

# A Narrative Study of Child's Views on Parental Involvement in Math

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**KLJUČNE BESEDE:** matematično izobraževanje, starševska vpletenost, matematične dejavnosti, kvalitativna raziskava, narativni pristop

**POVZETEK** – V tej kvalitativni raziskavi smo uporabili narativno analizo in analizo pripovedi za raziskovanje starševske vpletenosti v matematično izobraževanje z vidika otroka, ki je odraščal ob matematično kompetentnih starših. V okviru narativne analize smo na podlagi otrokove pripovedi o matematičnih izkušnjah in vlogi matematike v njihovem družinskem življenju izluščili ključne dogodke, pripetljaje, dejanja in osebe ter konstruirali zgodbo o njegovih izkušnjah. Analiza naracije je omogočila podrobnejši vpogled v njegove matematične izkušnje in doživljanje starševske vpletenosti na področju matematike. Ugotovitve razkrivajo, kako globoko je lahko matematika vpeta v družinsko življenje, kar prinaša tako prednosti kot izzive. Medtem ko lahko starši, ki so na matematičnem področju močni, pomembno oblikujejo otrokovo izobraževanje, a je to lahko včasih zaznано kot preobremenjujoče, saj matematika prežema številne vidike vsakdanjega življenja. Raziskava izpostavlja pomembnost ustvarjanja okolij, ki spodbujajo matematično raziskovanje in neodvisnost, hkrati pa uravnavajo učne zahteve za preprečevanje stresa. Priporočila za prakso vključujejo spodbujanje integracije matematike v vsakdanje življenje, spodbujanje neodvisnega reševanja problemov in vključevanja perspektive otrok za boljše razumevanje dinamike starševske vpletenosti v matematično izobraževanje.

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**KEYWORDS:** mathematics education, parental involvement, mathematical activities, qualitative research, narrative approach

**ABSTRACT** – In this qualitative study, we utilized a narrative analysis and analysis of narration to explore parental involvement in mathematical education from the perspective of a child raised by parents with strong mathematical backgrounds. Through the narrative analysis, we identified key events, incidents, actions, and people from the child's account of his mathematical experiences and the role of mathematics in his family life, constructing a coherent narrative of his experiences. The analysis of the narration provided a detailed insight into his mathematical experiences and perception of parental involvement in mathematics. The findings reveal how deeply mathematics can be integrated into family life, bringing both benefits and challenges. While parental expertise can profoundly shape a child's education, it may sometimes be perceived as overwhelming, with mathematics pervading many aspects of daily life. The study emphasizes fostering environments that encourage mathematical exploration and independence while balancing academic demands to prevent stress. Recommendations for practice include promoting integrative approaches to mathematics in daily life, supporting independent problem-solving, and incorporating children's perspectives in educational research to better understand the dynamics of parental involvement in mathematics education.

## 1 Introduction

In the realm of mathematics learning and teaching, parental involvement in child's education has gained increasing significance over the past two decades. Numerous studies highlight that active and supportive parental engagement correlates with higher academic performance and a stronger foundation in mathematical skills (Desfor-

ges & Abouchaar, 2003; Cui et al., 2021; Otani, 2020). Moreover, parental involvement significantly influences the affective aspects of learning, including children's attitudes towards mathematics, self-efficacy, and motivation (Fan & Williams, 2010; DiStefano et al., 2020; Hidayatullah & Csíkos, 2024).

While quantitative studies have primarily explored the links between parental involvement and children's mathematical success, attitudes, and development, a growing body of qualitative research offers deeper insights. For instance, Rockliffe (2001) and Remillard and Jackson (2006) suggest that parental involvement strategies are influenced by the parents' mathematical experiences and attitudes, with some parents finding it challenging to support their children's education due to the perceived gaps between their knowledge and current curricula. McMullen and Abreu (2010) found that the parents' mathematical identities, marked by effort, fear, and panic, emphasize the need to foster confidence in mathematics.

The literature indicates that promoting parental involvement is often hindered by the parents' modest mathematical knowledge (Brew, 2001), mistrust in their abilities or negative attitudes towards mathematics (Civil, 2001). However, understanding the dynamics of parental involvement in mathematics requires examining also parents with strong mathematical backgrounds. Antolin Drešar and Lipovec (2017) explored this by comparing mathematician parents to non-mathematician parents. They found that mathematician parents are generally less involved in school-related mathematics but engage extensively in home-based activities, integrating mathematics into daily life and fostering awareness of its functional, logical, and aesthetic values in their children.

