



The Correlation Between Father Involvement and The Academic Achievement of Their Children: Meta-Analysis

Nataša Lazović^{1*} , Jelena Krulj² , Slađana Vidosavljević³ , Emilija Marković⁴ 

¹Faculty of Teacher Education Prizren – Leposavic and Faculty of Sciences and Mathematics, University of Pristina – Kosovska Mitrovica, e-mail: natasa.mladenovic@pr.ac.rs

^{2,3,4}Faculty of Teacher Education Prizren – Leposavic, University of Pristina – Kosovska Mitrovica, e-mail: jelena.krulj@pr.ac.rs; sladjana.vidosavljevic@pr.ac.rs; emilija.markovic@pr.ac.rs

Abstract: Parental involvement is an important factor in students' achievement, and numerous studies have shown that it increases students' success. As research on father's involvement has become one of the current topics in education today, there is a need to separate the effect exercised by fathers from the overall family one. The aim of this study is to synthesize various studies which have focused on different aspects of fathers' involvement; therefore, a meta-analysis would be an ideal method to create a synthesis of these perspectives and provide one general measure of fathers' involvement effect. Nine studies have been included in the meta-analysis, where fathers' involvement has been operationalized through father's involvement in: education of children at school and at home, psychosocial well-being of children, modelling of behavior and leisure activities. The results show that the total measure of effect size differs from zero after applying the fixed model ($z=13.510$, $p=0.000$) and the random effect model ($z=4.588$, $p=0.000$), that is, there is a statistically significant positive correlation between the involvement of fathers and the academic success of their children. The value of the heterogeneity test ($Q=66.560$, $df=8$, $p=.000$, $I^2=87.981$) indicates that the overall effect can be viewed according to the assumptions of the random effects model. The conducted meta-analysis has confirmed the assumption that fathers' involvement is positively related to children's academic performance.

Keywords: father's involvement, academic achievement, children, meta-analysis.

Introduction

Student academic success is a major concern in many societies. Parental involvement is an important factor in student achievement, and numerous studies have shown that parental involvement increases student achievement (Hoover-Dempsey et al., 2005; Blazer, 2009; Galindo and Sheldon, 2012). However, little is known about the individual contributions of mothers and fathers to their children's education, as most studies have not differentiated between maternal and paternal involvement. Studies that have made this distinction have mostly focused on mothers (Kim and Hill, 2015), although researchers have suggested that fathers also play an important role (Lamb, 1975; Amato, 1994; Sarkadi et al., 2008). Few studies have been done on this topic, and those that have been done are mostly qualitative studies, while there are few studies that can offer quantitative data on the effect of fathers' involvement in children's academic performance (Fan, 2001).

Father's involvement has become one of the more current topics in education today (Coles, 2015). In the small number of studies dealing with fathers' involvement and children's academic success, it is not clear which aspects of involvement are most important (Paquette, 2004).

The very notion of father involvement dates to the 1980s. It is believed to have been conceived between 1984-1987 (Pleck and Masciadrelli, 2004), and in a paper from 1987, Michael Lamb was one of the first to offer the operationalization of this term through three dimensions: interaction (engagement) - availability - responsibility (Lamb, 1987; according to Krampe, 2009). There have also been attempts to define father involvement through 4 dimensions: expectations, interest, school involvement and family involvement (Fagan and Palm, 2004).

