Proceedings of the 12th International Conference on Music Perception and Cognition and the 8th Triennial Conference of the European Society for the Cognitive Sciences of Music, July 23-28, 2012, Thessaloniki, Greece
Cambouropoulos E., Tsougras C., Mavromatis P., Pastiadis K. (Editors)

Effects of Structural and Personal Variables on Children's Development of Music Preference

Michael Schurig,[*1] Veronika Busch,[*2] and Julika Strauß[*3]

[*] *Department of Musicology and Music Education, University of Bremen, Germany*
[1]schurig@uni-bremen.de, [2]veronika.busch@uni-bremen.de, [3]julika.strauss@uni-bremen.de

ABSTRACT

Hargreaves' (1982) hypothesis of an age-related decline in children's preference for unfamiliar music genres ("open-earedness") forms the theoretical background of our longitudinal study with four points of measurement between grade one and four. Primary school children answered a sound questionnaire with 8 music examples on a 5-point iconic preference scale. Structural and personal data was collected using standardized questionnaires, and complementary interviews were conducted.

We operationalized open-earedness as a latent construct with "classic" and "ethnic/avant-garde" music preference (Louven, 2011) as distinguishable factors through exploratory factor analyses. The aim is to identify predictor variables (e.g. gender, personality, music experience, migration background, and socio-economic status) using structural equation modelling. This way we tried to assess a measurement model to be used for further investigation of our longitudinal data.

So far, analyses of variance support the expected open-earedness for preference ratings of t_1 (n_1=617), but gender differences already show. Analyses of t_2 (n_2=1142) disclose the beginning decline of open-earedness, with t_3 (n_3=1132) supporting the trend furthermore.

By now, no differences in preference ratings according to migration background, socio-economic status, or music experience were observed in the MIMIC models. Cognitive domains and personality contribute only very low effects. Thus, up to this stage of our analyses, age and gender remain the prime indicators for music preference. Qualitative data also stresses gender differences. Repeated measurement analyses will provide further information on the development of music preference.

I. INTRODUCTION

Musical preference has been extensively investigated over the last decades. Research has covered developmental, social, personal, as well as musical aspects that might influence music preference. Different models have been proposed to group and explain music preference ratings for a variety of music examples from different music genres. Louven (2011) statistically distinguished between preferences of "pop", "classic" and "ethnic/avant-garde" music styles by using principle components analyses. Rentfrow et al. (2011) mention three factors they found in almost all reviewed studies: "classical/jazz", "rock/heavy metal", and "rap/hip hop". In addition to genre-based factors, the authors offer an empirically evolved Five-Factor-Model (MUSIC: "Mellow", "Unpretentious", "Sophisticated", "Intense", and "Contemporary"), as framework for future research, which takes specific musical features and their psychological effects into account (e.g. factor "Mellow": smooth / relaxing; factor "Sophisticated": complex, intelligent, inspiring; Rentfrow et al. (2011). They argue for multiple influences on music preference, like psychological dispositions, social interactions, and exposure to popular media and cultural trend and they point at the curiosity that we do know of the importance of music for people, but that we do not yet know why. Schäfer and Sedlmeier (2009) might offer a possible answer with their investigation of different functions music appears to fulfil.

A time, during which music seems to fulfil many functions and hence appears to be of high importance, is puberty. Hargreaves (1982) described young children as "open-eared" (p. 51), whereas juveniles seemed to have lost this openness for unfamiliar musical styles. His term "open-eared" generated lots of research activities into the development of music preference. Within this research the so-called "open-earedness" is generally understood as acceptance of a large variety of unfamiliar pieces of music. This hypothesis forms the theoretical background of our study on the development of music preference of primary school children.

Previous research generally supports an age-dependency for open-earedness (Hargreaves et al., 2006). LeBlanc (1991; LeBlanc et al., 1996) proposed four stages for age-related differences over the life-span: (1) young children are initially open-eared; (2) they lose their musical openness on the way to puberty; (3) young adults open up again; and (4) older adults show a decline in open-earedness.

While some authors support a decline in open-earedness already during primary school (Gembris & Schellenberg, 2003) or even before (Hargreaves, 1987), Kopiez & Lehmann (2008) provide empirical evidence that the whole primary school time should be seen as a period of open-earedness.

In addition to age-related differences, gender-specific effects were investigated. Most studies point towards differences according to gender and describe girls as more open-eared than boys (Hargreaves, 1995; Gembris & Schellberg 2003, 2007). But Kopiez & Lehmann (2008) do not support these findings and generally found only small effect sizes for gender-specific differences in music preference.