In exploring parental involvement in mathematical education, parents, as key actors, represent the richest source of information on the subject. They reveal their attitudes and thoughts on engaging in their children's mathematical education, as well as the ways, frequency, and uniqueness of their involvement (Jay et al., 2018; Wilder, 2017). However, an often overlooked yet crucial dimension of this involvement is the perspective of the children themselves. While research exists on children's views of parental involvement in general (e.g. Thomas et al., 2020; Liu et al., 2022; Clinton & Hattie, 2013), studies focusing specifically on mathematical education from the child's viewpoint are scarce. Understanding children's perspectives is essential for insights into how they perceive and are affected by their parents' involvement.

Despite these findings, a substantial research gap exists in exploring children's experiences with parental involvement in mathematical education. This qualitative study aims to bridge this gap by focusing on the experiences and perceptions of children with parents strong in mathematics. By highlighting the child's viewpoint, this research provides a unique dimension to the existing literature, revealing the lived experiences of children in mathematically enriched environments. It underscores the importance of incorporating children's voices in educational research to fully understand the dynamics of parental involvement in mathematics education.

## 2 Methods

### *Research Approach*

This study, part of a broader qualitative investigation into parental involvement in children's mathematical education (Antolin Drešar & Lipovec, 2017), employs narrative methodology, including narrative analysis and analysis of narration. This approach allows participants to share their stories, assigning personal meanings to their experiences (Curtin & Clark, 2005), and helps researchers understand the participants' lives by examining their stories (Schank, 1995).

We adopted Polkinghorne's (1995) approach, integrating key events into a story to explain the narrator's responses and actions, termed emplotment. This involves identifying significant events, discerning their interconnections, arranging them chronologically, and shaping them into a coherent story. Choosing narrative analysis was particularly relevant as it provided deeper insight into the familial enactment of mathematics from the child's viewpoint. Through emplotment, we captured and presented the child's experience of parental involvement in mathematics in narrative form. Following the construction of the narrative, we engaged in the analysis of narration, systematically comparing and interpreting the child's narrative within a broader theoretical framework (Polkinghorne, 1995).

### *Research Sample*

To illuminate the nature of parental involvement from the child's viewpoint, specifically in families where parents are academically grounded in mathematics, we included a child whose parents both hold a PhD in mathematics. This participant is part of a Canadian family, with both parents having previously contributed to a comparative study on the engagement of mathematician and non-mathematician parents in their children's education (Antolin Drešar & Lipovec, 2017). For this research, we focused on their 18-year-old son to capture the essence of parental involvement through his experiences. To protect his identity, we referred to him by the pseudonym Nick.

### *Data Collection Procedures*

We utilized the narrative interview technique as outlined by Bauer (1996), allowing the interviewee to tell stories about significant events (Kaasila, 2007). Open-ended questions encouraged candid sharing and reflection on significant life events (Riessman, 1993). According to Bauer (1996), an interviewee's perspective is best revealed when narrating events in their spontaneous language, so minimal interviewer interference was used to ensure authentic viewpoints. The narrative interview with the son of two mathematicians was conducted face-to-face in English, with prior consent and recorded using a dictaphone.

### *Data Analysis Procedures*

The narrative analysis began with transcribing the interview with the son of two mathematicians. Through multiple readings of his account regarding mathematical experiences and the role of mathematics in his family life, we identified key events, incidents, actions, and individuals. We then organized these elements sequentially to construct a coherent narrative of his experiences.

To understand his mathematical journey and perspective on his parents' engagement, we applied Polkinghorne's (1995) analysis of narration method. This involved a comparative examination of his narrative against those of his parents and other parents with a mathematical background to discern common themes and concepts. The child's narrative and his reflections on integrating mathematics into daily life were examined through a theoretical lens, enriched with retrospective analysis and interpretation.

### *Ensuring Validity*

Ensuring validity in qualitative research is of paramount importance. In our narrative analysis, we addressed validity by providing a detailed description of the child's experience of parental involvement where both parents are mathematicians. By narrating his story, which reflects his perspective and experiences of parental involvement in mathematics, we ensured that his voice was prominently featured ("voice is raised") (Riessman, 1993). To substantiate our interpretations, we meticulously integrated our findings within a broader theoretical framework, aiming to establish a solid foundation for the validity of our research findings.

