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MATH ANXIETY AND MATH ACHIEVEMENT AMONG PALESTINIAN PRIMARY SCHOOL-AGED CHILDREN: GENDER DIFFERENCES IN ASSOCIATION WITH PARENTS' MATH GENDER STEREOTYPES

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Abstract
Since Mathematics is a compulsory discipline in the primary cycle and a large body of studies reported higher levels of math anxiety compared with another disciplines. The present research aims to find some possible explanations for this phenomenon by exploring the levels of math anxiety, math achievements, and gender differences among Palestinian children next to their parents' math gender stereotypes. It also examines the potential relationship between parents' math gender stereotypes and both children's math anxiety and children's math achievements. Our sample consisted of 230 students in the 3rd and 4th grades (Mean age = 8.9; SD =.59), including one parent of each child. The Scale for Early Math Anxiety (SEMA) and The Gender Stereotype Scale toward Mathematics were used for data collection. Our results confirmed significant differences in math stereotypes as a function of child gender, in addition to significant gender differences in children's math anxiety. Thus, girls reported higher levels of math anxiety, while no significant gender differences were found in children's math achievements. Also, no significant association was found between parents' math gender stereotypes and children's math anxiety and achievements.

Keywords: math anxiety; math achievement; gender differences; gender stereotypes

Despite its importance and robust presence in our daily life, mathematics is often viewed as a complicated, difficult, and preferably avoided subject (Ramirez et al., 2018). Math-related fears represent a worldwide phenomenon affecting all age groups and have been collectively termed "Math anxiety" (Hembree, 1990; Ma, 1999). Math-anxious students may achieve less in mathematical tests (Devine et al., 2012), and tend to avoid math-related activities and careers (Casad et al., 2017) such as science, technology, engineering, and mathematics (STEM) domains

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(Brown & Stone, 2016; Maloney & Beilock, 2012). Women are even more vulnerable to developing math anxiety (Foley et al., 2017), and STEM avoidance due to the gender stereotype threat consisting of a commonly shared view of math as a male domain (Carey et al., 2017).

Math anxiety

Math anxiety refers to a set of psychological and affective symptoms that arise during the execution of math tasks or in math-related situations, such as negative emotions, fear, and stress (Hembree, 1990; Maloney et al., 2013). Math anxiety manifestations are not limited to emotional responses, but also to the cognitive and physiological reactions such as negative thoughts and worries or physical indicators like sweating, accelerating heartbeat, dizziness (Chang & Beilock; 2016; Rubinsten et al., 2018; Xie et al., 2018). Math anxious individuals may think they are less competent and they aren't qualified enough, therefore, they will start to avoid math classes, any activities related to mathematics, or any situations that require mathematical skills. These consequences will affect their academic achievements and their future orientations (Ashcraft, 2002; Popa et al., 2019; Shen et al., 2018). Many studies emphases on the negative impact of math anxiety on math achievements (Luttenberger et al., 2018, Rubinsten et al., 2018; Wilder, 2013).

Math anxious students achieve less in mathematical examinations compared to their non-anxious counterparts (Bruno, 2015; Ramirez et al., 2018; Tufeanu & Robu, 2019). The negative association between math anxiety and math performance was confirmed by Hembree's (1990) and Ma's (1999) meta-analysis and several studies later, such as Cipora et al. (2015), Devine et al. (2012), Radišić et al. (2015), and Rubinsten et al. (2018). Also, Schillinger et al. (2018) confirmed a negative correlation between the higher-order mathematical skills such as logarithms or algebra and math anxiety.