Research has also shown that personality traits influence music preference of juveniles and adults (Delsing et al., 2008; Rawlings & Ciancarelli, 1997). The importance of personality aspects for young children's music preference could thus be assumed, but is difficult to study as their personality is still developing. Research literature provides evidence for a critical time window, during which children are more sensitive towards influences on their developing musical taste (Gembris, 2005; Hargreaves et al., 2006). Young children's open-earedness could in reverse be interpreted as an indicator for this critical time window and might even be seen as an expression of the personality trait "openness to experience" described in the Five-Factor-Model by Costa & McCrae (1992).

In Germany various programs were started to offer children within this critical time window access to learning music instruments and experience musical styles other than mainstream pop (e.g. "JeKi – Jedem Kind ein Instrument").

Quite often those programs are motivated by expectations regarding transfer effects (especially cognitive ones) and also concerning effects on children's developing music preference (meaning: preserving their initial open-earedness).

Further research indicates that juveniles and adults with migration background prefer music from their country of origin (Sakai, 2011; Cremades et al., 2010; Henninger, 1999; Teo et al., 2008). This music often plays an important role in family life. And it could thus be argued, that "emancipation" from the parents' musical taste is delayed compared to children with no migration background (Greve, 2003; Wurm, 2006; Baumann, 1985).

Additionally, high socio-economic status seems to generally have a positive influence on musical openness (Eijck, 2001; Peterson, 1992).

But so far no satisfying answer has been given as to how these different influencing variables interact and whether they are able to predict open-earedness.

II. AIMS AND QUESTIONS

Our study addresses these general questions concerning the construct of open-earedness. The study is integrated into a larger cooperation project of the Universities of Bremen and Hamburg that investigates the effects of intensified music education of primary school children (for further information on the project visit: www.sigrun2009.de).

A. Aims

The main objective of our study is to analyse the plausibility to interpret open-earedness as a latent construct with distinct predictor variables for further usage.

Therefore we will investigate the influence of independent structural and personal variables on music preference ratings of primary school children. We will try to aggregate several observable variables into a model that might represent open-earedness.

This should provide us with refined ideas of how to construct a measurement model to be used in later latent class change and latent growth curve models. While concluding those tasks there is a wide array of questions that can be answered for our sample alongside.

B. Questions and Hypotheses

The basic question of the presented study is, whether the decline of open-earedness can be predicted.

Thus, our null hypotheses (H_0) would be that open-earedness is neither predicted by age, nor gender, personality, migration background, or socio-economic status. Our alternative hypotheses are:

- H_1: Open-earedness can be distinguished as a single factor via exploratory factor analyses.
- H_2: Older children are less open-eared than younger ones.
- H_3: Boys are less open-eared than girls across all points of measurement.
- H_4: Children with low values at the personality dimension "openness for experience" are less open-eared than children with high values at that dimension.
- H_5: Children with migration background are less open-eared than children without migration background.
- H_6: Children with low socio-economic status are less open-eared than children with high socio-economic status.

III. METHOD

A. Research Design and Participants

We conduct a cohort-design study with four points of measurement ($t_{1\text{-}4}$) between grade one and four of primary school. Pupils and their parents are questioned. By now, three points of data collection are completed (see Table 1).

Table 1: Participants

t_1 (End of 1st Grade)		t_2 (End of 2nd Grade)		t_3 (End of 3rd Grade)	
Children	Parents	Children	Parents	Children	Parents
1143 (617)	914	1223	745	1175	722

n=455 Children took part in all three parts of the sampling, ~52% Girls.

The sample was composed out of groups based on classes from 20 primary schools from North-Rhine-Westphalia and 13 schools from the City of Hamburg. Due to slightly different school programs the sample from Hamburg was not questioned for their musical preference at t_1. For the construction of this basal model all sub-groups are included.

B. Instruments

In addition to the presentation of a sound questionnaire to the children, which provided preference ratings as the dependent variable (see *Musical Examples and Procedure*), children and/or parents answered several standardized questionnaires covering information on age, gender, children's personality ratings, socio-economic status, migration background, cognitive competencies, parental support, and children's participation in learning musical instruments. Complementary interviews were conducted.

1) Definition of Independent Variables.

The independent variables personality, socio-economic status, migration background, and cognitive competencies were defined in the following way:

- *Personality*: Parents answered for their child the Five-Factor-Questionnaire for Children (Fünf-Faktoren-Fragebogen für Kinder, FFFK) by Asendorpf (1998), a tool for the external inquiry of the Big-Five dimensions of personality. The Cronbach's alphas in this study are satisfactory and range from α=.873 (extraversion, t_1) to α=.744 (agreeableness, t_1), and are on the same level as the norm. Though issues of multidimensionality were observed for single items in exploratory factor analyses (EFA) and exploratory structural equation models (ESEM) analyses, it was decided to take this measure into account nonetheless referring to Asendorpf and von Aken (2002). The factors "openness for experience" (1-5 Likert Scale, t_1, AM=4.05 SD=.550) and "extraversion" (t_1, AM=4.06 SD=.657) were taken into account as possible

regressors. The external rating of the children's personality are stable across all t ($p \leq .001$ in t-tests), therefore a possible change in personality cannot be taken into account.

