

**Verena Wießnet**

Friedrich-Alexander-Universität Erlangen-Nürnberg

**Marcus Penthin**

Friedrich-Alexander-Universität Erlangen-Nürnberg

**Eva Susanne Fritzsche**

Technische Universität München

**Stephan Kröner**

Friedrich-Alexander-Universität Erlangen-Nürnberg

**Who plays a musical instrument in elementary school?**

The explanatory value of the family economic and cultural capital in the musical domain

**Nicht jedes Kind spielt (irgend-)ein Instrument: Der familiäre Hintergrund als Determinante der Wahl von Musikinstrumenten im Grundschulalter**

**Summary**

*Playing a musical instrument requires economic capital and represents cultural capital. Thus, the odds to play an instrument are low for children from low-capital families. Moreover, if low-capital children are musically active, they should choose instruments providing lower distinction values. We investigated how economic capital (via highest International Socioeconomic Index of Occupation, HISEI) and music-related cultural capital (via parental musical activity) act together in explaining (a) whether children play any instrument and (b) explain the choice of classical vs. other vs. no instrument. We surveyed  $N = 685$  students ( $M_{age} = 9.88$ ,  $SD = 0.52$ , 50 % girls) from 16 elementary schools. Logistic regression ( $\chi^2(2) = 93.94$ ,  $p \leq .01$ ,  $n = 653$ ; correctly classifying 60 % of the cases) showed that the odds of child musical activity increased both with parental HISEI (odds ratio for HISEI = 1.03, Wald  $\chi^2(1) = 29.59$ ,  $p \leq .01$ ) and parental musical activity (odds ratio = 3.02, Wald  $\chi^2(1) = 35.70$ ,  $p \leq .01$ ). Moreover, playing an instrument related to classical music was associated with both a higher parental HISEI ( $F(2, 659) = 33.95$ ,  $p < .001$ ;  $\eta^2 = .09$ ) and parental musical activity. Implications of our results for equal access to musical activities are discussed.*

**Keywords:** cultural capital, economic capital, musical instrument, elementary school children

## 1. Background

In German cultural education, often effects in fields that are unrelated to the arts are taken as an argument for fostering cultural activities in children. An example for this mindset is the literature on the so-called Mozart effect: In the 90s, Rauscher and colleagues claimed that hearing particular works of classical music will enhance specific aspects of people's cognitive abilities (Rauscher, Shaw & Ky, 1993). Today, however, there is a broad consensus that the high expectations regarding extramusical effects of musical activities promised by studies like that of Rauscher and colleagues have not been fulfilled. Nevertheless, musical activity may be considered to be important for the development of children for various other reasons (Bastian, 2002; Rittersberger, 2002). Yet, not all German children are playing an instrument. According to the MediKuS study (an acronym for a study on media, culture and sports in young people), approximately 39 % of musically active children and adolescents are playing an instrument (Grgic & Züchner, 2013). The most frequent instruments played are the piano (26 %), the guitar (25 %) and the recorder (12 %). While these results are based on a sample aged 9 to 17, they also apply to younger age groups: At least regarding the proportion of children playing an instrument, with a proportion of 44 %, there are similar results for children aged 9 to 13 (Autorengruppe Bildungsberichterstattung, 2012). Thus, it may safely be assumed that a significant proportion of children in elementary school will play no instrument. Hence, the question is: How can it be explained who will play an instrument in elementary school? Moreover, how can it be explained which kind of instrument is chosen?

