Analyses: Disentangling social-relational classroom climate and its relation to students’ behavioral problems

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Version (2021-06-21)

Table of Contents

# Software acknowledgment

The following packages were used for this report:

R at version R version 4.1.0 (2021-05-18) ([R Core Team 2020](#ref-R-base)).

Package sjPlot at version 2.8.7 ([Lüdecke 2020](#ref-R-sjPlot)).  
Package knitr at version 1.33 ([Xie 2020b](#ref-R-knitr)).  
Package semTable at version 1.8 ([**R-semTable?**](#ref-R-semTable)).  
Package kableExtra at version 1.3.4 ([Zhu 2020](#ref-R-kableExtra)).  
Package bookdown at version 0.22 ([Xie 2020a](#ref-R-bookdown)).  
Package scaledic at version 0.1.20 ([Wilbert 2020a](#ref-R-scaledic)).  
Package Amelia at version 1.7.6 ([Honaker, King, and Blackwell 2019](#ref-R-Amelia)).  
Package wmisc at version 0.2.9 ([Wilbert 2020b](#ref-R-wmisc)).  
Package psych at version 2.1.3 ([Revelle 2020](#ref-R-psych)).  
Package lavaan at version 0.6.8 ([Rosseel, Jorgensen, and Rockwood 2020](#ref-R-lavaan)).  
Package nlme at version 3.1.152 ([Pinheiro, Bates, and R-core 2020](#ref-R-nlme)).  
Package lme4 at version 1.1.27 ([Bates et al. 2020](#ref-R-lme4)).  
Package tidyverse at version 1.3.1 ([Wickham 2019](#ref-R-tidyverse)).  
Package readxl at version 1.3.1 ([Wickham and Bryan 2019](#ref-R-readxl)).  
Package gridExtra at version 2.3 ([**R-gridExtra?**](#ref-R-gridExtra)).  
Package broom at version 0.7.7 ([**R-broom?**](#ref-R-broom)).  
Package sjPlot at version 2.8.7 ([Lüdecke 2020](#ref-R-sjPlot)).  
Package mclust at version 5.4.7 ([**R-mclust?**](#ref-R-mclust)).  
Package huxtable at version 5.4.0 ([**R-huxtable?**](#ref-R-huxtable)).

# Research questions

Q1: Is there a general factor that could be derived from various aspects of students relations within the classroom (ie. social inclusion; social position; bullying involvement; acceptance by the teacher) ?

Q1a: On an individual level: Is it possible to conflate various aspects of students relations within the classroom into one distinct general factor (social-relational situation)?

Q1b: On a classroom level: Is it possible to conflate the classroom means of various aspects of students relations into on distinct general factor (social-relational classroom climate)?

Q2: What is the connection between students behavioral problems and various aspects of their social relations?

Q2a: On an individual level: To what extend can students behavioral problems in a class be explained by means of various aspects of their social relations?

Q2b: In extension of hypothesis Q2a: To what extend do classroom means of various aspects of students social relations contribute to individual behavioral classroom problems?

Q2c: On a classroom level: To what extend can the average amount of behavioral problems in a classroom be explained by classroom means of various aspects of students social relations?

# Analyzing strategy

[This paragraph will later be included into the manuscript and deleted here]

*Question 1a: Factor structure of social-relation variables*

*Question 1b: Factor structure of Social-relational classclimate variables*

*Question 2a and b: Social-relations and behavior problems*

*Question 2c: Social-relational classclimate and average behavior problems*

Following Foster-Johson et. al. (2018), we calculated means of all variables for each class. The outcome variables (means of behavioral problems per class) were predicted through the means of the social-relation variables. A separate OLS regression was calculated for each behavioral problem variable.

