Iranian Evolutionary Educational Psychology Journal
IEEPJ
University of Hormozgan
Online ISSN: 2588 - 4395
Homepage: https://ieepj.hormozgan.ac.ir

Predicting Parental Self-Efficacy Based on Parent-Child Interaction and Metacognitive Beliefs in Mothers of Learning Disabilities Children

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Article Info

Article type:
Research Article

Article history:
Received 10 Jul. 2024
Received in revised form 11 Oct. 2024
Accepted 15 Nov. 2022
Published online 01 Mar. 2025

Keywords:
Parental self-efficacy,
Parent-child interaction,
Metacognitive beliefs,
Learning disabilities children

ABSTRACT

Objective: The overarching objective of the current empirical investigation was to comprehensively forecast the levels of parental self-efficacy, taking into account the dynamics of parent-child interactions as well as the metacognitive beliefs held by mothers specifically raising children who are diagnosed with particular learning disabilities.

Methods: The methodological approach employed in this research was correlational descriptive in nature. The statistical sample for this inquiry comprised 320 mothers of children with learning disabilities residing in Shiraz city during the academic year 2023, who were selected through purposive sampling techniques. The instruments utilized for data collection encompassed Parenting Self-Agency Measure(PSAM), Child-Parent Relationship Scale (CPRS), and Metacognitions Questionnaire (MCQ). The data underwent analysis utilizing the SPSS-24 statistical software.

Results: The findings of the regression analysis indicated that both parent-child interactions and the metacognitive beliefs of mothers serve as significant direct predictors of their levels of parental self-efficacy.

Conclusions: The results predominantly endorse the significance of cognitive and emotional frameworks within parents as determinants of parental self-efficacy.

Cite this article: Zarinkolah, S., Rezaei, A., Sohrabi Shegefti, N. & Kouroshnia, M. (2025). Predicting parental self-efficacy based on parent-child interaction and metacognitive beliefs in mothers of learning disabilities children. *Iranian Evolutionary Educational Psychology Journal*, 7 (1), 81-92.
DOI: https//doi.org/ 10.22034/7.1.81

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Publisher: University of Hormozgan.
DOI: https// doi.org/ 10.22034/7.1.81

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[DOI: 10.22034/7.1.81]

Introduction

One of the salient topics that has persistently engaged the attention of scholars and specialists within the domain of educational psychology is the phenomenon of learning disorder, which has been redefined as "specific learning disorder" in the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (Mortezapour et al., 2023; Peters & Ansari, 2019). Indeed, the neurophysiological underpinnings of learning disorders remain inadequately understood, and the ramifications of learning difficulties can extend beyond mere academic deficiencies and challenges (Moll et al., 2014). Considering that this disorder has been correlated with instances of child maltreatment, it leads investigators to postulate that this condition is predominantly a byproduct of the manner in which parents engage with their offspring, suggesting a link between parental maltreatment and the behavioral disturbances exhibited by these children; this finding underscores the significance of familial factors, particularly the maternal behavioral patterns as the primary caregiver during formative years, in the manifestation of behavioral disorders throughout childhood and into adulthood (Ronkainen et al., 2023). Consequently, any conduct exhibited by a child diagnosed with a specific learning disorder, being under the vigilant observation of their primary caregiver, is duly noted by the mother (Matteucci et al., 2019). In this context, empirical findings further illuminate those mothers of children diagnosed with a specific learning disorder exhibit diminished psychosocial well-being and manifest higher levels of depression and anxiety compared to their counterparts (Haft et al., 2019). Broadly speaking, the presence of behavioral complications in children serves as a significant predictor of maternal parental self-efficacy, thereby resulting in parents, particularly mothers, experiencing a diminished sense of efficacy regarding their expectations and perceptions of their capacity to function as competent and effective parents, as well as their ability to positively influence the behavior, development, and adaptation of their children (Abuhammad, 2020). In light of the critical role of self-efficacy for mothers of children with specific learning disabilities, a multitude of researchers (Ciesielski et al., 2020; May & Williams, 2024; Van der Oord & Tripp, 2020) are endeavoring to identify constructs that exert both direct and indirect influences on this psychological attribute.