Therefore, more than in its effects, we are interested in the reasons for the extent of musical activities of children, and why they choose particular kinds of these activities. Regarding reasons for musical activities, it should be taken into account that like any cultural activity, they are closely related to distinction (Bourdieu, 1979/1982). And, as a necessary condition to that, they require all three forms of capital – which children with low social status often lack: First, learning to play an instrument requires economic capital: Children and their families will need money for buying or lending an instrument, or for paying a teacher even though there are subsidies for low-income families. In addition, some of the instruments, like the piano, tend to be particularly expensive. Second, for playing an instrument, social capital will also be helpful: For example, especially young children will need someone who would drive them to their lessons or would nudge the children to practice their instrument. Third, learning to play an instrument will require cultural capital: If instruments are available at home, this will render it more likely that the children will start practicing it. The presence of instruments, especially of instruments related to classical music like the cello or the clarinet, may be regarded as an indicator of objectified cultural capital. Moreover, incorporated parental cultural capital – parents being able to read scores and to play an instrument – may also be helpful. Thus, taken together, children from low-socioeconomic status families should experience multiple obstacles to musical participation (Grgic & Züchner, 2013). This may especially be the case when it comes to playing an instrument related to classical music.

Having mentioned the theoretical importance of different kinds of capital for musical activities, we now want to take a glance on existing empirical evidence. Regarding social capital, in a previous study with adolescents, we showed that parental social support explains musical activities of students (Fritzsche, Kröner & Pfeiffer, 2011). In the present paper, we focus on economic and cultural capital. Parental economic capital has been shown to explain cultural

activities as a whole (Kröner, Vock, Robitzsch & Köller, 2012) and also musical activities in particular (Busch, Kranefeld & Koal, 2014). Nevertheless, there are not too many studies on economic predictors, at least not in peer-reviewed journals. This may be related to the fact that it is tedious to code indicators for socioeconomic status. In addition, parental cultural capital may enhance children's musical activities. Regarding the parental cultural capital as a predictor, we may also refer to evidence regarding the project JeKi (An Instrument for Every Child, German: Jedem Kind ein Instrument), as well as to our own previous work: If their parents were playing an instrument, children were more likely to participate in the JeKi-program (Busch et al., 2014). Studies from our research group also showed that this effect is not restricted to the JeKi program (Kröner, Schwanzer & Dickhäuser, 2009; Penthin, Fritzsche & Kröner, 2017). Moreover, the importance that is assigned to musical activities at home, most notably by the parents, has a large explanatory value for learning an instrument in grade 6 and 7 (Krupp-Schleußner & Lehmann-Wermser, 2016).

While there is some evidence regarding effects of either economic or cultural capital on musical activities of students, research that will include both as determinants of musical activities in elementary school students is still lacking. This is particularly true when the aim is not only to explain whether elementary school children play an instrument at all, but also, in case of activity, which type of instrument they choose: An instrument related to classical music or another one that is for example more connected to popular music. This has been our aim in the present study.

## 2. Research questions and hypotheses

In the present study, we addressed the following research questions and hypotheses:

1. Does the parental economic capital explain whether children are musically active?

We expected that the probability of a child playing an instrument should increase with parental economic capital as measured by the highest socioeconomic status in the family.

2. Does the parental cultural capital explain whether children are musically active?

As with economic capital, we expected that the probability of a child playing an instrument should increase with parental cultural capital as measured by at least one parent playing an instrument.

3. Do the parental economic and cultural capital provide information on the choice of a particular type of musical instrument?

Here our hypothesis is that the odds of at least one parent playing an instrument should be highest for children playing an instrument that is typical for classic music, intermediate for children playing any other instrument, and lowest for children playing no instrument at all.

### 3. Method

*Sample and procedure:* For our empirical analyses, we used data from the study “Determinants of musical activities in elementary school students” (Penthin, Fritzsche & Kröner, 2013). In this study, the data had been acquired by a standardized questionnaire survey. The participants were  $N = 685$  ( $M_{\text{age}} = 9.88$ ,  $SD = 0.52$ , 50 % girls) students in fourth grade, who filled in paper-pencil-tests at their classrooms. The participants came from 54 different classes of 16 Bavarian elementary schools in Middle Franconia. The proportion of students who were playing at least one instrument was 60 %. The sample for the logistic regression consists of 653 students, because there were missing data on the highest socioeconomic status in the family and on the musical activities of the parents.

*Variables:* To measure cultural capital, in the present study we used the musical activity of the parents. These indicators were operationalized dichotomously as mother or father currently playing vs. not playing an instrument (adapted from Penthin et al., 2017).

