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Status Dynamics: Popularity and Acceptance in an Ethnically Diverse Hungarian Primary School Sample

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Abstract[1]

Status among peers has been one of the central themes of peer relations research for decades. While the topic has been extensively researched in the Western European and North American literature, less is known about such dynamics in 'non-Western' contexts. The paper intends to address this gap by analyzing the status dynamics related to the two most frequently investigated dimensions of status – popularity and acceptance – in a Hungarian, ethnically diverse, longitudinal primary school database. Additionally, we apply a novel multilevel regression model, the within-between random effects model (Bell et al., 2019), which combines the strengths of fixed- and random-effects models and makes the decomposition of within-individual and between-individual effects possible. The paper analyses the first four waves of the panel dataset (N of observations = 4441, N of individuals = 1313). Most of our results are in line with the Western European literature, highlighting the important role of being good at sports, verbal aggression, being considered smart, and physical appearance. With regard to ethnic differences, our results show ethnicized patterns in the relationship between aggression and popularity.

Keywords: status, popularity, acceptance, Roma students, Hungary, within-between random effects regression.

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1. Introduction

The investigation of the correlates and dynamics of status among peers has been one of the central areas of peer relations research for decades. While the two most common conceptualizations of status, popularity and acceptance, have been widely discussed in the Western European and North American literature, less is known about such dynamics in 'non-Western' contexts; for instance, in Hungary. In addition, although most of the Hungarian peer relations literature has explicitly focused on interethnic relations, the relationship between ethnicity and status has mostly been assessed based on friendship nominations (e.g. Hajdu et al., 2019) or measurements of social preference (e.g. Habsz and Radó, 2018), while the relationship between ethnicity and the direct nominations of reputational status (e.g. popularity, 'coolness') have been less at the centre of attention (for an exception, see Pethes, 2015). Further, to our knowledge, multiple dimensions of status have not been studied simultaneously in Hungary so far. Therefore, we intend to address both gaps by analyzing (reputational) popularity and acceptance dynamics in an ethnically diverse primary school sample. The Roma population is the largest and most disadvantaged ethnic group in Hungary. Their multiple disadvantages involve low household incomes, low levels of labor market participation, poor housing conditions, low levels of educational attainment, as well as residential, educational, and labor market segregation and discrimination (see, for instance, Bernát, 2019; Kemény et al., 2004; Váradi, 2014; Zolnay, 2016). Consequently, the investigation of ethnic differences between Roma and non-Roma students in status dynamics may be of particular importance. Additionally, the paper applies a novel methodological approach, the within-between random effects (REWB) model for panel regression (Bell et al., 2019), which makes it possible to decompose and estimate both within- and between-individual effects.

2. Peer status and ethnicity

2.1 Popularity and acceptance

The concept and dynamics of *peer status* have been widely discussed in the literature. Predominantly, two main dimensions have been distinguished; a reputational one, typically called 'perceived' or 'reputational' popularity or simply *popularity*, and another dimension related to the extent someone is liked by their peers, typically called *acceptance*. Importantly, these two constructs have been found to be only moderately correlated (e.g. LaFontana and Cillessen, 2002; Parkhurst and Hopmeyer, 1998). Their most remarkable and distinctive feature is their relationship with aggression; while popularity has consistently been found to be positively associated with aggression, relational aggression in particular, acceptance is negatively associated with it (e.g. Cillessen and Mayeux, 2004; Mayeux et al., 2008). Although the notion of *popularity* has historically been used somewhat inconsistently in the literature, often referring to social preference, in contemporary research it is understood as a status dimension of social power, prestige, and visibility (Cillessen and Marks, 2011). Simultaneously, researchers have been experimenting with alternative constructs in the measurement of this reputational dimension, most importantly through the concept of 'coolness' (e.g. Bellmore et al., 2007; Kiefer and Wang, 2016). Bellmore and colleagues (2007) argue that coolness captures reputation-based peer status well, as it is a measure of students' perceptions of the possession of valued traits in the peer group.

Popularity has been associated with a wide range of behavioral and personality traits such as athleticism (e.g. Kennedy, 1995; Shakib et al., 2011), physical and relational aggression (e.g. Mayeux et al., 2008; Schwartz et al., 2006), school disengagement (e.g. Engels et al., 2017), physical appearance (e.g. Vaillancourt and Hymel, 2006), and extraversion (e.g. van der Linden et al., 2010). Similarly, acceptance has been positively associated with athleticism, physical appearance, and extraversion, while negatively with aggression (e.g. Cillessen and Mayeux, 2004). Additionally, several studies have hypothesized ethnic differences in status dynamics, most importantly in relation to athleticism, aggression, and academic performance. The following sections will give a brief overview of these differences.

2.2 Athleticism

While essentially all studies have found a positive association between popularity and athleticism, it has been presumed that for disadvantaged ethnic and racial minorities sports might be of particular importance. For instance, some research in the United States found that Black students attribute higher importance to sports than their White counterparts (e.g. Greendorfer and Ewing, 1981). Kennedy (1995) found from a nationwide sample of eighth-grade students that although athleticism was most strongly correlated with (self-rated) popularity for both Black and White boys, as well as for White girls, this association was the strongest for Black males. However, in the case of Black girls, popularity was most strongly associated with academic status. On the other hand, some more recent studies have found opposing results; for instance, Shakib and colleagues (2011) found that Black athletes were less likely to report (self-rated) popularity than White athletes, while Chase and Machida (2011) found that Black students ranked the importance of sports lower than their White counterparts (Chase and Machida, 2011). With regard to gender, a large body of research has shown that athleticism contributes to status to a greater extent for males than for females (e.g. Eder and Kinney, 1995; Holland and Andre, 1994).

2.3 School performance and 'oppositional culture'

Several theories have been suggested to explain ethnic differences in academic performance. For the present analysis, it is worth reviewing the main ideas represented by the 'acting white' hypothesis (Fordham and Ogbu, 1986; Ogbu, 1992). According to this hypothesis, for 'involuntary' minorities in a subordinate social position in the United States, good performance in areas that are believed to be the 'prerogatives' of White Americans can be interpreted as learning to 'act white'. For instance, minority students who perform well and are engaged academically can be perceived by their same-ethnicity peers as 'becoming acculturated into the white American cultural frame of reference' at the expense of their minority culture (Fordham and Ogbu, 1986: 182–183). As a consequence, academic success can be 'resisted' both socially and psychologically, and sanctions from the peer group can take multiple forms (Fordham and Ogbu, 1986). In order to cope with the 'burden of acting white,' academically successful Black students adopt a variety of strategies, involving becoming the class clown, pretending not to put much effort into getting good grades, excelling in other areas such as athletics, aligning themselves with bullies, 'putting brakes' on academic performance, or developing a 'raceless persona' (Fordham, 1988; Fordham and Ogbu, 1986).

