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Health

Social Inequality in Early Childhood Health

Participation in the Preventive Health Care Program for Children

By Sten Becker and Karin Kurz

Abstract

This paper asks how far socioeconomic differences in parental child health investments can be explained by personal and social resources within the family. Using SOEP data from the 2003 to 2008 newborn questionnaire, we estimate multiple logistic regressions to determine the effects of migration status, education, time resources, coping competencies, and social resources (in terms of shared parenthood and childcare support by the partner and relatives) on participation in the national German preventive health care program for children (U-Untersuchungen). First, our analyses reveal strong influences of maternal education and migration status, whereas social class plays no significant role for participation in preventive health checkups for children. Second, the likelihood of participation is higher the better mothers cope with motherhood and the more time they spend with their offspring. Finally, we find mixed effects of social resources ranging from a positive influence of parents living together, over no effect of childcare support provided by the father of the child, to a seemingly negative impact of support from further kin relations. All in all, personal and social resources do not seem to play a crucial role in explaining participation in child health programs in terms of social disparities between educational and ethnic groups.

JEL Classification: I10

1. Introduction

Although health as well as health-related behavior vary greatly with socioeconomic position, the causal relationships behind this correlation are still not fully understood (Jungbauer-Gans, 2006). One form of health-related behavior is participation in preventive health care programs for children. Though little is known about the long-term effects of missing out health checkups (Hartung et al., 2010, 411), previous research has indicated that attending them generally

decreases the risk of health problems for children (Meyer-Nürnberg, 2002; Ministerium für Justiz, Gesundheit und Soziales, 2005; Langness, 2007). More generally, recent research has shown that parental underinvestment in child health makes a major contribution to the emergence of health consequences in later life (e.g., Jungbauer-Gans/Kriwy, 2004, 15; Mueller/Heinzel-Gutenbrunner, 2001, 9; Hurrelmann, 2006; Hawe/Shiell, 2000, 875).

Since 1971, children in Germany are offered a diagnosis program consisting of ten health checks. Although this voluntary preventive health care program is free of charge, lower social classes are significantly less likely to participate in it (Lampert et al., 2005, 105; Lampert et al., 2010, 19). Drawing on the German Health Interview and Examination Survey for Children and Adolescents (KiGGS), Kamtsiuris et al. (2007, 839) report that only 72% of the low-status children took advantage of all available checkups compared to 84% of the middle and 85% of the high social status groups. In addition, parents with low education (Kalies/von Kries, 2000) as well as migrant families (Kamtsiuris et al., 2007; Stich et al., 2009) tend to have lower participation rates. The mechanisms behind the differential participation of different groups are, however, not yet well understood (Stich et al., 2009; Hartung et al., 2010).

With our contribution, we want to describe the main social structural patterns with respect to the participation in the preventive health care programs for newborns and gain a better understanding of the factors and mechanisms that help to explain the differential participation in this preventive health program. Following Klocke/Hurrelmann (1995), we assume that the relevant variables are the material, personal, and social resources. The SOEP data offer a unique opportunity to examine the impact of some of these resources on program participation.

We shall proceed as follows: The next section outlines theoretical arguments that aim to explain the relationship between social class and health. Section 3 describes the data and variables used in our analyses. Section 4 presents our empirical results from logistic regression models, and Section 5 closes with a brief summary and discussion of our findings.

2. Theoretical Considerations

We start from the assumption that the material, personal, and social resources of parents facilitate health-promoting behavior (Klocke/Hurrelmann, 1995; Jungbauer-Gans, 2002, 37–39). Material resources are important insofar as health-related behavior requires monetary investments. However, because the preventive health care program for children is free of charge, we do not expect a *direct* effect of parental income on program participation. It is surely personal resources such as knowledge on health issues and on the relevance of health checkups for babies that are more important along with general competencies

in caring for an infant and coping with the stresses and strains of having a newborn child. Personal resources thus refer to health-related cultural capital as well as to competencies in coping with parenthood. Based on the arguments of family economics (Becker, 1981), one could add time as a further personal resource (and restriction) that is likely to influence participation in preventive health care programs.