(Foster-Johnson, L., & Kromrey, J. D. (2018). Predicting group-level outcome variables: An empirical comparison of analysis strategies. Behavior Research Methods, 50(6), 2461–2479. <https://doi.org/10.3758/s13428-018-1025-8>)

# Material

Item Analyzes with the data of the present study.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Scale** | **n** | **n items** | **Alpha(CI95%)** | **Std.Alpha(CI95%)** | **Homogeneity** | **Discrimination** | **M** | **SD** | **|Loading|** |
| Social withdrawal | 1.71e+03 | 8 | .9 (.89-.9) | .9 (.9-.91) | .54 | .59 - .78 | 0.18 - 0.4 | 0.47 - 0.73 | .6 - .85 |
| Anxious/depressed | 1.71e+03 | 11 | .88 (.88-.89) | .88 (.87-.89) | .41 | .45 - .75 | 0.16 - 0.39 | 0.5 - 0.69 | .47 - .8 |
| Academically disorganized | 1.71e+03 | 8 | .92 (.91-.92) | .92 (.91-.93) | .59 | .58 - .8 | 0.35 - 0.93 | 0.73 - 1.02 | .6 - .84 |
| Oppositional behavior | 1.71e+03 | 8 | .93 (.93-.93) | .93 (.93-.94) | .63 | .7 - .82 | 0.27 - 0.69 | 0.67 - 0.9 | .72 - .85 |
| FEESS 1/2 teacher acceptance | 788 | 8 | .69 (.67-.71) | .7 (.68-.72) | .23 | .32 - .45 | 0.73 - 0.94 | 0.24 - 0.44 | .39 - .57 |
| FEESS 3/4 teacher acceptance | 853 | 8 | .82 (.81-.83) | .83 (.82-.84) | .37 | .44 - .61 | 2.02 - 2.63 | 0.7 - 1.05 | .48 - .7 |
| FEESS 1/2 social inclusion | 787 | 6 | .59 (.56-.61) | .6 (.57-.62) | .2 | .26 - .38 | 0.62 - 0.85 | 0.35 - 0.49 | .33 - .55 |
| FEESS 3/4 social inclusion | 853 | 6 | .75 (.73-.76) | .75 (.73-.77) | .33 | .41 - .56 | 2.02 - 2.49 | 0.72 - 0.99 | .48 - .68 |
| Bullying perpetrator | 1.72e+03 | 4 | .84 (.82-.85) | .84 (.83-.85) | .56 | .57 - .83 | 0.12 - 0.38 | 0.45 - 0.71 | .61 - .96 |
| Bullying victim | 1.72e+03 | 4 | .78 (.77-.8) | .8 (.78-.81) | .5 | .46 - .76 | 0.06 - 0.29 | 0.26 - 0.58 | .52 - .9 |

# Descriptives of all variables

|  |
| --- |
| 41-50 years |
| 8.333333 |
| More than 10 years |
| *Age and active years as a teacher were administered as categorical variables (age: 20-30; 31-40, 41-50, 51-60, > 60; active years: < 1, 1-3, 4-10, > 10)* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **name** | **valid** | **missing** | **mean** | **sd** | **min** | **max** | **range** | **median** | **mad** |
| Teacher acceptance | 1.64e+03 | 405 | 0.76 | 0.22 | 0 | 1 | 1 | 0.83 | 0.25 |
| Social integration | 1.64e+03 | 405 | 0.75 | 0.21 | 0 | 1 | 1 | 0.83 | 0.25 |
| Social relatedness | 1.72e+03 | 329 | 0.27 | 0.09 | 0 | 0.72 | 0.72 | 0.27 | 0.1 |
| Social positivity | 1.72e+03 | 329 | 0.55 | 0.14 | 0.02 | 0.97 | 0.95 | 0.56 | 0.13 |
| Bullying victim | 1.72e+03 | 325 | 0.18 | 0.35 | 0 | 3 | 3 | 0 | 0 |
| Bullying perpetrator | 1.72e+03 | 325 | 0.27 | 0.49 | 0 | 3 | 3 | 0 | 0 |
| Scale Socially withdrawn behaviour | 1.71e+03 | 337 | 0.28 | 0.48 | 0 | 3 | 3 | 0 | 0 |
| Scale Anxious/Depressed behaviour | 1.71e+03 | 337 | 0.28 | 0.43 | 0 | 3 | 3 | 0.09 | 0.13 |
| Scale Academic productive/disorganized behaviour | 1.71e+03 | 338 | 0.64 | 0.72 | 0 | 3 | 3 | 0.38 | 0.56 |
| Scale Oppositional/Disruptive behaviour | 1.71e+03 | 338 | 0.43 | 0.63 | 0 | 3 | 3 | 0.12 | 0.19 |
| Age | 1.96e+03 | 86 | 8.57 | 1.29 | 6.08 | 11.9 | 5.83 | 8.58 | 1.61 |
| Sex male | 2.03e+03 | 11 | 0.51 | 0.5 | 0 | 1 | 1 | 1 | 0 |
| Migration background | 1.9e+03 | 149 | 0.34 | 0.47 | 0 | 1 | 1 | 0 | 0 |

