

A re-examination of the Italian parental monitoring scale: Development, validation, gender, and school success measurement invariance

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Abstract

Parental monitoring (PM) is a key construct in research on children's well-being and healthy development referring to the attention parents pay to their children's activities and whereabouts. However, existing literature suggests that the psychometric properties of its measurement tools are still perfect. For this study, a revised Italian parental monitoring scale (I-PM-R) was developed and validated with data from 835 participants (63% females), aged between 10 and 20 years old. The sample was divided into two sub-samples. One was used for parallel and exploratory factor analyses, and the other was used for confirmatory factor analysis. A total of eight factors were thus identified. The scale exhibited invariance in relation to children's gender and school success, and associations with demographic variables and school performance. The I-PM-R contributes to the need to move toward psychometric quality advances in the measurement of PM.

KEYWORDS

Italian validation, parental monitoring, questionnaire, scale

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1 | INTRODUCTION

Parental monitoring (PM) is a key construct widely used in research on children's well-being and healthy development. As more studies are conducted, more directions in the interpretation of the construct are plausible, and its measurement is further perfectible. To frame proposed improvements in terms of psychometric measurement, a short historical overview of the interpretative evolution of the construct is first needed.

Toward the end of the twentieth century, PM was defined as a "set of correlated parenting behaviors involving attention to and tracking of the child's whereabouts, activities, and adaptations" (Dishion & McMahon, 1998, p. 61), and children's development research highlighted its associations with injury prevention, antisocial and problem behavior, involvement with antisocial peers, substance use, and academic achievement (Ary et al., 1999; Baker et al., 1999; Crouter et al., 1990; Dishion & Loeber, 1985; Dishion & McMahon, 1998; Dishion et al., 1991, 1998; Duncan et al., 1998; Kurdek et al., 1995; Patterson & Stouthamer-Loeber, 1984; Patterson et al., 1992; Peterson et al., 1993; Steinberg et al., 1994; Tremblay, 1999; Weintraub & Gold, 1991). Such associations provided the basis for the general recommendation of experts to increase the level of parental involvement, tracking, and monitoring, to promote healthier child development. With the beginning of the new century, a slight but fundamental change of perspective occurred with Stattin and Kerr (2000) introducing to the discourse a proposal to shift the emphasis in conceiving such parental practices, and pointing out that measures of PM assessed the level of knowledge of parents, but not the source of information thanks to which such knowledge was at their disposal. They therefore elaborated a series of measure items to gather data regarding three possible sources of information: (1) child disclosure; (2) parental solicitation; and (3) parental control. Their results suggested that child disclosure was the more informative dimension, and the one on which research and interventions should focus, more than parental tracking or surveillance (Kerr & Stattin, 2000; Stattin & Kerr, 2000). This vision was consistent with the reflection of Crouter et al. (1990), some years before, that PM is more akin to a relationship property, by which, for effective PM to occur, children must be willing to reveal details about their activities and experiences to their parents. If PM is considered a continuum, including its most extreme and dysfunctional positions, it becomes possible to identify forms of control that are, on the one hand, excessively privative, and, on the other, permissive enough to resemble forms of abandonment. For example, one recent study observed that a permissive parenting style influences the occurrence of high-risk behaviors in young adult children (Publico et al., 2021). Furthermore, a recent review focused on the impact of parenting styles on children's healthy diets and the risk of obesity, highlighted that parenting styles describable as permissive or authoritarian do not promote healthy eating habits as much as those describable as authoritative, and presented a good balance between warmth and control (Kiefner-Burmeister & Hinman, 2020). Caprara and Scabini (2000) showed that, in hyper-controlling contexts, there is a prevalence of relational dynamics rich in overtly expressed emotion, which may then generate a state of disguised anger or a negative emotional tone pervading the family atmosphere. On the contrary, family systems characterized by hypo-control appear to be more stimulating but not always efficient in maximizing their functioning, with intra-family roles unclear and poorly differentiated, leading to relational confusion.

As the complexity and number of studies concerning PM have increased, more directions in the interpretation of the construct have been investigated, starting with the contemplation of an overturning of directionality, according to which parental practices may be considered a reaction to adolescent problem behaviors (Kerr & Stattin, 2003). Moreover, adolescents' interpretations and feelings about PM have been brought into focus. For example, Hawk et al. (2008) explored the possible association of parental solicitation and control with adolescents' perceptions of privacy invasion, and found that adolescents may negatively interpret such aspects of PM. Likewise, Kakihara et al. (2010) underlined that youths' feeling of being over-controlled is a dimension that needs further examination. The over-involvement of parents, often referred to as "helicopter parenting," also appears to negatively relate to children's psychological well-being (Lemoyne & Buchanan, 2011). On the contrary, it has also been argued that a lack of perceived PM may embolden the perpetration of bullying in early adolescence (Doty et al., 2021).

Research has, furthermore, continued to explore the construct of PM in reference to externalizing conducts, such as antisocial behaviors, problem behaviors, delinquency, offensive behaviors, bullying, and alcohol and substance use (Abar et al., 2015; Flanagan et al., 2019; Fletcher et al., 2004; Fosco et al., 2012; Janssen et al., 2017; Keijsers, 2016; Kerr et al., 2010; Nocentini et al., 2019; Thompson et al., 2015; Trudeau et al., 2012), with the often associated affiliation with deviant peers (Bowman et al., 2007; Keijsers et al., 2012; Tilton-Weaver et al., 2013), and to moral disengagement (Campaert et al., 2018), injury prevention in young children (Morrongiello & Schell, 2010), self-harm (Benau et al., 2017), internet addiction (Ding et al., 2017), the risk of online harassment (Khurana et al., 2015), and cyberbullying (Aoyama et al., 2011, 2012; Meter & Bauman, 2018). The main indication of this large field of research is that PM reduces risk behaviors in children and adolescents. Nonetheless, the construct of PM has shown signs of fragmentation, and its traditional interpretation has encountered various criticisms (Omer et al., 2016), including the recent suggestion that self-report measures of PM for use with children need further studies focused on their psychometric quality (Handschuh et al., 2020).

To overcome some of the criticisms raised of the PM construct, Omer et al. (2016) proposed a “Vigilant Care Model,” taking a distance from the mechanistic connotation of the term “monitoring,” and hypothesizing that vigilant parental care may assume a flexible attitude, with different protective and attentive levels based on adolescent signaling and behaviors, and thus deepening our understanding of PM as a construct rooted in the parent–child relationship and in family functioning.

