

Research Paper

Gender Differences Among Teacher Education Students in Light of a Pilot Study

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Abstract

This paper aims to present the measurement tool designed to examine gender differences among teacher education students and the results obtained during the research. The theoretical section of the paper describes teachers' and parents' influence on children's gender role attitudes, gender socialization and career orientation. To prepare the questionnaire, we analyzed the Hungarian and international literature and built on the results of our previous qualitative research. We grouped our questions into three dimensions: (1) gender socialization in the family, (2) parental involvement, (3) gender socialization at school and career orientation. According to our results, gender-neutral toys were more often chosen by male students' parents, and mothers were more involved in their children's school activities than fathers, setting higher expectations as well. Teachers and parents, especially mothers, played an important role in students' career choice. In addition, students perceived that teachers handled them differently depending on their gender in terms of the evaluation of their academic progress and behavior as well as the frequency of compliments and punishment.

Keywords: teacher education students; gender roles; gender socialization; parental involvement; the role of teachers

Introduction

The elimination of gender inequalities is a crucial cornerstone for both education and the modern, 21st-century social lifestyle. Consequently, this topic can be approached in numerous ways, serving as an inexhaustible source of research. In our pilot study, we examine gender differences among teacher education students from three Hungarian universities (Debrecen, Szeged, Pécs). In our review of the international and Hungarian literature, we found very little research on teacher education students' gender role attitudes and gender socialization. Most studies focus on college or university students in general, as opposed to teacher education students in particular. The novelty of our research lies in the examination of this specific target group, as prospective teachers will have a major impact on the gender role attitudes of their students.

In the theoretical section of the paper, we describe the literature on how teachers and parents influence gender socialization, which helped us formulate our research questions and subsequent hypotheses. In exploring the literature, one can discover an ambiguity regarding teachers' influence: while some believe that teachers play a prominent role in children's gender socialization, others argue that this influence is negligible or non-existent (Martin & Marsh, 2005; Marsh et al., 2008; Clegg et al., 2000; Diallo & Hermann 2017; Driessen, 2007; Carrington et al., 2007).

In addition to teachers, parents have a powerful impact on children's gender socialization (Giddens, 2021). The literature highlights that parents also play an important role in students' self-esteem, career orientation and gender role attitudes (Bhanot & Jovanovic, 2009; Heaven & Ciarrochi, 2008; Bleeker & Jacobs, 2004; Papageorgiou & Callaghan, 2018). However, parents' excessive involvement and participation at school can also have detrimental effects on children (Heaven & Ciarrochi, 2008; Papageorgiou & Callaghan, 2018).

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Nevertheless, teachers' personal influence and efforts have the potential to override or mitigate the orientation received at home (Burkam et al., 1997).

In the empirical part of our research, we conducted a survey among teacher education students. Our research questions ask as to what differences are observed in students' gender socialization in the family by the students' and the parents' gender, to what extent parents are involved in their children's life at home and at school, whether students perceive gender differentiation by their teachers and who has influenced students' career choice.

As our research is based on a non-probability and non-representative sample, our findings do not allow us to draw final conclusions but still provide an opportunity to continue and develop our work.

Teachers and parents as influencing factors on gender stereotypes

Teachers' professional success (e.g. their professional, pedagogical and curricular expertise) is influenced not only by their knowledge but also by their pedagogical beliefs, values and attitudes (Seifried, 2012). An examination of the Hungarian and international literature reveals sharp contrasts in the extent to which teachers influence students' lives. According to Alan et al. (2018), teachers' beliefs about gender roles can directly and indirectly influence students' attitudes, behaviors and outcomes. In their research, they investigated whether teachers' beliefs about gender roles influenced girls' test scores. They found that teachers who held traditional views on gender roles negatively affected girls' performance. In mathematics test scores, teachers' implicit stereotypes had a significant impact on the gender gap: girls were left behind when placed with teachers who had stronger implicit associations classifying mathematics as a male strength and literature as a female one, but no such effect was found for boys (Carlana, 2019). Mathematics teachers' stereotypes were also found to influence secondary school choices for girls, who had expectations of their own abilities and were discouraged from jobs perceived as masculine (Carlana, 2019). Weiller and Doyle (2000) found a shift in teacher-student interactions in physical education classes: traditional attitudes towards boys and girls in physical education were found to make gradual progress towards equality.