As an indicator of economic capital, we used Socioeconomic Status (SES), as measured by the highest International Socio-Economic Index of Occupational Status (HISEI), which represents the maximum of the International Socio-Economic Index (ISEI) of the father and the mother (Ganzeboom, Graaf & Treiman, 1992). We operationalized the ISEI with a standard procedure that has been used in large scale studies before. However, we adapted the wording of the items to fit with elementary children. We asked children to answer the questions: “What is the occupation of your mother/father?” and “What is your mother/father doing at her/his job?”. To compute the ISEI, we had to code the children answers in occupational titles first. We did this according to the coding scheme ISCO 2008 (The International Standard Classification of Occupations; International Labour Office, 2012). The ISCO is a four-digit code. Before the actual rating procedure started, the rater was trained. For this purpose, she went through training together with a second rater who was coding similar data from another project. The training started with an introductory course by a senior researcher. Afterwards, it included the rating of about 200 cases of a separate dataset that has been coded by experts in a previous project. This had the advantage that interrater agreement could be computed both among the trained raters and among the rater trained for the present paper and the expert rating. If the interrater agreement should be too low following the training, further instruction could also be presented and another set of training cases could be provided until sufficient interrater agreement was granted. As will be shown in the results section, however, interrater agreement had been high enough following the first training cycle. Thus, we were able to immediately continue with the actual dataset for the present study. Moreover, the rater assigned confidence levels to their ratings and when the rater was not sure about the code, she discussed these cases with the other rater just trained. If both raters still could not find a consensus, they consulted the expert rater and discussed the case to come to an agreement. After coding the ISCO we used the Syntax provided by Ganzeboom (2010) to compute the HISEI.

To measure the musical activities, we used (1) playing vs. not playing an instrument (measured by the item “Do you play an instrument?”) and (2) the type of the particular instrument played as operationalization. To determine the type of instrument played, we categorized the answers to the item “If yes, which kind of musical instruments?” as follows: (1) playing an instrument frequently associated with classical music, for example the piano or the violin, (2) playing other

instruments like for example the e-guitar or tin whistle, (3) playing no instrument at all (cf. Table 1).

Table 1: Categorization of instruments.

Classical	alto recorder, cello, clarinet, contrabass, euphonium, flugelhorn, guitar, horn, piano, saxophone, tenor horn, transverse flute, trombone, trumpet, violin
Other	accordion, bongo, cajon, drum, drums, dulcimer, e-guitar, keyboard, marimbaphone, ocarina, recorder, tin whistle, ukulele, vee harp, xylophone

*Data analyses:* To explain the odds of children playing an instrument, we used hierarchical binomial logistic regression (method = enter; SPSS 25.0, IBM Corp., 2017). Doing so, we computed a model in which both HISEI and parental musical activity were entered simultaneously as well as two models in which either of the two variables was entered as the only predictor. Moreover, in order to answer the question how the parental HISEI is related to the choice of a particular type of instrument, we conducted an analysis of variance with HISEI as a criterion and the type of instrument as a random factor, followed by Bonferroni-Holm-adjusted pairwise comparisons between types of instrument. Finally, in reply to the question whether the parental musical activity is related to the choice of a particular type of instrument, we computed pairwise  $\chi^2$ -tests between the groups of children playing no instrument, an instrument related to classical music, or another instrument.

#### 4. Results<sup>1</sup>

*Descriptive statistics and bivariate correlations:* The descriptive statistics show that the most frequently played instruments were the piano (16 %,  $n = 109$ ), the guitar (14 %,  $n = 98$ ) and the recorder (13 %,  $n = 86$ ). According to our categorization of instruments, 38 % of the students were playing an instrument frequently associated with classical music, 21 % were playing other instruments and 40 % were playing no instrument at all (cf. Table 2).

Table 2: Distribution of types of musical activities.

