Structure of The Sibling Inventory of Differential Experience-Chinese Version (SIDE-C): A Bifactor Model Approach

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The Sibling Inventory of Differential Experience (SIDE; Daniels & Plomin, 1985) is a self-report to assess children's perception of parental differential treatment (PDT). Specifically, SIDE measures two specific constructs of PDT: control and affection. The present study applied both the traditional (two-correlated-factor model) and novel (bifactor) modeling approaches to derive the most optimal measurement structure of the Chinese version of SIDE (SIDE-C). Respondents were 225 primary school students who have only one sibling in the family. Results showed that, while the two-correlated-factor model was acceptable, the bifactor model had a better fit. The bifactor model is preferable in terms of fit indices and the principle of parsimony. Additionally, Omega hierarchical coefficient supported the strength of the general factor over the specific factors of parental differential treatment. The findings not only shed light on the factorial validity of the SIDE-C but also suggest future studies to consider the roles of the general and specific factors of PDT.

Keywords: perceived parental differential treatment, bifactor model, factor analysis, children

There are few subsystems that exist in a family, such as parent-child and siblings. In each subsystem, two or more family members interrelate and influence one another. The impacts that brought by parents on children's development are widely studied (e.g., Tramonte, Gauthier & Willms, 2015). Meanwhile, in a child-sibling dyad, both of them are relative equals. Thus, the child is more likely to mimic the sibling's behavior, particularly the social behavior (Stauffacher & DeHart, 2006).

Parenting practice is more goal-directed, where parents tend to apply different practices that are consistent with the purpose of parenting. For instance, parents are more likely to apply higher control toward a child who has more problem behaviors. Most of the time, it may vary according to the characteristics of the child, such as age, gender, and temperament. In other words, parents might apply different parenting practices to siblings in the same family (Roskam & Meunier, 2009). For instance, past studies found that parents tend to apply different parenting practices on females and males (Varner & Mandara, 2013). In specific, females reported higher parental monitoring than males.

Parental Differential Treatment

Plomin, Asbury, & Dunn (2001) defined parental differential treatment as the phenomenon in which children in the same family are treated differently by their parents, or children who perceive parents' treatment differently.

Past studies found that parents and children report differently regarding the parents' treatment. Atzaba-Poria & Pike (2008) concluded that parents often overestimate the consistency of their treatments toward the children. Children may

perceive parenting treatment differently even though their parents reported that they apply equal treatment to all children in the family, which subsequently, bring out the variance in sibling adjustment (Daniels, Dunn, Furstenberg & Plomin, 1985). As a result, it is important to take into consideration of children's perceptions and understanding of differential treatment (Kowal & Kramer, 1997).

As mentioned earlier, parenting practices are goal-directed. Parents who are sensitive tend to treat their children differently according to the characteristics and individual needs of children (Kowal & Kramer, 1997). For instance, in a family, if one of the children has a more problematic behavior, parents are more likely to use strict discipline or controlling strategy on that child compared to his or her siblings (Meunier et al., 2012). Similarly, parents tend to perform different parenting practices according to the temperament of children where parents are more likely to apply harsh parenting toward children who have a difficult temperament (Jenkins, Rasbash & O'Connor, 2003).

Dunn & Stocker (1989) argued that children are active observers; they observe their parents' behaviors toward themselves as well as toward their siblings. In other words, children are acutely aware of how their parents treat them and their siblings (Richmond, Stocker & Rienks, 2005). Thus, they are able to detect potentially discriminatory parental treatment and it may cause social comparison between sibling-dyads and form a particular understanding of the differential treatment (Feinberg, Neiderhiser, Simmens, Reiss & Hetherington, 2000). This realization is often associated with greater conflict and lesser affection between siblings (Jensen & McHale, 2017).

In line with social comparison theory, individuals tend to develop self-appraisals based on interpersonal evaluative comparisons, especially when the target of comparison is physically proximate and sharing a certain similarity in the personal attributes (Wills, 1991). Sibling-dyad tends to share an equal power and always competes for parental investment, such as attention and care (Lalumière, Quinsey & Craig, 1996). Thus, the social comparison in sibling-dyad is high, especially in the same-sex sibling-dyad and those who are close in age. Additionally, parental differential treatment is higher in the same-sex sibling-dyad compared to mixed-sex sibling-dyad (Coldwell, Pike & Dunn, 2008).

Children who observed and perceived differential treatments from parents are more likely to exhibit jealousy and rivalry toward their siblings (Scholte, Engels, de Kemp, Harakeh & Overbeek, 2007). Moreover, parental differential treatment is associated with the children's self-esteem (McHale, Updegraff, Jackson-Newsom, Tucker & Crouter, 2000). Children who received greater warmth and care or higher favoritism from their parents reported higher self-esteem than those who disfavored by their parents. On the other hand, children who reported higher parental differential treatment tend to have higher emotional distress and internalizing symptoms (Shebloski, Conger, & Widaman, 2005) and maladaptive behavioral problems (Moharib, 2013).