The evolution of the construct of PM points to a plural interconnection with other constructs, and to a complexity of perspectives. Accordingly, consideration of PM as a construct embedded in family dynamics gathered early attention in the context of Italian research. Marta et al. (2004) explored the joint effects of parent–child relationship quality and monitoring on adolescent adaptation, measured in terms of internalizing and externalizing symptoms. As a measure of PM, the authors selected nine items from other instruments assessing levels of parental control and monitoring (Kerr et al., 1999; Metzler et al., 1998; Schludermann & Schludermann, 1970), and had the foresight to propose them to adolescent participants in duplicate, measuring maternal monitoring on one hand, and paternal monitoring on the other.

A few years later, Miranda et al. (2012) validated an Italian version of the original instrument proposed by Kerr and Stattin (2000) and Stattin and Kerr (2000), maintaining the 25 original items (with a translation to the letter in Italian, and a back translation), loading on the four original dimensions of parental knowledge, child disclosure, parental solicitation, and parental control. This version was validated by performing a confirmatory factor analysis (CFA) with maximum likelihood (ML) estimator on the responses of 445 Italian adolescents and 231 of their mothers. Specifically, the authors tested a second-order CFA considering a “supervision modality” factor—including the three information sources of child disclosure, parental solicitation, and parental control—associated with the parental knowledge factor, and also assessing gender invariance. The authors also performed concurrent and predictive validity analyses, as well as a hierarchical regression to identify which of the three sources of information (disclosure, solicitation, or control) contributed most to the level of parental knowledge. This validated version was used in a more recent study by Everri et al. (2015) involving a sample of 322 adolescents and aimed at filling the gap in systematic empirical evidence concerning the joint impact of PM and family functioning on children's developmental outcomes and well-being.

Despite the interest in Italy in the construct of PM, at a distance of almost a decade, the Italian version of the instrument has never been refined. Nonetheless, Lionetti et al. (2016), based on an examination of the factorial validity of PM ($N = 1071$; Italian adolescents), suggested that the PM scale might benefit from further revisions, and that future studies might focus on psychometric quality advances.

With this contribution, our aim was to propose a refinement to the PM measurement tool for the Italian context, considering recent research developments concerning the importance of the PM construct in association with other dimensions. In this regard, we set out to explore the structure of the instrument including other dimensions treated and associated with PM in Kerr and Stattin's original works (Kerr & Stattin, 2000; Stattin & Kerr, 2000), since a solid multidimensional measurement tool may better grasp the complexity introduced in the last

few years of research, allowing the elaboration of even more complex research designs, and increasingly targeted interventions (Caso et al., 2021).

Moreover, a very recent meta-analysis by Lionetti et al. (2019) focused on the identification of developmental changes in parent-adolescent communication, conceptualized within the PM framework. The authors highlighted several important considerations, among that parents acknowledge their children's needs for privacy and that adolescents themselves are not passive recipients of parenting, since they can manage their disclosure and contribute to shaping the communication process. This supports the idea of a tendency to a more complex conceptualization of PM over the years. Among indications for future research lines, it has emerged that a more in-depth exploration of moderation mechanisms is needed, since authors clearly detected a high heterogeneity in study results.

This work proposes a revised Italian version of the PM scale, taking into account the broadening gaze toward other aspects of the family and relational context to which PM seems inevitably connected. To do so, we looked back at the original work of Stattin and Kerr (Kerr & Stattin, 2000; Stattin & Kerr, 2000), in which "norm-breaking" and "parent-child relationship" dimensions were also present and combined with the four PM measures of parental knowledge, child disclosure, parental solicitation, and parental control, but, instead of treating such dimensions as separate from PM, we included them in the same instrument.

In this framework of action, the specific objectives of our work were the following:

- i) To revise the original scale, adapting original items to the Italian context, and introducing methodological improvements (e.g., avoiding multiple-sentence items);
- ii) To test the psychometric validity of this version of the tool including the norm-breaking and parent-child relationship dimensions, by performing both exploratory factor analysis (EFA) and CFA;
- iii) To test the invariance of this multidimensional version of the tool in relation to both gender and school success;
- iv) To test the relationship between factors through Pearson product-moment correlations (PPMCs), as well as through multiple regression (MR);
- v) To explore associations with another multidimensional instrument concerning adolescents' relationship with family, peers, and externalizing behavior (FPEB; Caso et al., 2021).

2 | METHODS

2.1 | Sample size calculation

To calculate the required sample size, we followed the indications of Satorra and Bentler (2001), and Nunnally and Bernstein (1994, 1995), according to whom a rule of thumb can be used whereby the required sample size is obtained by multiplying q (the number of estimated parameters) by 5. In our case, this resulted in a required sample size of at least 510 participants.

2.2 | Participants

The participants of our study were all residing in the Lombardy Region of Northern Italy, in the Province of Bergamo, and were recruited with the collaboration of the Regional Schools Office of the Territorial Area of Bergamo, thus involving nine schools in the research. Among these nine schools, 33 classes were randomly selected, together with all their members, for potential inclusion in the research. In total, 835 students (age range 10–20 years old, $M = 13.81$, $SD = 1.54$) participated in the study. About 46% of the participants were middle school students, whereas the remaining were high-school students, with grades ranging from 6th to 12th grade (high school students = 451). About 63% of the students were older than 13, and about 63% were females.

The performance of the students was moderate ($M = 2.42$, $SD = 0.46$, see below), and 44 of them were not admitted to the following school year. None had learning disabilities, nor had any identified specific sociorelational difficulties.

2.3 | Measures

2.3.1 | FPEB in adolescence

The FPEB scale (Caso et al., 2021) is a recently published tool aimed at evaluating adolescent students' relationship with FPEB. The tool consists of 16 items, with one for each of four dimensions: (1) family conflict (characterized by a tense atmosphere and disagreements between family components); (2) lack of family negotiation (between family members, in particular between parents and children); (3) peer relations difficulties (quality and type of relationships of children with their peers), and (4) externalizing behavior (maladaptive behaviors, e.g., bullying). The tool uses a 5-point Likert response scale (from "Never" to "Always"). The tool appears to have good internal validity, model fit, reliability ($\alpha = .67 \div .78$), and concurrent validity with another scale in particular, the Moral Disengagement Scale (Caprara et al., 1995).