While Fordam and Ogbu's work was based on in-depth ethnographic research, other ethnographic studies at the time also found similar results (e.g. Miller, 1989: 181). However, some more recent ethnographic studies (e.g. Horvat and Lewis, 2003; Tyson et al., 2005), as well as research that tested the hypothesis on large quantitative databases, have been more contradictory. Some studies using large national samples in the United States found support for 'acting white' (e.g. Fryer and Torelli, 2010; Fuller-Rowell and Doan, 2010), while most of them did not (e.g. Ainsworth-Darnell and Downey, 1998; Cook and Ludwig, 1997; Wildhagen, 2011). Ainsworth-Darnell and Downey (1998) even found higher peer support for well-performing African American students. However, it is important to note that these studies, due to the properties of the large national samples they relied on, did not investigate peer-reported popularity, but relied on other conceptualizations of social standing, such as self-reported popularity (Ainsworth-Darnell and Downey, 1998; Cook and Ludwig, 1997), friendship networks (Fryer and Torelli, 2010), self-reported measurements of social acceptance (Fuller-Rowell and Doan, 2010), and negative sanctions (Wildhagen, 2011). Consequently, little is known about the potential racial or ethnic patterns of the relationship between popularity and school performance/engagement. One exception is Kiefer and Ryan (2008), who found that Black American girls with popularity goals were less academically engaged than Black boys or White students (Kiefer and Ryan, 2008).

Although the 'acting white' hypothesis was formulated to account for Black students' school disengagement in certain social contexts, the hypothesis has been extended to other disadvantaged social groups, such as Latin Americans in the United States (e.g. Flores-Gonzalez, 2005) and immigrant and ethnic minority students in Europe (e.g. Stark et al., 2017). The case of the Roma population in Hungary might also be a comparable example, due to the group's disadvantaged economic and social standing, the widespread prejudice they face (e.g. Keresztes-Takács et al., 2016; Váradi, 2014), the significant residential (e.g. Ladányi and Virág, 2009) and educational (e.g. Fejes and Szűcs, 2018) segregation, as well as to the significant academic performance gap between Roma and non-Roma students (Kertesi and Kézdi, 2011; 2016). These conditions create a situation in which an 'oppositional culture' could, it is assumed, be developed. Accordingly, some Hungarian research has also tested the 'acting white' hypothesis on Roma students, using the measurement of social preference (Habsz and Radó, 2018), friendship and adversary nominations (Hajdu et al., 2019), and victimization measures (Kisfalusi, 2018). However, none of these studies found support for the presence of an 'oppositional culture.'

2.4 Aggression

Some studies have found aggression to be strongly associated with popularity for African American students in Black-majority and multi-ethnic settings (e.g. Luthar and McMahon, 1996; Meisinger et al., 2007; Waasdorp et al., 2013). For instance Luthar and McMahon (1996) found that African American students were overrepresented in the aggressive-popular group in a multi-ethnic urban high school. Similarly, Meisinger and colleagues (2007) found that in Black-majority classes, 'tough' and excluding, relationally aggressive behaviors were positively associated with higher levels of popularity, while in White-majority classes 'acting tough' (bullying and not following school rules) was negatively associated with popularity. Bullying in schools can be seen as a serious form of aggressive behavior involving an individual or a group of individuals repeatedly attacking, humiliating, and/or excluding a relatively powerless person (Salmivalli, 2010: 112). Research has also shown that skilful bullies tend to have higher status in their peer group (e.g. Sijtsema et al., 2009). In the Hungarian school context, Kisfalusi (2018) found that low-SES Roma students were more likely to be the perpetrators of cyberbullying and verbal bullying, and the victims of physical and cyberbullying than low-SES non-Roma students, while there were no ethnic differences in the case of higher SES students. She found an inverted U-shaped relationship between physical and verbal bullying and popularity; up to a certain level of popularity, students were more likely to be nominated as perpetrators. However, since her paper focused on the relationship between bullying, ethnicity, and academic achievement, ethnic differences in the relationship between popularity and aggression in Hungary remain unexplored. In addition to ethnicity, some gender differences have also been found. For instance, Cillessen and Mayeux (2004) found that overt aggression was more strongly associated with popularity for boys, while in the case of girls relational aggression seemed to be more determinative (Cillessen and Mayeux, 2004).

3. Methods

3.1 Sample

We used the first four waves of a Hungarian panel dataset. The data were collected among primary school students in six waves between 2013 and 2017 in Northern and Central Hungary. One of the main objectives of the project was to explore ethnic segregation in the social relations of students, and to examine the interrelated status hierarchies and social dynamics in classes. Due to this aim, schools with a higher proportion of Roma students were overrepresented in the sample. The first wave of the data was gathered in the autumn of 2013 when students enrolled in the fifth grade, and the fourth wave of the data was collected in the spring of 2015, when students were in the sixth grade. The first wave involved 1183 students in 61 classes, while in wave four there were 1054 students in 53 classes. Our combined panel database of the first four waves involves 4441 observations for 1313 students. Fifty-three per cent of our panel database are male, 36 per cent ethnic Roma based on self-reports, and 35 per cent have a disadvantaged social background. Self-administered surveys were completed by the students on tablets during regular classes under the supervision of trained research assistants. Data collection in each classroom and wave took no more than 45 minutes. As the respondents were between the age of 10 and 14, permission was required from parents to allow their children to participate in the study. Students with parental permission filled out the questionnaires and were assured that their answers would be kept confidential and used only for research purposes.

3.2 Variables

Likeability score. In each wave, students were provided with a list of all classmates and asked to indicate their relationship with all of their peers. Positive and negative relations were measured on a five-point scale: 'I hate him/her' (coded to -2), 'I do not like him/her' (-1), 'He/she is neutral to me' (0), 'I like him/her' (1) and 'He/she is my friend' (2). We created a binary variable by coding the positive answers ('I like him/her' and 'He/she is my friend') to 1 and all the other categories to 0. We then calculated the score by dividing the sum of the incoming 'like' nominations by the number of respondents.

Coolness score. In each wave students were asked to select those classmates from the list of classmates whom they considered 'cool.' Selected students were coded to 1, all other students to 0. Incoming nominations were aggregated and divided by the number of respondents.

Smart score. In each wave students were asked to select those classmates from the list of classmates whom they considered smart. The score was calculated as described above.

Looks score. In each wave students were asked to select those classmates from the list of classmates whom they considered pretty or handsome. The score was calculated as described above.

Mock score. In each wave students were asked to select those classmates from the list of classmates who regularly mocked or insulted them. The score was calculated as described above.

Hit score. In each wave students were asked to select those classmates from the list of classmates who regularly pushed, hit, or beat them. The score was calculated as described above.

