Journal of Child and Family Studies (2022) 31:2903–2909
https://doi.org/10.1007/s10826-022-02377-z

ORIGINAL PAPER

Assessing Adolescents' Information Management with Mothers and Fathers: A Brief Report

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Accepted: 11 July 2022 / Published online: 1 August 2022

Abstract

Adolescents' information management is a fundamental topic for research on adolescence, with numerous studies using Kerr and Stattin's (2000; Stattin & Kerr, 2000) scale or adapted versions from this tool for the assessment of this key dimension of parent-child relationships. Although this measure was initially considered to be a unidimensional scale assessing disclosure, studies later suggested a two-factor structure, making a distinction between disclosure and secrecy. The objective of this study is to analyse the factorial structure of Kerr and Stattin's (2000) original scale of routine disclosure, including a separate analysis of the scale functioning when used to assess information management with mothers and with fathers. Participants came from a representative sample of Spanish adolescents aged 11–18 years old who had taken part in the 2014 edition of the WHO-collaborative survey Health Behaviour in School-aged Children (HBSC). Confirmatory factor analysis was performed using EQS 6.1 to compare two competing factorial structures based on the literature: one factor vs two correlated factors. Results showed that the two correlated-factors structure had a better fit to the data, both for the analysis of the maternal and paternal scales. However, one of the disclosure items also loaded on secrecy, which can be attributed to the item content. Therefore, although our results further support the differentiation between disclosure and secrecy, they also point to a possible effect of the imbalance of item content in this scale functioning, which requires attention in future research.

Keywords Adolescents · Disclosure · Secrecy · Mother · Father

Highlights

- The purpose of the study is to examine the factorial structure of the Kerr and Stattin's (2000) adolescents' routine disclosure scale and to assess the functioning of this scale for information management with mothers and with fathers separately.
- Our study supported the differentiation between disclosure and secrecy since the two-correlated-factors structure fitted the data better than the unidimensional structure. However, the two-correlated-factor model achieved appropriate goodness of fit indices when disclosure item 3 also loaded on the secrecy factor, which may be justified by the content of the scale items.
- Results were similar for the paternal and maternal scales, both the two-correlated-factors structure distinguishing between disclosure and secrecy, and the possible effect of the imbalance of item content.

Adolescents' information management with their parents is an important topic in research about adolescence. In fact, information management has been linked to a number of important adolescent outcomes, such as self-esteem (e.g., Kerr & Stattin, 2000), delinquency (e.g., Frijns et al., 2010; Tilton-Weaver, 2014) or depression (e.g., Frijns et al., 2010; Kerr & Stattin, 2000), as well as to a positive family relationships, which promotes adolescents' disclosure and this, in turn, parental knowledge (e.g., Liu et al., 2020;

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Stattin & Kerr, 2000); that is, a family context characterized by trust, warm and responsive parent-child relationships makes it easier that adolescents share information with their parents (Smetana, 2008).

The conceptual contributions from Kerr and Stattin (2000; Stattin & Kerr, 2000) can be considered one of the milestones in this area of research. Their studies about parental monitoring and parental knowledge underlined the fundamental role of adolescent disclosure as the main source of parental knowledge, highlighting the importance of adolescents' active role in parent-adolescent relationships. Conceptual developments in this area have led to a tendency to differentiate two dimensions in adolescents' information management with their parents: disclosure and concealment (Keijsers & Laird, 2010).

Disclosure may include different strategies, such as partial disclosure, disclosing freely or disclosing only when being asked (Keijsers & Laird, 2010). With these strategies, adolescents may disclose to their parents any information about their daily life, such as their behaviours, their beliefs, their ideology, their thoughts, or their feelings. In addition, two different types of disclosure have been described (Tilton-Weaver et al., 2014): routine disclosure and self-disclosure. Routine disclosure refers to disclosing information about adolescents' activities and whereabouts of their daily life to their parents. In contrast, self-disclosure refers to disclosing voluntarily private information, such as thoughts or feelings. Nevertheless, as Tilton-Weaver et al. (2014) noted, this distinction between routine disclosure and self-disclosure is not always clear, and the two forms of disclosure may co-occur.