Gender anxiety

Gender differences between females and males in math competence and math anxiety are ones of the most investigated areas in this field, with several studies reporting that females are more anxious than males in math-related situations (Ashcraft, 2002; Else-Quest et al., 2010; Hembree, 1990; Ho et al., 2000; Hopko et al., 2003). Women express higher levels of math anxiety compared to men, yet despite that, they perform better in mathematics tasks and math tests (Devine et al., 2012; Petruț & Visu-Petra, 2020; Schnell et al., 2013; Xie et al., 2018). For instance, Frenzel et al. (2007), Devine et al. (2012), and Huang et al. (2019) findings confirmed the gender differences in math anxiety, although there were no gender differences in math achievement, girls reported higher levels of math anxiety. In 2012, as stated by the Program for International Student Assessment (PISA) boys significantly outperformed girls in the mathematical test, while girls reported stronger math anxiety than boys. It

was proposed that the gender gap in mathematics is associated with gender equality and stereotyping within these countries (OECD, 2012).

The differences in mathematics performance and math anxiety have been attributed to the gender role and socialization theory, which proposes that girls are socialized to be tolerant, tender, collaborative and more willing to express their feelings compared to boys, while boys are socialized to be assertive, independent and competitive (Heyder & Kessels, 2013; Ongiti, 2014). The gender-role identification also leads to gender differences in personal values and occupational choices, for example, young men place a higher value on making money and occupying a position of power, while females place more value on the importance of having a career that allows them to play their gender role, for instance, housekeeping tasks (Eccles, 2009).

In addition, males link their achievement to future opportunities and outcomes, while girls don't perceive this link according to the limited offers provided to them, thus girls tend to avoid mathematics-related domains that they perceive to be less worthwhile. (Else-Quest et al., 2010; Casad et al., 2017). These gender differences in the workforce and opportunities offered for both genders reflect gender inequity in several areas, which are associated with gender differences in mathematics achievement, math anxiety, and stereotype threats (Nosek et al., 2009; Tenenbaum & Leaper, 2003).

Gender stereotype threat

Stereotype threat refers to the conscious or unconscious belief or the absolute persuasion that someone belongs to a stigmatized group known for certain deficits (Muntoni & Retelsdorf, 2019; Steele & Aronson, 1995; Stoet & Geary, 2012). Most theoretical approaches assumed that stereotype threats and gender-role socialization represent major factors that explain the gender gap in mathematics. Both math anxiety and stereotypes threat induce insufficient achievement in mathematics (Anbar & Visu-Petra, 2021; Picho & Schmader, 2017). For many years mathematics has been viewed as a male-predominant domain (Bieg et al., 2015; Tiedemann, 2002). The common stereotypes that men are naturally talented in math and more interested in math-related activities influence math achievements and career orientations in both genders (Nosek et al., 2009). For example, women who endorse such stereotype: 'math = male'' reported less interest in math and science, and are less likely to be involved in future math courses or related activities (Tenenbaum & Leaper, 2003). In fact, females' math performance is disrupted not because they are incompetent but due to threatening situations and the possibility that their performance will confirm the gender stereotype and the assumption of math as "a male domain" (Tomasetto et al., 2011).

The environment where the individual lives, the cultural norms, and the community members such as parents, friends, peers, and teachers are considered an important and a strong factor in the socialization mechanism (Ongiti, 2014). Children spend most of their time at home or school and are deeply affected by interactions with family members, teachers, and peers, thus the environmental and cognitive context established by these interactions is none ignorable (Rubinsten et al., 2018). Thus, parents are considered role models for their children and, children likely tend to embrace the attitudes, beliefs, values, and emotions of their parents (Soni & Kumari, 2017). Parents' academic values could be transmitted to their children through school educational activities or through direct and indirect home educational activities (Gniewosz & Noack, 2012). As a consequence, parents can enhance their children's math achievement by simply supporting positive math attitudes. Therefore, it is not surprising that math-avoiding behaviors stem from negative attitudes in both parents and children (Pugsley & Price, 2018).