Grade point average. For every student, grade point averages were calculated from the following four subjects: Hungarian literature, Hungarian grammar, mathematics, and history. For each wave we used the end-of-semester grades students got at the end of the previous semester. The Hungarian school system uses a five-point grading scale ranging from 1 (fail) to 5 (excellent).

Behavior and diligence grades. In the Hungarian school system, students are also evaluated on their behavior and diligence, receiving grades on a four-point scale ranging from 2 to 5 (failure is not possible).

Good at sports (binary). In each wave, form teachers were asked to select those students from the list of students who are good at sports. Those students who were selected were coded to 1, all the other students to 0.

Engagement score. In each wave, form teachers were asked to select those students from the list of students who they consider hardworking, who had received an official written warning, who had an official written laudation,[2] and those who had unjustified school absence/s. For each of these variables, those students who were selected by the teacher were coded to 1, and all other students to 0. Then, we created a composite school engagement score by adding the hardworking and laudation scores and deducting the warning and school absence scores from them. Thus our composite score ranged from -2 to +2.

Ethnicity. In each wave students were asked about their ethnicity. They could choose from the following four options: Hungarian, Roma, both Hungarian and Roma, or 'member of another ethnicity.' For the present analysis, we considered those students who selected either 'Roma' or 'both Hungarian and Roma' at least once during the four waves as Roma (coded to 1) and the others as non-Roma (coded to 0).[3]

Gender. In each wave students were asked about their gender. For the present analysis we coded boys to 1 and girls to 0.

Low SES. In the Hungarian school system there are two official categories for low SES: 'disadvantaged' and 'multiply disadvantaged' social backgrounds. In each wave, form teachers were asked to select from the list of students those pupils who belonged to these categories. For our present analysis, we coded those who were selected for either of the two categories to 1, and all the other students to 0.

Smoking. Students were asked in each wave whether they smoked. They could choose from the following four options: 'No, never'; 'No, but I have tried it'; 'Yes, but only in company'; and, 'Yes, regularly.' We coded those students who selected the last two options to 1 (smokers), and the others to 0.

3.3 Analytical strategy

Multilevel regression models are applied to data that are hierarchically structured; for instance, when subjects are nested within larger organizational units (e.g. school classes) or when repeated measurements of the same subjects are available (panel data). In these data structures, individual observations (level 1) normally cannot be assumed to be independent from one another, and the different multilevel techniques aim at accounting for their clustered nature in order to provide unbiased estimates. For panel data, two widely used models are fixed-effects (FE) and random-effects (RE) regressions. The FE approach first demeans the data in order to eliminate any higher level variance, and only estimates the effect of within-individual changes, while the 'traditional' RE estimator is a

[2] In the Hungarian school system, subject teachers, form teachers, and principals can register written warnings and laudations in students' report books. While the latter are mostly symbolic, the culmination of the former can eventually lead to the dismissal of a pupil.

[3] The 'other ethnicity' option was selected by fewer than three per cent of respondents in each wave (between 10 and 28 students).

weighted average of within- and between-individual effects. Bell and colleagues (2019) propose a modified version of the RE model, the *within-between random effects (REWB)* model, which, they argue, combines the strength of both the FE and the RE models, and is able to estimate both the within- and the between-individual effects separately. (For a more detailed discussion of the FE, RE and REWB models, see Appendix A).

For our analysis we built random-intercept REWB regression models, of which the following equation gives an overview:

$$y_{it} = \beta_0 + \beta_{1W}(x_{it} - \bar{x}_i) + \beta_{2B}\bar{x}_i + \beta_3 z_i + \beta_{4B}(x_{it} - \bar{x}_i)z_i + \beta_{5W}\bar{x}_i z_i + v_i + \epsilon_{it} \quad (1.)$$

Where y_{it} is the dependent variable for individual *i* at time *t*, x_{it} is the time-variant (level 1) independent variable for individual *i* at time *t*, $\bar{x}_i$ is the individual level average of x_{it}, and z_i is the time-invariant (level 2) independent variable. β_{1W} is the estimate of the average within effect of x_{it} (the effect of within-individual change) for individuals for whom $z_i = 0$, while β_{2B} is the estimate of the average between effect of x_{it} (differences between individuals) for individuals for whom $z_i = 0$ (for individuals for whom $z_i = 1$, these estimates are $\beta_{1B} + \beta_{4B}$ and $\beta_{2W} + \beta_{5W}$, respectively). β_3 is the estimate of the effect of the time-invariant (level 2) variable. Cross-level interactions between the time invariant and some of the time-variant independent variables are also included. v_i is the individual-level (level 2) random effect for individual *i*, attached to the intercept β_0, while ϵ_{it} is the idiosyncratic error term. In our models there are two time-invariant independent variables (z_i), gender and ethnicity, and nine time-variant independent variables (see section 4.1), out of which GPA, physical and verbal aggression, being good at sports, physical appearance, and being considered smart were interacted with gender and ethnicity. The within-effects estimates (β_{1W}) are the same as the estimates of a FE regression (see Appendix B).

4. Results

4.1 Descriptive statistics

If we compare the mean popularity (*coolness*) and acceptance (*likeability*)[4] scores along the key binary explanatory variables (Table 1), we can see that, on average, boys, Roma students, students with a poor socioeconomic background, and smokers are more popular but less liked than girls, non-Roma students, students with non-low SES, and non-smokers, respectively. Students who are considered to be good at sports are both more liked and more popular than students who are not considered as good at sports. Independent t-tests were conducted for each pair respectively, and all the differences were found to be highly significant.

Table 1: Mean coolness and likeability scores[5]

	Coolness score (mean/SE)	**Likeability score (mean/SE)**
Boy	.26(.004)***	.49(.004)**
Girl	.22(.004)***	.51(.005)**
Roma	.30(.003)***	.50(.006)**
Non-Roma	.23(.005)***	.52(.004)**
Low SES	.26(.005)***	.48(.005)***
Non-low SES	.23(.004)***	.51(.004)***
Smoker	.32(.015)***	.46(.139)***
Non-smoker	.25(.003)***	.51(.003)***
Good at sports	.32(.007)***	.55(.006)***
Not good at sports	.22(.003)***	.48(.004)***

** $p<0.01$, *** $p<0.001$

Note: independent t-tests were conducted for each pair respectively, and all the differences were found to be highly significant

If we look at the correlation table of the two dependent variables and their potential (non-binary) regressors (Table 2), we can see a picture that is mostly in line with the international literature. While the two constructs of status are moderately correlated (.47), verbal and physical aggression are negatively correlated with acceptance (likeability) and weakly but positively with the reputational dimension of status (coolness). On the other hand, being considered smart or good looking is positively associated with both dimensions, while good grades, diligence and school engagement are positively correlated with acceptance and are uncorrelated with popularity. In the case of the behavior grade, better grades are positively correlated with acceptance and negatively with popularity. In

[4] In the rest of the paper, when we refer to *popularity* we mean the reputational dimension of status, which was measured by the construct of 'coolness' in this particular database, and when we refer to *acceptance* we mean the score calculated from the like nominations.