|  |  |
| --- | --- |
| **grade** | **n** |
| 1 | 521 |
| 2 | 497 |
| 3 | 533 |
| 4 | 494 |

|  |  |
| --- | --- |
| **sex** | **n** |
| weiblich | 987 |
| männlich | 1047 |
|  | 11 |

|  |  |
| --- | --- |
| **migration\_background** | **n** |
| nein | 1258 |
| ja | 638 |
|  | 149 |

## Correlation matrix.  
## Probability signs above the diagonal are adjusted for multiple tests.  
## Tp<.10; \*p<.05; \*\*p<.01; \*\*\*p<.001.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **M** | **SD** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** |
| 0.76 | 0.22 | - |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.75 | 0.21 | .74\*\*\* | - |  |  |  |  |  |  |  |  |  |  |  |
| 0.27 | 0.09 | -.05T | .00 | - |  |  |  |  |  |  |  |  |  |  |
| 0.55 | 0.14 | .23\*\*\* | .34\*\*\* | -.12\*\*\* | - |  |  |  |  |  |  |  |  |  |
| 0.18 | 0.35 | -.14\*\*\* | -.20\*\*\* | .13\*\*\* | -.36\*\*\* | - |  |  |  |  |  |  |  |  |
| 0.27 | 0.49 | -.18\*\*\* | -.16\*\*\* | .16\*\*\* | -.31\*\*\* | .62\*\*\* | - |  |  |  |  |  |  |  |
| 0.28 | 0.48 | -.13\*\*\* | -.16\*\*\* | -.08\*\* | -.20\*\*\* | .26\*\*\* | .17\*\*\* | - |  |  |  |  |  |  |
| 0.28 | 0.43 | -.12\*\*\* | -.16\*\*\* | -.03 | -.16\*\*\* | .33\*\*\* | .27\*\*\* | .59\*\*\* | - |  |  |  |  |  |
| 0.64 | 0.72 | -.24\*\*\* | -.24\*\*\* | .09\*\*\* | -.38\*\*\* | .33\*\*\* | .39\*\*\* | .41\*\*\* | .36\*\*\* | - |  |  |  |  |
| 0.43 | 0.63 | -.21\*\*\* | -.18\*\*\* | .16\*\*\* | -.36\*\*\* | .52\*\*\* | .77\*\*\* | .13\*\*\* | .28\*\*\* | .45\*\*\* | - |  |  |  |
| 8.57 | 1.29 | -.03 | .00 | .30\*\*\* | -.01 | .06\* | .03 | .00 | .05T | .08\*\* | .01 | - |  |  |
| 0.51 | 0.50 | -.12\*\*\* | -.03 | .15\*\*\* | -.20\*\*\* | .11\*\*\* | .18\*\*\* | .06\* | .01 | .18\*\*\* | .23\*\*\* | .01 | - |  |
| 0.34 | 0.47 | -.06\* | -.08\*\* | -.02 | -.10\*\*\* | .08\*\*\* | .07\*\* | .06\* | .01 | .09\*\*\* | .06\* | .04 | .01 | - |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **name** | **valid** | **missing** | **mean** | **sd** | **min** | **max** | **range** | **median** | **mad** |
| Average tacher acceptance | 86 | 1 | 0.76 | 0.09 | 0.52 | 0.94 | 0.43 | 0.76 | 0.08 |
| Average social inclusion | 86 | 1 | 0.75 | 0.08 | 0.58 | 0.94 | 0.36 | 0.76 | 0.06 |
| Average social relatedness | 84 | 3 | 0.27 | 0.07 | 0.11 | 0.4 | 0.28 | 0.27 | 0.08 |
| Average social positivity | 84 | 3 | 0.55 | 0.05 | 0.46 | 0.71 | 0.25 | 0.55 | 0.04 |
| Average bullying victim | 87 | 0 | 0.18 | 0.16 | 0 | 0.7 | 0.7 | 0.15 | 0.14 |
| Average bullying perpetrator | 87 | 0 | 0.27 | 0.27 | 0 | 2 | 2 | 0.22 | 0.17 |
| Average social withdrawal | 87 | 0 | 0.29 | 0.23 | 0 | 1.81 | 1.81 | 0.22 | 0.15 |
| Average anxiety/depression | 87 | 0 | 0.29 | 0.24 | 0 | 1.8 | 1.8 | 0.24 | 0.19 |
| Average academically disorganized | 87 | 0 | 0.64 | 0.27 | 0.17 | 2.08 | 1.91 | 0.59 | 0.21 |
| Average oppositional behavior | 87 | 0 | 0.43 | 0.26 | 0.09 | 1.65 | 1.56 | 0.37 | 0.18 |
| Average age | 86 | 1 | 8.6 | 1.08 | 6.82 | 10.5 | 3.69 | 8.53 | 1.1 |
| Proportion male | 86 | 1 | 0.52 | 0.09 | 0.31 | 0.82 | 0.51 | 0.52 | 0.08 |
| Proportion migration background | 85 | 2 | 0.36 | 0.25 | 0 | 1 | 1 | 0.35 | 0.32 |