	<i>N</i>	percent
Classical	263	38.4
Other	145	21.2
None	275	40.1
Missing	2	0.3
Total	685	100.0

<sup>1</sup> Data file, syntax and output can be downloaded at the platform of the Open Science Framework (OSF) at the URL <https://osf.io/svynp/> (DOI 10.17605/OSF.IO/SVYNP).

Regarding HISEI, there was a sufficient interrater agreement both among the trained raters ( $\kappa = .64$ ) and among the rater trained for the present paper and the expert rating ( $\kappa = .57$ ) (Fleiss & Cohen, 1973). The HISEI of the parents had a median value of  $MD = 53.77$  ( $IQR = 36$ ). Descriptive statistics for the subgroups are displayed in Table 3. Only about 27 % of the mothers and 25 % of the fathers were playing at least one instrument. For 41 % of the children at least one parent is playing an instrument.

Table 3: HISEI for subgroups.

Subgroups	<i>n</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>IQR</i>
Classical	261	61.77	18.77	62.39	32
Other	137	55.65	18.59	53.77	32
None	264	48.19	19.21	47.30	31

*Explaining whether children are musically active or not (Research questions 1 and 2):* In order to answer the question how the economic and cultural capital could be used as predictors to explain the criterion of playing an instrument or not, a logistic regression analysis was performed to ascertain the effects of parental HISEI and cultural capital on the likelihood that children play an instrument. A Hosmer-Lemeshow-test indicated an appropriate goodness of fit for the logistic regression model ( $\chi^2(8) = 11.76$ ,  $p = .16$ ,  $n = 653$ ). The logistic regression model was statistically significant ( $\chi^2(2)$ ,  $n = 653$ ) = 93.94,  $p \leq .001$ ), indicating that the predictors, as a set, reliably distinguished between playing an instrument and the parental economic and cultural capital. It explained 18 % (according to Nagelkerkes  $R^2$ ) of the variance in musical activity and correctly classified 60 % of cases. Moreover, as to be seen from the Wald  $\chi^2$  column in Table 4, all predictors were statistically significant individually, too: When entered as the sole predictor to explain musical activity, both a higher parental HISEI (odds ratio for HISEI = 1.03; odds ratio for a ten-point ISEI-increment = 1.3; Nagelkerkes  $R^2 = .11$ ; Wald  $\chi^2(1, n = 653) = 29.59$ ,  $p < .01$ ), and at least one parent playing an instrument (odds ratio = 3.02; Nagelkerkes  $R^2 = .12$ ; Wald  $\chi^2(1, n = 653) = 35.70$ ,  $p < .01$ ) were associated with increased odds of a child playing an instrument.

Table 4: Logistic regression playing an instrument explained by parental economic (HISEI) and cultural capital (at least one of the parents plays an instrument).

	<i>B</i>	<i>SE</i>	Wald $\chi^2$	<i>df</i>	<i>p</i>	Odds Ratio	Nagelkerkes $R^2$
Constant	-1.36	.25	28.47	1	< .01	.26	
HISEI (Economic Capital)	.03	.01	29.59	1	< .01	1.03 <sup>2</sup>	.11 <sup>a</sup>
Parental Musical Activity (Cultural Capital)	1.11	.19	35.70	1	< .01	3.02	.12 <sup>a</sup>

<sup>a</sup>Related to this predictor being used as single predictor in the analysis.

<sup>2</sup> Note that, although this value seems to be rather low, it amounts to an odds ratio of more than 6 when comparing jobs from opposite ends of the ISEI scale. Further details are given in the discussion section.

*Explaining which type of instrument children choose (Research question 3):* Regarding the third hypothesis, we were interested in explaining the choice of types of instruments by (a) HISEI as an indicator of economic capital and by (b) parental musical activity as an indicator of cultural capital.

Regarding (a) HISEI, the error bars in Figure 1 show that children playing a classical instrument were more likely to come from families with a higher HISEI than children playing another type of instrument or no instrument at all. Moreover, the bars indicate that children not playing any instrument tended to come from families with the lowest HISEI.