The significant role of teachers is also reflected in their expectations towards students: the quality of teachers' expectations was found to influence students' performance (Doucet, 2017). Asadullah et al. (2019) investigated the impact of the institutional school setting on gender stereotypes in non-religious and Islamic (madrasah) schools in Bangladesh and concluded that a larger presence of female teachers, better teacher training, and the introduction of gender-balanced teaching, learning materials and textbooks helped reduce differences in Bangladeshi students' attitudes between genders and between madrasah and non-religious schools. However, Williams (2010) stresses that a regulation or law alone cannot bring about significant social progress: society needs to break down rigidly held beliefs according to which gender roles naturally follow from biological sex. The impact of societal changes on developmental pathways varies by gender (Elder, 2018), and girls tend to be less traditional in gender role perceptions (Gibbons, Stiles, & Shkodriani 1991). Values in relation to gender roles shift, while the values of family responsibilities remain (Georgas et al., 2006), making new cultural practices easier to adopt as they are in line with previously established cultural values and psychological needs, i.e. gender role practices that provide girls with extended opportunities to fulfil family responsibilities (Manago, 2015).

Parents provide children with "*the framework from which they can begin to develop and cultivate their own value system*" (Jones 2014:1) and continue to exert a strong influence on students' lives, despite the fact that students gain more autonomy as they grow older. Research by Parsons et al. (1984) has shown that children's self-perceptions of their mathematical abilities reflect their parents' perceptions of the children's abilities. When parents are involved in their children's schooling, children gain an advantage, especially in terms of academic confidence and interest. It has been documented that children are more likely to express an interest in mathematics and science when both mothers and fathers encourage them to take such courses or consider such a career (Bhanot & Jovanovic, 2009). Lower self-esteem is associated with an authoritarian parenting style: in grade 7, girls' self-esteem scores were higher than those of boys, but in grade 10, the opposite was observed (Heaven & Ciarrochi, 2008), notwithstanding boys' underperformance in terms of academic achievement (Papageorgiou & Callaghan, 2018). Bleeker and Jacobs (2004) highlight that gender-differentiated parental perceptions and adolescents' self-perception play a great role in career choice, but teachers who encourage students' participation in science regardless of gender can override the orientation received at home (Burkam et al., 1997). Excessive

parental supervision of homework, especially when done without the child's request, was shown to result in lower self-confidence in academic achievement: this was most evident for girls' mathematics performance, while no such association was found for boys (Pomerantz & Rubel, 1998). Dhar et al. (2019) suggest that parents have a crucial influence on students' gender attitudes, with the role of mothers being especially important. However, findings from other studies suggest that parents' views are strongly influenced by whether their child is a boy or a girl: fathers of girls tend to be more supportive of gender equality and more supportive of modern gender role concepts (Yu & Kuo, 2018). According to a meta-analysis of parent-child interactions, fathers are stricter, less caring and more directive with their sons, while mothers display minimal differences by the child's gender (Siegal 1987). However, Tam (2009) highlights that in traditional Chinese families, parents were found to be stricter, had higher expectations and were more preferential towards boys than girls.

In summary, both teachers and parents are major influences on children's gender attitudes, self-esteem and career orientation. This makes it crucial that the teachers of the next generations, as both prospective parents and teachers, take an objective approach to the discussion. In this paper, we do not discuss the influence of peer groups and the media, which can be additional spheres of socialization.

Background to the quantitative research

In the first phase of our empirical research, we conducted semi-structured interviews with teachers of physics, history and music. The measurement tool was divided into four blocks, focusing mainly on gender socialization in the teacher's family and schooling, and on the "hidden curriculum".

According to a significant number of interviewees in the qualitative research, children start school already predisposed towards subjects in accordance to their gender due to the parental model, and most teachers reinforce this phenomenon through the examples and values they provide. It is based on this insight that we selected the second target group of our study, namely teacher education students. It is assumed that for each of these dimensions, the detected differences in the various background variables (gender, grade, subject, socio-demographic background, etc.) can shed light on the orientation teacher education students have received and are expected to pass on, influencing the upcoming generations under their guidance.

Methodology of the quantitative study

In the empirical part of our research, we conducted a quantitative analysis among students at three Hungarian universities (Debrecen, Szeged, Pécs). By the end of data collection, 94 students had responded to our questionnaire. In designing the questionnaire, we took into account the results of our qualitative research and built on the literature aimed to answer similar questions (Lewis & Leach 2006; Witte, 2017; Krišová & Polánková (eds.), 2020; Kovács, 2018; Szabó, 2008; García-Cueto et al., 2015; Zeyneloglu & Terzioglu, 2011; MTA-DE-CSATOKK).