## Correlation matrix.  
## Probability signs above the diagonal are adjusted for multiple tests.  
## Tp<.10; \*p<.05; \*\*p<.01; \*\*\*p<.001.

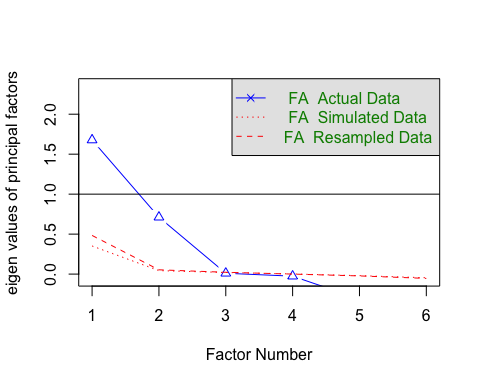
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **M** | **SD** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** |
| 0.76 | 0.09 | - |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.75 | 0.08 | .69\*\*\* | - |  |  |  |  |  |  |  |  |  |  |  |
| 0.27 | 0.07 | .03 | .06 | - |  |  |  |  |  |  |  |  |  |  |
| 0.55 | 0.05 | .32\*\* | .50\*\*\* | .06 | - |  |  |  |  |  |  |  |  |  |
| 0.18 | 0.16 | -.14 | -.17 | .06 | -.09 | - |  |  |  |  |  |  |  |  |
| 0.27 | 0.27 | -.21\* | -.18 | .01 | -.12 | .78\*\*\* | - |  |  |  |  |  |  |  |
| 0.29 | 0.23 | -.05 | -.01 | .09 | .18 | .53\*\*\* | .70\*\*\* | - |  |  |  |  |  |  |
| 0.29 | 0.24 | -.11 | -.18T | .02 | .02 | .62\*\*\* | .77\*\*\* | .82\*\*\* | - |  |  |  |  |  |
| 0.64 | 0.27 | -.15 | -.10 | .13 | .09 | .52\*\*\* | .69\*\*\* | .69\*\*\* | .64\*\*\* | - |  |  |  |  |
| 0.43 | 0.26 | -.24\* | -.24\* | -.10 | -.10 | .69\*\*\* | .85\*\*\* | .63\*\*\* | .75\*\*\* | .68\*\*\* | - |  |  |  |
| 8.60 | 1.08 | -.03 | .06 | .53\*\*\* | .08 | .15 | .04 | .05 | .13 | .20T | .02 | - |  |  |
| 0.52 | 0.09 | -.16 | -.22\* | .09 | -.14 | .24\* | .19T | .13 | .22\* | .21\* | .23\* | .04 | - |  |
| 0.36 | 0.25 | -.11 | -.16 | .01 | .09 | .02 | .09 | .13 | .24\* | .17 | .28\*\* | .01 | .03 | - |