- *Socio-economic status*: The socio-economic status was derived by Item-Response-Theory-Scaling (IRT) based on a tool for accessing the status for school-children in Hamburg (KESS or LAU 1) including socio-demographic items, like number of owned books in household, yearly income per household, international standards of classification of occupation and education indices (ISCO-88 & ISCED), and belongings (e.g. lawnmower or second car). Some items were added concerning parental behaviour and cultural participation for a stronger inclusion of children's socio-cultural capital. Though already integrated into this index some items were additionally included as separate indicators due to their potential predictive power. The resulting covariance was taken into account.
- *Migration background*: The migration background was indicated by the parents' answers to the questions whether one or both parents were born in Germany.
- *Test for cognitive competencies*: The test for cognitive competencies (KFT 1-3, Heller & Geisler, 1983) was used to measure deductive and numerical thinking capabilities. The results were IRT-scaled. For analyses on musical self-concept and cognitive competencies in our research network see: Nonte & Schwippert (2012).

The descriptive values of the observed variables are summarized in Table 2.

Table 2: Descriptives of the manifest and IRT-scaled covariates (t_1)

Construct	Values	AM	SD
Parental migration background	1 'no parental migration background' to 3 'both parents not born in Germany'	1.40	.718
Socio-economic index	*wle-score*	.077	.387
Books in the household	1 '1-10' to 5 'more than 200'	3.70	1.21
Households income per year	1 'less than 20.000€/year' to 6 'more than 60.000€/year'	3.69	1.90
ISCO-88 Level of the father	1 'ISCO-88 Level 1' to 3'ISCO-88 Level 4'	2.08	.786
ISCO-88 Level of the mother		2.08	.596
ISCED Level of the father	1 'ISCED Level 1' to 4 ISCED Level 5-6'	3.12	.870
ISCED Level of the mother		2.96	.840
KFT 1-3 subscale deductive thinking	*wle-score*	-.030	1.04
KFT 1-3 subscale numerical thinking		-.064	1.40

All predictor variables were taken from t_1. An imputation with data from t_2 will be conducted in one of our future steps concerning longitudinal analyses.

2) *Music Examples and Procedure.*

The sound questionnaire was composed of 8 musical excerpts with durations of 30 seconds each (see Table 3). Four of them were adopted form previous studies to increase comparability of the results. They were chosen to represent the music genres "classic", "contemporary", and "cross-over". Four further examples were included to represent music from different countries, namely Africa, Russia, Turkey, and China. The original sound questionnaire comprises additional music examples for "pop" and "classic" which were especially composed for the study to control for specific musical parameters. But in this paper we will concentrate on investigating the above mentioned music genres only, as they are known from previous research to generate increasing dislike during the course of primary school. Thus, they are the focus point of our investigation of the decline in open-earedeness.

The study was conducted during regular school hours within class. During the test children listened to each musical excerpt via CD-Player and indicated their preference for each example on a 5-point iconic rating scale (smileys), treated as ordered categoricals (ordinal). They are coded as '1'–'Want to hear more often' to '5'–'Don't want to hear'. The *AM* range from 1,75 (*SD*=1,25: African example at t_1) to 3,12 (*SD*=1,49: cross-over example at t_3) with most items being positively skewed and all normally distributed (see paragraph Results: Factor Modelling.).

3) *Statistical Analyses.*

For the analyses of inference techniques of structural equation modeling (SEM) were chosen to take into account multiple latent dimensions, the theory of measurement errors, and especially the easy inclusion of the clustered samples (Reinecke, 2005), correcting the standard error for children per school level. Due to partial non-normal distribution (observed variable migration background) and categorical data in the observed variables correlative / regressive analyses in the SEM environment will be concluded using a robust weighted least squares estimator (WLSMV). The analyses were calculated using SPSS 19 and MPlus 6.11.

IV. RESULTS

The presentation of results will follow our alternative hypotheses and demonstrate the path of our analysing strategy.

A. Factor Modelling

With regard to H_1, we calculated prime EFAs. Results support a distinction between two factors comparable to Louven (2011), who interpreted them as "classic" and "ethnic/avant-garde" music (Table 3). We deemed this two-factor solution as the statistically most fitting across-the-board by comparing all solutions fit indices for all t after corrections which are described in the following passage.