The measurement tool included several dimensions, such as socio-demographic background, gender socialization in the family, gender role attitudes, equal opportunities, gender stereotypes, gender socialization at school, career orientation. We attempted to develop a rich set of questions to get a better understanding and to be able to provide answers. However, the results presented in this paper are only indicative and help us in formulating hypotheses, making adjustments and enacting improvements for subsequent research.

The questionnaire was completed online and on paper. Initially, we planned to use an online platform exclusively, but this method proved less effective, so we gathered data on paper and online in parallel. We were able to reach 39 students from the University of Debrecen using paper-based questionnaires. The remaining students from Debrecen and those from the other two universities were surveyed online. We used social media pages set up by the universities to help us reach the students online, employing snowball sampling for additional respondents. The paper-based questionnaire was self-administered, while the online version was assisted by the software, which warned respondents if a field was skipped or the input exceeded the limit.

Research questions

In the initial phase of the research, we grouped our questions into three dimensions: (1) gender socialization in the family, (2) parental involvement, (3) gender socialization at school and career orientation.

1. *What differences can be observed in teacher education students' gender socialization in the family (as measured by the toys chosen by parents and students as children, the activities undertaken together and at the encouragement of parents, and parental expectations) by the students' and parents' gender?*
2. *To what extent are parents involved in their child's education (at home and at school) by gender?*
3. *Did the students notice any differences in their teachers' attitudes and expectations towards girls and boys? Who influenced students' career choice?*

Results

Summary statistics of the sample

Of the 94 respondents, 64 were women (71.3%) and 27 men (28.7%). As for the institution, 49 of them studied at the University of Debrecen (52.1%), 21 at the University of Szeged (22.3%) and 24 at the University of Pécs (25.5%). The average age among the respondents was 23.17, with most students aged 19-25. As regards the level of education, 94.7% of the respondents studied in undivided training offering a master's degree, with one bachelor's student and four master's students in the sample. In terms of the distribution of year groups, 14 students were in their first year, 21 in their second and 27 in their third, with 24 and eight students in their fourth and fifth year, respectively.

Table 1. Distribution of students by gender, institution and year (n=94 – author's calculations)

Distribution of students by gender, institution and year (n=94)						
Year			Higher education institution			Total
			U. of Debrecen	U. of Szeged	U. of Pécs	
Year I	Gender	Women	5	3	2	10
		Men	1	1	2	4
Year II	Gender	Women	2	4	7	13
		Men	4	2	2	8
Year III	Gender	Women	15	5	3	23
		Men	3	0	1	4
Year IV	Gender	Women	11	3	3	17
		Men	5	2	0	7
Year V	Gender	Women	1	1	2	4
		Men	2	0	2	4
Total	Gender	Women	34	16	17	67
		Men	15	5	7	27
	Total		49	21	24	94

Table 2. Distribution of students by field of study and gender (n=94 – author’s calculations)

Distribution of students by field of study and gender (n=94)								
No			Minor					Total
			foreign language	sciences	humanities	arts	physical education	
Women	Major	foreign language	8	4	10	4	1	27
		sciences	1	6	8	0	1	16
		humanities	4	1	11	3	1	20
		arts	0	0	1	1	0	2
		physical education	0	0	1	1	0	2
	Total		13	11	31	9	3	67
Men	Major	foreign language	0	4	1	0	1	6
		sciences	1	2	2	1	3	9
		humanities	1	2	5	0	1	9
		physical education	0	0	2	1	0	3
	Total		2	8	10	2	5	27
	Total number of respondents		15	19	41	11	8	94

The table above shows teacher education students’ gender by the choice of major and minor. Art and physical education were the least popular choices among women. No male art students completed our questionnaire. Physical education was generally uncommon. The most common field of study among men was humanities, with foreign languages the most popular among female students.

Next, we consider the parents’ educational attainment.

Table 3. Parents’ educational attainment (n=94 – author’s calculations)

Parent’s educational attainment (n=94)		
	father (%)	mother (%)
primary school or less than 8 years of education	3.2	4.3
<i>vocational training without secondary school-leaving certificate</i>	26.6	10.6
vocational secondary school	18.1	17.0
<i>secondary grammar school</i>	10.6	22.3
technical college	7.4	7.4
college degree	17.0	21.3
university degree	14.9	16.0
academic degree	2.1	1.1

(The highest value in each column is marked in bold.)