*Corresponding author: natasa.mladenovic@pr.ac.rs



There are several basic changes to the father's role over time. First, the changes concern the perception of the father as a parental figure - from the father as the breadwinner of the family, with an emphasis on the material aspect of the role, through the father as a biological necessity, to the father as a parent - in terms of the effects on the development of both the child and the father personally. Also, the concept of the tasks of fatherhood changed - from a father who had the position of moral supervision, to a father who is required to be dexterous in understanding and monitoring the child. Related to this is the change in the concept of fatherhood - from the dominance of the father's goals and the family program intended for the child, to parenthood as a process by which the child's development, characteristics and goals are met, directed and integrated. Considering these changes in the role of the father motivated by the historical context, sociologically oriented scholars describe two social aspects of these changes. One of them is the culture of fatherhood and it includes norms, values, beliefs about a man as a parent. Second aspect is implementation or behavior in the role of father. These two aspects do not necessarily have to be synchronous, and it is assumed that the culture changed (and is changing) faster than the behavior itself as a form of adaptation to changes (Lamb, 2000). Although there is a significant shift from the role of the father as a nurturer to the father as a guardian (Atkinson and Blackwelder, 1993), recent studies indicate that the role of the father in society is still shown to be deficient in various ways compared to the role of the mother as a parent (Phelke et al., 2009). The fact is that the 1990s have been declared the "decade of fathers" which brought with it a major shift in research attention devoted to types of fathers, father involvement, the effects of father presence and involvement, fathers' parenting behavior, father-child interaction, etc. (Tan and Golbderg, 2009). Modern generation of men, often known as "modern fathers", consists of individuals who reject the paternal practices of previous generations, actively and consciously participate in the development of children and spend more time with their children (Gottzen, 2011; Yogman and Eppel, 2022; Trahan and Cheung, 2016). Modern fathers strive to connect with their children, and focus on the emotional aspect (Carrillo et al., 2016). Moreover, fathers more often than mothers describe parenthood as a central part of their identity (Yogman and Eppel, 2022). Interestingly, there is a growing population of activist fathers who are gaining more attention through social media, by writing and reporting on fathers' contributions to child development and their fathering practices today (Scheibling, 2020).

There are multiple conceptualizations of father involvement and attempts to define the father's role in childcare. We will mention some of them. Social-structural approach (father's involvement as an aspect of division of labor), developmental approach (father's involvement as a result of developmental changes and adaptation), father's involvement as a social role (ecological theory), father's involvement as a behavioral aspect of parental identity... When we talk about the assessment of father involvement after overcoming the dichotomy of understanding the father's role as present or absent, the focus of research has become the type of involvement, the time and aspects of father involvement, the nature, reasons and context of father involvement. In this sense, great research and theoretical attention is devoted to the understanding of personal factors that have effects on its optimum solution. Addressing individual development and characteristics as potential determinants of father involvement in childcare has opened several very important domains of potential determinants. Fatherhood is one of the important aspects of family development, too. In addition, it is important to look at fatherhood in the context of society. Employed fathers who have positive emotional experience at work, such as autonomy at work, a sense of belonging to a team and job satisfaction, are associated with a more pronounced emotional closeness with the child, even when the father spends less time with him (Day and Padilla-Walker, 2009). The involvement of fathers has positive effects on children at all ages. The relationship with the father remains significant even in adulthood. The quality of the relationship with the father significantly contributes to life satisfaction, a lower expression of distress in adulthood, regardless of the quality of the relationship with the mother (Amato, 1994; Chung et al., 2020). Long-term effects on adult children's life satisfaction and mental health and better adaptive capacities in adulthood (Lewis and Lamb, 2003) have also been observed in another research. Apart from the children, the father's involvement has a positive impact on his personal development and the development of the family.

Some evidence suggests that fathers are spending more time with their offspring than they did in the past (Lamb, Pleck and Levine, 1985), although these findings are not consistent (Coverman and Shelley, 1986). In any case, most researchers agree that fathers' involvement is important for men themselves, their children, and their wives (Baruch and Barnett, 1986; Easterbrooks and Goldberg, 1984). Fathers who spend more time caring for their children may influence the development of secure attachment (Palkowitz, 1985), and their children benefit from these improved attachments (Lamb, 1975; Lamb, 1980).

School-aged children whose fathers are involved in care, upbringing and education achieve better academic results. They receive higher grades more often, have better quantitative and verbal abilities

(Campbell, 1973; Goldstein, 1984), have higher grade point averages, and generally perform better on tests than their peers (Astone and McLanahan, 1991; Cooksey and Fondel, 1996). Children of involved fathers are more likely to live in homes that are cognitively stimulating (Jeynes, 2007). Also, they prefer to enjoy school, have more positive attitudes towards school, get involved in school-related activities...

Epstein divides fathers' involvement in children's education into six dimensions: parenting (helps the family, provides support, understands child and adolescent development, adjusts the climate in the home to be conducive to learning and development); communication (communicates with children and the rest of the family about school programs, the child's progress, etc.; creates two-way communication between school and home); volunteering (encourages family members to volunteer at school and in the community); learning at home (involves family members in learning at home, doing homework, setting goals, etc.); decision-making (involves the family in decisions about the school the children attend, participates in committees and other school bodies); cooperation with society (Epstein, 2007).

Although expectations regarding fatherhood have increased, the parenting literature is still more focused on mothers. Mothers are believed to be more involved in childcare and education than fathers (Amato, Dorius and Lamb, 2010). The literature related to fatherhood does not offer much material related to father involvement and children's education.