## **3 Results**

### *Results of Narrative Analysis*

Herein, we first present the constructed narrative of 18-year-old Nick, the son of two Canadian mathematics PhDs, derived through narrative analysis.

The narrative analysis provides a detailed account of Nick's experiences and perspectives on parental engagement in mathematics. Nick was raised in an environment deeply intertwined with mathematics: "Everything I know is math-related, everything around me is math..." He grew up believing everyone was a mathematician, given that both his parents were mathematicians and nearly all their friends were in the field. Mathematical games, such as Hexagons, Tic Tac Toe, and puzzles, were common at home. "Math riddles are sort of a big passion in the family."

As a child, his father would accompany him to school, and they would count steps together. They counted by 10s, then by 5s, and also tackled other sequences like counting by 7s, which he found the most challenging. Conversations at home often gravitated towards mathematical topics. Nick recalls an incident involving his father's fasci-

nation with symmetries and bathroom tiles demonstrating the Pythagorean theorem, which everyone found amusing.

Mathematics came naturally to him. Regarding schoolwork, he almost never needed help: “I never really needed help.” On the rare occasions he asked his parents for assistance with homework, they knew exactly how to help and when to let him figure things out on his own. His inquiries were mostly about non-school-related topics of interest.

Currently, he attends a small private high school where he is highly satisfied with his mathematics teachers: “I think my teachers at school were really good.” He expressed a particular admiration for his calculus teacher: “My calculus teacher this year is amazing.”

He has participated in mathematical competitions and similar activities, yet notes that his parents did not play a special role in these endeavours. They believed he should pursue activities that brought him joy, without coercion. At one point, he declared he would never engage in anything related to mathematics. Sometimes, he found the omnipresence of mathematics somewhat irksome: “Math jokes all the time, you know, in the atmosphere ... and sometimes it seemed that anything that isn’t math, isn’t right.”

Occasionally, his parents would give him mathematical books to read. His mother gave him some when he was in seventh or eighth grade and bored, and he recalls reading a mathematics book given by his mother more recently. It introduced him to the Laplace operator, prompting him to ask his mother about it. She explained it extensively, even though he only wanted a brief explanation. He mentioned it could be annoying to listen to detailed explanations just to get the information he wanted.

Growing up, he was imbued with the idea that one should go to college, pursue graduate studies, and become a mathematician or a scientist. He felt that in some ways, he grew up at the university. His parents often took him to their department, where he would sit, read a book, or do something similar while they were busy.

He is interested in science, particularly physics and biology. He chose to study physics for college, but recognizing that physics fundamentally relies on mathematics, he also enrolled in mathematics courses. Despite once asserting he would never become a mathematician, his choice of study now suggests the opposite: “And even though I pledged to my parents that I would never be a mathematician, I am sort of backtracking on that promise.” He finds mathematics to be pure and beautiful, and he is grateful for his (family) experience with it.

### *Results of the Narration Analysis*

Building on Nick’s narrative, we present the outcomes of the narration analysis, highlighting the key insights and interpreting them within a comprehensive theoretical framework.

Nick’s narrative, set against a backdrop of pervasive mathematical engagement, offers distinct insights into the involvement of mathematician parents in their children’s education. His experiences, including mathematical games, counting exercises during walks, and mathematically themed anecdotes, illustrate the deep integration of mathe-

matics into his upbringing. These experiences align with the broader research on the positive impact of integrating mathematics into daily life (Lee & Kotsopoulos, 2016; Tsamir et al., 2016).

Mathematics became a fundamental element of his family's identity, supporting the research that suggests mathematics is a core component of intellectual lives in families with strong mathematical backgrounds (McCormick et al., 2020). Although Nick does not explicitly express a uniformly positive attitude towards mathematics, his descriptions of the subject as "pure" and "beautiful" indicate an appreciation shaped by his parents' emphasis on its aesthetic values (Betts & McNaughton, 2003).

Nick excelled in school mathematics and rarely required parental assistance: "I never really needed help." This finding supports the observations of Antolin Drešar and Lipovec (2017), who found that mathematician parents typically limit their involvement in school-based mathematics, likely due to a belief in fostering independence. Nick's remark – "I would sometimes ask them for help with homework. But they are math professors; they know what they should help me with and what they shouldn't." – echoes the emphasis of Jukić Matić et al. (2020, p. 239) on the importance of quality teaching tailored to cultural context.