As for concealment, adolescents may lie or keep secrets from their parents about any public or private information of themselves which they do not want to reveal. Lying or keeping secrets has been mentioned as frequent concealment strategies (Keijsers & Laird, 2010). It has also been stated that secrecy from parents requires an active and conscious effort to avoid telling secret information, different than mere non-disclosure (Frijns et al., 2010).

Further support for the differentiation between disclosure and secrecy has been found in differences associated to gender or age, and their links with adolescent adjustment or parent-adolescent relationship. Adolescents, especially girls, disclose more to their mothers than to their fathers, mothers overrate girls' disclosure, and boys and girls disclose to and keep secret from their fathers similarly (Smetana et al., 2006); in a similar way, it seems that adolescents disclose more to their mothers than to their fathers, and keep more secrets from their fathers than from their mothers (Elsharnouby & Dost-Gözkan, 2020). In addition, a meta-analysis of longitudinal studies published from 2000 to 2015 found that developmental changes in adolescent's disclosure and adolescent's secrecy were different; disclosure decreased whereas secrecy increased across adolescence (Lionetti et al., 2019), as expected.

Furthermore, associations between concealment strategies and adolescents' maladjustment are greater than associations between disclosure strategies and adolescents' maladjustment (Keijsers & Laird, 2010). Secrecy is a longitudinal predictor of delinquency and depression (Frijns et al., 2010), and delinquency and keeping secrets are related reciprocally (Tilton-Weaver, 2014). In addition, concealing misbehaviour is usually an indicator of trouble, although these negative effects can be reduced in a context with high levels of parents' trust and adolescents' authority beliefs (Laird & Marrero, 2010). Research also shows that adolescents' disclosure is more associated with positive well-being whereas adolescents' secrecy is more related to negative well-being (Elsharnouby & Dost-Gözkan, 2020).

Finally, the topic of disclosure and secrecy together with adolescent's beliefs of parents' legitimate authority and adolescents' obligations to disclose can determine adolescent's disclosure or secrecy (Smetana et al., 2006). Parents' positive reactions to adolescent disclosure are also associated with increases in adolescents' feeling connected to their parents, which fosters greater disclosure. In contrast, parents' negative reactions are related with increases in adolescents' feeling controlled and decreases in adolescents' feeling connected to their parents, which leads to increased secrecy and lower disclosure in the future (Tilton-Weaver et al., 2010). Additionally, adolescents disclose more to their parents and keep less secrets from their parents if they perceive their parents as supportive (Tilton-Weaver, 2014).

Moving to the assessment of information management, although diverse methodologies and measures have been used in this field (e.g., Darling et al., 2006; Marshall et al., 2005; Smetana et al., 2006), the adolescent disclosure scale developed by Kerr and Stattin (2000; Stattin & Kerr, 2000) for the assessment of routine disclosure has been widely used in subsequent studies (e.g., Frijns et al., 2010; Jäggi et al., 2016; Tokić Milaković et al., 2018).

Closer examination of the factorial structure and functioning of Kerr and Stattin's scale in subsequent studies have contributed to stimulating debates in this area of study. In this regard, Frijns et al. (2010) stated that Kerr and Stattin's (2000; Stattin & Kerr, 2000) measure of adolescents' routine disclosure includes two dimensions: information adolescents disclose to their parents and information adolescents conceal from their parents, somehow confusing disclosure with secrecy when used as a unidimensional scale. In fact, the authors concluded that a two-factor structure that differentiates between disclosure and secrecy fit the data better than the original one-factor structure (Frijns et al., 2010). The same conclusion was presented by Jäggi et al. (2016) in a more recent study. A number of other studies have also considered disclosure and secrecy as two distinct factors within Kerr and Stattin's (2000; Stattin & Kerr, 2000) routine disclosure scale (Ahmad et al., 2015; Almas et al., 2011; Lionetti et al., 2016;

Tilton-Weaver, 2014; Tilton-Weaver et al., 2010). Therefore, based on this line of research, conceptual and empirical work to some extent converge in the idea that disclosure and secrecy should be considered as related but different constructs in the study of adolescent information management (Frijns et al., 2010; Jäggi et al., 2016).