The decision to conduct a synthetic study looking at the effects of father involvement on children's academic performance arose from the lack of meta-analyses on this topic. In the literature, we found at least 10 meta-analyses dealing with the effects of parental involvement on various aspects of children's academic life (Fan, 2001; Jeynes, 2007, 2012; Hill and Tyson, 2009). There are meta-analyses looking at the effects of father involvement on children's cognitive development (Pedersen, Rubinstein and Yarrow, 1979). Also, most authors show more interest in family structure and parental involvement than they do in father involvement (Jeynes, 2015). Likewise, different studies have focused on different aspects of fathers' involvement, and therefore a meta-analysis would be an ideal method to synthesize these different perspectives and provide one general measure of effect.

Materials and Methods

Literature search and criteria for including papers in the meta-analysis procedure

The literature search was conducted during January and February 2022 and included the papers from the English-speaking area. The first database that was searched was Google Scholar using the key words: father involvement + child academic achievement; paternal involvement + child academic success/ grades/ attainment; father parenting + child cognitive outcomes. 43 potentially relevant papers were checked considering the title that indicated the involvement of fathers. A subsequent search using the same/similar keywords was followed by a search of databases and the Science Direct search engine, where 21 potentially relevant papers were found. Three papers that were found by searching through Google Scholar were duplicates. As for the Ebsco database, 5 potentially relevant papers and a Springer link where most of the papers were the same as in previous search engines and databases, and the number of potentially relevant papers was 9. The results of the search carried out in this way yielded 78 potentially relevant titles that could be included in the meta-analysis. An extensive review of the papers that were available (12 papers could not be opened) revealed that in 21 papers there are unclear indicators of academic success of children, and therefore they were excluded from further analysis. Also, 16 papers were the result of a repeated search, 7 papers were not empirical but theoretical, and 14 papers did not contain the data needed to calculate the effect size. Each research and study included in the meta-analysis had to meet the following criteria:

1) In the studies, the following operationalizations were accepted as measures of Father's Involvement, which resulted from the search of primary research and theoretical papers dealing with the involvement of fathers: - father's involvement in children's education from the school aspect (visiting school, participating in school events, visiting school on open-school days and parent-teacher meetings; fathers' involvement in children's education at home (writing homework, helping with learning), father's involvement related to children's psychosocial well-being (conversations with children about their problems, needs, wishes, involvement in their daily life and problems, warmth, openness), father's involvement in modeling and correcting children's behavior, father's involvement in leisure activities (playing with children, watching TV, going for a walk...). Measures of fathers' involvement were self-report questionnaires or questionnaires filled out by children about their perception of fathers' involvement.

2) Grade point average was used as a measure of the academic achievement (performance) of children, provided by children, teachers or parents. Also, variables that were quantified as a measure of

the most frequent grade at school (the most common grade 5, coded as 5) were also included. Studies that assessed children's general cognitive achievement were excluded.

3) The meta-analysis included papers published in scientific journals in English, as well as unpublished sources. The methodological quality of the study was not used as an inclusion/exclusion criterion on this occasion, given that the methodological requirements of the study are based on the existence of descriptive indicators when it comes to the grade point average and correlation when it comes to the involvement of fathers.

4) The Father Involvement variable was separated from other characteristics and variables in the study. For example, if Father Involvement could not be isolated due to operationalization specifics (e.g., Parental Involvement), such a study was not included in further analysis.

5) The imperative when conducting a meta-analysis is that the effect size measures from individual studies are mutually independent, that is, that there is no duplication of data, that is, that the same data are not included more than once in the analysis (Lipsey and Wilson, 2001). We made the decision that if there are multiple measures of father involvement in the study, the mean value of the effect size measure is calculated and that value is treated as the effect size measure in further analysis.

The final number of studies included in the meta-analysis was 9.

Data analysis

Given that the subject of the meta-analysis is the correlation between fathers' involvement and children's academic success, correlation coefficients were used as a measure of the effect size of individual studies and the overall measure of effect size. There was a dilemma whether to apply a fixed or random effects model as a model for calculating the overall effect size measure. Given that the random effects model can be reduced to a fixed model if the variance between studies is close to zero (Bornstein et al., 2009), both random and fixed effect size measures will be conducted. The software used to calculate individual and overall effect size measures is Comprehensive Meta-Analysis - trial version. Regarding the assessment of the existence of the "the file drawer effect", i.e., the bias of the effect size measure in published versus unpublished studies, the graph of the symmetry of the studies around the overall effect size measure and the results of the Trim and fill analysis are presented.