Finally, social resources – in the sense of being embedded in social relationships – can also be expected to exert an influence. There are several ways in which social relationships can impact on health-related behavior (cf., e.g., Jungbauer-Gans 2002): First, they provide support in managing the daily tasks of parenthood. Second, they might act as regulative measures that help to promote socially expected behavior such as health-promoting activities. Nonetheless, social relationships might also exert adverse effects by inducing stress and strain for the individuals involved in the interaction. The term ‘social resources’ thus refers to the notion of social capital in the sense of an individual resource based on being embedded in social networks or social relationships (cf. Bourdieu, 1983; Coleman, 1988, 1991; Portes, 1998). Indeed, numerous studies indicate a robust association between social capital and health-promoting behavior or good health (Mohens/Lindstrom, 2007; Lindstrom, 2005; Lundborg, 2005; Drukker et al., 2005; Klocke, 2004; Kroll/Lampert, 2007). When studying participation in the preventive health care program for children, it is not all forms of social capital that are relevant, but primarily relationships within family and kin (Richter, 2005, 144; Jungbauer-Gans/Kriwy, 2004, 18; Petermann et al., 2000, 27). At the same time, because mothers are empirically the prime caregivers for infants, we view the *mother's* (and much less so the father's) social resources as being of primary importance.

Hence, the central arguments guiding our empirical analyses are as follows: Mothers with more personal resources in terms of (a) education and health-related knowledge, (b) competencies in coping with motherhood, and (c) time are more likely to participate in preventive health care programs for children. Furthermore, having supportive family members and relatives should also increase the probability of the mother's program participation. With respect to general social structural patterns, we expect that participation in preventive health care programs for children is not related to income differences between families, but to educational level. This is because health-related knowledge and competencies in processing complex information are acquired during the course of an extended educational career (Jungbauer-Gans, 2002, 37). Participation should also be associated with social class due to its correlation with education. Following earlier studies, we also expect to find a lower participation rate of migrant families. On the one hand, this might be due to the generally lower educational level among migrants. However, other mechanisms – such as less knowledge of the German health system or different health concepts – might also be at work (cf. Hartung et al., 2010).

3. Data and Variables¹

We use data from the German Socio-economic Panel (SOEP) covering the period from 2003 to 2008 (Wagner et al., 2007). Our analyses draw on the *mother-child-questionnaire* (age: 0–1) gathering a variety of information on the newborn's health. Some mothers gave birth to several children during the observation period and therefore took part repeatedly in the mother-child interview. Because our unit of analysis is the mother, we selected only one mother-child interview for each mother (the first interview), resulting in $n = 1,179$ interviews. For 151 individuals, there were missing data on central independent variables. This reduced our sample size to 1,028 mothers with newborns aged 0 to 18 months (on average 7.03 months). We use the child's participation in the preventive health care program as the dependent variable. Mothers were asked the following question: "Which was the last checkup that took place?"² We use this item to construct a dichotomous measure. The outcome variable equals 1 when the child had participated in the latest age-appropriate medical checkup; otherwise 0.

The explanatory variables are the following: Because the SOEP contains no direct measures on health-related knowledge, we simply rely on the mother's educational level. We distinguish three categories: basic degree ('Hauptschule'), intermediate degree ('Mittlere Reife'), and university entrance qualification ('Fach-/Hochschulreife'). In addition, we measure social class by using the father's position according to the EGP-class scheme (Erikson/Goldthorpe, 1992). If there is missing information or if the mother is not cohabiting with the child's father, the maternal EGP-class position is used. We distinguish the upper and lower service class (1), routine white-collar workers (2), self-employed persons (3), skilled workers (4), and semiskilled and unskilled workers (5). In addition, we construct a dummy variable to indicate whether the child's father is not employed (and therefore the class position cannot be ascertained).

To measure the mother's competencies in coping with motherhood, we transform a 4-point scale (mothers' agreement to the statement "I do not feel up to the new tasks and demands") into a dummy variable with the values 1 (agree completely) and 0 (otherwise). In addition, we use an indicator measuring how satisfied the mother is with her role as a mother (dummy variable, agree completely = 1, otherwise = 0).