Parents may support the belief that mathematics is a "male-specific" domain by means of explicit or implicit messages (e.g., clear comments and feedback regarding gender differences in math abilities, homework monitoring of their daughters more than their sons or gifting their daughters a kitchen tool or a doll, whereas buying their sons mechanic tools). Such gender stereotype endorsement behaviors, certainly affects their children attitudes toward math (Tomasetto & Appoloni, 2013; Tomasetto et al., 2011).

Moreover, parents' math gender stereotypes, their expectations, and their attitudes towards mathematics have a critical influence on their children's math attitudes and the self-concept they have (Bhanot & Jovanovic, 2005; Else-Quest et al, 2010), and significantly impact children's math achievement and their participation in math activities (Bhanot & Jovanovic, 2005; Kleanthous & Williams, 2010; van der Meulen et al., 2014). Based on several empirical research investigating gender stereotypes, the link between the sociocultural parties and children's math anxiety has been documented (Chang & Beilock, 2016).

A meta-analysis concerning the effects and attitudes toward mathematics reported that young adults aged between (11 to 25 years) identify math as a male domain (Flore & Wicherts, 2015). Gender stereotypes related to the professional fields are seen as a consistent and strong predictor of the gender gap in the attitudes toward mathematics and math achievement, so when girls grow up in a societal context where women occupant positions in scientific fields, they automatically receive a clear message that STEM fields are within the possibilities for them. Conversely, when girls' mothers, sisters, or females, in general, are not involved in STEM careers, they will perceive that the STEM fields are male domains and they will feel more anxious about math, underachieve in math

assessments, will avoid math-related activities (Else-Quest et al., 2010; Maloney et al., 2013; Picho & Brown, 2011).

In the Palestinian community

According to the Trends in International Mathematics and Science Study (TIMSS) data (2003), Palestinian students' performance in mathematics is below the lowest International Benchmark, with the same results being reported in 2007 and 2011. Moreover, in the 2003 TIMSS edition was found that 33% of the Palestinian students reported a moderate level of liking math, while in 2011, 26% of the students endorsed the following statement, "I don't like math". On the other hand, according to the results of the international men and gender equality survey, Palestine represents a predominantly masculine community and displays inequitable gender attitudes. For instance, 87% of women stated that Palestinians need to do more to promote the equality of men and women, while 80% of men believe that "woman's most important role is to take care of the home and to cook for the family", moreover, 83% of men reported that "when work opportunities are scarce, men should have access to jobs before women" (Women, U.N., 2017).

Also, as reported by the Palestinian Statistical Center (2017), 21% of graduates in educational sciences were females, compared to 6.5% of male counterparts, while in engineering branches females represented only 3% of graduates, compared to 9% of male counterparts. Also, as it was reported by the Palestinian Statistical Center, girls outperformed boys in the annual national assessment in Math and science and in the high school examinations. Disparities in math achievements favoring girls have also been documented in the last 3 cycles of TIMSS and despite the that, girls have higher achievements in math tests, they are still underrepresented in STEM fields.

The current study

Based on the arguments presented above, it can be stated that math anxiety has a negative impact on the individual's mathematical skills, leading to lessen math achievement and math avoidance, and affecting career choice pathways. A plausible reason for the poor math achievements of the Palestinian students in the international tests, and for females' insufficient contributions in math-related fields might stems from their worries and negative emotions toward mathematics, in addition to the common belief that math is the males' domain.

This research extends the previous literature related to the relationship between children's math performance and their math anxiety in several directions. Along this line, the current study aimed to investigate parent's gender stereotypes regarding math domain and their relationship with their children's math anxiety and math achievement. Moreover, the

research explores Palestinian children's math anxiety and math achievement and examine the gender differences in both math anxiety and math achievement.

Study's hypothesis:

H1: We predicted girls would report higher levels of both math anxiety, and math achievement.

H2: We predicted significant differences in parents' math stereotypes as a function of child gender.

H3: We predicted associations between parents' math gender stereotypes and both child math anxiety and math achievement, such that parents' math gender stereotypes will correlate positively with child math anxiety and negatively with child mathematics achievement.