Results

Table 1

Meta-analysis: the correlation between fathers' involvement and children's academic success

Study name	r	95% confidence interval		Z	p
		DG	GG		
Jones	0,400	0,610	0,137	0,003	2,904
Grolnick, Ryan, Deci	0,170	0,278	0,058	0,003	2,968
Tan & Goldberg	0,220	0,354	0,077	0,003	2,992
Bogenschneider	0,240	0,277	0,202	0,000	12,046
McBride, Schoppe-Sullivan	0,040	0,093	- 0,014	0,144	1,460
Paulson	0,410	0,509	0,301	0,000	6,804
Rogers et. al	0,120	0,245	- 0,009	0,069	1,821
Grolnick, Ryan	0,060	0,151	- 0,032	0,201	1,279
Dumka	0,120	0,167	0,073	0,000	4,938
FIXED Model	0,161	0,184	0,138	0,000	13,510
RANDOM Model	0,182	0,256	0,105	0,000	4,588

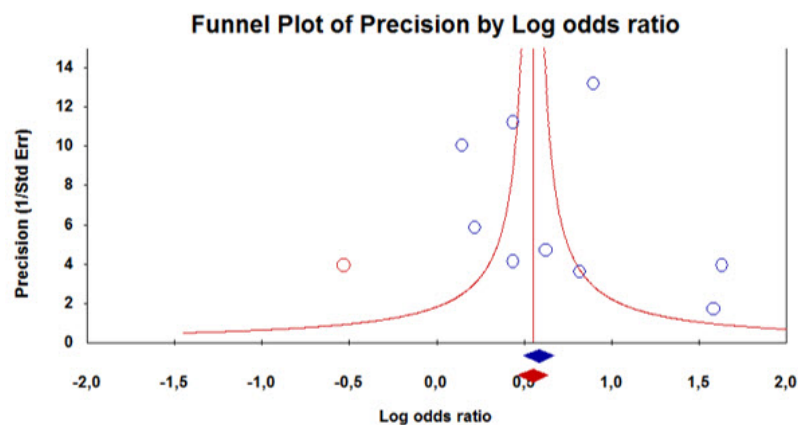
It follows from the above results that the overall effect size measure is different from zero both after applying the fixed model ($z = 13.510$, $p=0.000$) and after applying the random effects model ($z = 4.588$,

$p = 0.000$), that is, there is a statistically significant positive correlation between fathers' involvement and children's academic success.

As for the heterogeneity of the effect size measure, the value of the heterogeneity test $Q = 66.560$, $df = 8$, $p = .000$, $I^2 = 87.981$ indicates that the true/total effect most likely does not vary significantly within the studies themselves, that is, that the data from individual studies can be viewed according to the assumptions of the fixed effect model.

The file drawer effect

The existence of the file drawer effect, i.e., the bias of the studies that were included in the meta-analysis in relation to the study that was not, was also examined, which could have an impact on the overall measure of the effect size. The results conducted so far indicate that the overall measure of effect size does not differ between the random and fixed effects models, so we will present results only for the fixed effects model.



Graph 1. Asymmetry of studies included in the meta-analysis

As we can see from the graph, the studies included in the meta-analysis are not evenly distributed around the vertical axis, but there is a greater concentration of studies on the right side, but considering that this is a very small difference, it cannot be assumed that it is "the file drawer effect" until a larger sample is obtained. Trim and Fill analysis to correct the skewness indicates a lack of 1 study on the left side of the vertical axis (overall effect size measures). By adding these studies, the effect size measure within the fixed model would be $r = 0.15167$ (95% confidence interval = 0.12891- 0.17427), and within the random effects model $r = 0.15406$ (95% confidence interval 0.07322 – 0,23288). The dispersion measure for the fixed model is $Q=66.55990$, and for the random effects model $Q=86.76070$.

Discussion

The main and basic goal of this paper was to summarize the results of several studies and draw general conclusions about the effect of fathers' involvement on children's academic performance. The involvement of fathers has been given a well-deserved position in the scientific research field in recent decades. Many studies examine the effects of father involvement on various aspects of family, partnership, and father-child relationships. During the literature search and the process of defining the problem to be addressed with the meta-analysis, the aspect of fathers' involvement in children's academic performance stood out as a relevant area and as an area on which we could not find available synthetic studies. After the problem was identified, data collection by sampling valid and relevant studies, following the established operationalization, the statistical aggregation of the results of independent studies was started.