2.3.2 | Parental monitoring

The original Stattin & Kerr Parental Monitoring Scale (2000) was developed to explore the relationship between PM and children's behavior, using 42 items, with answers on a 5-point Likert scale, making up the following six measures: (1) PM (parents' knowledge of children's activities and associations); (2) child disclosure (children's free disclosure of information); (3) parental solicitation (parents' action of gathering information through active questioning); (4) parental control (parents' control exerted over their children's freedom, through active monitoring of their activities and plans); (5) parent-child relationship (exploring the quality of the relationship between children and their parents); and (6) norm-breaking (inappropriate or unlawful children's behaviors).

First, the original scale was analyzed in detail by a researcher with expertise in the field. Second, two researchers translated each item using a team approach (Behr & Shishido, 2016). Third, the first researcher developed a revised version (I-PM-R), adapting it to the Italian context. Multiple-sentence items were split into unique items. For example, one of the original items read, "Do your parents demand that they know where you are in the evenings, who you are going to be with, and what you are going to do?", thus including, in a single sentence, three different types of information which may be unrelated. Indeed, parents might be interested in knowing who their children are going to be with, but not what they are going to do. Furthermore, several items were excluded or adapted, because they did not fit with the Italian context, and several items were added. A comparison between the original scale and the revised, adapted Italian version is provided in Table 1. The revised scale ended up with a total of 62 items.

2.3.3 | Student performance

Following Caso et al.'s (2021) work, student performance was assessed by school success (end-of-year outcome, i.e., admitted to the following year vs. not admitted) and student marks. The performance was computed via the mean in each subject (e.g., Mathematics and Geography) assigned to the following marking categories: (1) "Fail," including scores from 0 to 5; (2) "Sufficient," including scores of 6 and 7; and (3) "Merit," including scores from 8 to 10.¹

¹We decided to recode 0–10 scores in three categories, since although students could, theoretically speaking, obtain scores over the full 0–10 range, extreme scores, for example, below 4, are hardly ever or never given by teachers.

TABLE 1 I-PM-R factor loadings and correlations.

I-PM-R items	Sub-sample A (EFA)						Sub-sample B (CFA)		Original version items	
	PM	FA	MO	PC	NB	DS	SO	OP		
Loadings										
mp17_sHD I miei genitori sanno con chi sono dopo la scuola	0.73	-0.07	0.03	-0.03	0.09	-0.07	0.23	-0.13	0.78	My parents know who I am with after school
mp16_sHD I miei genitori sanno dove vado dopo la scuola	0.73	-0.09	0.01	0.00	0.07	-0.05	0.06	-0.10	0.70	My parents know where I go after school
mp21_sHD I miei genitori sanno chi sono gli amici con cui sto durante il tempo libero	0.70	0.01	-0.02	-0.02	0.04	-0.12	0.12	0.11	0.67	My parents know the friends I am with in my free time
mp15_sHD I miei genitori sanno cosa faccio nel tempo libero	0.68	0.00	0.04	-0.07	0.07	0.04	0.18	-0.03	0.66	My parents know what I am doing in my free time
mp11_sHD I miei genitori sanno quando i miei amici vengono a casa, quando loro non ci sono	0.65	-0.05	0.02	-0.01	0.15	0.02	-0.12	0.19	0.47	My parents know when my friends come to my house when they are away
mp13_sHD Parlo spontaneamente ai miei genitori di quello che faccio con i miei amici	0.50	0.00	0.05	-0.04	-0.10	0.21	0.01	0.08	0.62	I spontaneously speak to my parents about what I do with my friends
mp26_sHD I miei genitori sanno dove vado quando esco la sera con gli amici	0.49	0.03	-0.07	0.13	0.03	0.09	-0.15	0.15	0.58	My parents know where I go when I go out with friends
mp27_sHD Nascondo ai miei genitori quello che faccio se esco la sera	-0.46	-0.06	-0.02	-0.01	0.16	0.18	0.12	-0.17	-0.40	I hide from my parents what I do if I go out in the evening
mp36_sHD Mi è capitato di fumare sigarette	-0.42	-0.20	0.04	-0.15	0.02	0.09	0.09	0.17	-0.38	It has happened that I have smoked cigarettes
mp23_sHD I miei genitori sanno come spendo i miei soldi	0.41	0.10	-0.01	-0.01	-0.09	0.05	0.11	-0.06	0.53	My parents know how I spend my money
mp20_sHD Nascondo ai miei genitori quello che faccio nel tempo libero	-0.39	-0.04	-0.04	0.06	0.18	-0.04	0.15	-0.03	-0.42	I hide from my parents what I do in my free time
mp61_sHD Accetto mio padre per quello che è	-0.10	0.79	0.14	0.07	-0.01	-0.14	0.07	0.09	0.76	I accept my father for what he is

TABLE 1 (Continued)

I-PM-R items	Sub-sample A (EFA)						Sub-sample B (CFA)			Original version items
	PM	FA	MO	PC	NB	DS	SO	OP	B	
mp60_sHD Mi sento fiero di mio padre	-0.10	0.78	0.15	0.06	0.00	-0.11	0.04	0.13	0.73	I am proud of my father
mp62_sHD Mio padre mi supporta ed incoraggia	0.04	0.75	0.04	-0.02	0.09	0.06	-0.05	0.01	0.65	My father supports and encourages me
mp56_sHD Io e mio padre ci capiamo bene a vicenda	0.09	0.75	-0.08	-0.03	0.09	0.13	0.03	-0.08	0.74	My father and I understand each other well
mp58_sHD Mi sento di parlare liberamente con mio padre	0.01	0.68	-0.07	-0.07	-0.06	0.18	0.02	-0.02	0.77	I feel I can speak freely to my father
mp57_sHD Vorrei che mio padre si comportasse diversamente	-0.05	-0.67	0.16	0.05	0.04	0.04	0.04	0.05	-0.54	I would like my father to behave differently
mp53_sHD Mi sento fiero di mia madre	-0.07	-0.05	0.82	0.09	0.01	-0.06	0.06	0.05	0.69	I am proud of my mother
mp54_sHD Accetto mia madre per quello che è	-0.07	0.05	0.75	0.04	-0.04	-0.17	0.10	0.01	0.65	I accept my mother for what she is
mp55_sHD Mia madre mi supporta e incoraggia	0.04	0.11	0.71	-0.06	0.13	0.07	-0.03	-0.07	0.67	My mother supports and encourages me
mp50_sHD Vorrei che mia madre si comportasse diversamente	-0.12	-0.03	-0.59	0.10	0.17	0.13	0.13	0.10	-0.59	I would like my mother to behave differently
mp49_sHD Io e mia madre ci capiamo bene a vicenda	0.09	-0.11	0.58	0.08	-0.02	0.23	-0.10	0.01	0.77	My mother and I understand each other well
mp51_sHD Mi sento di parlare liberamente con mia madre	0.13	-0.08	0.54	-0.01	-0.01	0.22	0.00	-0.03	0.78	I feel I can speak freely to my mother
mp30_sHD Per darmi il permesso di uscire la sera i miei genitori vogliono sapere con chi sono durante la serata	0.12	-0.05	-0.02	0.83	-0.02	0.03	-0.09	0.00	0.93	Before giving me permission to go out in the evening, my parents want to know who I will be with
mp31_sHD Per darmi il permesso di uscire la sera i miei genitori vogliono sapere cosa farò durante la serata	0.12	0.05	-0.03	0.71	-0.11	-0.06	0.00	-0.13	0.75	Before giving me permission to go out in the evening, my parents want to know what I am going to do