Method

Participants

The participants in the present study were 230 students from four primary schools in Palestine (Mean age = 8.9 years; SD = 0.59 Years). A priori power analysis (G*Power 3.1; Faul et al., 2009) was conducted to establish the minimum sample size needed. For a moderate effect size ($f2 = .50$), (two-tailed) $\alpha = .05$, $1\text{-}\beta = .80$, total sample size of 128 participants was required. Out of the total sample, 104 participants (37 boys, 67 girls) were in the third grade while, while 126 (42 boys, 84 girls) participants were in the fourth grade. All children were Palestinian and Arabic language was their mother tongue. Most children had a middle-class background, with 88.8% of parents earning the average to above-average wage per capita. 37.4% of the mothers; 25.3% of the fathers have at least a high-school diploma, while 15.7% of mothers and 13.5% of fathers had a college diploma. 26.1% of mothers and 15.2% of fathers had a university degree (e.g., bachelor's, master, or doctorate). For simplicity, we use the word "parents" to refer to their status as mothers or fathers. The parent's sample (N=230) was composed by 58 fathers (25.2%) and 172 mothers (74.8%).

Measures and procedure

Children Math anxiety. The Scale for Early Math Anxiety (SEMA) (Wu et al., 2012) was used. This is a 20-item self-report questionnaire, having the first 10 items assessing the anxiety related to numeral processing and the last 10 items assessing situational and performance anxiety. The children indicate how anxious they would feel "tell me how nervous answering that question makes you feel, so remember, you do not actually have to answer the questions, but I just want you to pretend you are going to answer them and see how it makes you feel". (e. g., "George bought two pizzas that had six slices each, how many total slices did George have to

share with his friends? ", "you are in class doing a math problem on the board"). Items were rated on 5-point scale to indicate how nervous would feel children during certain situations involving math. (1 = I don't feel nervous at all, 2 = a little nervous, 3= somewhat nervous, 4 = very nervous, 5 = extremely nervous). The total score range is from 20 to 100, while the range of each subscale is from 10 to 50. A higher summed score indicates greater math anxiety. In the present sample, this scale had good reliability, Cronbach's alpha = .87.

Children Math achievement. For students' math achievement, we used the teachers' evaluation math's record. These records represent student's final performance in math subject at the end of the first school semester. The marks scale range was 0-100.

Parents math's gender stereotype. For measuring parents' gender stereotype regarding math domain, the Gender Stereotype Scale toward Mathematics (Nurlu, 2017) was used, the scale consists of 34 items distributed in two subscales: Boy's form and Girl's form. A 5-point Likert scale was used to measure parents' accordance (1= strongly disagree to 5= strongly agree) with the 34 statements about gender stereotypes toward mathematics. Both forms of the scale have adequate reliability, Cronbach's alpha value for boys' form was .91, and for girls' form was .91.

Each form has four subscales: environments (e.g., "Boys are expected more than girls to do well in mathematics by their parents"), career (e. g., "Boys are encouraged more than girls to choose a career in a mathematically-related area"), attribution (e.g., "Boys mostly increase their mathematical achievement, because of the support of their teachers") and competence (e.g., "Boys have higher mathematical thinking abilities than girls have"). Items distributions are presented in Table 1.

Table. 1. Items' distribution of each scale

Items	Environment	Career	Competence	Attribution	Total
Boys form	4	4	6	3	17
Girls form	3	3	8	3	17
Total items	7	7	14	6	34

Results

Descriptive results are presenting in tables below. Children's math anxiety and math achievement according to gender are presented in Table.