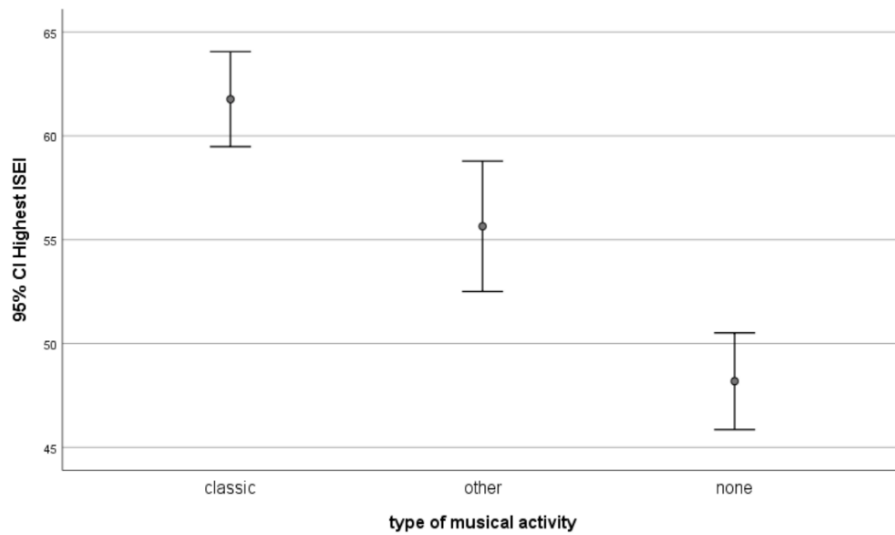


Figure 1: Relationship between choice of instrument type and parental economic capital (HISEI); means and 95 % CI for HISEI depicted.

To determine statistical significance of the effects of HISEI as an explanatory variable for the choice of instruments suggested by the error bars, we conducted a one-way analysis of variance (ANOVA) comparing the mean HISEI (dependent variable) of groups of children playing different types of instrument (independent variable). This ANOVA with the groups of children playing classical, other, or no instruments, respectively, turned out to be statistically significant,  $F(2, 659) = 33.95, p < .001; \eta^2 = .09$ . (cf. Table 5). Bonferroni-adjusted post-hoc comparisons of HISEI means showed that all group mean differences were statistically significant (cf. Table 6).

Table 5: ANOVA with parental economic capital as dependent variable and the instrument type played by the children as independent variable.

	Sum of Squares	df	Mean Square	F	p
Between Groups	24270.00	2	12135.00	33.95	< .01
Within Groups	235577.83	659	357.48		
Total	259847.83	661			

Table 6: Bonferroni-Holm-adjusted post-hoc tests for the ANOVA with parental economic capital as dependent variable and the instrument type played by the children as independent variable.

(I)Type of musical activity	(J)Type of musical activity	Mean Difference (I-J)	Standard Error	p	95 % Confidence Interval for Difference	
					Lower Bound	Upper Bound
classic	other	6.12	2.00	< .01	1.33	10.91
classic	none	13.58	1.65	< .01	9.62	17.54
other	none	7.46	1.99	< .01	2.68	12.24

Regarding (b) parental musical activities as the second predictor for the choice of type of instrument, the error bars depicted in Figure 2 suggest that children playing a classical instrument tended to be raised in families where at least one parent plays an instrument. The children playing no instrument tended to be raised by parents not playing an instrument, while children playing other instruments showed an intermediate probability of their parents playing an instrument.