The most common response was *vocational training without a secondary school-leaving certificate* among fathers and *secondary grammar school* among mothers. The respondents’ parents mostly completed secondary education, with a negligible share of *incomplete or completed primary education*, which was slightly higher for mothers. In terms of higher education, mothers were more likely to have both *college* and *university degrees*, but fathers were slightly overrepresented in terms of *academic degrees*.

Results on the research questions

In the first dimension of the research, we examined questions on gender socialization in the family. We asked about the types of children's toys that the students played with as children: from the 12 different categories, respondents could select the ones they liked to play with and the ones their parents chose for them.

Table 4. Distribution of the toys preferred by the students and chosen by the parents among men and women (n=94 -author's calculations)

Distribution by gender of the games preferred by students and chosen by their parents (n=94)				
children's toys	Women		Men	
	child's choice (%)	parent's choice (%)	child's choice (%)	parent's choice (%)
toy dolls/Barbie dolls	74.6**	82.1**	<u>11.1</u>	<u>11.1</u>
cars/trucks	11.9**	4.5**	51.9	51.9
sports equipment	<u>17.9*</u>	<u>17.9*</u>	48.1**	40.7**
kitchen/cooking toys	55.2**	49.3**	11.1*	11.1*
action figures	<u>6.0</u>	<u>1.5</u>	48.1*	22.2*
toy guns	<u>7.5</u>	<u>0</u>	48.1**	33.3**
clothes, accessories, make-up	55.2**	62.7**	<u>3.7</u>	<u>11.1</u>
plush toys	82.1**	88.1**	25.9*	33.3*
board game, puzzle, book	77.6**	82.1**	29.6**	55.6**
playdough	35.8*	46.3*	22.2*	25.9*
video/computer games	<u>13.4</u>	<u>9</u>	55.6**	37.0**
LEGO	28.4*	29.9*	63.0**	77.8**

(** = 0.000; * = 0.001; underlined values: $0.001 < p < 0.005$)

The table shows that female students and their parents preferred “girly” toys (*dolls/Barbie dolls, kitchen/cooking toys, clothes, accessories, make-up*) and those that are considered gender-neutral (*plush toys, board games, puzzles, books*). The types of toys that are considered “boyish” were selected occasionally but not often. Among toys chosen by parents, “boy” toys were even less frequent, especially toy guns (0%). Our results show that both parents and students preferred “girly” or gender-neutral toys, with a low incidence of atypical choices.

For male students, the gender-appropriate “boy” toys (*cars/trucks, sports equipment, action figures, toy guns, video/computer games, LEGO*) were frequently chosen as a child, while the parents' choices also included gender-neutral items (*board games, puzzles, books*). For example, *action figures* and *toy guns* were popular children's choices but parents rarely selected them, while the opposite was observed for *board games, puzzles and books*. We speculate that this may be due to parents' reluctance towards toys that involve violence, while boys may not prefer quiet activities such as board games, puzzles or reading books. The choice of “girly” toys appeared in both cases, but only infrequently. Our results suggest that male students chose toys in line with traditional gender stereotypes, while their parents chose gender-neutral items as well. In aggregate, however, both students and parents tended to choose toys in line with traditional gender stereotypes.

We examined joint activities with parents by the parents' and students' gender. For joint activities with mothers, homework and conversations stood out for both genders, as did cooking among female students and playing board games among male students. Reading was also universally important, albeit with slightly lower values (*47.8% of female students, 48.1% of male students*), while shopping was a more common joint activity among male students (*44.4%*). Construction, wrestling, visiting museums, skiing/snowboarding, hiking, hunting/fishing and camping were universally uncommon activities to do with mothers.

Table 5. Joint activities by the parents' and students' gender (n=94 – author's calculations)