# Experimental Multilevel Confirmatory Factor analyzes

## lavaan 0.6-8 ended normally after 98 iterations  
##   
## Estimator ML  
## Optimization method NLMINB  
## Number of model parameters 30  
##   
## Used Total  
## Number of observations 1411 2045  
## Number of clusters [id\_class\_teacher] 84   
##   
## Model Test User Model:  
##   
## Test statistic 847.045  
## Degrees of freedom 18  
## P-value (Chi-square) 0.000  
##   
## Model Test Baseline Model:  
##   
## Test statistic 2323.924  
## Degrees of freedom 30  
## P-value 0.000  
##   
## User Model versus Baseline Model:  
##   
## Comparative Fit Index (CFI) 0.639  
## Tucker-Lewis Index (TLI) 0.398  
##   
## Loglikelihood and Information Criteria:  
##   
## Loglikelihood user model (H0) 2242.206  
## Loglikelihood unrestricted model (H1) 2665.729  
##   
## Akaike (AIC) -4424.413  
## Bayesian (BIC) -4266.851  
## Sample-size adjusted Bayesian (BIC) -4362.150  
##   
## Root Mean Square Error of Approximation:  
##   
## RMSEA 0.181  
## 90 Percent confidence interval - lower 0.170  
## 90 Percent confidence interval - upper 0.191  
## P-value RMSEA <= 0.05 0.000  
##   
## Standardized Root Mean Square Residual (corr metric):  
##   
## SRMR (within covariance matrix) 0.161  
## SRMR (between covariance matrix) 0.196  
##   
## Parameter Estimates:  
##   
## Standard errors Standard  
## Information Observed  
## Observed information based on Hessian  
##   
##   
## Level 1 [within]:  
##   
## Latent Variables:  
## Estimate Std.Err z-value P(>|z|)  
## social\_relations =~   
## feess\_ga 0.169 0.005 30.857 0.000  
## feess\_si 0.193 0.006 34.167 0.000  
## soc\_relatednss -0.007 0.002 -3.338 0.001  
## soc\_positivity 0.055 0.004 14.062 0.000  
## sar\_victim -0.076 0.009 -8.110 0.000  
## sar\_perpetratr -0.099 0.014 -7.157 0.000  
##   
## Intercepts:  
## Estimate Std.Err z-value P(>|z|)  
## .feess\_ga 0.000   
## .feess\_si 0.000   
## .soc\_relatednss 0.000   
## .soc\_positivity 0.000   
## .sar\_victim 0.000   
## .sar\_perpetratr 0.000   
## social\_relatns 0.000   
##   
## Variances:  
## Estimate Std.Err z-value P(>|z|)  
## .feess\_ga 0.015 0.001 14.102 0.000  
## .feess\_si 0.007 0.001 5.548 0.000  
## .soc\_relatednss 0.004 0.000 25.699 0.000  
## .soc\_positivity 0.016 0.001 24.985 0.000  
## .sar\_victim 0.091 0.004 25.503 0.000  
## .sar\_perpetratr 0.185 0.007 25.418 0.000  
## social\_relatns 1.000   
##   
## R-Square:  
## Estimate  
## feess\_ga 0.651  
## feess\_si 0.833  
## soc\_relatednss 0.010  
## soc\_positivity 0.156  
## sar\_victim 0.060  
## sar\_perpetratr 0.050  
##   
##   
## Level 2 [id\_class\_teacher]:  
##   
## Latent Variables:  
## Estimate Std.Err z-value P(>|z|)  
## social\_relations =~   
## feess\_ga 0.018 0.009 1.868 0.062  
## feess\_si 0.013 0.009 1.440 0.150  
## soc\_relatednss -0.003 0.008 -0.366 0.714  
## soc\_positivity 0.007 0.005 1.458 0.145  
## sar\_victim -0.130 0.021 -6.203 0.000  
## sar\_perpetratr -0.178 0.025 -6.987 0.000  
##   
## Intercepts:  
## Estimate Std.Err z-value P(>|z|)  
## .feess\_ga 0.755 0.009 85.584 0.000  
## .feess\_si 0.752 0.008 100.093 0.000  
## .soc\_relatednss 0.274 0.007 36.548 0.000  
## .soc\_positivity 0.553 0.005 120.681 0.000  
## .sar\_victim 0.171 0.017 9.971 0.000  
## .sar\_perpetratr 0.252 0.021 12.031 0.000  
## social\_relatns 0.000   
##   
## Variances:  
## Estimate Std.Err z-value P(>|z|)  
## .feess\_ga 0.003 0.001 4.263 0.000  
## .feess\_si 0.002 0.001 3.046 0.002  
## .soc\_relatednss 0.004 0.001 6.085 0.000  
## .soc\_positivity 0.001 0.000 2.005 0.045  
## .sar\_victim 0.002 0.004 0.428 0.669  
## .sar\_perpetratr -0.007 0.007 -0.933 0.351  
## social\_relatns 1.000   
##   
## R-Square:  
## Estimate  
## feess\_ga 0.083  
## feess\_si 0.081  
## soc\_relatednss 0.002  
## soc\_positivity 0.093  
## sar\_victim 0.909  
## sar\_perpetratr NA