To capture time constraints, we employ the information on whether the mother is on parental leave (yes = 1, no = 0) and whether she has more than one

¹ Sample summary statistics are presented in Table A1, in the appendix.

² Overall, there are 10 voluntary medical checkups for children (Stich et al., 2009). Seven of these are offered in early childhood: Checkup 1: after giving birth; Checkup 2: Day 3–10; Checkup 3: Week 4 to 5; Checkup 4: Month 3–4; Checkup 5: Month 6–7; Checkup 6: Month 10–12; Checkup 7: Month 21–24.

child (yes = 1, no = 0). Mothers on parental leave are assumed to have more time for their children. Further, the time a mother can devote to a child is expected to decrease with the number of children (Coleman, 1988).

To measure family structure and social support by the partner and by relatives, we draw on the following characteristics: First, we distinguish cohabiting from noncohabiting mothers with the item “Does the father live in the household?” (yes = 1, no = 0). We view cohabiting with the child’s father as an indirect indicator for receiving support from the partner in daily childcare. For mothers having a partner, we capture the amount of support with both a qualitative measure (how strongly the mother feels supported by the partner in childcare: very strongly/strongly = 1, not very/not at all/no partner = 0) and a quantitative measure (for how many hours a week a partner provides childcare: 0–5 hours = 0, > 5 hours = 1). Additionally, mothers were asked whether relatives such as grandparents, older siblings, or other relatives look after the child on a regular basis. From this item, we create a dummy variable, indicating whether kin support exceeds 5 hours a week (= 1) or is less or equal to 5 hours (= 0).

When analyzing the likelihood of participation in the preventive health care program for children, we might run into the problem that participation is perhaps not only a function of the factors and mechanisms spelled out in our theoretical considerations, but also a function of the initial health status of the child. We assume that participation in the checkup program is more likely when the child is seriously ill. Therefore we use a binary indicator for the child’s objective health during the first three months after birth. If the child suffered from serious health problems requiring a hospital visit, or if any retardations, disorders, or disabilities had been identified, the child health indicator equals 1 and otherwise 0. In addition, we use a binary indicator for pregnancy disorders (mother’s physical and mental health in the last third of pregnancy). Child’s health as well as mother’s health during pregnancy is expected to exert direct effects on the utilization of medical checkups for children.

Sociodemographics taken into account in the analyses are migration status (whether the mother has a direct or indirect migration background) and region (east vs. west Germany). Furthermore, the following control variables are included: age of mother at birth (metric), whether the pregnancy was planned or not, and sex of child.

4. Results

We begin our empirical analyses by presenting bivariate associations between standard socioeconomic indicators and participation in the preventive checkup program for children. Figure 1 shows the well-known positive association with maternal education level ($r = 0.148$, $p < 0.001$): Of those with the lowest degree, 74.5% participate in the preventive health care program; with

an intermediate degree the proportion rises to 84.2%; and with a high degree, to 89.4%. Overall, 84.7% of all mothers had taken their child to the latest age-appropriate preventive health checkup. In contrast, as Figure 2 shows, there is no consistent statistical association between social class and the outcome variable. However, program participation is somewhat less likely for children when the father is an unskilled or semiskilled manual worker or not gainfully employed. In addition, Figure 3 illustrates that children with a migration background are significantly less likely to participate in a preventive health checkup ($\text{Chi}^2 = 23.1733, p < 0.01$).

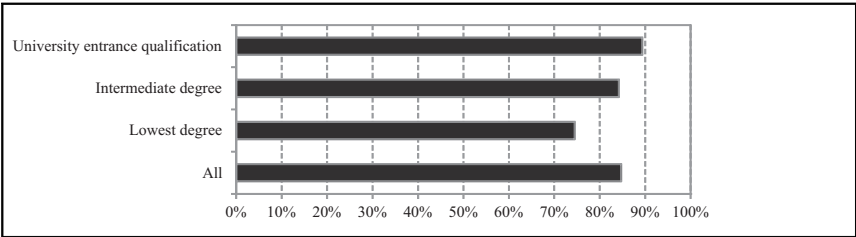


Figure 1: Participation in preventive health checkups for children depending on maternal education