Joint activities by the parents' and students' gender (n=94)				
Joint activities	mothers		fathers	
	female students (%)	male students (%)	female students (%)	male students (%)
sports activities	<u>4.5</u>	<u>14.8</u>	<u>26.9</u>	<u>29.6</u>
reading	47.8*	48.1*	<u>17.9</u>	<u>22.2</u>
drawing, painting, art	38.8*	25.9*	<u>9.0</u>	<u>18.5</u>
cinema	26.9**	14.8**	23.9**	3.7**
cooking	64.2**	14.8**	11.9**	18.5**
beach, swimming	<u>25.4</u>	<u>11.1</u>	<u>23.9</u>	<u>22.2</u>
construction	<u>4.5</u>	<u>7.4</u>	<u>19.4</u>	<u>29.6</u>
board games	37.3**	51.9**	35.8*	22.2*
homework	55.2**	51.9**	37.3*	25.9*
meals together	41.8**	33.3**	47.8**	29.6**
conversation	<u>58.2</u>	<u>63.0</u>	<u>61.2</u>	<u>51.9</u>
shopping	35.8*	44.4*	<u>19.4</u>	<u>3.7</u>
wrestling	<u>1.5</u>	<u>0.0</u>	<u>13.4</u>	<u>25.9</u>
walking	22.4*	11.1*	19.4*	3.7*
museum visit	<u>6.0</u>	<u>0.0</u>	<u>9.0</u>	<u>7.4</u>
skiing/snowboarding	<u>0.0</u>	<u>3.7</u>	<u>0.0</u>	<u>18.5</u>
hiking	<u>1.5</u>	<u>7.4</u>	<u>14.9</u>	<u>22.2</u>
hunting/fishing	<u>0.0</u>	<u>0.0</u>	<u>9.0</u>	<u>11.1</u>
camping	<u>0.0</u>	<u>3.7</u>	<u>4.5</u>	<u>7.4</u>

(** = 0.000; * = 0.001; underlined values: 0.001 < p < 0.005)

One outstanding value was found for fathers, which appeared among both male and female students (*conversation: female students: 61.2%, male students: 51.9%*). However, high values were observed for board games, homework and joint meals, with a higher incidence observed among female students in all three cases. This suggests that fathers may be more involved in their daughters' upbringing and schooling. Apart from the four joint activities listed above, the values for fathers were not remarkable, suggesting mothers' greater involvement in their children's lives compared to fathers.

When tabulating the activities encouraged by the parents, we observed that football and basketball were frequent for male students, whereas dance and music lessons, in addition to religious education, drawing clubs and choirs, were common for female students. These findings suggest parents' prioritization of sports for boys and the focus on "feminine" activities established throughout centuries for girls. The data reveal parents' preference towards traditional, gender-typical options in their children's leisure activities.

Table 6. Activities encouraged by the parents by gender (n=94 – author’s calculations)

Activities encouraged by the parents by gender (n=94)		
Activities	female students	male students
football	3.0*	40.7*
dance	53.7**	22.2**
athletics	<u>10.4</u>	<u>22.2</u>
basketball	<u>19.4</u>	<u>37.0</u>
religious education	43.3*	14.8*
fishing	7.5*	25.9*
book club	<u>23.9</u>	<u>3.7</u>
mathematics club	<u>22.4</u>	<u>25.9</u>
chess	<u>31.3</u>	<u>25.9</u>
music education	58.2**	29.6**
drawing club	41.8**	11.1**
handball	<u>9.0</u>	<u>14.8</u>
majorette	22.4*	0.0*
table tennis	<u>4.5</u>	<u>0.0</u>
choir	32.8*	3.7*
martial arts	<u>4.5</u>	<u>29.6</u>

(** = 0.000; * = 0.001; underlined values: 0.001 < p < 0.005)

For both male and female students, mothers were found to expect more from their children than fathers. For female students, both parents expected good grades, but among male students, this was only true for mothers. Fathers expected their children to be strong regardless of gender, but sport only appeared as common expectation for boys. For girls, expectations in relation to going to university, getting a good job/career and earning a lot of money dominated. Expectations of starting a family (*getting married, having children*) did not differ by the parents’ and students’ gender. According to students’ perceptions in the table, parents’ main priority for their children was to have a stable career rather than to start a family. In addition, mothers’ emotional expectations also emerged: for girls, *being open and social, making friends, being kind and well-liked* were important, which was also observed for boys, but *being successful* was more crucial than making friends.