Based on the previous finding, older siblings or the early-born children perceive the later-born child as being favored by parents and receive better parental treatment (Ng, Mofrad, & Uba, 2014). However, they are expected to be more thoughtful. This contradiction may lead to higher negative consequences. Ong, Krishnan, and Zaman (2017) found a positive relationship between maternal differential treatment and relational aggression against sibling. When children perceived higher maternal differential treatment, this perception is more likely to provoke the feelings of jealousy and increase the

occurrence of relational aggression. In a nutshell, the presence of parental differential treatment is observed in different cultures. Moreover, parental differential treatment is likely to lead to various negative consequences, particularly the development of children.

Measurement of Parental Differential Treatment

Several methods have been proposed to assess the perception of parental differential treatments. For example, McHale & Pawletko (1992) recruited mothers to report their experiences with older and younger children through a phone interview. However, this study only examined the mother's perception of the experience with different children. As children and mothers may have a different perception toward a similar experience, the findings may not be able to offer a comprehensive understanding. In contrast, Kowal & Kramer (1997) used a face-to-face interview to examine children's perception of parental differential treatments. Both siblings were interviewed individually about their family relationships, such as the quality of sibling relationship, the degree of parental differential treatment which occurred in the family, and their justification of parental differential treatment. Although the face-to-face interview allows the researchers to clarify questions with and retrieve more information from the respondents, the method is not applicable to large-scale research and studies in which researchers have limited contact hours with participants.

Daniels & Plomin (1985) developed the Sibling Inventory of Differential Experience (SIDE) to investigate the dimensions of differential experience in a family. It focuses on the social-affective aspect rather than the cognitive experience of children. It involves differential sibling interaction, differential parental treatment, differences between the siblings' peer group, as well as the events that specify to the individual. The nine items of the SIDE have been widely used in examining parental differential treatment. It consists of two subscales: differential affection and control. Participants are required to rate the statement based on their experiences in the family.

The original SIDE has been used to assess children's perception of the differential treatment they received from their parents (Daniels & Plomin, 1985; Jensen & Whiteman, 2014). Whereas a revised version was used in the study of McHale, Crouter, McGuire & Updegraff (1995) to assess parent's perception of their own parenting practice to different children in their family.

Even though there have been some studies investigating the children's and parent's perception regarding parental differential treatment, only a few studies discussed this topic in Asian cultures. Additionally, it remains unclear if the SIDE is appropriate for the Asian cultures. The present study aims to clear the gap by administering the SIDE on Taiwanese children. Moreover, the SIDE was translated into Chinese language to ensure the respondents understand the items. The main goal of this study, therefore, was to investigate the psychometric qualities of the Chinese SIDE (SIDE-C).

Method

Participants

This study was part of a larger research project concerned with the impacts of parental differential treatment. A total of 225 primary school students (112 males and 113 females) were recruited from primary schools in Taiwan. They ranged in age from 10 to 12 years old (M = 11.59, SD = 0.77). Half of the participants (52.5%) were from the same sex sibling-dyad, and 52.9% of them are the younger child in

their family. A purposive sampling method was used in this study. This sample was recruited based on the following inclusion criteria: (1) with the consent of parents, (2) age ranging from 10 to 12 years old, (3) living permanently with the mother, (4) come from family with two children, and (5) the age difference with their sibling is within four years (elder or younger).

Translation procedure

Back to back translation procedure was utilized to translate the scale. The original English version was first translated into the Chinese language by a psychology expert with good competency in both English and Chinese language. Next, the translated Chinese version of the scale was then back-translated into the English language without referring to the original English version by another expert with high English competency. Meanwhile, the translated version of SIDE was checked by Taiwanese primary school teachers to ensure the terms are matching to the children's competency level. Then, both original and translated versions of SIDE were compared to make sure the consistency of the scale remains.

Procedures

With the assistance of primary school teachers, parental consent was obtained prior to the data collection. At the same time, teachers ensured that all children have fulfilled all the inclusion criteria. On the day of data collection, a written consent was obtained from the participants. The data collection was conducted in the classroom settings with the assistance of the teachers.

Measures

Sibling Inventory of Differential Experience (SIDE; Daniels & Plomin, 1985).