Table 3: Exemplary rotated communality matrix of an exploratory factor analyses (t_3, all items, n_3=1132)

Musical excerpt	*classic*	*ethnic/ avant-garde*
Sinfonie Nr. 4 op. 90, 1. Satz (Felix Mendelssohn-Bartholdy)	*0.799*	*-0.078*
Air (David Garrett)	*0.681*	*0.007*
"Gavotte I" from Orchestral Suite No. 3, D major (J.S. Bach)	*0.801*	*0.007*
Russia: Smyglyanka (Samovar Russian Folk Ensemble)	*0.412*	*0.315*
3. Sinfonie, 3. Satz „Beschwörungstanz" (H. W. Henze)	*-0.061*	*0.587*
Ümmü (Sümer Ezgü)	*-0.006*	*0.710*
Yu Fu Rong (Chinese Ensemble of Movie Music and Folk Music)	*0.068*	*0.652*
Upepu (Magi Shamba)	*0.007*	*0.606*

Delta Parametersation, Oblique-Geomin Rotation, WLSMV Estimator; RMSEA=.082, TLI=.946.

The communalities of the EFAs at t_1 & t_2 can be interpreted alike. The solution is not satisfactory due to the inconclusive attribution of the Russian folk music. The Russian folk music can be contributed to the "classic" factor at t_1 and to the "ethnic/avant-garde" factor at t_2 a little more clearly, but in either matrix the communality loadings are below 0.550. Therefore it is excluded from further analyses.

After excluding the Russian folk music example the model fits for the two-factor solution ranged from: $RMSEA_{t3}$=.069 TLI_{t3}=.964 (n_3=1132) to $RMSEA_{t1}$=.029 TLI_{t1}=.994 (n_1=599) and can be deemed satisfactory.

Because the extracted factors were to be used in a multiple indicators – multiple causes (MIMIC-) SEM (Joreskog & Goldberger, 1975), those were utilised for creating a confirmatory factor model (CFA) as basis of further analyses.

The factors were reproduced in a CFA for each t. The model of t_3 is shown in Figure 1. The absolute (RMSEA=.043) and the incremental (TLI=.987) model fit indices are absolutly satisfying. It has to be stressed out, that the high correlation (r=.595) between the factors "classic" and "ethnic/avant-garde" imply the possibility of a second order latent. This possibly points to a more generalized construct of open-earedness than it could be operationalised by our data by now. The variance of the residual variance of the avant-garde example (σ^2_{res}=.71) remains high.

The Fit-indices of the CFA for the other t are: $RMSEA_{t1}$=.045, TLI_{t1}=.985 (n_1=599) and $RMSEA_{t2}$=0.042, TLI_{t2}=0.989 (n_2=1125).

A restricted and a one-factor-model were tested and found significantly worse than the two-factor model. The model was tested for factorial invariance and weak metric invariance and found valid, though the fit of gender-specific models of boys was only acceptable, while the girls' models were good.

We assume this model to be reliable and convergent as well as discriminative valid enough for the intended purpose. The indicators' and the latents' distributions can overall be treated as normal (Kolmogorow-Smrinow-tests and Shapiro-Wilk-tests for all t_x p<.01), though kurtosis and skewness values reach factors slightly bigger than 1 in single indicator items. To sum it up, the EFA stressed that open-earedness cannot be distinguished as a single factor via factor analyses ($\neq H_1$) in our data. The two-factorial solution for the preference of unconventional music appears adequate.