However, in a recent study, Tokić Milaković et al. (2018) stated that it is not completely clear whether the two-factor structure may be due to a conceptual difference between disclosure and secrecy or to a topic specificity (some items refer to school and others to leisure time). These authors reformulated secrecy items to evaluate disclosure and used exploratory factor analyses, obtaining a one-factor solution. Tokić Milaković and colleagues' study (2018) is one of the few that have assessed Kerr and Stattin's scale functioning separately for information management with mothers and fathers. Frijns et al. (2010), despite advocating for a two-factor structure, had also noted that the content of the secrecy items focuses on free time whereas the content of the disclosure items mainly refers to the school context, which may contribute to the two-factor structure results (Frijns et al., 2010). For this reason, another study, which used the secrecy concerning routine activities subscale from Kerr and Stattin (2000; Stattin & Kerr, 2000) added another item about school to achieve a balance between the content of the disclosure and the secrecy subscales and to get a better reliability (Dietvorst et al., 2018).

In summary, although progress has been made in the examination of Kerr and Stattin's scale, the debate about its factorial structure is not completely settled. Furthermore, in our review of the literature we noted some diversity in the use of Kerr and Stattin's (2000; Stattin & Kerr, 2000) measure of adolescents' routine disclosure depending on the study due to slight variations of the items used, which makes it more challenging to reach a definitive conclusion about the functioning and factorial structure of this scale.

The aim of this study is to further analyse the factorial structure of Kerr and Stattin's (2000) original scale of routine disclosure paying attention to two important aspects: (1) comparing the two theoretical-informed factorial structures discussed in the literature (the unidimensional structure vs the two correlated factors structure that makes a distinction between disclosure and secrecy); and (2) analyzing this scale functioning separately for information management with mothers and with fathers, which have not been widely explored in previous research.

Method

Participants

The sample for this study consisted of adolescents aged 11 to 18 years, who had participated in the 2014 edition of the WHO-collaborative survey Health Behaviour in School-aged Children (HBSC) in Spain. A random multistage sampling stratified by conglomerates considering adolescents' age, habitat (rural or urban), and type of school (public or private) was used to obtain a representative sample. From them, 13,474 adolescents (50% girls; mean age 14.20) had complete answers for the items on routine disclosure to mother and 12,058 (48.9% of girls; mean age 14.17) for the items on routine disclosure to father.

Measures

This study used the Spanish HBSC questionnaire, which included a great variety of measures. Among these measures, the routine disclosure measure by Kerr and Stattin (2000) was one of them and it was analyzed in this study. This measure was translated into Spanish and back-translated into English to ensure the validity of the measure. This scale includes 5 items, which in the present study were presented twice (once referring to mothers and once referring to fathers) for adolescents living with both parents; if adolescents lived with either father or mother, they responded to father or mother items only: (1) "Do you talk to your mother/father about how you are doing in the different subjects in school?", (2) "Do you usually tell to your mother/father how school was when you get home?", (3) "If you are out at night, when you get home, do you tell where you have been or what you have done that evening?", (4) "Do you keep a lot of secrets from your mother/father about what you do during your free time?" and (5) "Do you hide a lot from your mother/father about what you do during nights and weekends?". The items response options range from 1 to 5 (very often, quite often, occasionally, seldom, nothing). Items 1 to 3 can be conceptualized as disclosure items and items 4 and 5 as secrecy items.

Procedure

The 2014 edition of the HBSC study questionnaire and procedure were approved by the Research Ethical Committee of the University of Seville. The HBSC study data collection in Spain used an electronic questionnaire, which was completed either via computers with Internet connection or via tablets. The procedure for data collection met the recommendations made by the international network of the HBSC study: adolescents must respond to the questionnaire at their schools, and the anonymity of adolescents' responses must be ensured (Inchley et al., 2016). Furthermore, passive consent was obtained from participants' parents. Participants' parents could reject the participation of their children in the study with a signed consent, but they had to do nothing if they authorized to their children's participation in the study.