(Continues)

TABLE 1 (Continued)

I-PM-R items	Sub-sample A (EFA)						Sub-sample B (CFA)	Original version items		
	PM	FA	MO	PC	NB	DS			SO	OP
mp34_sHD Se torno oltre l'orario stabilito i miei genitori pretendono di sapere con chi ero	-0.12	-0.02	0.08	0.64	0.10	0.04	0.12	0.04	0.53	If I come back home after the pre-established time, my parents want to know who I was with
mp29_sHD Per darmi il permesso di uscire la sera i miei genitori pretendono di sapere dove sono durante la serata	0.16	-0.01	-0.02	0.63	0.00	-0.02	-0.02	-0.06	0.80	Before giving me permission to go out in the evening, my parents want to know where I will be
mp33_sHD Se torno oltre l'orario stabilito i miei genitori pretendono che spieghi perché	-0.22	0.03	0.07	0.59	0.09	0.11	0.11	0.09	0.45	If I come back home after the pre-established time, my parents want to know why
mp45_sHD Mi è capitato di deridere un compagno	0.04	0.06	-0.06	-0.03	0.77	0.01	-0.05	-0.03	0.84	It has happened that I have mocked a schoolmate
mp46_sHD Mi è capitato di insultare un compagno	0.04	0.00	0.02	0.00	0.75	-0.04	-0.02	0.03	0.77	It has happened that I have insulted a schoolmate
mp44_sHD Mi è capitato di ignorare un compagno	0.07	0.00	0.02	0.09	0.68	-0.02	-0.11	0.00	0.60	It has happened that I have ignored a schoolmate
mp6_sHD Ho voglia di parlare ai miei genitori di cosa succede in classe	0.01	0.00	-0.01	0.05	0.01	0.80	0.01	0.04	0.79	I am willing to talk to my parents about what happens at school
mp7_sHD Ho voglia di parlare ai miei genitori della mia relazione con gli insegnanti	-0.13	-0.05	-0.04	0.03	0.00	0.78	0.11	0.02	0.69	I am willing to talk to my parents about my relationship with my teachers
mp4_sHD Ho voglia di parlare ai miei genitori di come vado a scuola	0.04	0.20	0.00	0.00	-0.10	0.59	-0.06	-0.09	0.71	I am willing to talk to my parents about my school performance
mp18_sHD I miei genitori mi chiedono di raccontare loro che cosa succede nel tempo libero	0.22	0.06	-0.05	0.01	-0.09	0.04	0.69	0.05	0.81	My parents ask me to tell them what happens in my free time
mp19_sHD I miei genitori pretendono di sapere che cosa faccio nel mio tempo libero	-0.05	0.01	-0.11	0.22	-0.06	-0.01	0.56	-0.02	0.51	My parents want to know what I do in my free time

TABLE 1 (Continued)

I-PM-R items	Sub-sample A (EFA)					Sub-sample B (CFA)			Original version items	
	PM	FA	MO	PC	NB	DS	SO	OP		
mp5_sHD I miei genitori mi chiedono di raccontare loro che cosa succede a scuola	0.01	-0.01	0.17	-0.07	-0.05	0.11	0.54	0.04	0.60	My parents ask me to tell them what happens at school
mp9_sHD Capita che alcuni amici vengano a casa mia	0.08	0.07	-0.10	0.01	-0.04	-0.04	-0.01	0.72	0.77	It happens that my friends come to visit me at home
mp10_sHD I miei genitori chiacchierano con i miei amici quando vengano a casa mia	0.15	-0.11	-0.01	0.02	-0.06	0.07	0.06	0.65	0.57	My parents chat with my friends when they come to visit me at home
mp8_sHD Mi capita di frequentare degli amici	-0.02	0.11	0.05	-0.08	0.10	0.00	0.03	0.44	0.43	It happens that I hang out with my friends

Note: The scale was validated with the Italian items. The English items are reported only for indicative purposes.

Abbreviations: DS, child disclosure; FA, father-child relationship; MO, mother-child relationship; NB, norm-breaking; OP, social openness; PC, parental control; PM, parental monitoring; SO, parental solicitation.

2.4 | Procedure

First, schools were contacted to present the aim of the study to students and their families. Second, authorization for participation in the research was obtained from school heads and students' parents. Third, students over the age of 18 years old and parents of underage students filled out and signed the informed consent. The whole process was conducted in accordance with the Declaration of Helsinki (World Medical Association, 2004) and the Italian Psychological Association Ethics Guidelines (AIP, 2015). Students were then instructed on how to fill out the survey, and anonymously answered the questions. No remuneration was offered.

2.5 | Statistical analyses

Parallel analysis (PA) was conducted with the software Jamovi, version 1.2 (Jamovi Project, 2020). Descriptive analyses, EFA, internal-consistency analyses, *t* tests, and regressions were conducted with the software IBM SPSS Statistics, version 17 (IBM). CFA and measurement invariance tests were conducted with the lavaan package (Rosseel, 2012) for R (R Core Team, 2020; RStudio Team, 2020). To deal with missing values, we used hot-deck imputation, a procedure that can be used when less than 10% of the data are missing (Roth, 1994). This method replaces missing values with those of a donor in the data set (sex and age were used as references for the donors; cf. Caso et al., 2021).