Table 7. Parental expectations as reported by the students, by gender (n=94 – author’s calculations)

Parental expectations as reported by the students, by gender (n=94)				
Expectations	female students		male students	
	mother (%)	father (%)	mother (%)	father (%)
getting good grades	61.2**	50.7**	59.3**	37.0**
being kind and well-liked	41.8*	29.9*	40.7*	25.9*
making friends	41.8*	22.4*	29.6*	33.3*
being successful	<u>29.9</u>	<u>37.3</u>	40.7**	37.0**
doing sports	<u>19.4</u>	<u>26.8</u>	29.6*	40.7*
being open and social	49.3*	32.8*	11.1*	11.1*
being strong	38.8*	41.8*	<u>14.8</u>	<u>44.4</u>
earning a lot of money in the future	17.9*	20.9*	<u>14.8</u>	<u>14.8</u>
going to university	47.8*	41.8*	44.4*	29.6*
getting a good job/career	<u>26.9</u>	<u>44.8</u>	44.4**	33.3**
getting married	<u>31.3</u>	<u>26.9</u>	22.2*	22.2*
having children	32.8*	31.3*	33.3*	29.6*
being modest and reserved	<u>16.4</u>	<u>6.0</u>	<u>14.8</u>	<u>22.2</u>
being sensitive to the needs of others	<u>16.4</u>	<u>17.9</u>	<u>18.5</u>	<u>3.7</u>

(** = 0.000; * = 0.001; underlined values: 0.001 < p < 0.005)

The next section analyses the responses to our questions on parental involvement.

Table 8. Decisive role in matters concerning education, studies/schooling and finances (p=0,003; n=94 – author’s calculations)

	Decisive role in matters concerning education, studies/schooling and finances (n=94)					
	female students			male students		
	<i>education (%)</i>	<i>studies, schooling (%)</i>	<i>finances (%)</i>	<i>education (%)</i>	<i>studies, schooling (%)</i>	<i>finances (%)</i>
mother/ foster mother	46.3	64.2	37.3	59.3	70.4	33.3
father/ foster father	7.5	11.9	32.8	14.8	18.5	25.9
equally	46.3	23.9	29.9	25.9	11.1	40.7

(For highlighted values, the adjusted residuals are greater than two, while for values in italics, they are less than two.)

As regards education, studies and schooling, mothers were the more common decision-makers for male students, with mothers and fathers being equally influential in female students’ education. For studies/schooling, mothers made decisions for both male and female students. In relation to finances, the mothers’ decisions were the most common. Fathers did not stand out as decision-makers in any of these areas. Education, studies and schooling were dominated by mothers, with equally split decision-making emerging in relation to finances. The literature (Kim & Hill, 2015; Berryhill, 2017) suggests that mothers are more involved in issues affecting their children’s education, display stronger parental involvement and more frequent contact with teachers. Regarding the latter point, our results corroborate the findings in the literature.

Although our research does not extend to the investigation of this factor, an interesting question arises as to the extent to which parental educational attainment influences support. Csák (2023) demonstrated in his research that fathers with higher educational qualifications are more likely and willing to engage in their children’s studies and education, while those with lower qualifications tend to more strongly identify with traditional gender roles and show reluctance towards participation within institutional frameworks.

Table 9. Contact with teachers by the parents’ and students’ gender (p=0,002; n=94 – author’s calculations)

	Contact with teachers by the parents’ and students’ gender (n=94)			
	female students		male students	
	mother (%)	father (%)	mother (%)	father (%)
weekly	19.4	3.0	22.2	7.4
monthly	17.9	11.9	37.0	14.8
only during parent- teacher conferences	59.7	41.8	33.3	<i>48.1</i>
never	3.0	<i>43.3</i>	7.4	29.6

(For highlighted values, the adjusted residuals are greater than two, while for values in italics, they are less than two.)

For female students, our findings indicate that mothers predominantly engage in regular contact with teachers, encompassing monthly and weekly interactions, alongside participation in parent-teacher conferences. In contrast, fathers, in most cases, opt for involvement solely during parent-teacher conferences or choose not to initiate contact. Interestingly, a comparative analysis reveals that fathers of male students exhibit a higher propensity to attend weekly or monthly meetings compared to fathers of female students. According to Bogenschneider (1997), mothers are more involved in the academic life of male children compared to female children, which our results seem to confirm. This may be because girls are often more successful academically and have fewer behavioral problems (Fényes, 2009), so the parents’ presence in their children’s education is not always necessary, while the opposite is true for boys.

Finally, we considered gender socialization at school and career orientation. In the question on the people influencing career choice, respondents were asked to evaluate the influence on their career orientation on a five-point Likert scale. The analysis is complicated by the fact that for the students in the sample, the degree programs featured both a major and a minor, which were not necessarily selected from the same broad field of study. In

our analysis, we considered students' major as the relevant specialization according to which respondents were categorized. Students majoring in art (n=2) and physical education (n=5) were not examined as their low incidence may bias the results. In an effort to streamline the analysis and maintain a focused exploration of the influence on career choices among students, we have omitted information pertaining to friends and siblings from the tables and text. This decision allows for a more concentrated examination of the pivotal roles played by parents and teachers, providing a clearer understanding of their impact on students' career choices by gender and degree program.