The modality of communication and interaction that parents, particularly mothers, employ when engaging with their children is incontrovertibly significant in shaping maternal parental self-efficacy (Hashemi & Eyni, 2021; Lung et al., 2022). The parent-child relational dynamic

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encompasses a constellation of distinctive behaviors, emotions, and anticipations that are reciprocally exchanged between parents and their progeny (Sherafati et al., 2020). Children with learning disabilities frequently experience strained relationships with their parents, which jeopardizes the equilibrium of the familial milieu (Bonifacci et al., 2016). Effective parent-child interactions within the family context have the potential to alleviate parental stress and enhance feelings of self-efficacy (Hashemi & Eyni, 2021; Yan et al., 2024). Furthermore, effective communication and interaction between parents and children, as well as parental self-efficacy, are influenced by a variety of constructs, including metacognitive beliefs (Küçükaydın, 2024).

Metacognition is defined as the capacity to analyze and regulate one's own cognitive processes and states (Kim et al., 2020), and it also encompasses the capability for mental inference and the ability to comprehend and reflect upon one's cognitive state to effectively navigate life tasks and modulate cognitive processes as well as interpersonal dynamics (D'Abate et al., 2020). Moritz and Lysaker (2018) believed that Flavell was the pioneer in employing the term metacognition to denote cognition concerning cognitive phenomena, or, in a different formulation, the act of contemplating one's own thought processes. Metacognition is deemed to be influential in the formation of both constructive and maladaptive cognitive patterns (Winne & Azevedo, 2014). As metacognitive processes are not derived from external realities, their origin lies within an individual's cognitive representations of reality, encompassing aspects such as knowledge acquisition, behavioral actions, and emotional responses related to these processes (Kafizade et al., 2020). Moreover, general metacognitive competencies are established during the early stages of childhood and adolescence (Akturk & Sahin, 2011), to the extent that certain implicit metacognitive abilities can be identified in infants as young as two months old (Brinck & Liljenfors, 2013). Despite the fact that these skills undergo evolution and organization throughout human developmental stages, they are amenable to instruction; thus, individuals lacking these competencies can receive training to enhance their metacognitive abilities.

Considering the irreplaceable role of the mother in the child's development and the fact that the psychological advancement of children is contingent upon the psychological well-being of their parents, particularly the mother, numerous studies have been conducted to enhance maternal parenting efficacy in mothers of children diagnosed with specific learning disorders. Nonetheless, the unique contributions and innovative dimensions of this research lie in the exploration of

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psychosocial and cognitive factors, including parent-child interactions and metacognitive beliefs. In light of the aforementioned considerations, this study aims to address the extent to which maternal self-efficacy can be predicted by examining parent-child interaction and metacognitive beliefs among mothers of children with specific learning disorders.

Material and Methods

The current investigation was conducted with a specific focus on its objectives and employed a quantitative methodology concerning the nature of the data. The research design was characterized as descriptive-correlational regarding the approach to data acquisition. The statistical sample encompassed 320 mothers of children diagnosed with learning disabilities in Shiraz during the academic year 2024, selected through purposive sampling techniques. The sampling strategy utilized in this research was purposive sampling (non-probability). The criteria for inclusion of participants in the study comprised (having a child who fulfills the diagnostic criteria for specific learning disabilities as delineated by DSM-5 and validated by the clinical psychologist of the corresponding center based on available documentation, playing a significant role in the child's care, possessing a minimum educational attainment at the literacy level, and consenting to partake in the study through a written consent form) while the criteria for exclusion involved (lack of cooperation with the researcher, or a documented history of psychological issues in either the child or mother as per diagnostic criteria). Information was gathered utilizing the questionnaires.