In the first step, the data were screened to explore their descriptive qualities and distribution. Skewness above |2| and/or kurtosis above |7| indicated non-normality (West et al., 1995). Items with a non-normal distribution were transformed in their reversed scores (1/*X*) (Barbaranelli & D'Olimpo, 2007). Outliers (participants with scores placed $SD > |2|$) were excluded. In the first step of the analyses, scores of the six factors of the original Parental Monitoring Scale (Stattin & Kerr, 2000) were computed, and a first CFA was run, to explore fit indexes of the scale.

The total sample was then randomly split into two sub-samples using SPSS, as the fit of the original scale was not satisfactory (see below), thus determining two sub-samples of 348 participants each. One sub-sample (A) was used to conduct a PA and EFA, and the other (B) was used for a subsequent CFA.

For the second step, involving sub-sample A, we started by conducting a PA with Horn's method (Horn, 1965), due to its merits as an objective test for identifying the dimensionality of multivariate data (Hubbard & Allen, 1987). Indeed, selecting the number of factors only based on a scree plot or eigenvalues can be misleading: judging the elbow of a scree plot might reflect a sampling error, and is a subjective process, whereas too many factors are retained when eigenvalues are used (Hubbard & Allen, 1987; Netemeyer et al., 2003). Thus, we relied on PA to decide how many factors to extract, followed by an EFA with promax oblique rotation, since there was theoretical background showing a relation between the dimensions of the Parental Monitoring Scale (Stattin & Kerr, 2000). To make sure that the correlation matrix could be used to run the EFA, the Kaiser–Meyer–Olkin (KMO) test and Bartlett's sphericity test were run, providing an adequate result of $KMO > 0.60$ and a significant Bartlett's test. The EFA was conducted on all 62 items, 9 of which were added to the original scale due to their relevance in the Italian context. Subsequent factor analyses were conducted until a stable solution appeared. Items with loadings < 0.32 or > 0.32 on more than one item were excluded (Comrey & Lee, 1992). Internal consistency was assessed via Cronbach's alpha, with values > 0.60 indicating a sufficient level of reliability (Nunnally & Bernstein, 1994, 1995).

For the third step, involving sub-sample B, we conducted a CFA using the R package Lavaan (Rosseel, 2012) and an ML estimator. To explore the model fit, the following indexes were analyzed (Hu & Bentler, 1999): chi-square test statistic, root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The comparative fit index (CFI) and Tucker–Lewis index (TLI) were only reported when the null model RMSEA was > 0.158 , since lower values imply that such criteria are not reliable (Kenny et al., 2015). Nonsignificant chi-square test statistics and RMSEA and SRMR < 0.08 were interpreted as reasonable fits. Furthermore, measurement invariance in relation to gender and school success was assessed (Blunch, 2012), obtaining and

comparing three different models: (1) configural invariance, where the factor structure is assumed to be the same across groups; (2) metric invariance, where the loadings are fixed to be equal across groups; and (3) scalar invariance, where both loadings and intercepts are fixed to be equal across groups. To compare the models, we focused on changes in RMSEA and SRMR values (Lu et al., 2018; Ma, 2020; Zhao et al., 2019), and on the Bayesian Information Criterion (BIC), but refrained from exploring the χ^2 difference test, as this is too sensitive with large samples ($N > 300$; Chen, 2007). Measurement invariance was deemed present when $\Delta\text{RMSEA} < 0.015$ and $\Delta\text{SRMR} < 0.030$ (Chen, 2007; Cheung & Rensvold, 2002). Furthermore, according to Cheung and Rensvold (2002), we interpreted lower BICs as indicative of better fit and evidence of invariance (see also Zhou et al., 2019).

Differences on the I-PM-R scores were explored with *t* tests between males and females, and between students who were admitted to the following school year versus those who were not. For such comparisons, we also report Bayes factors, which allow testing the probability of the observed data under the null compared to the alternative hypothesis. A Bayes factor of 10 indicates that the alternative hypothesis is the numerator and the null hypothesis the denominator. Consequently, a $\text{BF}_{10} > 1$ indicates evidence for the alternative hypothesis, whereas a $\text{BF}_{10} < 1$ indicates evidence in favor of the null hypothesis. According to Wagenmakers et al. (2018), a BF_{10} in the range of 1–3 indicates weak evidence for the alternative hypothesis, a BF_{10} in the range of 3–10 indicates substantial evidence, and a $\text{BF}_{10} > 10$ indicates strong evidence. The association between the questionnaire and students' performance (school marks) was explored via Pearson's correlations. Validity was also explored via correlations between the I-PM-R and the FPEB (Caso et al., 2021). Finally, the relationship between PM and all other I-PM-R factors was explored via MR conducted using SPSS.

Last, as explained above, multiple comparisons were made for some analyses, which might lead to spurious significant findings. According to Gelman et al. (2012), the fact of reporting Bayes Factors together with NHST results might have been sufficient to not consider such an issue; nonetheless, we adopted a conservative alpha level of $p < .01$ instead of a more liberal $p < .05$ to provide stricter control for this kind of error.

3 | RESULTS

3.1 | Preliminary analyses

Treating missing values with hot-deck imputation failed in 10 cases, which were then excluded from the analyses, thus providing a final sample of 825 students. The item response rate was high (Min = 97.3%, Max = 99.88%), whereas average response scores ranged from 1.05 to 4.56 ($SD_{\min} = 0.39$; $SD_{\max} = 1.40$). Of the 62 items, 6 showed skewness above |2| and/or kurtosis above |7|. Three items were transformed into their reciprocal (Barbaranelli & D'Olimpo, 2007): (*i*₁, "Do your parents know how you do in different subjects at school? [I miei genitori sanno come vado nelle diverse materie scolastiche]—back-translatable as "My parents know how I do in different school subjects"; *i*₃₉, "Have you skived school? [Mi è capitato di marinare la scuola]—back translatable as "It has happened that I have skived off school"; *i*₄₁, "Have you taken items from a mall, store, or newsstand without paying? [Mi è capitato di prendere oggetti senza pagare]—back translatable as "It has happened that I have taken items without paying". Three items were excluded as transformation formulas were unsuccessful (*mp*_{37sHD}, *mp*_{38sHD}, *mp*_{47sHD}), likely because of the content of the items itself. These items read, respectively: "I have tried hashish, marijuana, and cannabis" ($M = 1.19$, $SD = 0.71$, Skewness = 4.16, Kurtosis = 17.23), "I have tried cocaine, heroin, ecstasy, or acids" ($M = 1.05$, $SD = 0.39$, Skewness = 8.25, Kurtosis = 71.91), and "It has happened that I was taken to the police station and interrogated" ($M = 1.06$, $SD = 0.40$, Skewness = 7.80, Kurtosis = 64.84). Students answered "Never" or "Few times" in 94.3% of cases to the first item, and in 98.5% of cases to both the second and third items.