# Q1a

We conducted a parallel analysis to determine the number of factors to be extracted from the data. The analysis point to two factors (see figure xxx)



Parallel analysis scree plot.

## Parallel analysis suggests that the number of factors = 2 and the number of components = NA

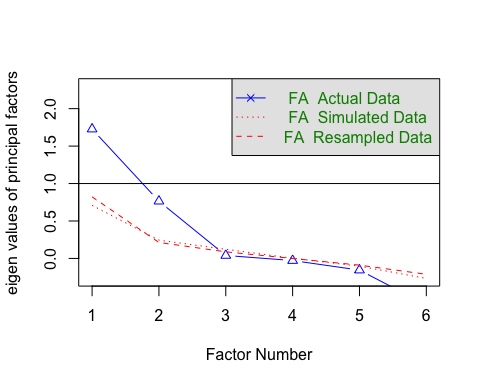
## Loading required namespace: GPArotation

Exploratory factor analyzes of social relation variables.

|  |  |
| --- | --- |
| **MR1** | **MR2** |
| 1 |  |
| 0.72 |  |
|  | 0.82 |
|  | 0.76 |
| 0.23 | -0.38 |
|  | 0.2 |
| 1.61 | 1.45 |
| 0.27 | 0.24 |
| 0.27 | 0.51 |
| 0.53 | 0.47 |
| 0.53 | 1 |

# Q1b

We conducted a parallel analysis to determine the number of factors to be extracted from the data. The analysis point to two factors (see figure xxx).



Parallel analysis scree plot.

## Parallel analysis suggests that the number of factors = 2 and the number of components = NA

Exploratory factor analyzes of mean social relation variables.

|  |  |
| --- | --- |
| **MR1** | **MR2** |
| 1.01 |  |
| 0.67 |  |
| 0.49 |  |
|  |  |
|  | 0.99 |
|  | 0.78 |
| 1.7 | 1.61 |
| 0.28 | 0.27 |
| 0.28 | 0.55 |
| 0.51 | 0.49 |
| 0.51 | 1 |

# Q2a, Q2b, and Q2c

Note for my co-authors: I changed the analyzes for Q2c from an aggregated OLS regression approach to a multilevel means-as-outcome model. While the unstandardized estimators are very similar in both models, the latter (means-as-outcome) model has much lower standardized betas. Probably this is due to a significant proportion of within class variance that has not been accounted for in the simple aggregated OLS regression (due to the aggregation). The change allows for representing all three models in one table, which I find much more convenient.

For calculating the influence of the average social relations within a class on the average behavior problems in a class, we fitted a mean-as-outcome model to the data. Mean-as-outcome model are multilevel models with level 2 predictors (here: the class level) but no level 1 predictors (here: the indivdual level). As a result, the predictors describe the changes in the grand mean of the criteria variable (here: behavior problems) that is due to compositional (here: means) aspects of students social relations within a class.

Social withdrawal regressed on individual social-relations and social-relational classclimate

Model 1 (L1)

Model 2 (L1+L2)

Model 3 (mean-as-outcome)

Predictors

Beta

SE

p

Beta

SE

p

Beta

SE

p

(Intercept)