Another significant aspect of Nick's experience is his parents' encouragement to pursue activities that bring him joy, even those unrelated to mathematics. This approach reflects a broader understanding among parents of the importance of nurturing diverse interests for overall development (Lebenstein et al., 2005). Similar sentiments were found in other narratives involving mathematician parents (Antolin Drešar & Lipovec, 2017) and align with the findings that young people who perceive strong parental support in their life choices tend to be more satisfied with their lives (Cugmas et al., 2017, p. 137). However, Nick also described the omnipresence of mathematics in his environment as "annoying," stating: "It kind of annoys me that everything is always about math ... math jokes all the time ... and sometimes it seemed that anything that isn't math, isn't right." Despite this, his decision to study physics and mathematics indicates that his interest in science and mathematics ultimately prevailed, aligning with his parents' pursuit of higher education and scientific careers.

## 4 Discussion

Insights into parental involvement from the child's perspective, particularly concerning parents with strong mathematical expertise, offer significant implications for fostering effective mathematics learning environments. Nick's narrative underscores the importance of creating environments that support mathematical exploration, autonomy, and perseverance (Middleton et al., 2015). Encouraging children's natural curiosity and independent problem-solving, as demonstrated by mathematician parents, provides a valuable model for all families.

To enhance parental engagement, particularly for those less confident in mathematics, it is crucial to develop resources and workshops for parents, and to foster open communication between educators and families (Sheldon & Epstein, 2005). These ef-

forts should promote an integrative approach to mathematics, seamlessly incorporating it into daily life to strengthen problem-solving skills and mathematical confidence (Galindo & Sheldon, 2012; Sonnenschein et al., 2012). Additionally, encouraging parental involvement that supports independence rather than direct intervention may provide a more balanced approach to nurturing mathematical skills and interest (Panaoura, 2017).

Nick's experience also highlights the value of allowing children the freedom to explore their interests, even when they diverge from mathematics, to prevent any sense of mathematical imposition. Balancing a rich mathematical environment (Lee & Kotsoopoulos, 2016; Tsamir et al., 2016) with respect for the child's individuality (Christoph, 2023) is essential. Broader research indicates that children may experience stress and overload, affecting their satisfaction and success in school, highlighting the need to balance academic demands with students' abilities (Dubovicki & Peko, 2016, p. 81). The transition to higher education is especially critical, as motivation and positive attitudes towards mathematics often decline during this period (Poredoš & Puklek Levpušček, 2017, p. 57).

However, the reliance on a single narrative and specific familial context points to the need for broader research into diverse family structures and backgrounds. Such investigations are crucial for validating the universality and applicability of the proposed strategies, ensuring they are effective across a wide range of familial environments (Salminen et al., 2021).

## 5 Conclusion

This study sought to gain insight into parental involvement of mathematically competent parents from the child's perspective. The findings underscore the importance of supportive parental practices in children's mathematical journeys, even for parents without a strong mathematics background.

Nick's narrative, from a household with both parents as mathematicians, offers valuable lessons on parental involvement. The narrative approach revealed how mathematician parents integrate mathematics into daily life, fostering environments that develop mathematical skills and positive attitudes. This aligns with literature emphasizing the integration of mathematics into daily routines (e. g. Leder, 1992; Tsamir et al., 2016).

Nick's account showed that his parents rarely intervened in his school-related mathematics, highlighting the significance of fostering autonomy and confidence in children's mathematical abilities (Hill & Tyson, 2009; Silinskas et al., 2010; Bone et al., 2021, p. 47). This suggests that helping with mathematical homework should be reserved for when the child requests it, promoting independence and perseverance (Middleton et al., 2015). Teachers should tailor homework to the child's level, ensuring that it is achievable independently (Hampshire et al., 2014) and that the assignments are not too time-consuming (Lipovec & Ferme, 2020, p. 14).

Nick's narrative also revealed that the pervasive presence of mathematics in his environment sometimes felt overwhelming, despite his parents' encouragement to pursue



diverse interests. While a supportive mathematical environment is crucial (Skwarchuk, 2009; Kliman, 2006), there is a need for balance to prevent overload.

Acknowledging this study's limitations, such as its focus on a single narrative and specific familial context, is essential as these factors may limit the generalizability of the findings. Future research should incorporate diverse narratives from various family structures to enhance the applicability of the insights. By embracing the strategies informed by the involvement of mathematician parents and considering the child's perspective, we can better support the mathematical development of all children.