3.1.1 | CFA of the original Parental Monitoring Scale (Stattin & Kerr, 2000)

As a first step, according to the aims of the present work, the six measures presented in the original work of Stattin and Kerr (2000) were considered as possible dimensions of a multidimensional model. The scores of the six factors were calculated as the mean of the items belonging to each factor. Then, outliers (students whose score on any of the six factors was above $[2\text{ SDs}]$) were excluded, leaving a sample of 696 participants available for analyses. A CFA was then conducted on this reduced sample, resulting in a unsatisfactory fit [$\chi^2(1112) = 5445.12, p < .001$; RMSEA = 0.075; SRMR = 0.079]. The CFI and TLI are not reported, as they may be not informative, since the baseline model's RMSEA was <0.158 . The internal consistency of the parental solicitation factor was mediocre ($\alpha = .49$). For such reasons, and considering that the original scale was revised and adapted to the Italian context, we also conducted EFA and CFA.

3.1.2 | I-PM-R: PA and EFA

The data of sub-sample A ($n = 348$), including 59 items (the original items revised plus the additional items, cf. Table 1), were used to perform PA and EFA. The PA indicated that the 10-factors solution was the most appropriate.

Moreover, Bartlett's sphericity test [$\chi^2(1711) = 9082.10, p < .001$] and the KMO test (0.84) both indicated that the correlation matrix was suitable to conduct an EFA. The scree plot (Figure 1) showed two elbows, one at five factors, and the other at eight factors. The eigenvalue suggested a 14-factor solution. Considering all these results together, we forced an EFA with an 8-factor structure. Then, after a series of EFAs conducted in a stepwise manner, the initial pool consisting of 59 items was reduced to 40 items (Table 1). Nine items were excluded because their loadings were below 0.32. Another nine items were excluded because they exhibited cross-loadings. One last item, concerning the father-child relationship, was excluded because, although its loading was good and there was no cross-loading, the corresponding mother-child relationship item had been excluded. Otherwise, there would have been an imbalance in the number of items relating to the mother-child relationship and those relating to the father-child relationship.

Factor loadings are provided in Table 1. The first factor, labeled "Parental monitoring," included items mainly concerning parents' knowledge of their children's activities (explained var. = 9.82%). The second factor, labeled "Father-child relationship," (explained var. = 8.68%), consisted of items regarding the relationship between fathers and their children. The third factor mirrored the second one, since its items concerned the relationship between

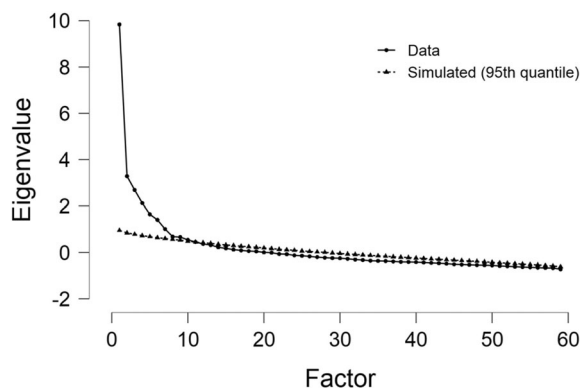


FIGURE 1 Scree plot of the EFA and parallel analysis. EFA, exploratory factor analysis.

mothers and their children, and was hence labeled “Mother–child relationship” (explained var. = 7.32%). In the original work of Stattin and Kerr (2000), the relationship between the mother and the father belonged to the same unique factor of “Parent–child relationship”. The fourth factor was “Parental control” (explained var. = 6.45%), relating to the control exerted by parents on children's freedom in their activities. The fifth factor focused on children's “Norm-breaking” (explained var. = 4.61%), whereas the sixth was “Child disclosure” (explained var. = 5.08%). The seventh factor concerned “Parental solicitation” (explained var. = 3.71%) that is active questioning of children to obtain information about their activities, whereabouts, and so on. The eighth and last factor included items relating to the sociality of the family and was thus labeled “Social openness” (explained var. = 3.52%).

3.2 | I-PM-R: CFAs

The data from sub-sample B were used for CFA, which showed a good model fit [$\chi^2(712) = 1805.07, p < .001$; RMSEA = 0.066; SRMR = 0.064]. The CFI and TLI are not reported as, once again, the baseline model's RMSEA was below 0.158 (0.14). Furthermore, the χ^2 test may be unreliable, as its power relates to the sample size and often results in significant values. Hu and Bentler (1999) suggested that a χ^2/df ratio of less than 3:1 indicates a good model fit. In this case, the ratio was 2.53. All items showed significant loadings on their relative factors (cf. Table 1). All the following analyses were conducted on the entire data set ($N = 696$).

3.3 | I-PM-R: Internal consistency

To explore the internal consistency of the eight factors of the I-PM-R, factor scores were computed as means of the items composing each specific factor. Both the distribution and the reliability were acceptable ($\alpha_{\text{MIN}} = 0.62 - \alpha_{\text{MAX}} = 0.84$), and almost all the correlations among factors were significant and between small and moderate (cf. Table 2).

3.4 | I-PM-R: Gender measurement invariance and school success

Multigroup CFAs were conducted to test for measurement invariance, showing that it applied to both gender and school success. As Table 3 shows, Δ RMSEA and Δ SRMR never exceeded 0.0009 and 0.0024, and the BICs of scalar invariance were always the lowest. Group comparisons (see below) can, therefore, be made.

3.5 | Validity

3.5.1 | Relationships between the I-PM-R and demographics

Eight different *t* tests were conducted to explore the relationship between gender and the factors of the I-PM-R. Table 4 shows that all tests, except those for the mother–child relationship and parental solicitation were statistically significant. Males reported higher scores than females for the father–child relationship and for norm-breaking, and lower scores for all other dimensions.

Furthermore, we explored the differences on the I-PM-R dimensions between students who were admitted to the following school year and those who were not. However, only 44 students were not admitted. Hence, to avoid a strong imbalance between the two groups, we randomly selected 44 cases from students who were admitted, thus providing two samples of equal size for the comparison. The analyses showed that no statistically significant result

TABLE 2 Correlations between the I-PM-R scores.