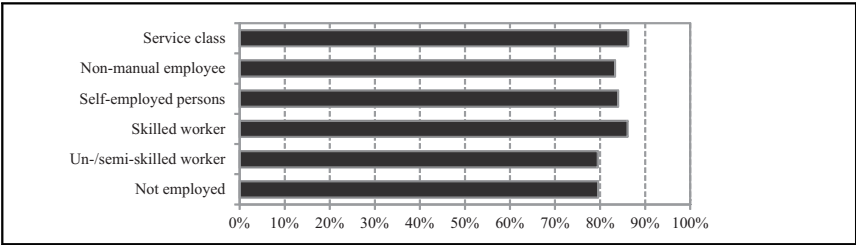


Figure 2: Participation in preventive health checkups for children depending on parents' social class

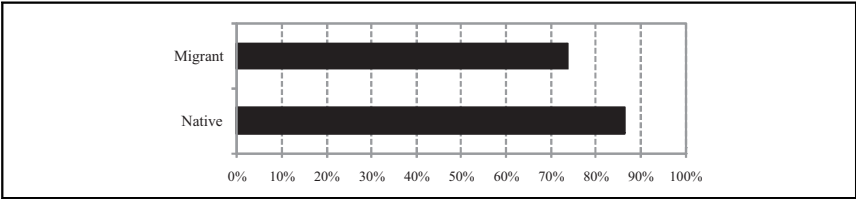


Figure 3: Participation in preventive health checkups for children depending on mothers' migration background

We shall now report the results from multiple logistic regression models on participation in preventive child health checkups (Table 1). The first model inc-

ludes mother's educational level and migration status as central sociostructural variables while additionally controlling for age and sex of child, year of child's birth, age of mother at child's birth, and east/west German origin.³ We left out social class because it is no longer relevant for predicting participation in the preventive health care program after controlling for education (model not shown). Model 2 adds variables on the mother's coping competencies, indicators for time constraints and social support, as well as control variables referring to the child's and the mother's health. The stepwise modeling procedure allows us to examine how far the effects of the social structural variables in Model 1 are brought about by the mediating effects of personal and social resources. The coefficients presented are, on the one hand, odds ratios – $\exp(b_i)$ – and, on the other hand, y -standardized coefficients – b_i . In contrast to the odds ratios, the latter coefficients can be compared between hierarchical models such as Models 1 and 2 (Winship/Mare, 1984; Mood, 2009).

When considering the effects of education (Model 1), we again find children with low or medium educated mothers to be less likely to participate in the health program compared to those with highly educated mothers. Besides this familiar result, migration background matters ($p < 0.01$). Having a direct or indirect migration background results in a more than 50% reduced participation chance – net of the effect of education, which means that the lower participation probability is *not* mainly due to educational differences between natives and migrants. The finding is in line with recent research identifying ethnic origin as an important predictor for participation in the preventive child health program (Stich et al., 2009; Kamtsiuris et al., 2007). Furthermore, Model 1 shows the well-established result that the older children are, the less likely it is that they will participate in the health check program (Lampert et al., 2010).

Comparing the y -standardized coefficients for education and migration background between Models 1 and 2 reveals only minor changes. Thus, we conclude that neither the mother's social capital nor other maternal resources, such as competencies in coping with the mother role or the mother's time resources, can explain the rather lower health program participation rates of mothers with a low educational level or with a migration background.

In addition, Model 2 indicates that mothers who are better able to cope with their new maternal tasks and demands are more likely to use the preventive health checkups. However, the effect is only significant at the 10 percent level. In contrast, the less direct indicator for coping competencies, satisfaction with the role of a mother, does not seem to be relevant. Following Coleman (1988), we predicted higher participation chances for children whose mothers spend more time at home and who do not have many siblings to compete with for

³ Not all coefficients for the control variables are included in the table.