Table 10. People influencing career choice among students by gender and degree program (major) – (n=94) author's calculations

People influencing career choice among students by gender and degree program (major) (n=94)				
female students		mother (%)	father (%)	teachers (%)
foreign language	did not influence me	22.2**	22.2*	22.2**
	influenced me	77.8**	77.8*	77.8**
sciences	did not influence me	25.0**	18.8*	18.8**
	influenced me	75.0**	81.3*	81.3**
humanities	did not influence me	5.0**	30.0*	10.0**
	influenced me	95.0**	70.0*	90.0**
male students		mother (%)	father (%)	teachers (%)
foreign language	did not influence me	16.7**	<u>33.3</u>	16.7*
	influenced me	83.3**	<u>66.7</u>	83.3*
sciences	did not influence me	11.1**	<u>33.3</u>	33.3*
	influenced me	88.9**	<u>66.7</u>	66.7*
humanities	did not influence me	33.3**	<u>55.6</u>	22.2*
	influenced me	66.7**	<u>44.4</u>	77.8*

(** = 0.000; * = 0.001; underlined values: 0.001 < p < 0.005;

For highlighted values, the adjusted residuals are greater than two, while for values in italics, they are less than two)

For further analysis, dummy variables (0=did not influence me; 1=influenced me) were created from four indicators. At the beginning of the analysis, we assumed that orientation towards STEM fields was initiated by parents and later reinforced by teachers. In other words, we expected science students' parents to be especially influential, while for other students, the teachers' influence was assumed dominant. The table shows that teachers had a major influence on students' career orientation irrespective of gender and major (66.7-90.0%). For female students, parents played a major role regardless of the field of study.

Male students of foreign language perceived a large influence for all options. In contrast, humanities students were not influenced by their fathers. Irrespective of the choice of major, mothers influenced male students more than fathers did, which may be related to Bogenschneider's (1997) finding that mothers are more involved in the studies of their children, especially their sons. Our results reveal a significant influence on students from both parents and teachers, with the exception of male humanities students, who were reportedly unaffected by their fathers.

In addition to influential people, we also examined those who the students felt were not in agreement with their choices. Again, we did not examine students of art and physical education.

Table 11. Share of people disapproving of students' career choice by gender and degree program (major) (n=94 – author's calculations)

Share of people disapproving of students' career choice by gender and degree program (major) (n=94)				
female students		foreign language	sciences	humanities
	mother	<i>11.1*</i>	12.5**	<u>20.0</u>
	father	18.5*	6.3**	<u>20.0</u>
	teachers	22.2*	18.8**	<u>10.0</u>
	nobody	37.0*	43.8**	35.0
male students		foreign language	sciences	humanities
	mother	50.0**	<u>22.2</u>	<u>0.0</u>
	father	<i>16.7**</i>	<u>0.0</u>	<u>0.0</u>
	teachers	16.7**	33.3	44.4
	nobody	50.0**	<u>22.2</u>	<u>44.4</u>

(** = 0.000; * = 0.001; underlined values: $0.001 < p < 0.005$;

For highlighted values, the adjusted residuals are greater than two, while for values in italics, they are less than two.)

Most students found that there was nobody who disapproved of their career choice, with the exception of male students, among whom humanities students indicated disapproval from their mother, students of foreign languages from their teachers and science students from their teachers. These data suggest that female students may have a more supportive background environment than male students.

Our measurement tool asked students whether they perceived a difference in teachers' attitudes by gender. If so, respondents were given several alternatives to specify the perceived areas of difference.

Table 12. Perceived differences in teachers' behavior and expectations towards girls and boys

(n=94 – author's calculations)

Perceived differences in teachers' behavior and expectations towards girls and boys (n=94)		
	female students (%)	male students (%)
very often/often	47.7**	48,1*
rarely	40.3**	25.9*
never	11.9**	25.9*
Total	100.0	100.0

(** = 0.000; * = 0.001)

Based on the table, it can be determined that a significant percentage of both male and female students (females: 47.7%, males: 48.1%) frequently or very frequently perceived discrimination from teachers based on their gender.