	PM	FA	MO	PC	NB	DS	SO	OP
PM	-							
FA	0.30*	-						
MO	0.45**	0.32*	-					
PC	0.32*	0.09*	0.15*	-				
NB	-0.28*	-0.22*	-0.19*	0.01	-			
DS	0.47*	0.29*	0.40*	0.18*	-0.30*	-		
SO	0.32*	0.14*	0.17*	0.37*	-0.06	0.30*	-	
OP	0.17*	0.01	0.09*	-0.03	-0.05	0.11*	0.08*	-
Students' marks	0.25*	0.14*	0.12*	0.21*	0.03	0.22*	0.16*	0.05
Externalizing behavior	-0.45*	-0.27*	-0.33*	-0.15*	0.55*	-0.35*	-0.12*	0.06
Peer relations difficulties	0.15*	0.20*	0.16*	-0.06	-0.10*	0.13*	0.02	0.36*
Family conflict	-0.21*	-0.49*	-0.29*	-0.05	0.14*	-0.17*	-0.05	-0.04
Lack of family negotiation	0.50*	0.33*	0.35*	0.28*	-0.18*	0.33*	0.23*	0.08*

Abbreviations: DS, child disclosure; FA, father-child relationship; MO, mother-child relationship; NB, norm-breaking; OP, social openness; PC, parental control; PM, parental monitoring; SO, parental solicitation.

* $p < .01$; ** $p < .001$.

TABLE 3 Measurement invariance tests for children's gender and school success.

	Model	χ^2	df	RMSEA	SRMR	BIC
Gender	Configural	3527.635	1424	0.066	0.066	74,911.780
	Metric	3571.706	1456	0.065	0.069	74,746.860
	Scalar	3716.003	1488	0.066	0.070	74,682.170
School success	Configural	4076.089	1424	0.074	0.065	73,602.580
	Metric	4140.224	1456	0.074	0.066	73,458.380
	Scalar	4238.555	1488	0.074	0.067	73,348.390

appeared, although the father-child relationship Bayes Factor indicated weak evidence in support of the hypothesis that successful students show a better relationship than unsuccessful students (cf. Table 5). Finally, we explored the correlation between I-PM-R dimensions and students' school marks. Table 2 shows that most of the correlations were statistically significant but small.

3.5.2 | Correlations between the I-PM-R and the FPEB

Most of the correlations between the I-PM-R and the FPEB (Caso et al., 2021) were significant and small to moderate in size (cf. Table 2).

TABLE 4 Gender differences on the I-PM-R dimensions.

	<i>t</i>	Gender	<i>M</i>	<i>SD</i>	<i>d</i>	<i>BF</i> ₁₀
Parental monitoring	-4.905*	Males	3.71	0.57	-0.39	9511.40
		Females	3.93	0.56	-	-
Father relationship	4.305*	Males	4.19	0.73	0.34	685.214
		Females	3.91	0.88	-	-
Mother relationship	0.203	Males	4.14	0.71	0.02	0.090
		Females	4.13	0.78	-	-
Parental control	-3.131*	Males	3.48	0.95	-0.25	10.346
		Females	3.72	0.97	-	-
Norm-breaking	4.572*	Males	2.36	0.80	0.36	2122
		Females	2.08	0.75	-	-
Child disclosure	-5.314*	Males	3.04	1.01	-0.42	68,709
		Females	3.45	0.98	-	-
Parental solicitation	-1.214	Males	3.28	0.91	-0.10	0.181
		Females	3.37	0.90	-	-
Social openness	-3.580*	Males	3.67	0.75	-0.28	44.217
		Females	3.89	0.81	-	-

p* < .01.TABLE 5** School success differences on the I-PM-R dimensions.

	<i>t</i>	School success	<i>M</i>	<i>SD</i>	<i>d</i>	<i>BF</i> ₁₀
Parental monitoring	0.81	Admitted	3.78	0.56	0.17	0.23
		Not admitted	3.68	0.68	-	-
Father relationship	2.14	Admitted	3.97	0.77	0.46	1.62
		Not admitted	3.55	1.08	-	-
Mother relationship	0.80	Admitted	4.06	0.76	0.17	0.30
		Not admitted	3.92	0.88	-	-
Parental control	-1.06	Admitted	3.19	0.91	-0.23	0.37
		Not admitted	3.39	0.85	-	-
Norm-breaking	-0.98	Admitted	2.21	0.63	-0.21	0.34
		Not admitted	2.35	0.67	-	-
Child disclosure	0.85	Admitted	3.08	1.06	0.18	0.30
		Not admitted	2.90	0.96	-	-
Parental solicitation	0.30	Admitted	2.99	0.81	0.06	0.23
		Not admitted	2.94	0.87	-	-
Social openness	-0.96	Admitted	3.78	0.84	-0.20	0.33
		Not admitted	3.95	0.79	-	-

TABLE 6 Multiple regression estimates, with outcome variable of parental monitoring.

Predictor latent variables	est.	se	β	t	p
FA	0.064	0.022	0.093	2.908	<.01
MO	0.185	0.025	0.244	7.314	<.001
PC	0.122	0.019	0.206	6.415	<.001
NB	-0.101	0.023	-0.137	-4.363	<.001
DS	0.126	0.020	0.223	6.396	<.001
SO	0.067	0.021	0.104	3.151	<.01
OP	0.087	0.022	0.120	4.003	<.001

Note: All tolerances > 0.1 and all VIF < 10.

Abbreviations: DS, child disclosure; FA, father-child relationship; MO, mother-child relationship; NB, norm-breaking; OP, social openness; PC, parental control; SO, parental solicitation.

3.5.3 | Relationships between the I-PM-R factors

Building on previous works regarding PM (Lionetti et al., 2016; Stattin & Kerr, 2000), via MR, we tested the relationship between PM, as the outcome variable, and the other latent variables of the I-PM-R, as predictors (including father-child relationship, mother-child relationship, parental control, norm-breaking, child disclosure, parental solicitation, and social openness). Table 6 shows that all the latent variables entered as predictors attained statistical significance (adj. $R^2 = 0.395$). The two strongest predictors of PM were the factors of mother-child relationship ($\beta = .24$) and child disclosure ($\beta = .22$).

