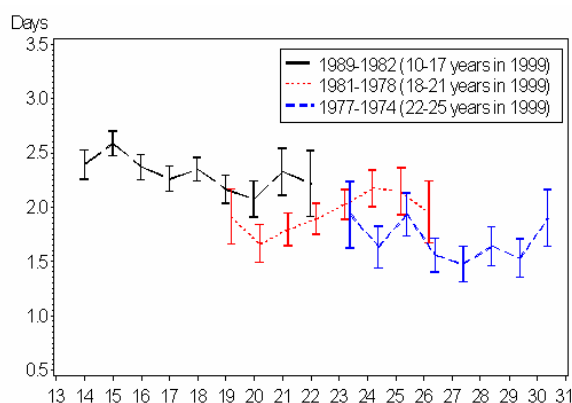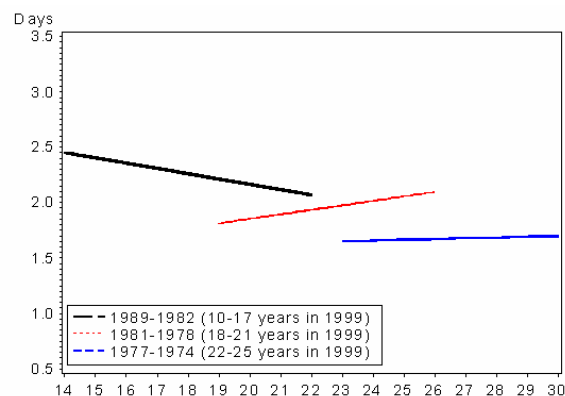Fig. 1 Boys DWBA distribution by age and cohort   Fig. 2 Boys fitted trajectories of DWBA by cohort

The rate of change of -0.1 d/yr among the youngest boys cohort changing their studies track is significantly decreasing (fig. 3) compared to the flat rate among those changing towards work or not changing at all. Non-members in a sport's club among the youngest cohort start at age 14 at a significant lower DWBA than members, but their rate of change of -0.05 d/yr, although higher than in members, is not significant (fig. 4). Quitting a sport's club has as well a significant decrease in the rate of change of -0.2 d/yr (fig. 5).
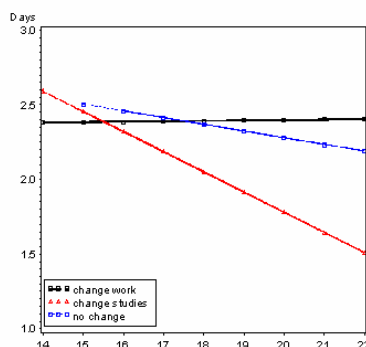
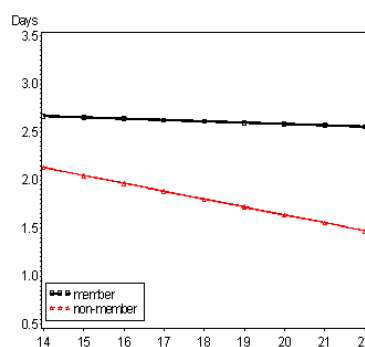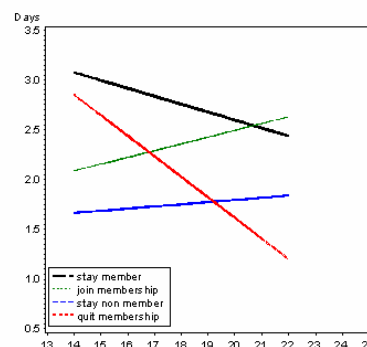Fig. 3 Changing studies track   Fig.4 Sport's club membership   Fig. 5 Quitting a sport's club

The final model is including the main effect of cohort with its rate of change, the main effect of membership without its rate of change, and the rate of change only for the changes in studies track :

$$NBD_{ij} = [\gamma_{00} + \gamma_{10} \, age_{ij} + \gamma_{20} \, cohort2_i + \gamma_{30} \, cohort3_i + \gamma_{40} \, membership_{ij} + \gamma_{50} \, studies \ to \ work_{ij} \ x \ age_{ij}$$
$$+ \gamma_{60} \, change \ studies \ track_{ij} \ x \ age_{ij} + \gamma_{70} \, cohort2_{ij} \ x \ age_{ij} + \gamma_{80} \, cohort3_{ij} \ x \ age_{ij}] +$$
$$\{\xi_{0i} + \xi_{0i} \, membership_{ij} + \varepsilon_{ij}\}$$

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The complete final model concludes that when older cohorts start at a predicted age 14 at a lower initial status of 2.1 d/yr (2.8-0.7) and 2.0 d/yr (2.8-0.8) DWBA and non members at 2.0 d/yr (2.8-0.8) DWBA, the rate of change is significantly decreasing by -0.03 d/yr for those changing studies track. After controlling for the main effects of cohort and membership, the rate of change in physical activity is decreasing when changing school track. There is a 2.2 (95%CI=1.3-3.6) risk in decreasing PA when changing studies track adjusted for quitting a sport's club. The association between quitting a sport's club and changing school is positive showing that among the 12% of boys who are quitting a sport's club, the difference in the proportion of those changing studies track (14%) compared to the lower proportion of those not changing (12%) or those changing toward working track (10%) is significant (p=0.02).

Discussion

The prevalence of physical inactivity is higher in girls than in boys and is increasing with age but not in time from 1999 to 2004. There are indications that the widely described decreasing trend in physical activity levels with age is not attributable to age per se but to life events intrinsic to age and to cohort effect[9]. Some selected determinants of inactivity as foreign nationality, French or Italian linguistic region in Switzerland, working versus studying, lower income and lower parent's education or parent's physical activity, moving to another region or changing civil status, as well as TV watching and other sedentary leisure occupations might be added as predictors in the multilevel model for change. In young adolescents, quitting a sport's club can be a consequence of a change in education track, and as the joint effect of changing the educational cycle and quitting a sport's club is associated with a decrease in physical activity, a particular attention should be given to the timing of key life changes. Prevention programs targeted at children or young adults should focus on the time sequence of life transitions.

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[9] Results of the Swiss Health Survey 2002 and measures of more intensive PA (not shown here) are depicting similar trends and reinforce our findings Health Indicators. Prevalences and Trends- Data comparison of the Swiss Health Survey (SHS surveillance program "Bus Santé" 1993-2002. Rapport. Zimmermann-Sloutskis D, Morabia A, Beer-Borst S, Costanza M. Division of Clinical Epidemiology, Geneva University Hospital