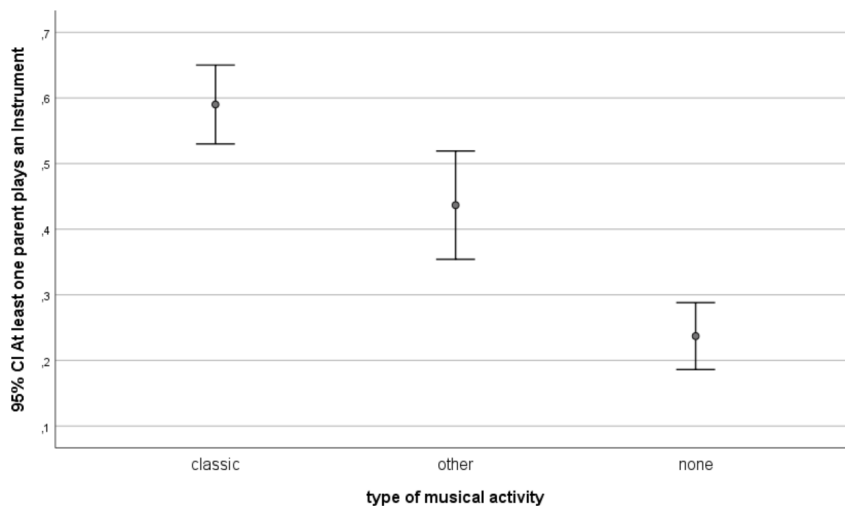


Figure 2: Relationship of choice of instrument type and parental cultural capital (at least one parent playing an instrument vs. no parent playing an instrument); means and 95 % CI for parental musical activity depicted.

To determine statistical significance of the effects suggested by the error bars in Figure 2, we conducted pairwise  $\chi^2$ -tests between the groups of children playing no instrument, an instrument related to classical music, or another instrument. As Table 7 shows, all pairwise comparisons were statistically significant.

Table 7: Pairwise  $\chi^2$ -tests comparing parental musical activity between the groups of children playing no, classical or other instruments

	$\chi^2$	df	p
none vs. classic	68.34	1	<.01*
none vs. other	17.46	1	<.01*
other vs. classic	8.70	1	<.01*

\* Still statistically significant after Bonferroni adjustment (critical p = .0167).



## 5. Discussion

The results of the present study show that parental economic and cultural capital may be used to explain the musical activities as well as the choice of types of instruments in elementary school children. Children from families with low economic or cultural capital are less likely to play an instrument. This is in line with Krupp-Schleußner and Lehmann-Wermser (2016), who found out that “[...] parental influence, i.e. the importance of music at home, has a much stronger influence on learning an instrument in the group of children with high socio-economic status” (p. 12) than in children from low-SES families. In addition, if the children from low-SES families are playing an instrument rather than choosing one related to classical music, they will play other instruments.

One limitation of the present study is that only self-report data from pupils was available and no additional information from parents had been collected. This may raise questions regarding the validity of some of our variables: Regarding the answers on the instrument chosen, it is possible that children were answering that they were playing the piano, just because they had one at home but actually they may not have been taking lessons nor may they have been able to play it. Regarding the answers on the parents’ jobs, it is also possible that elementary school children may not have been perfectly able to describe their parents’ job exactly and know what the mother or father were exactly doing there. Thus, for further research it would make sense to rely on multiple perspectives, for example parents’ answers. Moreover, further variables should be included like the musical activities of siblings. Furthermore, although this would require a larger sample, it might also be interesting to apply a more fine-grained categorization of instruments and it might be promising to include information on more than just one instrument per student. Regarding social background, data on formal education of parents should be collected. Such analyses might also involve multinomial logistic regressions using the type of instrument played as a criterion and the aforementioned variables as predictors.

Another aspect is the generalizability of our results to older students, and maybe also to younger ones. Particularly the former issue is relevant, because in secondary schools, availability of musical programs declines, most notably beyond grade 7, and the alignment of these programs (e.g. regarding the kind of instruments available) may differ as compared with elementary schools. Also there would probably not be so many pupils playing the recorder, an instrument that has traditionally been prevalent at German elementary school programs. Thus, the risk to quit learning an instrument can be expected to be higher during adolescence than during elementary school (Grgic & Züchner, 2013, p.131). Moreover, while the choice of an instrument during elementary school age is limited by the supply of lessons, the situation is different during adolescence: Here, lessons for the full range of instruments are available. Especially, the situation is more open regarding the choice of wind instruments. This may lead to more pronounced differences between children from high- vs. low-SES-families, and increase the effects of a more music-friendly environment.