All participants were asked to assess the treatment of their mothers in the comparison with their siblings (Daniels & Plomin, 1985). The SIDE consists of nine items which targeted to assess two main factors: differential affection and differential control. The differential affection scale measures maternal pride, interest, favoritism, enjoyment, and sensitivity (e.g., "our mother enjoys doing things with us"). The differential control scale measures maternal strictness, punishment, blame, as well as discipline (e.g., "our mother punishes us for our misbehavior"). Participants were required to rate on a five-point Likert scale (1 = applies more to my sibling, 2 = applies a little more to my sibling, 3 = applies equally to me and my sibling, 4 = applies a little more to me, 5 = applies more to me) to indicate the extent to which the statement applied to his/her sibling or him/her. The Cronbach alpha coefficient for control scale and affection scale was .807 and .814 respectively. The present study wishes to examine the degree of maternal differential treatment, thus, score in each item was recoded into a specific number. For instance, 1 and 5 were recoded into 2 which indicates that the degree of maternal differential treatment is higher; 2 and 4 were recoded into 1 which indicates that the maternal treatment is slightly different; and 3 was recoded into 0 which indicates both of the participant and the sibling received a similar degree of maternal treatment. A total score was computed. A higher score in each subscale indicates they received a higher differential treatment (affection or control) from their mothers.

Analytic Strategies

Confirmatory factor analysis (CFA) with maximum likelihood estimation was conducted using Mplus 6.0 to examine the factor structure of the Chinese SIDE. Several model fit indices were used to examine the fitness of the model, including model chi-square, Comparative Fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and the standardized root-mean-square (SRMR). If the chi-square value is large and statistically significant, this model is considered as a poor fit model. However, chi-square value is highly sensitive to the sample size. Thus, the ratio of chi-square value divided by degrees of freedom was used as an index of model fit. A ratio below 3 is considered as acceptable (Tabachnick & Fidell, 2007). Values greater than .95 in TLI and CFI are indicating a good model fit. The RMSEA value should be less than .05 for a good model fit, but a value less than .08 is considered as acceptable. Lastly, the value of SRMR should be less than .08 for a good model fit (Hu & Bentler, 1999). Apart from that, another two fit measures, the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC) were used for model comparisons. Smaller values indicate a better model fit.

Results

Confirmatory Factor Analysis

The skewness of all the items in the SIDE-C ranged between 1.24 to 1.87 and kurtosis ranged between -0.06 to 2.08. Since the absolute values of skewness and kurtosis are less than three and eight respectively, the normality of data is assumed (Kline, 2005). Besides, multicollinearity of each item was examined through the value of squared multiple correlations (R^2). Values greater than 0.90 indicate multicollinearity. All the R^2 ranged from 0.38 to 0.66.

Table 1

Goodness-of-fit statistics for different models

	Models	*df*	χ^2	*p*	RMSEA	TLI	CFI	SRMR	AIC	BIC
1	Two-correlated factor model	26	61.119	.0001	.078	.942	.958	.038	6612.912	6726.238
2	Unidimensional model	27	91.443	< .0001	.075	.949	.962	.034	6640.310	6749.589
3	Bifactor model[a]	18	28.408	.0561	.037	.988	.994	.017	6592.796	6738.501
4	Bifactor model[b]	21	35.849	.0227	.041	.985	.991	.020	6594.236	6727.800

Note. [a]Model with all items and factor loadings. [b] Items 1,6, and 8 that showed insignificant factor loading were removed from the specific factors.

Table 1 presents goodness-of-fit statistics for the models. The theoretical two-correlated factor model (Model 1) was first examined. The model generated a good fit. However, a high correlation between the two factors (r = .91) was found in the proposed model. This may be due to two reasons. Firstly, the two-correlated model can be merely accounted for by a single factor. A unidimensional model (Model 2) was then tested and found to have a good fit. Another possibility is that, while a general factor may account for the commonality, the two specific factors remain to have unique influences. Thus, this study explored the possibility of a novel bifactor model (Model 3). The TLI and CFI were higher than the other models, indicating that the bifactor model is superior to the two-correlated factor model and unidimensional model. However, the factor loadings of items 1, 6, and 8 on the two specific

factors were not statistically significant (see Figure 1). Therefore, we examined another version of the Bifactor model without the non-significant factor loadings (Model 4). The fit indices showed that the Model 4 was superior to the first two models but not the original bifactor model. Considering the principle of parsimony and model fit,