2. Parents' math gender stereotypes for each subscale as a function of child gender are presented in Table. 3.

Table 2. Means and standard deviations for children's measures as a function of gender

	***N* = 230**	**Boys (*n* = 79)**	**Girls (*n* = 151)**
Math anxiety	29.09 (10.32)	26.92 (8.36)	30.20 (11.07)
Math achievement	84.70 (12.12)	85.99 (11.81)	84.02 (12.26)

Table 3. Means and standard deviations for Parents' math stereotypes as a function of child gender

	Boys (*n* = 230)	Girls (*n* = 230)
Parents' math gender stereotypes (Total)	43.25 (11.09)	47.97 (11.09)
Parents' math gender stereotypes (Environment)	9.32 (2.90)	8.00 (2.63)
Parents' math gender stereotypes (Career)	10.82 (2.96)	7.87 (2.33)
Parents' math gender stereotypes (Competence)	15.49 (4.62)	23.88 (6.11)
Parents' math gender stereotypes (Attribution)	7.61 (2.26)	8.21 (2.42)

The descriptive results from Table 2 revealed that girls had higher levels of math anxiety (M = 30.2, SD = 11.07) compared to boys, (M = 26.9, SD = 8.36), while in math achievement girls reported very close values (M = 84.02, SD = 12.2) compared to boys, (M = 85.99, SD = 11.8). The results in Table 3 showed that parents' math gender stereotypes in favor of girls were higher (M = 47.97, SD = 11.9) compared to boys (M = 43.25, SD = 11.09).

Correlations among study variables

Pearson's correlations revealed a negative correlation between children's math achievement and their math anxiety (r = -.25, p =.00). No significant association was found between parents' math gender stereotypes and children's math anxiety or between parents' math gender stereotypes and children's achievements (see Table 4).

Table 4: Correlations among study variables

	Measures	**1**	**2**	**3**
1	Math anxiety	-		
2	Math achievement	-.25**	-	
3	Parents' math gender stereotypes (Boy's form)	.00	.02	-
4	Parents' math gender stereotypes (Girl's form)	.00	.06	.49**

Note. **p < .001

Gender differences

A significant gender-related differences were found in children's math anxiety, $t(228) = -2.32$, $p = .021$ with a moderate effect size, Cohen's $d = .33$, revealing that girls reported higher levels of math anxiety (M = 30.2, SD = 11.07) compared to boys, (M = 26.9, SD = 8.36). No significant gender differences were found in math performance, $t(228) = 1.34$, $p = .18$. In addition, a significant gender differences were found in parents' total score for math gender stereotypes, $t(229) = -6.16$, $p = .00$ with a moderate effect size, Cohen's $d = .41$. The analysis of each subscale reveals the same differences (for the environment subscale, $t(229) = 6.36$, $p = .00$ with a moderate effect size, Cohen's $d = .47$; for the career subscale, $t(229) = 15.25$, $p = .00$ with a large effect size, Cohen's $d = .1.10$; for the competence subscale, $t(229) = -20.56$, $p = .00$ with a large effect size, Cohen's $d = 1.54$, and for the attribution subscale, $t(229) = -3.66$, $p = .00$ with a small effect size, Cohen's $d = .25$).

Discussion

The current study has investigated parents' math gender stereotypes and their relationship with children math anxiety and children math achievement. In addition to the levels of math anxiety among primary school students, we examined the gender differences in both math anxiety and math achievement, and we explored the relation between math anxiety and math achievement. The main findings confirm significant differences in parents' math stereotypes as a function of child gender, and significant differences in children math anxiety with higher levels of math anxiety among girls. No gender differences were found in math achievement. Also, a negative relation between children's anxiety and their math achievement was found. Next, we will discuss these results, integrating them into the existing literature on factors increasing math achievements and enhancing women's participation in the STEM fields. Our results suggest that while the subjective assessment of anxiety differs between girls and boys and that parents mirror this assessment; the actual achievement does not reveal the same gender-specific pattern. In the discussion below, we address our main research arguments, presenting Parents' Math gender stereotypes levels and gender differences, the levels of Math anxiety and Math achievement among Palestinian children and gender difference and Congruence between children's and parents' measures.