Analysis Plan

Regarding statistical analyses, we used confirmatory factor analysis, which was conducted using EQS 6.1. For model specification, variables were specified as categorical, and ML with robust estimators being used. Specifically, we used the strategy of comparing two competing nested factorial structures based on the literature about the examined scale: one factor vs two correlated factors (items 1 to 3 were assigned to factor 1: disclosure and items 4 and 5 were assigned to factor 2: secrecy). The goodness of fit of the models was assessed using Satorra-Bentler Chi-square and the following approximate goodness-of-fit indices: CFI, RMSEA and SRMR. Values of CFI higher than 0.90 are considered to be indicative of acceptable fit (McDonald & Ho, 2002), although values of 0.95 or higher have also been recommended (Hu & Bentler, 1999). RMSEA values lower than 0.06 and SRMR values of 0.08 or lower are also indicative of a good-fitting model (Hu & Bentler, 1999). Once we selected the best fitting model for the maternal and the paternal scales, LM Test and Wald Test were also calculated to check whether minor modifications in terms of adding or dropping parameters would improve the model fit. Since these tests suggestions rely purely on empirical criteria, the theoretical soundness of the proposed modifications, if any, was also taken into consideration before their inclusion in the model.

Finally, multigroup analysis was used to test invariance across gender in the best fitting factorial structure according to previous analyses (either 1-factor or 2-correlated factor) for the maternal and paternal scale. Specifically, configural and metric invariance were tested. Based on Cheung and Rensvold (2002), decreases in CFI below 0.01 (along with acceptable values for other fit indices) were interpreted as support for invariance.

Results

Goodness-of-fit indices for the estimated models for the maternal scale are presented in Table 1. As can be seen in Table 1, the one-factor model showed a poor fit to the data. For the two-correlated-factors model, the Chi-square statistic was significant, which is not consistent with accepting the exact fit hypothesis. However, it must be noted that this statistic is affected by sample size, meaning that when sample size is large, as in the present study, slight discrepancies can result in a significant chi-square test, which makes it important to examine approximate fit indices. Focusing on these, CFI and SRMR were consistent with a good-fitting model, but RMSEA was above the recommended threshold, suggesting that some problems with the model fit to data remained. Next, we ran LM Test and Wald Test to see whether some minor modifications would result in a significant improvement in this model fit. Based on the results, no parameter should be dropped, but allowing for disclosure item 3 to also load on the secrecy factor resulted in a significant improvement in fit. Because this modification was interpretable from a conceptual standpoint (both item 3 and items in the secrecy factor focus on leisure time), it was incorporated into the model, with results now being consistent with a good fitting model according to all approximate goodness-of-fit indices.

For the paternal scale (see Table 2), the estimated 1-factor model showed a poor fit to the data. As with the maternal scale, modeling two correlated factors resulted in a significant chi-square statistic, but approximate fit indices were consistent with a good fitting model. In this case all approximate fit indices were in the recommended thresholds. Still, we tested whether any minor modifications would significantly improve model fit using LM Test and Wald test. As in the analyses for the maternal scale, these tests suggested that allowing item 3 to load on the secrecy factor would result in a significant improvement in model fit, so based on the same rationale used for the maternal scale the final model was estimated after introducing this modification (see Table 2).

Factor loadings for the estimated two-correlated factor models for the maternal scale and for the paternal scale are shown in Table 3.