In terms of the results, gender differences are also observable: while we obtained approximately equal values for the options of very frequently/rarely, there is a noticeable difference in the rarely option (female students: 40.3% – male students: 25.9%). From this, we can infer that female students are more sensitive to teacher discrimination than males. This is supported by the "never" option, where a higher percentage of males (25.9%) felt that they had never experienced different behavior from their teachers. These data suggest that gender-based discrimination persists in education to this day, although global efforts have been identified for its elimination. One limitation of our findings is that the responses do not reveal at which level of education discrimination is most perceptible. Therefore, this emerges as a future research goal.

In their research conducted in 2017, Mehring-Tóth and Vámosi pointed out that the majority of male teachers they surveyed accept traditional social roles, thus not taking steps to promote gender equality. In this regard, it is thought-provoking to consider to what extent male students participating in our study will take actions to minimize gender differences – although our results indicate that they themselves perceive differentiated treatment and expectations from educators.

Table 13. Areas of differences observed n=94 – author’s calculations)

Areas of differences observed		
	female students (%)	male students (%)
academic evaluation	47.8**	<i>29.6**</i>
evaluation of behavior	53.7*	<i>44.4*</i>
frequency of contact	<i>17.9**</i>	25.9**
quality of the relationship	<u>31.3</u>	<i>22.2</i>
frequency of compliments	<u>32.8</u>	<i>18.5</i>
frequency of punishment	<i>25.4</i>	33.3
stricter with boys, more permissive with girls	<i>14.9*</i>	37.0*
stricter with girls, more permissive with boys	32.8**	<i>18.5**</i>

(** = 0.000; * = 0,001; underlined values: 0.001 < p < 0.005;

For highlighted values, the adjusted residuals are greater than two, while for values in italics, they are less than two)

In terms of the perceived differentiation, female students chose several options in larger proportions than male students, namely academic evaluation, the evaluation of behavior, the quality of the teacher-student relationship and the frequency of compliments. Men highlighted the perception of behavior and the frequency of punishment. Less unexpectedly, gender differences emerged in terms of who teachers were stricter with: women found teachers to be stricter with girls, while men perceived teachers to be stricter with boys.

Summary

In this study, we examined selected gender differences among teacher education students. In our research, we first attempted to gain insight into the Hungarian and international literature on children’s gender role attitudes, gender socialization and career orientation. In analyzing the findings, we found conflicting views on teachers’ influence complementing the parents’ impact: while some researchers argue that teachers exert an influence on students’ development, others find that this influence is limited or non-existent. In our research, we conducted a pilot study among teacher education students at three Hungarian universities. The questionnaire was completed by 94 students. We grouped our questions into three dimensions: (1) gender socialization in the family, (2) parental involvement in the child’s education, (3) gender socialization at school and career orientation. In each of these areas, we examined differences and similarities by the students’ and parents’ gender.

Our results revealed gender differences in the way teacher education students were treated as children by their parents and teachers. Our first research question concerned gender differences in teacher education students’ gender socialization in the family. The data obtained show that both students and parents chose activities according to traditional gender role expectations. Some differences emerged as regards the choice of toys: female students and parents of both genders displayed gender-neutral choices, with male students selecting toys according to their gender. Our second question focused on parents’ involvement in their children’s education. Our results show mothers’ greater involvement compared to fathers regarding education, schooling and attendance of parent-teacher conferences, regardless of the child’s gender. Female students’ parents had contact with teachers mostly during parent-teacher conferences, whereas male students’ parents usually had monthly contact – a phenomenon explained by Fényes (2009) in her study with girls’ fewer behavioral problems and consequently the reduced need for parental involvement in their education. Our third question concerned the perception of teachers’ gender differentiation and the influences on career choice by gender and field of study. Since the analyzed undivided degree programs featured both a major and a minor, we considered students’ major as the relevant specialization according to which respondents were categorized. Students majoring in art and physical education were not examined due to their infrequency. Our results reveal parents’ and teachers’ sizable influence on all students, regardless of major. The importance of mothers’ influence was observed for male students. Female students noted differences in teachers’ attitudes in several areas (academic evaluation, the evaluation of behavior, quality of teacher-student relationships and frequency of compliments), while male students only highlighted differences in the evaluation of behavior and frequency of punishment. This suggests female students’ greater sensitivity towards discrimination, perceived or real.

Our results do not allow us to form definitive conclusions but highlight that parents and teachers play a significant part in teacher education students' gender role attitudes and career choice. Answering the research questions helps us in formulating hypotheses that can be further tested and refined on a larger and representative sample.

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