Parental Self-Efficacy Questionnaire: Parenting Self-Agency Measure (PSAM) (Dumka et al., 1996) was formulated to evaluate parents' self-efficacy in matters pertinent to parenting and encompasses three dimensions: parents' efficacy and frustration in engaging with interactive situations with their offspring (items 1, 3, 5, 6, 2); parents' competence in resolving conflicts between parent and child (items 2, 4, 7, and 8); and parents' resilience in parenting-related challenges (items 9 and 10). The scoring methodology employed for this questionnaire is predicated on a 7-point Likert scale (ranging from disagree: 1 to agree: 7). This instrument comprises 10 items, featuring five positively framed items and five negatively framed items, and evaluates parents' overall confidence in their parental roles. The questions within this instrument are structured according to a 7-point Likert scale ranging from 1: rarely to 7: always. Items 1, 3, 5, 6, and 8 are scored in reverse order. A substantial score on this assessment signifies elevated

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parental self-efficacy, whereas a diminished score indicates lower parental self-efficacy. The reliability of this questionnaire was established via a Cronbach's alpha coefficient of 0.92.

Parent-Child Questionnaire: The Parent-Child Relationship Scale was established by Rinaldi et al. (2023). This scale consists of 33 items, and its scoring methodology is based on a 5-point Likert scale (ranging from definitely not true to definitely true). The identified subscales encompass the closeness factor (items 1, 5, 6, 8, 10, 13, 16, 29, and 30), dependency (items 9, 11, 15, 18, 20, and 22), and conflict (items 2, 3, 4, 7, 12, 14, 17, 19, 21, 23, 24, 25, 26, 27, 28, 31, 32, and 33). The conflict and dependency scales, in conjunction with the closeness scale, illustrate two distinct domains of the parent-child relationship. The reliability of this questionnaire was confirmed through a Cronbach's alpha coefficient of 0.89.

Metacognitive Beliefs Questionnaire: The Metacognitive Beliefs Scale was developed by Bailey and Wells (2015) and measures individuals' beliefs about their thinking. This scale has 30 items and 5 subscales. The positive beliefs subscale was measured with items 1, 7, 10, 19, 23, and 28, the uncontrollability and danger of thoughts subscale with items 2, 4, 9, 11, 15, and 21, the cognitive certainty subscale with items 8, 14, 17, 24, 26, and 29, the need to control thoughts subscale with items 6, 13, 20, 22, 25, and 27, and cognitive self-awareness with items 3, 5, 12, 16, 18, and 30. The scoring of this questionnaire is based on a 4-point Likert scale (from disagree: 1 to strongly agree: 4). The reliability of the questionnaire was obtained through Cronbach's alpha coefficient of 0.91.

Results

Table 1 reports the descriptive indices of the research variables and their related components.

Table 1. Descriptive indices of the research variables

Variable	Min.	Max.	Mean	SD	Skewness	Kurtosis
Positive beliefs	7	23	16.64	4.03	-0.69	-0.44
Uncontrollability	7	24	16.47	4.13	-0.70	-0.38
Cognitive certainty	7	23	16.62	4.14	-0.71	-0.46
Need for thought control	6	24	16.60	4.05	-0.73	-0.25
Cognitive self-awareness	6	24	16.61	4.20	-0.80	-0.31
Metacognitive beliefs (total)	4	110	83.04	18.27	-0.99	0.02
Closeness	13	44	32.25	7.83	-0.90	-0.38
Dependence	8	30	21.74	5.57	-0.87	-0.34
Conflict	29	86	64.98	14.99	-0.95	-0.31
Parent-child relationship (total)	56	154	118.97	27.40	-0.97	-0.32
Parent efficacy	6	28	19.77	5.51	0.78	-0.27
Parent ability	4	28	19.65	5.95	0.74	-0.59
Parent resistance	2	14	9.92	3.03	-0.78	-0.33
Parenting self-efficacy (total)	17	69	49.34	13.37	-0.78	-0.49

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As can be seen in the table 1, the mean value of the metacognitive beliefs, parent-child relationship, and parenting self-efficacy variables is higher than its theoretical average. To show the normality of the data (the conformity of the distribution of sample scores with the normal distribution), the Shapiro-Wilk statistical test was used and the result was reported in Table 2.