[5] All calculations presented in the paper were made using Stata/MP 13.1.

terms of the correlation between the potential regressors, we see that there is a very strong positive correlation between the GPA and the diligence grade (.88). This implies that the diligence grade, in practice, is almost exclusively based on students' GPA (i.e. performance), not on diligence (i.e. effort) per se. This makes this variable theoretically redundant, thus it was excluded from our models. Similarly, although the behavior grade seems a promising composite measurement of behavior-related factors, its strong correlation with the diligence grade (.74) and moderate to strong correlation with the GPA (.68) simultaneously with its somewhat weaker correlation with physical (-.45) and verbal (-.49) aggression, implies that teachers may also take multiple non-behavior-related factors into consideration when they give this grade. Since this makes the interpretation of this variable also somewhat problematic, it is not included in our models either. Finally, although school grades and being considered smart could refer to different dimensions in theory, their strong correlation (.71) means that students' judgment about smartness is mostly in line with one's school grades. Thus, these variables will not be run in the same models either, although in order to check the robustness of our results, we include smartness in separate models.

Table 2: Correlation table with non-binary independent variables

	Coolness	Likeability	GPA	Engagement	Smart	Diligence	Behaviour	Mock	Hit	Looks
Coolness	1.0000									
Likeability	0.4666***	1.0000								
GPA	0.0293	0.3240***	1.0000							
Engagement	-0.0341*	0.2487***	0.5781***	1.0000						
Smart	0.2929***	0.5659***	0.7111***	0.4987***	1.0000					
Diligence	-0.0158	0.3086***	0.8788***	0.5957***	0.6518***	1.0000				
Behaviour	-0.1463***	0.2552***	0.6798***	0.5932***	0.4827***	0.7351***	1.0000			
Mock	0.1310***	-0.2635***	-0.3380***	-0.2981***	-0.2768***	-0.3683***	-0.4849***	1.0000		
Hit	0.1103***	-0.2159***	-0.3088***	-0.3029***	-0.2416***	-0.3331***	-0.4485***	0.6939***	1.0000	
Looks	0.4938***	0.4940***	0.1601***	0.0891***	0.4110***	0.1247***	0.0294	-0.0305*	-0.0052	1.0000

* p<0.05, *** p<0.001

4.2 The REWB regression models

We ran separate models for popularity (*coolness*) and acceptance (*likeability*) as dependent variables.[6] In both cases, we included the other status dimension among the control variables. For the time-variant explanatory variables both their demeaned values (denoted with the labels 'diff') and their individual level averages (denoted as 'mean') were involved in the equation. Gender and ethnicity were involved as time-invariant (level 2) independent variables. The first model only involves the overall effects of the explanatory variables, while the second model also includes the interaction of ethnicity with verbal and physical aggression, GPA and being good at sports. The third model further adds the interaction of gender with verbal and physical aggression, being good at sports, and physical appearance. In models 4–6, GPA and the engagement score are replaced by the score calculated from the smartness nominations, otherwise they are identical to models 1–3. The same six models were run both for popularity and acceptance.

In the case of popularity (Table 3), we can see that being good at sports, verbal aggression, being considered good-looking, being liked, being a boy, and being ethnic Roma have significant positive overall effects, while being academically engaged has a very limited (-0.02) but significant negative effect (Model 1). In this model, changes within an individual over time had significant effect only in the case of verbal aggression, smoking, perceived physical attractiveness, and being liked. Somewhat surprisingly, positive changes in perceived physical appearance decreased one's popularity. This is remarkable, considering that being perceived as good-looking on average is a strong positive predictor of popularity in this database. After adding ethnic interactions for verbal and physical aggression, GPA, and being good at sports (Model 2), we can see that within-individual changes do not follow an ethnicized pattern, while between-individual differences showed significant interaction effects in three out of the four cases. While verbal aggression positively contributes to non-Roma students' popularity, its contribution to Roma students' popularity is not significant statistically (for the joint significance tests of the main and interaction effects see Appendix C). On the other hand, the effect of physical aggression is statistically nonsignificant for both Roma and non-Roma students (see also Appendix C). Additionally, while becoming more verbally aggressive did have a significant positive overall effect on popularity, after introducing ethnic interaction this effect lost statistical significance for both Roma and non-Roma students. In the case of GPA, a negligible but statistically significant positive effect (0.01) is observable for non-Roma students, while this effect is not significant statistically for Roma students. In the case of the effect of sports participation, no significant ethnic differences are observable.

In the next step, gender interactions were also introduced (Model 3). Significant gender effects were found in the case of every observed variable. Being good at sports only turned out to be a significant predictor of popularity in the

[6] As mentioned above, popularity is measured by coolness nominations, and acceptance by like nominations in this paper.

case of boys, while becoming better at sports actually had a slight negative impact on girls' popularity, while the effect for boys is nonsignificant. In the case of verbal aggression, there are larger returns on popularity for girls (0.40) than for boys (0.40-0.20 = 0.20), while the effect of physical aggression is nonsignificant for both genders. Interestingly, being perceived as good-looking results in greater returns for boys than for girls, while within individual changes in this perception (becoming perceived as better looking than before) yields a nonsignificant effect for girls and a negative effect for boys. In Models 4–6, GPA and academic engagement (i.e. more 'objective' measures of performance and effort) are replaced by peers' perceptions of smartness. As we have seen previously, the strong correlation between the GPA and the perception of smartness implies that students base their assessments on peers' smartness to a great extent on their school performance. Therefore, not surprisingly, the results of Models 4–6 are very similar to the results of Models 1–3. However, the main within effect of being perceived smart yields a significant and relatively large coefficient; i.e. students who are perceived as having become smarter over time have a significant positive return on popularity, without ethnic or gender differences.