*Dr. Darja Antolin Drešar, dr. Marija Javornik*

### **Narativna raziskava vključenosti staršev v matematiko z vidika otroka**

*Starševska vpletenost v otrokovo izobraževanje na področju matematike v zadnjih desetletjih pridobiva vse večji pomen. Številne raziskave poudarjajo, da je aktivna starševska vpletenost povezana z boljšim učnim uspehom in matematičnimi spretnostmi otrok (Desforges in Abouchaar, 2003; Cui idr., 2021; Otani, 2020). Poleg tega starševska vpletenost pomembno vpliva tudi na afektivne vidike učenja matematike, kot so odnos do matematike, samoučinkovitost in motivacija (Fan in Williams, 2010; DiStefano idr., 2020; Hidayatullah in Csikos, 2024).*

*Medtem ko se je večina dosedanjih kvantitativnih raziskav osredotočala predvsem na raziskovanje povezave med starševsko vpletenostjo in otrokovimi matematičnimi dosežki ter odnosom do matematike, naraščajoče število kvalitativnih raziskav ponuja globlje vpoglede. Rockliffe (2001) ter Remillard in Jackson (2006) ugotavljajo, da na strategije starševske vpletenosti vplivajo starševske lastne izkušnje z matematiko in njihova stališča, pri čemer nekateri starši težko podpirajo izobraževanje svojih otrok zaradi zaznavanja vrzeli med svojim matematičnim znanjem in trenutnimi učnimi načrti. Pregled literature kaže, da spodbujanje starševske vpletenosti pogosto ovirajo skromno matematično znanje staršev (Brew, 2001), nezaupanje v lastne sposobnosti ali negativna stališča do matematike (Civil, 2001). Matematična identiteta staršev, ki je bila zaznamovana z naporom, strahom in paniko, nakazuje potrebo po izboljšanju njihove samozavesti na področju matematike, da bi lahko učinkovito podpirali matematično izobraževanje svojih otrok (McMullen in Abreu, 2010).*

*Za razumevanje dinamike starševske vpletenosti v matematično izobraževanje otrok je potrebno tudi preučevanje vpletenosti staršev, ki so na matematičnem področju močni. Antolin Drešar in Lipovec (2017) sta to raziskovala s primerjavo staršev-matematikov z "nematematičnimi" starši. Ugotovila sta, da se starši-matematiki na splošno manj vključujejo v šolsko matematiko, vključujejo pa matematične dejavnosti doma, integrirajo matematiko v vsakdanje življenje in spodbujajo pri svojih otrocih zavedanje o njenih funkcionalnih, logičnih in estetskih vrednotah.*

*Pri raziskovanju starševske vpletenosti v matematično izobraževanje starši kot ključni akterji predstavljajo najbogatejši vir informacij o tem področju. Razkrivajo svoj*



odnos, stališča o vpletenosti v matematično izobraževanje svojih otrok, pa tudi načine, pogostost in posebnosti svoje vpletenosti (Jay idr., 2018; Wilder, 2017). Ena izmed ključnih dimenzij te vpletenosti, tj. perspektiva otrok, pa je pogosto spregledana. Obstajajo sicer raziskave o otrokovih pogledih na starševsko vpletenost v splošnem (npr. Thomas idr., 2020; Liu idr., 2022; Clinton in Hattie, 2013), zelo malo pa je raziskav, ki bi se osredotočale na vpletenost v matematično izobraževanje z vidika otrok. Razumevanje perspektive otrok je bistveno za vpogled v to, kako doživljajo starševsko vpletenost in kako le-ta nanje vpliva. S to kvalitativno raziskavo želimo zapolniti to vrzel in prispevati k boljšemu razumevanju starševske vpletenosti v matematično izobraževanje s perspektive otroka, s poudarkom na izkušnjah iz družine s starši, ki so močno vpeti v področje matematike.

V raziskavi, ki je del širše kvalitativne raziskave o starševski vpletenosti v otrokovo matematično izobraževanje (Antolin Drešar in Lipovec, 2017), smo uporabili narativno metodologijo, vključno z narativno analizo in analizo naracije. Ta pristop omogoča udeležencem, da delijo svoje zgodbe in izkušnjam pripisujejo osebni pomen (Curtin in Clark, 2005), ter pomaga raziskovalcem razumeti življenje udeležencev z analizo njihovih zgodb (Schank, 1995). Narativno raziskovanje na področju didaktike matematike se je že večkrat izkazalo za koristno, npr. Lutovac in Kaasila (2010) sta narativno metodologijo uporabila pri raziskovanju matematičnih izkušenj bodočih učiteljev.