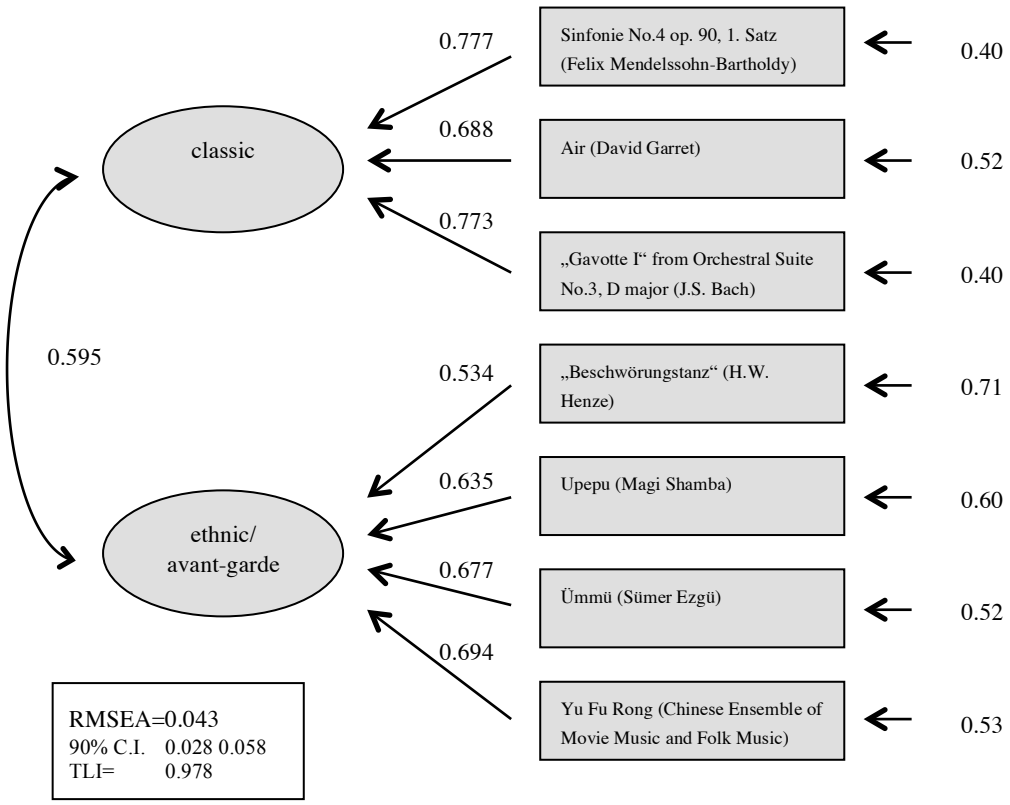

Figure 1: Confirmatory factor analysis, (t_3, n=1132)

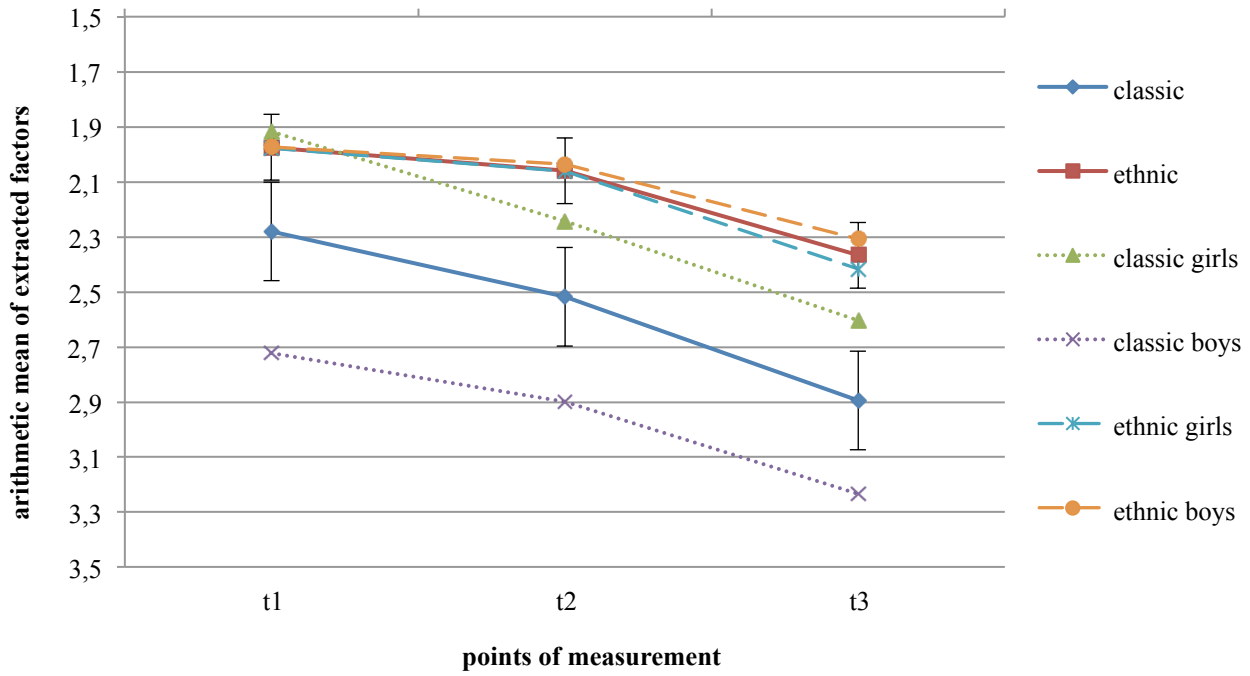

Figure 2: Mean structure of preference factors including gender differentiation

B. Analyses of Variance

For analyses of variance the two factors "classic" and "ethnic/avant-garde" were operationalized as means per case per *t*. Concerning H_2 and H_3 analyses of the mean structure (Figure 2; the *y*-axis was inverted for a more intuitive understanding, *S.E.* included on main factors) so far show that preference ratings of "ethnic/avant-garde" music at t_1 (n_1=617) are very positive. But already ratings for "classic" music, due to the strongly negative boys' ratings, do not differ from the hypothetical generalised mean of all ratings (*AM*=2,349; $p>.05$). If not stated otherwise all described comparisons on the mean structure were found highly significant ($p\leq.01$) using t-tests or ANOVAs respectively.