Parents' Math gender stereotypes

Significant differences were found in parents' math gender stereotypes as a function of child gender, and these differences were also

found in all subscales (environments, career, attribution and competence). Flore and Wicherts's (2015) meta-analysis are in line with our results by identifying math as a domain for male. These gender disparities are reflecting the power of adults' stereotype as threats in the children' socialization process (Kurtz-Costes et al., 2008).

Our results showed that there are gender differences in parents' math stereotypes in favor of boys in the environment and career subscales, while there are gender differences in parents' math stereotypes in favor of girls in the competence and attribution subscales. In other words, the mean values were found to be significantly higher for boys in the subscales of environment and career, the assumptions frequently endorsed by the parents were: "boys are encouraged more than girls to choose a career in a mathematics related area" or "boys are expected more than girls to do well in mathematics". Also, the mean values were found to be significantly higher for girls in the competence and attribution subscales. Examples of items for this result "Girls have higher mathematical thinking abilities than boys have or "girls mostly increase their mathematics scores because their parents provide them with mathematical support". Regarding the environmental and the career orientations, parents are more supportive to their sons than their daughters. Sons are seen as more willing than girls to work in mathematically related areas and they are expected to outperform in math-related fields compared to girls. Although parents admit their daughters' math competence and admit girls' outperforming in math, they still believe that this is coming from other sources like parents' or teachers' support or studying longer hours, not from their own abilities. which is confirming the assumption of math as male domain (Batchelor et al., 2017). Moreover, Arab countries have a larger gender gap due to cultural reasons, common beliefs regarding mathematics, and stereotypical gender roles. In Arabic communities, it is common to see boys and girls treated differently, with girls expected to take on traditional household roles when they grow up, as housewives or mothers, and if they are encouraged to work, their suitable jobs that do not require late working hours or night shifts, while masculine tasks such as many tasks considered the domain of males (Rapp, 2015).

Due to these common stereotypes threat, girls' aspirations and performance are negatively affected, and they are discouraged to make a part in the STEM domains, limiting their chances of active participation in the global workforce market (Ongiti, 2014). According to social theory, when girls grow up in a societal context where women are rarely being involved in STEM careers, they receive a clear message that these fields are a male domain and therefore, feel anxious about math and are less confident about their mathematical abilities, hence they are less likely to get involved in careers related to these fields (Else-Quest et al., 2010).

Math anxiety among Palestinian children

Our results showed significant gender differences in math anxiety, girls reported higher scores of math anxiety, compared to boys. Our findings are consistent with previous studies conducted in China, Poland, and England (Devine et al., 2012; Schnell et al., 2013; Xie et al., 2018). Also, our findings are in line with the many previous research such as Hembree's (1990) meta-analysis, Carey's et al. (2017) findings among British students and Balogˇlu and Koçak (2006) investigation among American college students.

Another study was conducted by Ho et al. (2000) among sixth-grade students from the USA, China, and Taiwan, the results revealed that there are significant gender differences in math anxiety levels among Taiwanese, girls reported higher scores of math anxiety. While no math anxiety gender differences were found among Chinese and American students. Our results also didn't confirm findings by Birgin et al. (2010), Chiu and Henry (1990), Newstead (1993), Tapia and Marsh (2004), and Tufeanu and Robu (2019), who reported no significant differences between boys and girls in math anxiety levels.

One potential explanation for girls experiencing greater levels of math anxiety than boys stems from the gender differences in socialization practices and gender roles. In particular, females are socialized to express their feelings and emotions easier than men, this may result in the inclination for women to admit their fears and worries more than men do (Devine et al., 2012; Kavanagh et al., 2016). Another plausible reason for the gender disparities in math anxiety results from the traditional belief of math as a male domain, females socialized to perceive their mathematical skills as less competent and therefore they tend to avoid mathematical activities (Muzzatti & Agnoli, 2007). It was expected from girls in this study to report higher levels of math anxiety compared to boys, according to the Arabic culture that imposes such gender roles, where girls are raised to be cooperative and sensitive, while boys are to be independent and tough, which may lead them to report lower levels of math anxiety, hence not surprisingly, females are more willing to admit their worries and anxieties (Kavanagh et al., 2016).