Table 3: Within-between random effects (REWB) models of popularity

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Sports (diff)	-0.01	-0.00	**-0.05*****	-0.00	-0.01	**-0.05*****
Sports (mean)	**0.06*****	**0.06*****	0.01	**0.05*****	**0.05*****	0.01
GPA (diff)	-0.01	-0.01	-0.00			
GPA (mean)	0.01	**0.01***	**0.01***			
Engagement (diff)	0.01	0.01	0.01			
Engagement (mean)	**-0.02*****	**-0.02*****	**-0.02****			
Smart (diff)				**0.18*****	**0.16*****	**0.20*****
Smart (mean)				-0.03	-0.03	-0.00
Mock (diff)	**0.12****	0.07	-0.05	**0.16*****	**0.11***	-0.00
Mock (mean)	**0.14****	**0.27*****	**0.40*****	**0.14****	**0.25*****	**0.36*****
Hit (diff)	0.00	0.08	0.09	0.02	0.09	0.10
Hit (mean)	0.01	-0.14	0.15	0.03	-0.11	0.19
Smoker (diff)	**0.03***	0.03	0.03	**0.04***	**0.04***	**0.03***
Smoker (mean)	0.04	0.03	0.03	0.03	0.03	0.03
Looks (diff)	**-0.26*****	**-0.26*****	-0.03	**-0.27*****	**-0.27*****	-0.02
Looks (mean)	**0.72*****	**0.71*****	**0.62*****	**0.74*****	**0.73*****	**0.63*****
Likeability (diff)	**0.26*****	**0.26*****	**0.23*****	**0.23*****	**0.23*****	**0.19*****
Likeability (mean)	**0.15*****	**0.15*****	**0.15*****	**0.16*****	**0.16*****	**0.16*****
Disadvantaged (diff)	0.01	0.01	0.01	0.01	0.01	0.00
Disadvantaged (mean)	-0.01	-0.01	**-0.02***	-0.01	-0.01	-0.02
Boy	**0.07*****	**0.07*****	**0.04*****	**0.08*****	**0.08*****	**0.05*****
Roma	**0.02*****	**0.10*****	**0.10*****	**0.03*****	**0.04****	**0.04****

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Roma x Mock (diff)		0.11	0.13		0.10	0.12
Roma x Mock (mean)		**-0.26****	**-0.26****		**-0.20***	**-0.22***
Roma x Hit (diff)		-0.15	-0.14		-0.14	-0.14
Roma x Hit (mean)		**0.26***	**0.28***		**0.26***	**0.28***
Roma x GPA (diff)		-0.01	-0.01			
Roma x GPA (mean)		**-0.02***	**-0.02****			
Roma x Sports (diff)		-0.00	-0.01		0.01	0.00
Roma x Sports (mean)		-0.00	-0.01		-0.01	-0.02
Boy x Mock (diff)			0.15			**0.14***
Boy x Mock (mean)			**-0.20***			**-0.17***
Boy x Hit (diff)			-0.02			-0.03
Boy x Hit (mean)			**-0.27***			**-0.32***
Boy x Sports (diff)			**0.06****			**0.07*****
Boy x Sports (mean)			**0.06*****			**0.06****
Boy x Looks (diff)			**-0.34*****			**-0.38*****
Boy x Looks (mean)			**0.22*****			**0.25*****
Roma x Smart (diff)					0.04	0.04
Roma x Smart (mean)					-0.01	-0.01
Boy x Smart (diff)						-0.05
Boy x Smart (mean)						-0.03
Constant	-0.08***	-0.11***	-0.09***	-0.07***	-0.08***	-0.06***
N of observations	3005	3005	3005	3400	3400	3400
N of individuals	1113	1113	1113	1153	1153	1153
sigma_e	0.12	0.12	0.12	0.12	0.12	0.12
sigma_u	0.06	0.06	0.05	0.06	0.06	0.06
r2_w	0.11	0.12	0.14	0.12	0.12	0.16
r2_b	0.64	0.64	0.66	0.65	0.65	0.68
r2_o	0.54	0.54	0.57	0.54	0.54	0.57

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

In the case of acceptance (Table 4), being considered good-looking and being considered 'cool' have positive overall effects, while being verbally aggressive has a negative overall effect on popularity (Model 1). Within-individual changes for these variables (i.e. being perceived as having become better looking and cooler, or becoming more verbally aggressive), also have significant overall effects in the same direction as the between effects. Additionally, while the individual average does not yield significant results, becoming more physically aggressive also has a negative effect on acceptance. There are small but significant positive effects for

GPA, academic engagement, and becoming better at sports, while receiving better grades has a slight negative effect on acceptance. Being a boy also has an overall positive effect, although ethnicity does not have such an impact. After including the same ethnic interactions as above, we can see that none of them yield any significant results (Model 2), which implies that there may not be significant ethnic differences in acceptance dynamics.

Gender interactions also yield limited results (Model 3). Becoming more aggressive verbally has a smaller negative effect on acceptance for boys (-0.29+0.14 = -0.15) than for girls, while positive changes in the perception of one's physical appearance has a smaller positive effect for boys (0.31-0.22 = 0.09) than for girls. Additionally, becoming better at sports only has statistically significant returns for girls (0.04), while none of the other interactions yielded significant results. Models including perceived smartness (Models 4–6) show that both being perceived as smart on average and positive changes in this perception have a significant positive effect on acceptance, without statistically significant ethnic or gender differences.

Table 4: Within-between random effects (REWB) models of acceptance

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Sports (diff)	**0.02****	**0.03****	**0.04****	**0.02****	**0.03****	**0.04****
Sports (mean)	-0.01	-0.01	0.01	-0.00	0.00	0.02
GPA (diff)	**-0.03*****	**-0.03****	**-0.02***			
GPA (mean)	**0.02*****	**0.02****	**0.02****			
Engagement (diff)	-0.00	-0.00	-0.00			
Engagement (mean)	**0.02*****	**0.02****	**0.02****			
Smart (diff)				**0.20*****	**0.22*****	**0.20*****
Smart (mean)				**0.23*****	**0.23*****	**0.20*****
Mock (diff)	**-0.19*****	**-0.19*****	**-0.29*****	**-0.17*****	**-0.13****	**-0.23*****
Mock (mean)	**-0.40*****	**-0.48*****	**-0.62*****	**-0.38*****	**-0.43*****	**-0.52*****
Hit (diff)	**-0.17*****	**-0.16***	-0.11	**-0.18*****	**-0.13***	-0.11
Hit (mean)	-0.09	0.10	0.18	-0.06	0.09	0.16
Smoker (diff)	0.00	0.00	-0.00	0.01	0.01	0.01
Smoker (mean)	-0.02	-0.01	-0.01	-0.04	-0.04	-0.04
Looks (diff)	**0.18*****	**0.18*****	**0.31*****	**0.13*****	**0.13*****	**0.29*****
Looks (mean)	**0.36*****	**0.36*****	**0.36*****	**0.28*****	**0.27*****	**0.30*****
Coolness (diff)	**0.19*****	**0.19*****	**0.16*****	**0.17*****	**0.17*****	**0.15*****
Coolness (mean)	**0.31*****	**0.31*****	**0.34*****	**0.27*****	**0.27*****	**0.28*****
Disadvantaged (diff)	0.01	0.01	0.01	**0.02****	**0.02****	**0.02****
Disadvantaged (mean)	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Boy	**0.05*****	**0.05*****	**0.05***	**0.04*****	**0.04*****	0.03
Roma	0.02	-0.02	-0.02	0.02	0.02	0.02