Results about invariance are summarized in Table 4. Both for the maternal and paternal scales, fit indices were consistent with the configural invariance hypothesis

Table 1 Goodness-of-fit Indices for the competing models for the maternal scale

Goodness-of-fit indices	1-factor model	2 correlated factors model	Modified 2 correlated factors model[a]
Satorra-Bentler X^2	6455.4986	271.2885	17.3047
p	<0.001	<0.001	0.001
df	5	4	3
CFI	0.621	0.984	0.999
RMSEA (90% CI)	0.309 (0.303, 0.316)	0.070 (0.063, 0.078)	0.019 (0.011, 0.028)
SRMR	0.181	0.068	0.017

[a]Modified two correlated factor model, in which item 3 is allowed to load on the secrecy factor based on LM Test results.

Table 2 Goodness-of-fit Indices for the competing models for the paternal scale

Goodness-of-fit indices	1-factor model	2 correlated factors model	Modified 2 correlated factors model[a]
Satorra-Bentler X^2	8105.7692	88.0453	16.4470
p	<0.001	<0.001	0.001
df	5	4	3
CFI	0.697	0.997	0.999
RMSEA (90% CI)	0.367 (0.360, 0.373)	0.042 (0.034, 0.049)	0.019 (0.011, 0.029)
SRMR	0.207	0.050	0.028

[a]Modified two correlated factor model, in which item 3 is allowed to load on the secrecy factor based on LM Test results.

Table 3 Factor loadings for the estimated two-correlated factor models

	Maternal scale		Paternal scale	
	F1: disclosure	F2: secrecy	F1: disclosure	F2: secrecy
Item 1	0.691	NA	0.817	NA
Item 2	0.825	NA	0.900	NA
Item 3	0.515	NA	0.613	NA
Item 4	NA	0.590	NA	0.683
Item 5	NA	0.999	NA	0.999

Correlation between F1 and F2 was 0.185 for maternal scale and 0.034 for paternal scale. Standardized solution is reported.

Table 4 Invariance across adolescents' gender

	Maternal scale		Paternal scale	
	Configural invariance	Metric invariance	Configural invariance	Metric invariance
χ^2	610.189	613.930	284.577	321.524
df	8	11	8	11
CFI	0.960	0.959	0.991	0.987
ΔCFI	–	0.001	–	0.004
NNFI	0.901	0.926	0.978	0.977
RMSEA	0.065	0.056	0.041	0.042
SRMR	0.051	0.052	0.035	0.037

Where applicable, robust statistics are reported.

(i.e., the same factorial structure or correspondence pattern between items and factors held for boys and girls). In addition, when factor loadings were constrained to be equal across groups to test metric invariance, CFI decreases were lower than 0.01 (0.001 for the maternal scale and 0.004 for the paternal scale) and the remaining indices showed acceptable values for both scales, which is consistent with metric invariance in boys and girls.

Discussion

This study presents an additional analysis of the factorial structure of Kerr and Stattin's (2000) original scale of routine disclosure, with the aim of testing the two competing factorial structures derived from existing literature—a unidimensional structure vs a two-correlated-factors (disclosure and secrecy) structure - in a representative sample of Spanish adolescents. To our knowledge, this is the first study on the factorial structure of this adolescents' information management scale conducted in Spain. In addition, it is one of the few studies that have tested this scale functioning when used for separate assessments of informational management with mothers and with fathers.

Using confirmatory factor analysis, we found that the two-correlated-factors structure, which makes a distinction between disclosure and secrecy, showed a better fit to the data than the unidimensional structure, both for the maternal scale and for the paternal scale. This finding is in line with those of other researchers, who concluded that disclosure and secrecy are related but distinct constructs in the study of adolescents' information management (e.g., Frijns et al., 2010; Jäggi et al., 2016; Tilton-Weaver et al., 2010). Developmental trajectories across adolescence (e.g., Lionetti et al., 2019) and associations with family relationships (e.g., Tilton-Weaver, 2014) and adolescent adjustment (e.g., Frijns et al., 2010) are also consistent with this idea.