Mean differences across time were analysed using the difference scores (AM_{t2}-AM_{t1}, AM_{t3}-AM_{t2}).

While the ratings of the "ethnic/avant-garde" music examples are almost equivalent and drop nearly simultaneously, but not significantly until t_2 and t_3, the ratings of the "classic" music examples differ considerably.

Though the girls' ratings stay clearly above those of the boys', their ratings drop more between t_1 and t_2. Between t_2 and t_3 the amount of decline of "classic" preference is the same for boys and girls.

First analyses of the qualitative data highly support the reported gender differences, with boys displaying a stronger gender bias.

As expected generalized open-earedness declines with age for all groups alike (=H_2). It remains to be analysed with upcoming t_4 whether this decline is linear in a more sophisticated way. It has to be taken into account that the preference for "ethnic/avant-garde" music taken alone does not drop significantly until t_2.

To say that boys are generally less open-eared than girls across all points of measurement cannot be supported by our data (≠H_3). The more differentiated answer would be that boys' preference for "ethnic/avant-garde" music does not differ to those of the girls', but their preference for "classic" music is in fact significantly lower.

C. Regressive Model

In the last step of our present analyses a regressive model was composed. As the basis of this model the CFA was used and supplemented with manifest and latent potential regressors serving as predictors and loading on both extracted factors each. Without having done imputation by now there remain *n*=247 cases after conservative listwise exclusion of partial missing data. In Table 4 the regression coefficients standardized β, the correlative coefficient *r* between the musical preference factors, the explained variance r^2 of the musical preference factors, and the fit indices can be seen, condensing the core-results. For the interpretation it has to be remembered, that high values in the items of music preference state a lower preference rating.

Regarding H_4, a small effect (β=.166, $p\leq.05$) of the construct "openness for experience" could be observed concerning "classic" music, indicating a positive regressive effect. This can be interpreted the following way: children who are more open to experience are predicted to display less preference for classical music in our data (≠ H_4). Another significant result emerged on the personality dimension "extraversion" (small effect sizes β=-.236 on "classic" music and β=-.115 on "ethnic/avant-garde" music; both $p\leq.05$). A possible explanation could be that more extraverted children generally like music better. This correlative connection will be reviewed before further examination of the data as a whole.

Referring to H_5, a small negative effect (β=-.178, $p\leq.05$) is showing. According to the coding of parental migration background this means, that children with migration background are predicted to express more preference for classical music (≠H_5).

And finally as for H_6, we could not find any relationships between children's music preference and their socio-economic status ($\neq H_6$).

Table 4: MIMIC regressive model (n_{1-3}=247)

Regression	classic t_3 *stand β*	ethnic/avant-garde t_3 *stand β*
Factor at t2	.446***	.350***
Gender	.301***	-.053
SES	.046	-.029
Income per Year	.076	.164
Migration background	-.178*	-.012
Books in household	.015	-.016
ISCED of the Father	-.041	-.007
ISCED of the Mother	-.027	.087
ICSO-88 of the Father	-.068	-.069
ISCO-88 of the Mother	-.047	.043
Instrumental tuition	-.015	-.085
KFT 1-3 subscale deductive thinking	-.055	-.059
KFT 1-3 subsclae numerical thinking	-.137	-.127
FFFK Dimension Openness	.166*	-.007
FFFK Dimension Extraversion	-.236*	-.115*
Correlation	*ethnic t_3 with classic t_3* .291	
R Square	.383	.210
Fit Indices		
chi/df/p	419,909/373/0.047	
RMSEA	0.018	
TLI	0.960	

Delta Parameterisation, WLSMV Estimator, Clustered per School (complex); ***=p≤.001, **=p≤.01, *=p≤.05

After reviewing the latent factors r^2 values in this model it has to be stated, that the predictors taken into account so far do not contribute well to the explanation of the children's preference ratings. Additionally the sheer number of possible predictors is making it statistically plausible for an error of the first kind to create a false positive at the 5% level, meaning that 1 out of 20 H_x is a false positive by definition. Therefore, the significant effects should not have been overrated if they supported our hypotheses and shall not be dropped completely before being refined more sophisticated. Though it can be stated that the included variables do not hold major predictive power for our construct of open-earedness, except for gender.

V. CONCLUSION AND PROSPECT

The model is working well with our data. But the low explained variance (r^2) implies that there are other predictors to be taken into account. We found age and gender to be the remaining main predictors for open-earedness ($\neq H_0$). Surprisingly few other factors show predictive power in a generalised model and if so, effect sizes are small.