The results of the conducted meta-analysis indicate that there is a significant overall effect, i.e., that there is a statistically significant low positive correlation between fathers' involvement and children's academic performance ($r=0.161$, 95%IP = 1.138-1.184, $z = 13.510$, $p = 0.000$ - fixed model; $r = 1.182$. 95%IP = 0.105-0.256, $z = 4.588$, $p=0.000$ – random effects model). The measure of the size of the total effect is significant in both the fixed and random effect models that do not rest on the same assumptions. A fixed effect model assumes that there is a single true effect and all variances are attributed to the study sampling error. The random effects model, on the other hand, assumes that there is a distribution of

true effects and that the variance also comes from individual effects between studies. The heterogeneity test tells us that the overall effect most likely does not vary significantly within the studies themselves. By calculating the “file drawer effect”, we cannot conclude that there is a bias in relation to the selection of studies that will be included in the meta-analysis process. However, it should be borne in mind that 9 studies were included in this analysis, so calculating the symmetry of the distribution of studies using this method is difficult, which is why the results should be interpreted with extra caution.

The meta-analysis that was conducted confirmed our assumption about the positive effect of fathers' involvement on children's academic performance. Children from stable families have the privilege of growing up with both parents by their side, which does not mean that if parents are present, they are really involved in their children's lives (Belsky, 2007; Miller et al., 2020). Primary research on the topic of fathers' involvement has mostly confirmed the assumption that fathers who are involved in raising their children, as well as in their education, raise children who will have better quantitative and qualitative results in school (Bing, 1963; Baker, 2018; Baker, Kainz and Reynolds, 2018). There are many benefits that father's involvement has on children, in addition to academic performance; more self-confidence, a higher sense of responsibility, better capacities for cooperation with adults as well as with peers, all of which contribute to equipping the child with skills and capacities that will facilitate the achievement of high academic success (Hastings and Rubin, 1999). Also, research was done on the subject of father's involvement on the regularity of school attendance (Epstein and Sheldon, 2002) as well as on other behavioral aspects of children related to school that also confirm the importance of father's involvement on positive outcomes. There is longitudinal research that proved big impact of father involvement into educational activities of child on child's cognitive outcomes, too (Cano, Perales and Baxter, 2019).

As it was said in the theoretical section of this research, some papers dealt with the involvement of fathers and the academic success of children, but it was not emphasized which aspects of involvement are the most important (Paquette, 2004; Henry et al., 2020). In this research, we tried to include as many aspects of fathers' involvement as possible: fathers' involvement in children's education related to the school domain (visiting school, participating in school events, visiting school on open-school days and parent-teacher meetings; fathers' involvement in children's education at home (writing homework, helping with learning); father's involvement in children's psychosocial well-being (conversations with children about their problems, needs, wishes, involvement in their daily life and problems, warmth, openness); father's involvement in modeling and correcting children's behavior, fathers involvement in leisure activities (playing with children, watching TV, going for a walk ...).

Conclusions

The aim of this study was the synthesis of different researches which focused on different aspects of father's involvement and their connection with children's academic achievement. After an extensive search, nine studies were included in the final analysis. The hypothesis about the positive effect of father's involvement on children's academic performance was confirmed.

The limitations of this study are reflected in the small sample of primary studies that were used in the meta-analysis procedure (N=9), although on the other hand, this same disadvantage can be seen as an advantage due to the appropriateness, quality and reliability of the data contained in the final selection of papers. In this meta-analysis, there were no restrictions on the geographical area from which the participants come, so we have participants from Europe, but also from other continents (Mexico, Taiwan, USA).

Studies from leading scientific journals were included in the narrow analysis, although this was not the intention of the researchers. This could lead to study selection bias and to the effect of meta-analysis results. In support of these limitations are graphical and quantitative indicators of the “file drawer effect”.

As a recommendation for the next meta-analysis that would address this topic, the moderating influence of some other variables from the domain of personality or family relationships could be considered.

Regardless of the above-mentioned limitations and the fact that the results should be used tentatively, this meta-analytical study can allow parents and experts who work with children (teachers) to understand the importance that father's involvement has on children's development in general, and especially on the academic aspect and academic achievement of their children.

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Conflict of interests

The authors declare no conflict of interest.

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