4 | DISCUSSION AND CONCLUSIONS

In this work, our aim was to develop a refined version of the original Parental Monitoring Scale, adapt it for the Italian context, and validate it, considering the fact that previous work had suggested that the psychometric properties of such a scale were unsatisfactory (see Lionetti et al., 2016). Our first CFA, performed on the six originally devised factors (Stattin & Kerr, 2000), did not appear to be an adequate model. However, based on our study of the reference literature suggesting the need for a broadening gaze when considering PM, we suppose that such an unsatisfactory result might be partly due to the way in which the Italian versions of the items were originally developed, and how such items perform in the specific context of Italy. Given these considerations, we conducted an EFA on the items of the original scale (Stattin & Kerr, 2000), re-adapted to the Italian context (e.g., by avoiding multiple-sentence items), and included several additional items that had been developed (cf. Table 1). The subsequent EFA attained a stable and satisfactory solution made up of eight factors, thus further increasing the facets we expected by embracing a multidimensional perspective: five of the six original measures were included in the model, whereas the original scale's parent-child relationship dimension was split into two different dimensions, the father-child relationship, and the mother-child relationship, and the eighth factor, social openness, was taken as referring to the sociality of the child's family in relation to social encounters and friendship. The results from our Italian sample suggest a need to look at the relationship of the father with the child and the mother with the child as separate constructs, considering that children might behave and disclose with fathers and mothers differently. This resonates with results outside of Italian culture, being in line with a recent Swedish study in which it was supposed that the processes concerning PM and information management seem to conform as peculiar to mother-child and father-child dyads (Darling & Tilton-Weaver, 2019).

As presented above, CFA corroborated the eight-factor solution, thus indicating that our results mainly align with previous research on PM, and that further dimensions can be associated with the PM construct within the framework of a solid multidimensional tool. The CFA also lent support to the presence of measurement invariance in relation to children's gender and school success, meaning that the scale can be used regardless of these two characteristics, and that scores can even be compared. Furthermore, the model proposed in this work responds in part to the need to move a step further toward psychometric quality advances in the measurement of PM (Hands Schuh et al., 2020; Lionetti et al., 2016).

We also explored the effect of the father-child relationship, the mother-child relationship, parental control, norm-breaking, child disclosure, parental solicitation, and social openness as predictors of PM, in relation to the knowledge parents have about their children's lives. Previous research has found that the highest contribution to parental knowledge comes from child disclosure, followed by parental control (Lionetti et al., 2016). We found that all variables entered as predictors had a significant role in the model, and that the two strongest predictors of PM were the mother-child relationship and child disclosure. It is interesting to note that while child disclosure was indeed an important predictor of parental knowledge, it was not the strongest contributor. Rather, the strongest contribution came from the mother-child relationship, whereas the contribution of the father-child relationship appeared to be lower. This supports the above reflection on the usefulness of considering children's relationships with their mothers and fathers as two separate constructs in the Italian context.

Our results also indicate that male and female participants differed on all factor scores excluding the mother-child relationship and parental solicitation. These results seem to suggest that: (1) the mother-child relationship does not appear to be associated with children's gender; (2) parents make a stronger effort to obtain information from their female children, while, at the same time, females disclose more than males; (3) the father-child factor scores (and hence, the relationship quality) is higher for male than for female children. Taken together, these results suggest that the genders of both children and parents should be accounted for when looking at PM, as their joint effect seems to play an important role. This consideration appears to be supported by recent research (Tapia et al., 2018) in which it has been highlighted that fathers' parenting styles have a greater influence on juvenile delinquency. School success (being admitted or not to the next school year) did not show significant results in the t-test conducted for each I-PM-R dimension. That said, when looking at students' marks rather than the mere fact of being admitted or not to the following school year, all correlations except those with norm-breaking and with social openness were statistically significant, which may suggest that better monitoring and relationships are associated with better school results, though the correlations were mainly small.

Finally, our results also showed that the I-PM-R scores were correlated with the FPEB (Caso et al., 2021) scores, lending support to the concurrent validity of the former.

4.1 | Future lines of research and limitations

The instrument developed by our multidimensional approach (I-PM-R) exhibited a solid structure through the performed analyses, suggesting that it may have applied value in the PM research area for elaborating even more complex research designs or for inspiring a similar approach in the construction of equivalent multidimensional tools in other languages. Furthermore, since this work presents the validation study of a revised version of the PM tool for Italy, it aspires to support further developments of research on PM in the Italian context, not only continuing the important work of Miranda et al. (2012), but also embracing the considerations of the literature developed over the last few decades of research and reflections on this field. Application contexts of the instrument may be schools, communities, and institutions involved in policies targeting young people and in supporting parenthood, as well as academic and research contexts that have the aim of expanding and refining research advances concerning the construct of parental monitoring.

Notwithstanding the interesting results and the comprehensive approach, our study presents some limitations that deserve to be highlighted and we hope might be solved in future research. First, it is designed as a cross-sectional study, which by its nature is limited to the *hic et nunc* of the questionnaire administration. Therefore, longitudinal studies are needed to explore the effect I-PM-R scores may have on long run of children's lives. Second, the focus on the psychometric advances of the instrument inevitably leads to the exclusion of measurements that may help explain some of our results, and which cannot be further explored given the data available in the present study. For example, we found that the Parental Monitoring dimension was the one greatly associated with school achievements (students' marks). However, if some of the questions—taken from the original English version—are isolated from the scale (e.g., “My parents know what I am doing in my free time,” “My parents know where I go when I go out with friends,” “My parents know where I go after school”), one may not totally exclude an interpretation consistent with a controlling attitude, especially considering the age of the respondents. In this sense, a hierarchical or authoritarian controlling family background, may play a role in school achievements (e.g., higher control determined by parents' expectations of good grades). If, in the future, an opportunity arises to associate the I-PM-R with specific instruments, such as adultcentrism or poisonous (or black) pedagogy scales (Florio et al., 2020a, 2020b), it would be possible to further explore this question and refine the instrument.

In addition to the aforementioned applicative implications, including the possible future research lines deriving from the limitations of the present work, it is also worth mentioning the opportunity of using the I-PM-R as a support in designing interventions focused on enhancing parenting skills, especially in consideration of problematic contexts. Indeed, as Tapia et al. (2018) noted, both neglectful and authoritarian parenting have been found to be associated with the highest levels of youth delinquency, therefore promoting an awareness of what children might expect from the relationship with their parents could result in a stimulus for parents to improve in certain aspects, which, in turn, may have an important role, for example, in terms of the prevention of juvenile deviance.

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