Especially the result on openness (H_4) appears surprising for the obvious conclusion that "more openness" as a personality trait should bring about "more openness" towards unconventional music. But it has to be taken into account, that the operationalization of openness as a personality trait may also cause more openness or more frankness in expressing negative opinions in situations such as a scientific inquiry, negating known response bias towards the middle and towards positive answers (Schwarz & Sudmann, 1992). It also remains to be analysed, how children's music preference is influenced by other personality scores indicated by the five-factor model of personality (Costa & McCrae, 1992). A serious problem on the measurement of personality through external parental information is the neglect of the children's ups-and-downs in their personality. For it is known that the personality traits are still highly variable in childhood and adolescence. That is why we requested it each *t*. But the traits reflected by the parents were highly invariant over time (t_2-t_1 *and* t_3-t_2, p≤.01 in t-tests). Because of that we treated the children's personality as unchanging, and thus could not live up to more complex facets of personality measurement.

Concerning migration background (H_5) it remains to be analysed whether there are item-level differences on the preference for "ethnic/avant-garde" music that is frequently heard at home and would therefore not be an adequate indicator for open-earedness anymore. Furthermore up to this stage our study did not take into account whether parents with and without migration background differ in their daily musical behaviour and their involvement of their children's musical life.

The differential preference ratings of classic and ethnic music examples between gender groups remain intriguing. Moreover as cognitive capabilities on numerical thinking showed a small significant effect (β=-.254, p≤.05; n_g=140) in this model when calculated for girls alone for the intent of factorial invariance testing. It is to check whether the measurement invariance of group (gender) remains valid for higher levels of statistical invariance especially on latent mean of the factor "classic" music. It is possible that boys already dislike "classic" music at an early age (1st grade), in which case the factor would really measure the same for boys and girls alike. On the other hand it could be possible that even young boys already cling more firmly to the idea of gender-specific music than girls, which would be supported by our preliminary analyses of the interview data. In those interviews girls and boys display strong opinions on gender-specific music alike, but boys were stricter in their rejection of girls' music. In that case the statistical analysis would not come up with an interpretable answer as the measurement itself would be flawed by the boys' bias on their perception of gender-specific music. Explanations for the observed gender differences might be given with regard to theories concerning the development of gender identity (Maccoby, 2000, Ruble et al., 2006). Boys are generally believed to display a stronger fixation on gender stereotypes, which already developed before school age, whereas girls are supposed to be more flexible in this regard. The sensitivity towards atypical gender-specific behaviour increases during primary school. Taken together, children's music preference might not just be explained by socialisation, but could also be seen as an expression of the developing gender identity – and thus (referring to Schäfer & Sedlmeier, 2009) might possibly reflect a specific function for the children.

As mentioned earlier, this study is a part of the refinement of a latent change (LC) / latent growth curve model (LGC). The latent change model will be used to assess group differences furthermore and the latent growth curve modelling will be used to assess the form of change. By now it has to be stated

that few of the checked covariates have to be taken into account for the further analyses of the latent variables themselves in the LC modelling. Some will be assessed again when analysing the growth curve for some may not contribute direct effects but effects on the development of open-earedness.

Two other steps include the assessment of the preference for different kinds of pop music, that were inquired alongside the less well known kinds of music and the opportunity to approach open-earedness as a possible 2nd order latent variable in a summarizing model.

ACKNOWLEDGMENT

This research is part of the cooperation project SIGrun "Studien zum Instrumentalunterricht an Grundschulen" conducted by the Universities of Bremen and Hamburg, which is funded by the Federal Ministry of Education and Research of Germany within a research program initiated to evaluate the program "JeKi – Jedem Kind ein Instrument".

REFERENCES

Asendorpf, J. D. & van Aken, M. A. G. (2003). Validity of Big Five personality judgments in childhood: A 9 year longitudinal study. *European Journal of Personality, 17*, 1-17.

Baumann, M. P. (Ed.) (1985). *Musik der Türken in Deutschland*. Kassel: Verlag Yvonne Landeck.

Costa, P. T. & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five Factor Inventory. Professional Manual*. Odessa, FL: Psychological Assessment Ressources.

Cremades, R., Oswaldo, L., & Lucia, H. (2010). Musical tastes of secondary school students with different cultural backgrounds: A study in the spanish north african city of Melilla. *Musicae Scientiae, 14(1)*, 121–141.

Delsing, M. J. M. H., Bogt, T. F. M. T., Engels, R. C. M. E. & Meeus, W. H. J. (2008). Adolescents' music preferences and personality characteristics. *European Journal of Personality, 22*, 109-130.

Eijck, K. (2001). Social differentiation in musical taste patterns. *Social Forces, 79 (3)*, 1163-1184.