Table 2. Results of the Shapiro-Wilk test for research variables

Variable	S-W test	P
Positive beliefs	0.90	0.071
Uncontrollability	0.96	0.65
Cognitive certainty	0.93	0.12
Need for thought control	0.96	0.46
Cognitive self-awareness	0.96	0.56
Metacognitive beliefs (total)	0.86	0.56
Closeness	0.93	0.11
Dependence	0.97	0.65
Conflict	0.97	0.64
Parent-child relationship (total)	0.93	0.12
Parent efficacy	0.93	0.12
Parent ability	0.96	0.56
Parent resistance	0.95	0.28
Parenting self-efficacy (total)	0.97	0.85

According to the results of Table 2, it is clear that the type I error rate of the Shapiro-Wilk statistics is so high ($p>0.05$) that the null hypothesis cannot be rejected in this test. The null hypothesis of the present test is that there is no difference between the sample distribution chart and the normal distribution chart. Based on the results of this section, the assumption of normality of the data for all variables is confirmed. To show the pairwise correlation between the research variables, the Pearson correlation test (order zero) was used. Table 3 shows the correlation matrix of the research variables.

Table 3. Correlation matrix of the research variables

Variable	1	2	3
1. Parental self-efficacy	1		
2. Metacognitive beliefs	0.83**	1	
3. Parent-child relationship	0.77**	0.84**	1

** $p < 0.05$

The results of the correlation coefficient showed that the correlation coefficient of metacognitive beliefs with parental self-efficacy was (0.835), the parent-child relationship with parental self-efficacy was (0.77), and the parent-child relationship with metacognitive beliefs was (0.84).

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Regression weights (standard and non-standard) along with the significance level are reported in Tables 5 and 6.

Table 5. Direct Regression Weights

Predictor	Criterion	B	ß	S.E	T	P
Parent-child relationship	Parental self-efficacy	0.89	0.73	0.026	34.23	0.001
Metacognitive beliefs	Parental self-efficacy	0.76	0.73	0.046	16.52	0.001
Metacognitive beliefs	Parent-child relationship	0.72	0.56	0.041	17.56	0.001

Next, using bootstrap analysis, regression weights were calculated along with the significance level of the indirect path and are displayed in Table 6.

Table 6. Results of bootstrap analysis to determine the regression weights of indirect paths

Predictor	Mediator	Criterion	ß	P
Metacognitive beliefs	Parent-child relationship	Parental self-efficacy	0.41	0.001

Discussion

The objective of the current investigation was to forecast parental self-efficacy predicated on the dynamics of parent-child interactions and metacognitive beliefs among mothers of children diagnosed with specific learning disabilities. According to the findings, the direct pathway from the parent-child relationship to parental self-efficacy is assessed to be statistically significant. This finding underscores the predictive capacity of the parent-child relationship variable with regard to parental self-efficacy. The outcomes of this research align with the investigations conducted by past studies (Haft et al., 2019; May & Williams, 2024).

In elucidating this observation, it can be posited that self-efficacy, which pertains to the conviction in one's capabilities, is intrinsically linked to effective performance in designated responsibilities (Mortezapour et al., 2023). Consequently, a mother's dynamic, robust, and vibrant interaction with her child is emblematic of her successful execution of the maternal and parental roles, which can enhance her belief in personal capabilities and subsequently elevate her parental self-efficacy. Conversely, mothers encountering numerous challenges in relation to their child tend to harbor doubts regarding their individual capabilities, thereby resulting in diminished self-efficacy. In essence, the successful upbringing of a child, particularly those with disorders, amplifies mothers' sense of empowerment and, in turn, their parental self-efficacy. In this context, it is pertinent to note that behavioral achievements constitute a significant source of self-efficacy, as articulated by Ronkainen et al. (2023). Therefore, when mothers observe their child's accomplishments in

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addressing or ameliorating behavioral issues or enhancing academic performance, their satisfaction regarding the effectiveness of their parenting and interactions increases, fostering a sense of competence that further contributes to an elevation in parental self-efficacy among these mothers. Mothers of children with disorders frequently confront heightened challenges and frustrations in interpersonal relationships due to their child's challenging behaviors and the father's limited involvement in child-related matters, which consequently diminishes mother-child interactions and can jeopardize the mother's self-efficacy ((Ronkainen et al., 2023).