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Roma x Mock (diff)		0.00	0.02		-0.06	-0.05
Roma x Mock (mean)		0.14	0.14		0.07	0.07
Roma x Hit (diff)		-0.02	-0.04		-0.07	-0.09
Roma x Hit (mean)		-0.31	-0.31		-0.23	-0.21
Roma x GPA (diff)		-0.00	-0.01			
Roma x GPA (mean)		0.01	0.01			
Roma x Sports (diff)		-0.02	-0.01		-0.01	-0.01
Roma x Sports (mean)		-0.01	-0.01		-0.02	-0.01
Boy x Mock (diff)			**0.14***			**0.15***
Boy x Mock (mean)			0.22			0.16
Boy x Hit (diff)			-0.07			-0.03
Boy x Hit (mean)			-0.16			-0.13
Boy x Sports (diff)			**-0.03***			-0.03
Boy x Sports (mean)			-0.02			-0.02
Boy x Looks (diff)			**-0.22*****			**-0.27*****
Boy x Looks (mean)			-0.05			-0.07
Roma x Smart (diff)					-0.05	-0.04
Roma x Smart (mean)					0.02	0.02
Boy x Smart (diff)						0.07
Boy x Smart (mean)						0.05
Constant	0.29***	0.31***	0.31***	0.32***	0.32***	0.33***
N of observations	3005	3005	3005	3400	3400	3400
N of individuals	1113	1113	1113	1153	1153	1153
sigma_e	0.11	0.11	0.10	0.11	0.11	0.10
sigma_u	0.10	0.10	0.10	0.10	0.10	0.10
r2_w	0.11	0.11	0.13	0.15	0.15	0.17
r2_b	0.51	0.51	0.51	0.56	0.56	0.56
r2_o	0.44	0.44	0.45	0.48	0.48	0.48

* p<0.05, ** p<0.01, *** p<0.001

5. Discussion

In this paper we analyzed the status dynamics related to the two most frequently used dimensions of status, popularity and acceptance, in an ethnically diverse primary school sample. The novelty of our paper is twofold: on the one hand, to our knowledge our paper is the first in the Hungarian literature to include multiple status dimensions in the analysis of the relationship between status and ethnicity; on the other hand, we applied a novel methodological approach, within-between random effects regression analysis (Bell et al., 2019), which makes the separation of the effects of within-individual changes and between-individual differences possible. The inclusion of the two most frequently used conceptualizations of status, as well as the most frequently used explanatory variables, makes our results comparable to those found in North American literature. In line with the international literature, we found in our sample that being good at sports, verbal aggression, perceived attractiveness, and being liked had an overall positive effect on popularity, while being academically engaged had a minimal but statistically significant negative effect. For physical aggression and GPA, no significant overall effects were found. Similarly, in the case of acceptance we found that being verbally and physically aggressive had an overall negative effect, while being perceived as good-looking and cool had a sizeable positive effect, whereas being good at sports, having a good GPA, and being academically engaged had a minimal but statistically significant positive effect. Additionally, in line with the 'maturity gap' hypothesis (Moffitt, 1993), becoming a smoker had a slight but statistically significant positive effect on popularity.

With regard to ethnic differences, some ethnicized patterns were found in the relationship between aggression and popularity, while no ethnic differences were found in the case of being good at sports, and a minimal but statistically significant difference in the case of GPA. In the case of acceptance dynamics, no ethnic differences were found. In contrast to the claims in the American literature, verbal aggression only contributed to the popularity of non-Roma students, whereas the effect of physical aggression was nonsignificant for both groups (in spite of the positive and statistically significant interaction effect for Roma students). While Hungarian studies on interethnic relations usually consider African Americans to be a reasonable 'reference group' when discussing the situation of the Roma in Hungary – and we have also argued for the similarities in the social situation of the two disadvantaged groups above –, one has to acknowledge their potential differences as well. In the case of the returns of sports participation on popularity, we have seen above that even in the case of African American students, more recent research has found limited or no ethnic effects. Additionally, this may be a good example of a situation in which the Roma and the African American population potentially differ: while in the United States a significant portion of elite athletes are African Americans in many sports, there are smaller proportions of Roma athletes in all the popular sports in Hungary. Thus our findings about the lack of an ethnic effect in the case of sports may not be surprising after all.[7] Finally, in the case of GPA, we found a minimal (0.01) but statistically significant positive effect for non-Roma, and a minimal (-0.01) but a statistically non-significant negative effect for Roma students; however, this difference is so small that it would be unreasonable to assume any real ethnic differences. In the case of GPA, our results, to some extent, may be comparable to those in the Hungarian literature about the relationship between ethnicity, status, and academic performance, even though these studies use different conceptualizations of status. Hajdú and colleagues (2019) found that having better GPA resulted in more non-Roma friends and fewer non-Roma adversaries for Roma students, while the proportion of their Roma friends and adversaries was unaffected by GPA. Habsz and Radó (2018) used a measurement of social preference, calculated from friendship and antipathy nominations, and found a slightly larger positive effect of GPA on status in the case of Roma than non-Roma students. Similarly to these studies, our models of acceptance measure the dimension of status related to social preference (as contrasted with the reputational dimension). Our results show a small, positive, and statistically significant overall between-individual effect of GPA on acceptance, and a small, negative, and statistically significant overall within-individual effect. This implies, similarly to the results of the two former Hungarian studies, that individuals with a higher GPA have, on average, somewhat higher status. However, we found no significant ethnic differences, which might be due to the different conceptualization of status. Additionally, our results show that, on average, Roma students are more popular than non-Roma students, while no such ethnic effect is observable in the case of acceptance.

In addition to ethnicity, we found interesting gender differences in status dynamics. The finding that being good at sports only contributed to boys' popularity, while the effect for girls was nonsignificant, is partly in line with the international literature. Interestingly, however, positive within-individual changes in athletic ability contributed negatively to girls' popularity. Additionally, while the literature suggests a stronger positive association between overt aggression and popularity for boys, our results show a positive effect of overt verbal aggression that is twice as large for girls as for boys. However, in the case of acceptance there is a larger negative effect of verbal aggression for girls. Similarly surprising is the result that perceived physical appearance contributes more to boys' than girls' popularity.