However, especially in the case of information management with mothers, a two-correlated-factor model did not reach appropriate goodness of fit indices, unless item 3 was allowed to load on the secrecy factor too. This modification also improved the model fit for the paternal scale. In our view, this finding may be explained by the content of the scale items. Specifically, item 3, as the two secrecy items, refer to adolescents' free time, whereas the other two disclosure items focus adolescents' school life. Previous research had noted that the imbalance in the content of the items in the Kerr and Stattin's (2000; Stattin & Kerr, 2000) scale may be problematic (Dietvorst et al., 2018) and that it can contribute to the scale two-factor structure (Frijns et al., 2010; Tokić Milaković et al., 2018), which seemed to be the case in our study.

Furthermore, the good fitting models and equivalent factorial structures for the maternal and paternal scales provide support for the adequacy of the scale developed by

Kerr and Stattin (2000) for separate assessments of information management with mothers and fathers. This required additional examination, since to our knowledge few studies have explored this possibility (Baudat et al., 2020; Elsharnouby & Dost-Gözkan, 2020; Tokić Milaković et al., 2018). Employing separate assessments for relationships with mothers and fathers is important since, as shown by previous research, adolescents can use information management strategies in a different way with mothers and fathers (Smetana et al., 2006; Elsharnouby & Dost-Gözkan, 2020). In addition, invariance results suggest that factorial structures for the paternal and maternal scales are equivalent in boys and girls. A similar result was found in the study of Baudat et al. (2020), in this case regarding the maternal and paternal models of results, which included disclosure and secrecy measures among others. More research about invariance of the scale developed by Kerr and Stattin (2000) would be of interest to this field of knowledge.

In our view, this study makes a valuable contribution to the study of Kerr and Stattin's (2000; Stattin & Kerr, 2000) routine disclosure scale, but it must be acknowledged that our analysis focused on the factorial structure of the scale, which is only one of several different aspects connected to scale functioning. In future studies, it would be interesting to analyse whether other family dimensions may have a differential effect on disclosure and secrecy (as e.g., Tilton-Weaver et al., 2010), or whether differences exist between disclosure and secrecy roles in adolescent adjustment (as e.g., Frijns et al., 2010) or in the way they vary depending on age and adolescents' and parents' gender (as e.g., Smetana et al., 2006). It would also be interesting to test modifications of the original scale that may improve its functioning, such as adding additional items to correct the items content imbalance (Dietvorst et al., 2018), but while keeping the conceptual distinction between disclosure and secrecy.

In summary, Kerr and Stattin's (2000; Stattin & Kerr, 2000) studies highlighted the adolescents' active role in parent-adolescent relationships. These authors not only directed attention to the role of adolescents' routine disclosure in parent-child relationships, but also developed a scale for its assessment that has been widely used. Subsequent studies increased the scientific knowledge about adolescents' information management, making a conceptual distinction between disclosure and concealment strategies (Keijsers & Laird, 2010). Our study supported this distinction in the sense of pointing to a two-correlated-factors structure, but it is also consistent with previous works that wondered whether the imbalance in item content may be contributing to this structure. We hope this additional evidence can be useful for future attempts to refine this measure and allow us to get a deeper understanding and more refined measurement of adolescents' disclosure and secrecy in parent-adolescent relationships in the future.

Data Availability

The data used in the research are available. The data can be obtained at: Ministry of Health, Spain (https://www.sanidad.gob.es/en/profesionales/saludPublica/prevPromocion/promocion/saludJovenes/estudioHBSC/bancoDatos.htm).

Author Contributions All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Antonia Jiménez-Iglesias, Irene García-Moya, and Carmen Moreno. The first draft of the manuscript was written by Antonia Jiménez-Iglesias and Irene García-Moya and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding The HBSC study in Spain is supported by the Ministry of Health, Social Services, and Equality. Irene García-Moya's work is supported by the Ministry of Science, Innovation, and Universities through the Ramón y Cajal Programme (RYC-2017-21626). Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature.

Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Consent to Participate Passive consent was obtained from participants' parents. Participants' parents could reject the participation of their children in the study with a signed consent, but they had to do nothing if they authorized to their children's participation in the study.

Ethics The 2014 edition of the HBSC study questionnaire and procedure were approved by the Research Ethical Committee of the University of Seville.

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