Math achievement among Palestinian children

Although our results revealed that girls were more math anxious than boys, no significant gender differences in math achievements were documented. This result is confirming several previous findings suggesting minimizing the gender gap in mathematics performance in the last decades, especially among primary school-aged children (Cassady &Johnson, 2002; Devine et al., 2012). In this respect, in 1990 a meta-analysis of 100 studies conducted by Hyde, Fennema, and Lamon revealed that gender differences

in math performance have significantly declined over the years. For example, Schnell et al. (2013) findings revealed there were no significant gender differences in math scores mong German students in the 5th and 6th grades. A possible explanation for girls outperforming in math achievements is that girls are more self-disciplined than boys studying and doing more homework (Duckworth & Seligman, 2006). On the other hand, our results did not confirm previous findings suggesting that males outperform females in mathematics tests and activities (Else-Quest et al., 2010; Erturan & Jansen, 2015; Osborne, 2006). Unfortunately, although many recent studies have shown the gender disparities diminishing across the years (Gunderson et al., 2011; Hyde et al., 2008; Schnell et al., 2013) few girls end up pursuing math disciplines (Eccles, 2009), a tendency noticeable in Palestinian community as well (Rubel & Ehrenfeld, 2020).

Congruence between children's and parents' measures

We also found a negative correlation between children math anxiety and children math performance. In this respect, Hembree's meta-analysis (1990) results confirmed that math anxiety correlates negatively with mathematic achievement and math grades. Later, in 1999 similar finding was confirmed by Ma's meta-analysis. In addition, Schillinger et al. (2018) findings revealed a negative correlation between the higher-order mathematical skills such as logarithms or algebra and math anxiety. Also, Cipora et al. (2015) investigated math anxiety among Polish students, the results revealed a negative association between math grade and math anxiety. Moreover, Schnell et al. (2013) conducted a study among 5th and 6th-grade students of a German school, and the findings confirmed the negative correlation between math anxiety and math performance. Our results did not reveal any significant correlation between parents' math gender stereotypes and children math anxiety or between parents' math gender stereotypes and children's achievements. We justify this result by gender stereotypes awareness at an early age, simply being aware of a negative stereotype is enough to push children to perform under their actual abilities, hence, at a young age, children haven't yet sufficiently developed enough awareness of the stereotypes threat (Flore & Wicherts, 2015). A stronger association between parents' gender stereotypes and children performance is more likely to be found in middle school-aged students rather than primary school-aged students (Kurtz-Costes et al., 2008).

Conclusion

The findings of this study contribute to the growing literature on stereotype threat and the intergenerational transmission of math anxiety by addressing several factors affecting math achievements and women's under-representation in STEM fields. Important factors such as investigating the

levels of math anxiety, gender differences, parents' math gender stereotypes, and the potential association between children math achievement and parents' math gender stereotypes are included. Our findings revealed significant gender differences in math anxiety levels and parents' math gender stereotypes, while no gender differences in math achievements were found. In addition, the study showed that mathematics anxiety level significantly and negatively affects mathematics achievements.

The present study offers an investigation of math anxiety in the Palestinian primary school-aged children, specifically the relation between math achievements and math anxiety and parents' gender stereotypes toward mathematics, and it may contribute to a better understanding of females' under-presence in math-related fields in the Palestinian workforce. We have discussed the theoretical backgrounds and the empirical data we have, in the light of the previous findings and interpretations. We recommend further investigations of cultural-specific and universal barriers to females' participation in the global economy of the 21st century.

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