Nevertheless, even in elementary school age, parental economic and cultural capital may not only explain if elementary children will play an instrument or not, but also, which type of instrument these children will play: an instrument related to classical music or another, less distinctive instrument. Eventually, this may translate to a more profound musical training and higher perceptual abilities as measured by the Gold-MSI (Fiedler & Müllensiefen, 2015).

Regarding the size of our effects, the proportion of variance explained by the predictors in our analyses seem to be rather low. For example, as mentioned in the results section, Nagelkerkes  $R^2$  for HISEI explaining playing vs. not playing an instrument seemed to be rather low and the odds ratio of 1.03 for any one-point increase in HISEI seems barely noticeable. If, however, we apply this to the 27 point ISEI difference of a nurse (ISEI = 42) vs. an elementary school teacher (ISEI = 69), then the odds of playing an instrument will be almost twice as high for the teacher's child than for the nurse's child. Accordingly, if we compare the odds of playing an instrument for the child of a judge residing at the top of the ISEI scale (ISEI = 90) and those for the child of a cleaner located at the bottom of the scale (ISEI = 16), the odds for the judge's child will be more than six times higher than that of the cleaner's child.<sup>3</sup>

Including further predictors may substantially improve the model. Thus, there is a need to integrate our analyses with prior analyses on children's beliefs. This may include behavioral beliefs ("I like making music", "I like playing an instrument") and normative beliefs ("If I play an instrument my father will be happy about it", see Penthin et al., 2017 for further details). Additionally, control beliefs might be relevant as well ("There is a room at home where I can make music" or "There are instruments at home to play with").

Nevertheless, the results of the present study showed that in spite of numerous activities to provide access to musical activities at German elementary schools, social distinction continues to be present in musical activities of elementary children. Thus, if the aim is to provide equal access to musical activities for children from low-SES families, there is still some work to be done.

## Notes

The data collection for this research was supported by a grant from the Staedtler Foundation (DS/eh 28/11) to Stephan Kröner.

---

<sup>3</sup> To be precise, the odds ratio will be  $e^{(.025*(69-42))} = 1.96$  in the nurse vs. teacher example and  $e^{(.025*(90-16))} = 6.36$  in the judge vs. cleaner example.