0.01

0.04

<0.001

-0.00

0.04

0.637

-0.00

0.04

0.473

Social integration

-0.04

0.04

0.363

-0.04

0.04

0.367

Teacher acceptance

-0.06

0.04

0.136

-0.07

0.04

0.106

Social relatedness

-0.17

0.03

<0.001

-0.23

0.04

<0.001

Social positivity

-0.13

0.03

<0.001

-0.16

0.03

<0.001

Bullying victim

0.24

0.03

<0.001

0.23

0.04

<0.001

Bullying perpetrator

-0.09

0.03

0.008

-0.09

0.03

0.007

migration\_background1

0.02

0.03

0.419

0.00

0.03

0.904

Age

0.02

0.04

0.509

-0.00

0.05

0.940

sex1

0.03

0.03

0.306

0.03

0.03

0.231

Average social inclusion

0.01

0.06

0.804

0.00

0.06

0.947

Average tacher acceptance

0.04

0.06

0.464

-0.02

0.05

0.727

Average socialrelatedness

0.17

0.05

0.002

0.03

0.04

0.475

Average social positivity

0.10

0.04

0.025

0.08

0.04

0.045

Average bullying victim

0.00

0.07

0.998

0.11

0.06

0.083

Average bullyingperpetrator

0.11

0.07

0.103

0.05

0.06

0.473

Average age

-0.03

0.06

0.652

-0.05

0.04

0.290

Proportion migrationbackground

0.05

0.04

0.275

0.03

0.04

0.422

Proportion male

0.01

0.04

0.725

0.03

0.04

0.507

Random Effects

σ2

0.16

0.16

0.20

τ00

0.02 id\_class\_teacher

0.01 id\_class\_teacher

0.01 id\_class\_teacher

ICC

0.09

0.07

0.06

N

83 id\_class\_teacher

83 id\_class\_teacher

83 id\_class\_teacher

Observations

1345

1345

1630

Marginal R2 / Conditional R2

0.112 / 0.194

0.134 / 0.195

0.031 / 0.088

Anxiety/depression regressed on individual social-relations and social-relational classclimate

Model 1 (L1)

Model 2 (L1+L2)

Model 3 (mean-as-outcome)

Predictors

Beta

SE

p

Beta

SE

p

Beta

SE

p

(Intercept)

-0.02

0.05

0.001

-0.03

0.04

0.586

0.00

0.04

0.500

Social integration

-0.03

0.04

0.396

-0.01

0.04

0.719

Teacher acceptance

-0.06

0.04

0.120

-0.07

0.04

0.062

Social relatedness

-0.07

0.03

0.032

-0.07

0.04

0.059

Social positivity

-0.06

0.03

0.041

-0.08

0.03

0.008

Bullying victim

0.27

0.03

<0.001

0.26

0.03

<0.001

Bullying perpetrator

-0.01

0.03

0.675

-0.03

0.03

0.325

migration\_background1

-0.06

0.03

0.030

-0.09

0.03

0.004

Age

0.04

0.04

0.254

0.05

0.05

0.292

sex1

-0.03

0.03

0.226

-0.04

0.03

0.164

Average social inclusion

-0.11

0.06

0.075

-0.08

0.06

0.169

Average tacher acceptance

0.12

0.06

0.052

0.06

0.05

0.296

Average socialrelatedness

0.01

0.05

0.843

-0.03

0.04

0.461

Average social positivity

0.07

0.05

0.138

0.05

0.04

0.281

Average bullying victim

0.00

0.07

0.952

0.12

0.07

0.074

Average bullyingperpetrator

0.15

0.07

0.035

0.14

0.07

0.037

Average age

-0.02

0.06

0.759

0.04

0.05

0.445

Proportion migrationbackground

0.10

0.04

0.032

0.07

0.04

0.095

Proportion male

0.06

0.04

0.144

0.04

0.04

0.262

Random Effects

σ2

0.14

0.14

0.15

τ00

0.02 id\_class\_teacher

0.01 id\_class\_teacher

0.01 id\_class\_teacher

ICC

0.13

0.09

0.08

N

83 id\_class\_teacher

83 id\_class\_teacher

83 id\_class\_teacher

Observations

1345

1345

1630

Marginal R2 / Conditional R2

0.106 / 0.221

0.166 / 0.243

0.080 / 0.150

Academic disorganized behavior regressed on individual social-relations and social-relational classclimate

Model 1 (L1)

Model 2 (L1+L2)

Model 3 (mean-as-outcome)

Predictors

Beta

SE

p

Beta

SE

p

Beta

SE

p

(Intercept)