V raziskavi smo uporabili narativno analizo in analizo naracije po Polkinghornu (1995). Narativna analiza temelji na povezovanju ključnih dogodkov v zgodbo, ki podaja smiselno razlago pripovedovalčevih odzivov in dejanj. Ta postopek iskanja zvez med dogodki in njihovo povezovanje v pripoved ali zgodbo Polkinghorne (1995, str. 4–5) imenuje upovedovanje. Izbira narativne analize je bila še posebej relevantna, saj je omogočila globlji vpogled v udejanjanje matematike v družini z otrokovega vidika. V drugem delu raziskovanja smo uporabili analizo naracije, pri čemer smo pripoved otroka sistematično primerjali in interpretirali s povezovanjem in umestitvijo v širši teoretični okvir (Polkinghorne, 1995).

Za osvetlitev narave starševske vpletenosti z otrokovega vidika, zlasti v družinah z matematično kompetentnimi starši, smo vključili otroka, katerega starša imata oba doktorat iz matematike. Udeleženec je del kanadske družine, pri čemer sta starša že prej sodelovala v primerjalni raziskavi o vpletenosti staršev, ki so matematiki, in staršev, ki niso matematiki (Antolin Drešar in Lipovec, 2017). Za to raziskavo smo se osredotočili na njunega 18-letnega sina, da bi zajeli bistvo starševske vpletenosti skozi njegove izkušnje. Z namenom zaščite njegove identitete smo ga poimenovali s psevdonimom Nick.

Za zbiranje podatkov smo uporabili tehniko narativnega intervjuja, kot jo je opisal Bauer (1996). Z odprtimi vprašanji smo intervjuvanca povabili k pripovedovanju in razmišljanju o pomembnih dogodkih iz njegovega življenja (Riessman, 1993). Narativni intervju s sinom dveh matematikov je bil izveden v živo v angleščini in z vnaprejšnjim soglasjem posnet z diktafonom.

Osnovno izhodišče za narativno analizo je predstavljal prepis narativnega intervjuja s fantom, katerega oba starša sta doktorja matematike. V okviru narativne analize smo na podlagi njegove pripovedi o matematičnih izkušnjah in vlogi matematike v njihovem družinskem življenju izluščili ključne dogodke, pripetljaje, dejanja in osebe ter konstruirali zgodbo o njegovih izkušnjah. Za podrobnejši vpogled v njegovo doživljanje

starševske vpletenosti smo uporabili analizo naracije, pri čemer smo njegovo pripoved primerjali s pripovedmi njegovih staršev in te izkušnje osvetlili s teoretičnega vidika ter vključili svojo retrospektivno razlago.

Pri kvalitativnih raziskavah je potrebno posebno pozornost posvetiti zagotavljanju veljavnosti raziskave. V naši narativni analizi smo za veljavnost poskrbeli s podrobnim opisom doživljanja starševskega vključevanja otroka, katerega oba starša sta matematika. Skozi upovedovanje njegove pripovedi v zgodbo, ki predstavlja njegov pogled in izkušnje starševske vpletenosti v matematično izobraževanje, smo poskrbeli, da je njegov glas opazen ("voice is raised") (Riessman, 1993). Da bi okrepili verodostojnost ugotovitev, ki so nastale na podlagi analize podatkov, smo njihovo interpretacijo podkrepili s konkretnimi citati iz pripovedi, s skrbno utemeljitvijo in umestitvijo svojih spoznanj v širši teoretični okvir.