## References

- Autorengruppe Bildungsberichterstattung. (2012). *Bildung in Deutschland 2012: Ein indikatoren-gestützter Bericht mit einer Analyse zur kulturellen Bildung im Lebenslauf*. Bielefeld: Bertelsmann.
- Bastian, H. G. (2002). *Musik(erziehung) und ihre Wirkung: Eine Langzeitstudie an Berliner Grund-schulen* (3. Aufl.). *Musikpädagogik*. Mainz: Schott.
- Bourdieu, P. (1979/1982). *Die feinen Unterschiede: Kritik der gesellschaftlichen Urteilskraft* (10. Aufl.). Frankfurt am Main: Suhrkamp-Taschenbuch-Verlag.
- Busch, T., Kranefeld, U., & Koal, S. (2014). Klasseneffekte oder individuelle Einflussgrößen. Was bestimmt die Teilnahme am Instrumentallernen im Grundschulalter. In B. Clausen (Ed.), *Teilhabe und Gerechtigkeit* (pp. 57–75). Münster, New York: Waxmann.
- Fiedler, D., & Müllensiefen, D. (2015). Validierung des Gold-MSI-Fragebogens zur Messung Mu-sikalischer Erfahrungheit von Schülerinnen und Schülern der Sekundarstufen an allgemeinbil-denden Schulen. In A. Niessen & J. Knigge (Eds.), *Musikpädagogische Forschung: Band 36. Theoretische Rahmung und Theoriebildung in der musikpädagogischen Forschung: Theory frame-work and development in music education research*. Münster, New York: Waxmann.
- Fleiss, J. L., & Cohen, J. (1973). The Equivalence of Weighted Kappa and the Intraclass Corre-lation Coefficient as Measures of Reliability. *Educational and Psychological Measurement*, 33(3), 613–619. <https://doi.org/10.1177/001316447303300309>
- Fritzsche, E. S., Kröner, S., & Pfeiffer, W. (2011). Chorknaben und andere Gymnasiasten – De-terminanten musikalischer Aktivitäten an Gymnasien mit unterschiedlichen Schulprofilen. *Jour-nal for Educational Research Online*, 3, 94–118.
- Ganzeboom, H. B.G. (2010). Retrieved from <http://www.harryganzeboom.nl/isco08/index.htm>
- Ganzeboom, H. B.G., Graaf, P. M. de, & Treiman, D. J. (1992). A standard international socio-economic index of occupational status. *Social Science Research*, 21(1), 1–56. [https://doi.org/10.1016/0049-089X\(92\)90017-B](https://doi.org/10.1016/0049-089X(92)90017-B)
- Grgic, M., & Züchner, I. (2013). Musikalische Aktivitäten von Kindern und Jugendlichen. *Zeitschrift für Erziehungswissenschaft*, 16, 123–141. <https://doi.org/10.1007/s11618-013-0427-8>
- IBM Corp. (2017). IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.
- International Labour Office. (2012). *International Standard Classification of Occupations: Struc-ture, group definitions and correspondence tables. International standard classification of occu-pations: Vol 1*. Geneva: International Labour Organization. <https://www.ilo.org/public/eng-lish/bureau/stat/isco/docs/publication08.pdf>
- Kröner, S., Schwanzer, A., & Dickhäuser, O. (2009). Jenseits von Mozart - eine Pilotstudie zu Determinanten musikalischer Aktivitäten während der Grundschulzeit. *Psychologie in Erziehung und Unterricht*, 56, 224–238.
- Kröner, S., Vock, M., Robitzsch, A., & Köller, O. (2012). Highbrow cultural activities, social back-ground, and openness in lower-secondary level students. *Journal for Educational Research Online*, 4, 3–28.
- Krupp-Schleußner, V., & Lehmann-Wermser, A. (2016). An instrument for every child: A study on long-term effects of extended music education in German primary schools. *Music Education Research*, 20, 44–58. <https://doi.org/10.1080/14613808.2016.1249361>

- Penthin, M., Fritzsche, E., & Kröner, S. (2013). *Determinanten musikalischer Aktivitäten im Grundschulalter*. BMBF, Berlin.
- Penthin, M., Fritzsche, E., & Kröner, S. (2017). Bereichsspezifische Determinanten außerschulischer musikalischer Aktivitäten von Grundschulkindern. *Beiträge Empirischer Musikpädagogik*, 8, 1–30.
- Rauscher, F. H., Shaw, G. L., & Ky, K. N. (1993). Music and spatial task performance. *Nature*, 365(6447), 611. <https://doi.org/10.1038/365611a0>
- Rittersberger, A. (2002). *Jedes Kind will musizieren: Musik macht Kinder intelligenter und selbstbewusster* (1. Aufl.). *KidsWorld*. München: Beust.

**Verena Wießnet**

Friedrich-Alexander-Universität Erlangen-Nürnberg  
Regensburger Straße 160  
90478 Nürnberg  
Email: [verena.wiessnet@fau.de](mailto:verena.wiessnet@fau.de)

**Marcus Penthin**

Friedrich-Alexander-Universität Erlangen-Nürnberg  
Regensburger Straße 160  
90478 Nürnberg  
Email: [marcus.penthin@fau.de](mailto:marcus.penthin@fau.de)

**Eva Susanne Fritzsche**

Technische Universität München  
Arcisstraße 21  
80333 München  
Email: [eva.fritzsche@tum.de](mailto:eva.fritzsche@tum.de)

**Stephan Kröner**

Friedrich-Alexander-Universität Erlangen-Nürnberg  
Regensburger Straße 160  
90478 Nürnberg  
Email: [stephan.kroener@fau.de](mailto:stephan.kroener@fau.de)

Elektronische Version / Electronic Version:

<https://www.b-em.info/index.php/ojs/article/view/166>

URN: urn:nbn:de:101:1-2018082840