0.00

0.03

<0.001

-0.00

0.03

0.291

-0.01

0.03

0.468

Social integration

-0.02

0.04

0.512

-0.02

0.04

0.554

Teacher acceptance

-0.10

0.04

0.006

-0.11

0.04

0.003

Social relatedness

-0.02

0.03

0.470

-0.02

0.04

0.588

Social positivity

-0.25

0.03

<0.001

-0.27

0.03

<0.001

Bullying victim

0.09

0.03

0.004

0.09

0.03

0.008

Bullying perpetrator

0.21

0.03

<0.001

0.20

0.03

<0.001

migration\_background1

0.02

0.03

0.464

0.01

0.03

0.803

Age

0.08

0.03

0.014

0.06

0.05

0.166

sex1

0.05

0.02

0.049

0.04

0.03

0.076

Average social inclusion

-0.01

0.05

0.775

-0.02

0.05

0.720

Average tacher acceptance

0.06

0.05

0.192

-0.02

0.04

0.700

Average socialrelatedness

-0.02

0.04

0.686

-0.00

0.04

0.925

Average social positivity

0.14

0.04

<0.001

0.06

0.03

0.095

Average bullying victim

-0.06

0.06

0.301

-0.01

0.05

0.866

Average bullyingperpetrator

0.08

0.06

0.138

0.14

0.05

0.012

Average age

0.02

0.05

0.704

0.06

0.04

0.142

Proportion migrationbackground

0.01

0.03

0.687

0.03

0.03

0.367

Proportion male

0.02

0.03

0.556

0.04

0.03

0.230

Random Effects

σ2

0.34

0.34

0.47

τ00

0.02 id\_class\_teacher

0.01 id\_class\_teacher

0.01 id\_class\_teacher

ICC

0.06

0.04

0.03

N

83 id\_class\_teacher

83 id\_class\_teacher

83 id\_class\_teacher

Observations

1344

1344

1628

Marginal R2 / Conditional R2

0.246 / 0.290

0.258 / 0.286

0.029 / 0.055

Oppositional behavior regressed on individual social-relations and social-relational classclimate

Model 1 (L1)

Model 2 (L1+L2)

Model 3 (mean-as-outcome)

Predictors

Beta

SE

p

Beta

SE

p

Beta

SE

p

(Intercept)

-0.00

0.03

<0.001

-0.01

0.02

0.297

0.00

0.02

0.505

Social integration

0.02

0.03

0.489

0.03

0.03

0.340

Teacher acceptance

-0.06

0.03

0.028

-0.06

0.03

0.021

Social relatedness

0.06

0.02

0.004

0.10

0.03

<0.001

Social positivity

-0.10

0.02

<0.001

-0.10

0.02

<0.001

Bullying victim

0.06

0.02

0.013

0.06

0.02

0.007

Bullying perpetrator

0.67

0.02

<0.001

0.66

0.02

<0.001

migration\_background1

-0.01

0.02

0.547

-0.03

0.02

0.097

Age

-0.01

0.02

0.681

0.02

0.03

0.555

sex1

0.05

0.02

0.003

0.05

0.02

0.006

Average social inclusion

-0.04

0.04

0.341

-0.03

0.04

0.402

Average tacher acceptance

0.03

0.04

0.423

0.01

0.03

0.798

Average socialrelatedness

-0.11

0.03

0.002

-0.05

0.03

0.110

Average social positivity

0.03

0.03

0.321

0.00

0.03

0.927

Average bullying victim

-0.05

0.04

0.265

-0.03

0.04

0.490

Average bullyingperpetrator

0.04

0.04

0.355

0.30

0.04

<0.001

Average age

0.00

0.04

0.978

0.02

0.03

0.467

Proportion migrationbackground

0.08

0.03

0.004

0.06

0.02

0.015

Proportion male

0.00

0.03

0.986

0.03

0.02

0.305

Random Effects

σ2

0.14

0.14

0.35

τ00

0.01 id\_class\_teacher

0.01 id\_class\_teacher

0.00 id\_class\_teacher

ICC

0.08

0.06

0.00

N

83 id\_class\_teacher

83 id\_class\_teacher

83 id\_class\_teacher

Observations

1344

1344

1628

Marginal R2 / Conditional R2

0.604 / 0.635

0.614 / 0.638

0.093 / 0.093

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