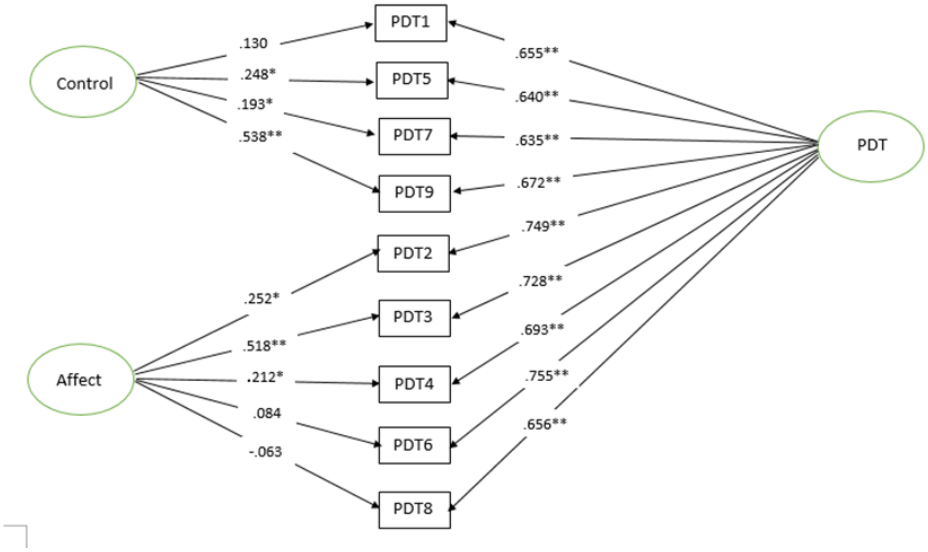

Figure 1. Bifactor analysis for the Chinese Sibling Inventory Differential Experience (SIDE-C). PDT1 to 9 = item 1 to 9 of the SIDE-C. Parental differential treatment (PDT) is the general factor of the SIDE-C. Control and Affect are the two specific factors of the SIDE-C. * $p < .05$, ** $p < .001$

the original bifactor model (Model 3) is preferable to the other models.

Reliability

The internal consistency of the SIDE-C was tested by the omega and omega hierarchical values using the Watkins's (2013) Omega program. The general factor had a higher omega hierarchical value (.698) than the two specific factors (.133 for differential affection and .056 for differential control). Moreover, the explained common variance was .76, indicating that the general factor explains 76% of the common variance while 24% of the common variance spread across the specific factors.

Discussion

The 9-item Sibling Inventory Differential Experience (SIDE) was initially developed to examine the extent to which children perceive their parents treat them and their siblings differently in western cultures. The present study translated the SIDE into Chinese and tested the scale in a Taiwanese sample. To our knowledge, this is the first study to develop and examine psychometric properties of the Chinese SIDE (SIDE-C).

The results of this study suggest that the SIDE-C is a useful tool for assessing parental differential treatment among school-aged children in Taiwan. In line with the findings of the original version (e.g., Daniels & Plomin, 1985), the two-correlated-

factor model provided a good fit to the data. The replication not only offers further support to the factorial validity of the SIDE but also indicates that the conceptualization of parental differential treatment is similar across cultures. The results also imply that translating the SIDE into Chinese did not distort the meaning of the items. Researchers are encouraged to translate the SIDE into the mother tongue of their targeted participants to ease their burdens.

It is worth noting that our results also support the 9-item bifactor model with one general parental differential treatment factor and two specific factors (i.e., affection and control). Indeed, the bifactor model is more superior to the theoretical two-factor model. Moreover, the Omega hierarchical coefficient indicates that the general factor, rather than the two specific factors, of the parental differential treatment should be used. To our knowledge, the present study is the first to examine and offer support to the bifactor model of the Chinese SIDE.

The present study contributes to the literature by providing empirical support to the bifactor model of SIDE as a useful measurement in assessing children's perception of parental differential treatment. The findings also offer insight into the question whether PDT should be represented by two correlated factors or one higher-order factor. Theoretically speaking, the latter is preferable and makes more sense because the strong correlation implies that the two (first-order) factors overlap with each other and can be accounted for by a higher order factor. However, a second-order model requires at least three first-order factors in order to achieve the model identification (Chen, Sousa,& West, 2005). As a result, when using the SIDE, the PDT is usually represented by a two-factor model. The bifactor model address this methodological limitation by examining the general and two specific factors simultaneously. Our findings show that, while the PDT can be explained by a general factor, the two specific factors remain to have unique influences.

There are two limitations of the study that need to be addressed. First, the validity of the SIDE-C was not examined in the present study. However, parental differential treatment (measured by the SIDE-C) was found to have a positive relationship with relational aggression (Ong et al., 2017). Future studies are warranted to further examine the concurrent validity of the SIDE-C. It is also noteworthy that the findings were derived solely from a Taiwanese sample. Future works are needed to replicate the present findings in different Chinese populations such as Malaysia and China. Researchers may also consider administering the original SIDE and the SIDE-C to the same group of participants to further ensure that the concept of the scale is not distorted by translation.

In conclusion, our results support that the Chinese SIDE is adequate for assessing parental differential treatment in the Asian context. More studies, however, are required to further confirm appropriateness and usability of the bifactor model and investigate the unique roles of the general and specific factors of PDT.

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