Finally, the limitations of our study must also be emphasized. First, our findings are not generalizable to the Hungarian school population, as ethnic Roma students and students with disadvantaged social background are overrepresented in our sample. Second, our composite school engagement score might not represent actual school engagement well, as interpreted by peers. Thus, similarly

[7] Additionally, one has to keep in mind that the variable that measures athletic abilities is a binary variable based on teacher nominations, as the first three waves of the database, unfortunately, do not contain peer nominations concerning athletic abilities. The binary nature of the variable, as well as the different nomination procedure compared to the peer-nominated proportional variables (verbal and physical aggression, physical appearance, smartness, etc.), limits the conclusions one can draw about athletic abilities.

to the teacher-nominated variable on sports, we might not have been able to measure the full impact of this variable on status. Third, for modeling network dependencies such as triadic relationships, social network analysis may be a more appropriate method. Despite these limitations, we believe that our paper provides a valuable contribution to the literature by being the first Hungarian study to simultaneously analyze the dynamics of the two most widely used status dimensions.

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Appendices

A. Multilevel panel regression models[8]

Consider the following general equation:

$$y_{it} = \beta_0 + \beta_1 x_{it} + \beta_3 z_i + a_i + \epsilon_{it} \qquad (2.)$$

Where y_{it} denotes the observed value of the dependent variable for individual *i* at time *t*, x_{it} is the observed time-varying (level 1) independent variable for individual *i* at time *t*, z_i is the observed time-invariant (level 2) independent variable for individual *i*, a_i is an unobserved, person-specific (level 2) characteristic (e.g. cognitive ability), and ϵ_{it} is the idiosyncratic error term. If we apply standard regression models to this equation, two main problems arise. First, they provide biased estimates for β_1 and/or β_3 if a_i is correlated with x_{it} and/or z_i (omitted variable bias). Second, β_1 is a composite estimate of the effect of within-individual changes and between-individual differences for the time-variant independent variable without the potential to decompose these within- and between-individual effects. The *fixed effects (FE)* estimation model aims at solving both problems by demeaning the data first and then running a pooled OLS regression:

$$y_{it} - \bar{y}_i = \beta_{1W}(x_{it} - \bar{x}_i) + (\epsilon_{it} - \bar{\epsilon}_i) \qquad (3.)$$

After deducting the individual-level means, the time-invariant observed and unobserved variables a_i and z_i drop out of the equation. Since all higher level heterogeneity is wiped out, β_{1W} becomes the estimate for the within-individual effects. While this estimate might be particularly useful when evaluating the impact of policy interventions, some problems arise. First, the effects of within-individual changes and between-individual differences may not be the same (for some examples, see Bell et al., 2019: 1053), and the latter would also often be of interest for social science research. Similarly, if key explanatory variables are constant over time (e.g. gender), the application of FE estimations might be problematic (Wooldridge, 2016) as their effect cannot be estimated.

A different approach is taken by *random effects (RE)* models. In random-intercept models, individual-level random effects (v_{i0}) are added to the intercept of equation (2.):

$$y_{it} = \beta_0 + \beta_1 x_{it} + \beta_3 z_i + a_i + v_{i0} + \epsilon_{it} \qquad (4.)$$

These random effects are treated as random draws from a normal distribution (Bell et al., 2019: 1060).[9] Consequently, while the FE model assumes non-random

[8] This description is based on Bell and colleagues (2019), Brüderl and Ludwig (2015), and Wooldridge (2016, Chapter 14).

individual-specific intercepts, the RE model assumes random individual intercepts, thus allowing for the estimation of coefficients for higher level (i.e. time-invariant) variables. However, this model assumes, similarly to the model in equation (2.), that the unobserved confounders are unrelated to any of the explanatory variables (Brüderl and Ludwig, 2015; Wooldridge, 2016). According to Wooldridge, the key issue when selecting between the FE and RE models is whether we can 'plausibly assume' that a_i is uncorrelated with the explanatory variables (Wooldridge, 2016: 445). If this and some other RE assumptions are met, the RE estimation is consistent and also more efficient than the FE estimation for the time-variant explanatory variables (see Wooldridge, 2016: 458–459). Bell and colleagues (2019) propose an alternative model, *the within-between random effects (REWB) model*, which combines the strength of the FE and RE models and effectively decomposes the within-individual and between-individual effect of the time-variant explanatory variable:

$$y_{it} = \beta_0 + \beta_{1W}(x_{it} - \bar{x}_i) + \beta_{2B}\bar{x}_i + \beta_3 z_i + v_{i0} + v_{i1}(x_{it} - \bar{x}_i) + \epsilon_{it} \quad (5.)$$

Where β_{1W} is the estimate of the average within effect of x_{it} and β_{2B} is an estimate of the average between effect of x_{it}, v_{i0} is a random effect attached to the intercept and v_{i1} is a random effect attached to the within slope. Similarly to the FE model, this model prevents any bias on the coefficients of time-variant (level 1) variables deriving from unobserved time-invariant (level 2) variables, and yields the same estimates for β_{1W} as the FE regression (Bell et al., 2019: 1058–1059). However, unobserved time-invariant variables can cause bias in estimates of the between-effects (β_{2B}) and the effects-observed level 2 variables (β_3). Bell and colleagues argue that this is a problem only if we want to measure the direct causal effect of these variables, but not so much if we consider these variables as proxies for group-level characteristics that also include unmeasured social processes, as long as we interpret the coefficients with these unmeasured variables in mind (see Bell et al., 2019: 1059–1060). Finally, the authors demonstrate through simulations that not including random intercepts generates anti-conservative standard errors, and assuming that the random intercepts are normally distributed, when in reality they are not, only introduces modest biases into the estimates.

[9] In random-slopes models, in addition to random intercepts, individual-level random effects (v_{i1}) are added to β_1, thus allowing for individual-level variation in the effect of some of the explanatory variables.

B. Fixed-effects regression results

Table 5: Fixed-effects models for popularity

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Sports	-0.01	-0.00	**-0.05****	-0.01	-0.01	**-0.05*****
GPA	-0.01	-0.01	0.00			
Engagement	0.01	0.01	**0.01***			
Mock	**0.11****	0.06	-0.09	**0.16*****	**0.10***	-0.03
Hit	-0.03	0.05	0.01	0.02	0.08	0.04
Smoker	0.03	0.02	0.02	0.04*	0.04*	**0.03***
Looks	**-0.28*****	**-0.27*****	-0.05	**-0.27*****	**-0.27*****	-0.03
Likeability	**0.26*****	**0.26*****	**0.22*****	**0.23*****	**0.23*****	**0.19*****
Disadvantaged	0.00	0.00	0.00	0.01	0.01	0.00
Boy	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)
Roma	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)
Roma x Mock		0.11	0.13		0.12	**0.15***
Roma x Hit		-0.17	-0.19		-0.13	-0.15
Roma x GPA		-0.02	-0.02			
Roma x Sports		-0.02	-0.02		0.00	0.00
Boy x Mock			**0.20***			**0.16***
Boy x Hit			0.05			0.04
Boy x Sports			**0.06****			**0.07*****
Boy x Looks			**-0.33*****			**-0.35*****
Smart				**0.18*****	**0.16*****	**0.20*****
Roma x Smart					0.04	0.03
Boy x Smart						-0.04
Constant	0.22***	0.21***	0.19***	0.11***	0.11***	0.11***
N of observations	3005	3005	3005	3400	3400	3400
N of individuals	1113	1113	1113	1153	1153	1153
sigma_e	0.12	0.12	0.12	0.12	0.12	0.12
sigma_u	0.19	0.19	0.20	0.17	0.17	0.18
r2_w	0.11	0.12	0.15	0.12	0.12	0.16
r2_b	0.04	0.08	0.04	0.01	0.01	0.01
r2_o	0.00	0.01	0.01	0.02	0.03	0.02