Table 1

Logistic Regression Models Predicting the Probability of Participating in Preventive Checkups for Children

	Model 1		Model 2	
	Exp(b)	BStdY	Exp(b)	BStdY
Sociostructural characteristics				
Mother's education (Ref.: university entrance qualification)				
Lowest degree	0.401 **	-0.476	0.414 **	-0.439
Intermediate degree	0.597 *	-0.268	0.591 *	-0.262
Mother's migration status (Ref.: native)				
Direct or indirect migration background	0.454 **	-0.411	0.470 **	-0.376
Age (child)	0.935 **	-0.035	0.940 *	-0.031
Year of birth (child)	1.110 ~	0.054	1.093	0.044
Coping competencies and time constraints				
Difficulties coping with motherhood			0.705 ~	-0.174
Satisfaction with mother role			1.057	0.028
Having more than one child			1.049	0.024
On maternal leave			1.582 *	0.228
Family structure and social support				
Single mother			0.524 *	-0.322
Strong feeling of support through partner's childcare			0.958	-0.021
Childcare from partner (> 5 hours per week)			0.778	-0.125
Childcare from relatives (> 5 hours per week)			0.678 *	-0.194
Health-related issues				
Child in poor health			2.041 *	0.355
Mother with very good health in last third of pregnancy			1.747 *	0.278
Constant	22.910 **		23.675 **	
Pseudo R ²	0.06		0.10	
Chi ²	56.0 **		94.1 **	
Observations	1028		1028	

Note: Models 1 and 2 also control for sex of child, age of mother at birth of child, and east/west German origin; Model 2 additionally controls whether the pregnancy was planned or not. None of the control variables exerts a significant effect.

Significance level: ** $p < 0.01$; * $p < 0.05$; ~ $p < 0.1$.

Source: SOEP 2003–2008.

their mother's time. As expected, the coefficient for the mother being on parental leave is positive and significant at the 5 percent level. However, there is no significant effect for the number of siblings. Thus, shared parental attention does not seem to have a negative influence on the likelihood that a child will take part in the early examinations of the preventive health program. In contrast, other studies find children with older siblings to be more likely to miss

one or more health checkups (Kamtsiuris et al. 2007), and this is particularly the case for later preventive examinations (U8, U9) (Hartung et al., 2010).

Turning to the relevance of living together with the father of the child and receiving support from him and from relatives, we find, first of all, that single mothers are clearly less likely to participate in the preventive health program for children (odds ratio = 0.52; $p < 0.05$). Note that the regression model controls for education and coping competencies; thus, regardless of the mother's educational level and her coping competencies, participation in the preventive healthcare program is lower in single-parent families. In contrast, the expected influence of the amount of childcare support by the child's father is not confirmed empirically. At the same time, there is an unexpectedly negative effect for the variable measuring support by relatives that is significant at the 5 percent level (net of the effects of all other controlled variables). The coefficient indicates that children have a lower probability of participating in a preventive health checkup when childcare regularly provided by relatives (e.g., grandparents, older siblings, or other relatives) exceeds more than 5 hours a week. We should add that other categorizations of support by the partner and by relatives yield basically the same results.

Finally, Model 2 controls for the child's objective health status and the mother's well-being during the last third of pregnancy. As mentioned before, accounting for these variables is important due to the possibility of reverse causality. Although mother's and child's health are good predictors – both coefficients are significant at the 5 percent level – there is no indication for reverse causality, because the social support measures do not change in size and direction when we control for the health status of mother and child in a stepwise modeling procedure (results not shown). Interestingly, however, the predictors exert opposite effects: Whereas *poor* child health promotes participation in the health care program (as expected), mother's health *positively* influences participation in the program. It seems likely that a mother's good health during pregnancy is at least partly the result of her more health-oriented behavior in the past. Thus, we believe that mother's health during pregnancy constitutes an indirect indicator for her own health-promoting behavior, which, in turn, is a good predictor for how she promotes her child's health.

5. Discussion

This paper focused on social inequalities in parents' child-health-promoting activities using the example of participation in preventive health checkups for children (U-Untersuchungen). Our main interest was to investigate how far personal and social resources play a role in whether mothers participate in these checkups. The resources we looked at were education, coping competencies, and time resources as well as social support in terms of living with a partner

and receiving support from him and from relatives. Using SOEP data from the newborn questionnaire 2003 to 2008, we estimated multiple logistic regressions to determine the effects of these explanatory variables on parental child health investments.