Since the identification of specific learning disorders typically commences concomitant with the initiation of formal education, a considerable number of mothers ascribe these disorders to the phenomenon of procrastination exhibited by their children, consequently imposing significant psychological pressure on them with the objective of enhancing their academic performance. This not only fails to facilitate improvements in academic achievements but also detrimentally affects the mother-child relationship, thereby casting doubt upon the mother's perceived parenting competencies. Hence, the prompt identification and intervention for this disorder emerge as critical determinants for fostering effective communication with children diagnosed with specific learning disorders.

Furthermore, the findings indicate that the direct pathway from metacognitive beliefs to parental self-efficacy is statistically significant. The outcomes of this investigation align with the research conducted by previous studies (Akturk & Sahin, 2011; Moritz & Lysaker, 2018). In elucidating the results of the present study, it may be posited that metacognition encompasses the capability to scrutinize and regulate one's mental states and cognitive operations (Kim et al., 2020), and it additionally pertains to the aptitude for understanding and reflecting on the mental states of oneself and others, thereby facilitating the management of life tasks and the regulation of cognitive processes and interpersonal interactions (D'Abate et al., 2020). Individuals exhibiting elevated levels of metacognition effectively utilize their experiences due to their heightened metacognitive awareness. The process of planning enables the selection and execution of the most suitable strategy in accordance with prevailing circumstances. Moreover, the mechanisms of metacognitive control and review empower individuals to modify their strategies or adjust cognitive activities promptly. Indeed, the employment of metacognitive strategies is intended to assist individuals in engaging with their thoughts in a transformative manner, thereby fostering adaptive metacognitive

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control and awareness while mitigating cognitive processes characterized by worry and rumination. In other terms, the metacognitive framework offers individuals strategies to liberate themselves from cognitive mechanisms that induce fixation on worry, threat monitoring, and maladaptive self-regulation, and by imparting the principles of emotional flexibility in processing, it establishes a foundation for future planning, contemplation, and behavior in confronting threats and harm. Consequently, mothers possessing metacognitive skills are better equipped to make deliberate and judicious decisions while adeptly managing situations due to their command over their mental states and cognitive activities. Accordingly, the conviction in personal efficacy and capability is substantially heightened among these parents when juxtaposed with their counterparts.

Ineffective metacognitive beliefs serve to exacerbate adverse emotional experiences, and due to the lack of emotional regulation capabilities in individuals facing such circumstances, their difficulties persist and are perpetuated by the establishment of erroneous cognitive patterns and the employment of inadequate strategies. Consequently, mothers who lack metacognitive competencies or have not adequately developed this skill within themselves are prone to displaying maladaptive emotional responses upon confronting the challenges associated with a child exhibiting learning disorders, which can subsequently undermine their perceived efficacy in parental roles.

In light of the findings from the study, it is posited that since the initial relational experiences of a child lay the groundwork for personality development, and acknowledging the critical nature of the mother-child attachment along with the impact of maternal caregiving on child growth, it is advisable that, in addition to other medical interventions for expectant mothers, relevant authorities consider implementing training programs focused on emotional-communication skills to equip mothers for fostering appropriate and effective communication with their infants. Furthermore, recognizing the existing communicative dynamics and reciprocal influences between mothers and children, it is recommended that comprehensive screening initiatives be conducted across educational institutions to identify children with specific learning disabilities, and that requisite actions be taken to facilitate the diagnosis and referral of mothers to appropriate support services.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

Funding

The authors did (not) receive support from any organization for the submitted work.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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