Rezultat narativne analize, konstruirana zgodba, razkriva, da je Nick, sin dveh kanadskih doktorjev matematike, odraščal v okolju, kjer je bila matematika močno vpletena v njihovo vsakdanje družinsko življenje. Njegove izkušnje, vključno z matematičnimi igrami, štejem med sprehodi in anekdotami o matematiki, poudarjajo integracijo matematike v njegovo vzgojo. Te izkušnje so skladne z raziskavami, ki poudarjajo pozitiven vpliv vključevanja matematike v vsakdanje življenje (Lee in Kotsopoulos, 2016; Tsamir idr., 2016). Čeprav Nick v svoji pripovedi ni izrecno izražal pozitivnega odnosa do matematike, njegovi opisi matematike kot "čiste" in "lepe" nakazujejo, da so mu straši privzgojili občudovanje estetskih vrednot matematike (Betts in McNaughton, 2003). Nick je v šoli blestel v matematiki in redko potreboval pomoč staršev, kar podpira ugotovitve avtorjev Antolin Drešar in Lipovec (2017), ki sta ugotovila, da se starši matematiki redko vključujejo v šolsko matematiko svojih otrok, saj verjamejo v moč vztrajnosti in samostojnega dela. Nick je dejal: "Včasih sem ju prosil za pomoč pri nalogah. A onadva sta profesorja matematike in vesta, pri čem je dobro, da mi pomagata, in pri čem ne." Starši so ga spodbujali k dejavnostim, ki so ga veselile, tudi če niso bile povezane z matematiko, kar odraža širše razumevanje pomembnosti spodbujanja raznolikih interesov za celostni razvoj (Lebenstein idr., 2005). Kljub temu je Nicka včasih motila vseprisotnost matematike v njegovem okolju. Dejal je namreč: "Moti me, da je vse vedno povezano z matematiko /.../, matematične šale ves čas /.../ in včasih se je zdelo, da kar ni matematika, ni prav." Kljub temu njegova odločitev za študij fizike in matematike kaže na prevlado zanimanja za znanost in matematiko po zgledu staršev.

Vpogled v starševsko vpletenost z otrokovega vidika, zlasti glede staršev s poglobljenim matematičnim znanjem, ponuja pomembne implikacije za podporo razvoja otrok na matematičnem področju, tudi za starše, ki na matematičnem področju niso močni. Nickova pripoved poudarja pomen ustvarjanja okolij, ki spodbujajo matematično raziskovanje, avtonomijo in vztrajnost (Middleton idr., 2015; Antolin Drešar in Lipovec, 2017), kar se je med drugim zrcalilo tudi v pristopu njegovih staršev, da pomagajo pri matematičnih (domačih) nalogah le, ko otrok to potrebuje. Je pa to pogojeno tudi s prakso učiteljev, ki bi morali domače naloge prilagoditi otrokovi ravni, tako da jih lahko le-ta samostojno reši (Hampshire idr., 2014). Vendarle pa lahko spodbujanje otrokove naravne radovednosti in neodvisnega reševanja problemov, kot so to pokazali starši matematiki, služi kot dragocen model za vse družine.

Za izboljšanje starševske vpletenosti, zlasti za tiste, ki so manj samozavestni v matematiki, so ključne strategije razvoja gradiv in delavnice za starše ter spodbujanje od-

prte komunikacije med vzgojitelji in družinami (Sheldon in Epstein, 2005). Spodbujati bi bilo potrebno integrativni pristop, da matematiko vključimo v vsakdanje družinsko življenje za krepitev veščin reševanja problemov in matematične samozvesti (Galindo in Sheldon, 2012; Sonnenschein idr., 2012). Poleg tega bi veljalo usmeriti fokus starševske vpletenosti v spodbujanje otrokove neodvisnosti namesto v neposredno starševsko pomoč (Panaoura, 2017).

Nickove izkušnje prav tako poudarjajo, da je potrebno otrokom omogočiti, da raziskujejo svoje interese, tudi če niso neposredno povezani z matematiko, da ne dobijo občutka vsiljevanja matematike. Uravnoveženje bogatega matematičnega okolja (Lee in Kotsopoulos, 2016; Tsamir idr., 2016) s spoštovanjem otrokove individualnosti (Christoph, 2023) je ključnega pomena.

Omejitve naše raziskave, predvsem osredotočenost na eno samo pripoved in specifičen družinski kontekst, omejujejo splošljivost naših ugotovitev in nakazujejo potrebo po nadaljnjih raziskavah, ki bodo zajele več pripovedi o doživljanju starševske vpletenosti z vidika otrok in zajele raznolika družinska okolja.

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*Darja Antolin Drešar, PhD, associate professor in the field of didactics of mathematics at the Faculty of Education, University of Maribor.*

*E-mail: darja.antolin@um.si*

*Marija Javornik, PhD, full professor of pedagogy at the Faculty of Arts, University of Maribor.*

*E-mail: marija.javornik@um.si*