First, our analyses confirm substantial differences in participation rates depending on maternal education and migration status. In contrast, parents' social class exhibits – after controlling for education – no significant effect. Second, we find some evidence that the mother's coping competencies as well as her time constraints do influence the likelihood of participating in the preventive health program for children. Third, results show that the mother's social capital in terms of support by her partner or relatives is not of crucial importance in explaining the likelihood of participating. Only one aspect seems to be important, namely, whether the mother lives together with the child's father. This greatly increases the likelihood of participating. This indicates that shared parenthood eases coping with the demands of caring for a newborn. Further, it is noteworthy that drawing on kin support with childcare is associated negatively with participating in the child health program. First and foremost, this means that our interpretation of the role of childcare support is not valid to such a general degree. Childcare support alone cannot be assumed to increase participation chances in the preventive child health program. We speculate that mothers who extensively use kin support in child care seem, for some reasons, less able or willing to take care of their child, which also results in a reduced participation probability. Finally, and most importantly, our empirical findings reveal that neither social capital nor the mother's personal resources mediate the link between education and migration status, on the one hand, and participation chances in preventive health checkups on the other hand: After accounting for the mother's personal and social resource variables, the effects of education and migration background drop only slightly. This means that we were unable to capture the decisive mediating mechanisms.

Thus, the results of our analyses leave us skeptical about the mother's social capital being of primary relevance for predicting program participation and for explaining social disparities therein. It is mainly social capital arising from shared parenthood that helps to increase participation chances. But this is not the only important factor. Competencies in coping with motherhood (and fatherhood) as well as time constraints and perhaps even more importantly, health-related knowledge and attitudes surely play an important role in explaining program participation. What is missing most in our analysis is direct indicators of health-related knowledge and attitudes. However, these factors were captured indirectly and roughly by mother's educational level and perhaps her own health status that exerted sizeable influences in our analysis. We conclude that further research is needed to examine the processes that mediate the link between social and ethnic background on the one hand and health-related behavior on the other.

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Appendix

Table A1

Sample Summary Statistics

Variables	Categories	n	Percent / mean
Child's participation in preventive health checkups	Yes	861	83.75
	No	167	16.25
EGP	Service class	342	33.27
	Nonmanual employee	102	9.92
	Self-employed persons	75	7.3
	Skilled worker	194	18.87
	Un- / semiskilled worker	122	11.87
	Not employed	137	13.33
	Missings	56	5.45
Mother's education	University entrance qualification	385	37.45
	Intermediate degree	392	38.13
	Lowest degree	216	21.01
	Missings	35	3.4
Mother's migration status	Native	776	75.49
	(In)Direct migration background	252	24.51
West German origin	Yes	769	74.81
	No	259	25.19
Mother's age at birth	Metric	1.028	30.08
	(S.E.)		(0.174)
Child's age in the survey year	Metric	1.028	7.03
	(S.E.)		(0.117)
Child's year of birth	2002	240	23.35
	2003	210	20.43
	2004	172	16.73
	2005	142	13.81
	2006	122	11.87
	2007 / 08	142	13.81
Sex of child	Girl	512	49.81
	Boy	516	50.19
Single mother	Yes	88	8.56
	No	940	91.44

Variables	Categories	n	Percent / mean
Strong feeling of support through partner's childcare	Yes	788	76.65
	No	240	23.35
Childcare from partner (> 5 hours per week)	Yes	613	59.63
	No	415	40.37
Childcare from relatives (< 5 hours per week)	Yes	287	27.92
	No	741	72.08
Satisfaction with mother role	Yes	586	57.00
	No	442	43.00
Difficulties in coping with motherhood	Yes	483	46.98
	No	545	53.02
Planned pregnancy	Yes	723	70.33
	No	305	29.67
Number of siblings	0	577	56.13
	1	286	27.82
	2 and more	165	16.05
Maternal leave	Yes	811	78.89
	No	217	21.11
Child in poor health	Yes	152	14.79
	No	876	85.21
Mother with very good health in last third of pregnancy	Yes	335	32.59
	No	693	67.41

Note: Source: SOEP 2003–2008.