* p<0.05, ** p<0.01, *** p<0.001

Table 6: Fixed-effects models for acceptance

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Sports	**0.02****	**0.03****	**0.04****	**0.02****	**0.03****	**0.04****
GPA	**-0.03*****	**-0.03****	**-0.02***			
Engagement	-0.00	-0.00	-0.00			
Mock	**-0.20*****	**-0.18*****	**-0.27*****	**-0.17*****	**-0.12****	**-0.21*****
Hit	**-0.17****	**-0.16***	-0.12	**-0.17*****	**-0.13***	-0.11
Smoker	0.00	0.00	-0.00	0.01	0.01	0.01
Looks	**0.17*****	**0.17*****	**0.31*****	**0.13*****	**0.13*****	**0.29*****
Cool	**0.19*****	**0.19*****	**0.16*****	**0.18*****	**0.18*****	**0.15*****
Disadvantaged	0.02	0.02	0.01	**0.02****	**0.02****	**0.02****
Boy	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)
Roma	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)	(Omitted)
Roma x Mock		-0.03	-0.02		-0.10	-0.08
Roma x Hit		-0.00	-0.02		-0.06	-0.09
Roma x GPA		0.00	-0.00			
Roma x Sports		-0.03	-0.02		-0.02	-0.01
Boy x Mock			0.13			**0.13***
Boy x Hit			-0.07			-0.02
Boy x Sports			-0.03*			-0.03
Boy x Looks			**-0.24*****			**-0.28*****
Smart				**0.19*****	**0.22*****	**0.20*****
Roma x Smart					-0.06	-0.05
Boy x Smart						0.05
Constant	0.56***	0.56***	0.54***	0.39***	0.38***	0.38***
N of observations	3005	3005	3005	3400	3400	3400
N of individuals	1113	1113	1113	1153	1153	1153
sigma_e	0.11	0.11	0.10	0.11	0.11	0.10
sigma_u	0.16	0.16	0.16	0.13	0.13	0.13
r2_w	0.11	0.11	0.13	0.15	0.15	0.17
r2_b	0.26	0.27	0.26	0.54	0.51	0.46
r2_o	0.22	0.23	0.23	0.45	0.43	0.40

* p<0.05, ** p<0.01, *** p<0.001

C. Joint significance tests of the main and interaction effects

Table 7: Joint significance tests for the popularity models (p-values)

	Model 2	Model 3	Model 5	Model 6
Mock (diff) + Roma x Mock (diff)	**0.006**	0.275	**0.000**	**0.043**
Mock (mean) + Roma x Mock (mean)	0.838	0.085	0.499	0.072
Hit (diff) + Roma x Hit (diff)	0.460	0.644	0.539	0.664
Hit (mean) + Roma x Hit (mean)	0.156	**0.000**	0.093	**0.000**
GPA (diff) + Roma x GPA (diff)	0.156	0.311	-	-
GPA (mean) + Roma x GPA (mean)	0.478	0.269	-	-
Sports (diff) + Roma x Sports (diff)	0.683	**0.008**	0.933	**0.010**
Sports (mean) + Roma x Sports (mean)	**0.000**	0.950	**0.004**	0.493
Mock (diff) + Boy x Mock (diff)	-	0.063	-	**0.007**
Mock (mean) + Boy x Mock (mean)	-	**0.001**	-	**0.010**
Hit (diff) + Boy x Hit (diff)	-	0.563	-	0.540
Hit (mean) + Boy x Hit (mean)	-	0.218	-	0.184
Sports (diff) + Boy x Sports (diff)	-	0.417	-	0.425
Sports (mean) + Boy x Sports (mean)	-	**0.000**	-	**0.000**
Looks (diff) + Boy x Looks (diff)	-	**0.000**	-	**0.000**
Looks (mean)+ Boy x Looks (mean)	-	**0.000**	-	**0.000**
Smart (diff) + Roma x Smart (diff)	-	-	**0.000**	**0.000**
Smart (mean) + Roma x Smart (mean)	-	-	0.196	0.601
Smart (diff) + Boy x Smart (diff)	-	-	-	**0.000**
Smart (mean)+ Boy x Smart (mean)	-	-	-	0.142

Table 8: Joint significance tests for the acceptance models (p-values)

	Model 2	Model 3	Model 5	Model 6
Mock (diff) + Roma x Mock (diff)	**0.000**	**0.000**	**0.000**	**0.000**
Mock (mean) + Roma x Mock (mean)	**0.000**	**0.000**	**0.000**	**0.000**
Hit (diff) + Roma x Hit (diff)	**0.016**	0.153	**0.002**	**0.030**
Hit (mean) + Roma x Hit (mean)	**0.033**	0.545	0.130	0.802
GPA (diff) + Roma x GPA (diff)	**0.000**	**0.004**	-	-
GPA (mean) + Roma x GPA (mean)	**0.000**	**0.000**	-	-
Sports (diff) + Roma x Sports (diff)	0.518	0.080	0.271	0.065
Sports (mean) + Roma x Sports (mean)	0.337	0.954	0.356	0.842
Mock (diff) + Boy x Mock (diff)	-	**0.003**	-	0.099
Mock (mean) + Boy x Mock (mean)	-	**0.000**	-	**0.000**
Hit (diff) + Boy x Hit (diff)	-	**0.012**	-	**0.045**
Hit (mean) + Boy x Hit (mean)	-	0.916	-	0.786
Sports (diff) + Boy x Sports (diff)	-	0.591	-	0.446
Sports (mean) + Boy x Sports (mean)	-	0.371	-	0.691
Looks (diff) + Boy x Looks (diff)	-	**0.000**	-	0.502
Looks (mean)+ Boy x Looks (mean)	-	**0.000**	-	**0.000**
Smart (diff) + Roma x Smart (diff)	-	-	**0.000**	**0.000**
Smart (mean) + Roma x Smart (mean)	-	-	**0.000**	**0.000**
Smart (diff)+ Boy x Smart (diff)	-	-	-	**0.000**
Smart (mean)+ Boy x Smart (mean)	-	-	-	**0.000**