Gembris, H. (2005). Musikalische Präferenzen. In R. Oerter & T. H. Stoffer (Eds.), *Enzyklopädie der Psychologie, Vol. 2, Spezielle Musikpsychologie* (pp. 279-342) Göttingen: Hogreve.

Gembris, H., & Schellberg, G. (2003). Musical preferences of elemantary school children. Paper presented at the *5th Triennial Conference oft he European Society for the Cognitive Sciences of Music* (ESCOM 8.-13.9.2003). Hannover.

Greve, M. (2003). *Die Musik der imaginären Türkei. Musik und Musikleben im Kontext der Migration aus der Türkei in Deutschland*. Stuttgart, Weimar: J. B. Metzler.

Hargreaves, D. J. (1995). Effects of age, gender, and training on musical preferences of British secondary school students. *Journal of Research in Music Education, 43(3),* 242-250.

Hargreaves, D. J., North, A. C., & Tarrant, M. (2006). Musical preference and taste in childhood and adolescence. In G. E. McPherson (Ed.), *The child as musician: A handbook of musical development* (pp. 135-154). New York: Oxford University Press.

Heller, K. & Geisler, H.-J. (1983). KFT 1-3: Kognitiver Fähigkeits-Test. Weinheim: Beltz.

Henninger, J. C. (1999). Ethnically diverse sixth graders' preferences for music of different cultures. *Texas Music Education Research*, 37-43.

Jöreskog, K. G. & Goldberger, A. S. (1975). Estimation of a model with multiple indicators and multiple causes of a single latent variable. *Journal of the American Statistical Association*, 70(351), 631-639.

Kopiez, R., & Lehmann, M. (2008). The 'open-earedness' hypothesis and the development of age-related aesthetic reactions to music in elementary school children. *British Journal of Music Education, 25(2)*, 121-138.

MPLUS (Version 6.11). [Computer Software]. Los Angeles, CA: Muthén & Muthén.

LeBlanc, A. (1991). Some unanswered questions in music preference research. *Contribution to Music Education, 18*, 66-73.

LeBlanc, A., Sims, W. L., Siivola, C., & Obert, M. (1996). Music style preferences of different age listeners. *Journal of Research in Music Education, 44(1)*, 49-59.

Louven, C. (2011). Mehrjähriges Klassenmusizieren und seine Auswirkungen auf die „Offenohrigkeit" bei Grundschulkindern. Eine Langzeitstudie. *Diskussion Musikpädagogik 50(11)*, 48-59.

Maccoby, E. (2000). *Psychologie der Geschlechter. Sexuelle Identität in den verschiedenen Lebensphasen*. Translated by E. Vorspohl. Stuttgart: Klett-Cotta.

McCrary, J. (1993). Effects of listeners' and performers' race on music preferences. *Journal of Research in Music Education, 41(3)*, 200-211.

Nonte, S. & Schwippert, K. (2012). Musikalische und sportliche Profile an Grundschulen. *Beiträge empirische Musikpädagogik*, 3(1).

Peterson, R. A. (1992). Understanding audience segmentation: From elite and mass to omnivore and univore. *Poetics, 21*, 243-258.

Rawlings, D., & Ciancarelli, V. (1997). Music preference and the five-factor model of the NEO Personality Inventory. *Psychology of Music, 25,* 120-132.

Reinecke, J. (2005), Strukturgleichungsmodelle in den Sozialwissenschaften. München: Oldenbourg.

Rentfrow, P. J., Goldberg, L. R. & Levitin, D. J. (2011). The structure model of musical preferences: A five-factor model. *Journal of Personality and Social Psychology, 100(6)*, 1139-1157.

Ruble, D. N., Martin, C. L. & Berenbaum, S. A. (2006). *Gender development*. In W. Damon & R. M. Lerner (Eds.), Handbook of Child Psychology, Vol. 3, 6th ed. (pp. 858-932). Hoboken: Wiley.

Sakai, W. (2011). Music preferences and family language background: A computer-supported study of children's listening behavior in the context of migration. *Journal of Research in Music Education, 59(2)*, 174-195.

Schäfer, T., & Sedlmeier, P. (2009). From the functions of music to music preference. *Psychology of Music, 37*, 279-300.

Schwarz, N. & Sudman, S. (Eds.) (1992). Context effects in social and psychological research. New York: Springer..

Teo, T., Hargreaves, D. J., & Lee, J. (2008). Musical preference, identification, and familiarity: A multicultural comparison of secondary students from Singapore and the United Kingdom. *Journal of Research in Music Education, 56(1)*, 18–32.

Wurm, M. (2006). *Musik in der Migration. Beobachtungen zur kulturellen Artikulation türkischer Jugendlicher in Deutschland*. Bielefeld: transcript.