



The Exploratory Factor Analysis of the Six Dimension of Parenting Scale in the Population of Chinese Academically Successful College Students

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Abstract. This study focused on the validation of the revised version of Six Dimension of Parenting Style(SDP) model using a sample from Chinese academically successful college students population. With two more items added in each of the six subscales in the SDP model, the result for exploratory factor analysis indicated a satisfactory internal consistency with some necessary modifications on the proposed subscales structure to satisfy the validity for the SDP parenting scale data.

Keywords: Parenting Styles, Exploratory Factor Analysis, Psychometric Scale.

1 Introduction

In China, high school students are facing severe anxiety and pressure as a result of the competitive nature of the National College Entrance Examinations (NCEE, also known as Gaokao), making high level of academic motivation a crucial factor in their academic success in comparison to high schoolers in other countries. Due to varying historical and cultural backgrounds, Chinese parents rely on different strategies to motivate their high school children compared to what American parents use^[7]. Parenting has been recognized as one of the most important factors in students' academic motivation and performance^[11]. In China, high school students are facing severe competition in the National College Entrance Examinations (NCEE, known as Gaokao), making high level of motivation more crucial in their academic performance than in other countries. Due to variations in both historical and cultural backgrounds, Chinese parents use different strategies to motivate their high school children from what American parents use^[7]. As a student who grew up in China under the stresses of the Gaokao exam, I am interested in the styles of parenting in high stakes testing. This project examines the underlying factors of parenting that academically successful Chinese college students experienced during their high school. My research interest is in exploration of parenting styles that Chinese students received from their parents. In this project, I would like to study how Chinese students who are successful in school perceive the strategies that their parents use to motivate them academically using the scale (MMSDP) developed

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by Skinner^[6] in the paper of Six Dimension of Parenting: A Motivational Model. The primary purpose of this study is to check the validity and reliability of this scale within the mainland Chinese academically successful students from the top two universities: Tsinghua University and Peking University.

1.1 Parenting

Being studied as a broad concept in Sociology and Psychology, parenting factors involve “parental acceptance, autonomy support^[5], behavioral control, involvement, structuring, encouragement of children's task endogeny (i.e., intrinsic interest in a task), and provision of task-extrinsic rewards/consequence”^[9]. In general, parental practice have been studied through parenting styles^[1]. For parenting styles, Diana Baumrind proposed a typology including four parenting patterns based upon a two-dimensional space defined by two factors: parental responsiveness and demandingness^[8]. After Maccoby and Martin's configuration, an empirical framework with four typical categories was developed for parenting styles. Besides neglecting parents (low demanding and low responsive), three more patterns are defined to categorized different parenting styles: authoritarian (high demanding and low responsive), authoritative (high demanding and high responsive) and permissive (low demanding and high responsive). Among her definition for these three terms, authoritarian parents train and assess their children's minds and activities according to a set of strict standards, which is usually generated by their self identification as higher authority. Meanwhile, authoritative parents encourage rational discussion with kids and focus on children's feelings and rights as an individual person rather than restricting their behavior for sake of parental authority. For permissive families, the kids are entitled with higher authority than the parents, where the parents are merely a protocol for their kids' need whenever they want. Those neglecting parents are just paying little attention to their kids' rearing. However, one popular definition of parenting styles are from Darling and Steinburg in 1993, which is “a constellation of attitudes toward the child that are communicated to the child and that, taken together, create an emotional climate in which the parent's behaviors are expressed”^[10].

1.2 The SDP Model

Another model focused on parenting styles from a motivational perspective was developed by Skinner et al. in 2005. After a careful review and synthesis of relevant literature, three pairs of opposite dimensions were extracted in parenting practices from a motivational perspective by Skinner^[8]: Warmth v.s. Rejection, Structure v.s. Chaos, Autonomy Support v.s. Coercion. Instead of three bipolar ones, six unipolar dimensions were validated to be supreme for future use as a metric to quantify parenting styles. (See Table 1 for definitions of the six dimensions of parenting).

Table 1. Definitions of SDP and Comparable Constructs (Skinner et al., 2005)

Dimension	Definition	Related Constructs	
Warmth	Expression of love, affection, caring and enjoyment, Appreciation, Emotional availability	Approving Acceptance Love Support Supportive control	Positive involvement Closeness Connection Child-centered
Rejection	Active dislike, aversion, and hostility Harsh, over-reactive, irritable, critical, disapproving	Deprecating Hostility Harsh Disapproval Negativity Cold Derogation	Critical Over-reactivity Aversion Irritability Dislike Irritable explosive discipline
Structure	Provision of information about pathways to reach desired outcomes. Predictable, consistent. Clear expectations, firm maturity demands	Demandingness Firm control Behavioral control Contingent Responsiveness Directive Assertive control	Strictness Supervision Organization Regulation Rule-setting Regularity of routine Household organization
Chaos	Interferes with or obscures the pathways from means to ends Noncontingent, inconsistent, erratic, unpredictable, arbitrary or undependable	Permissiveness Non-directive Lax control, Laxness Unpredictable Undependable Non-contingent	Erratic Causal Under-controlled Laissez faire Inconsistent discipline
Autonomy Support	Allow freedom of expression and action. Encourage child to attend to accept and value genius preferences and opinions.	Psychological autonomy Freedom Responsiveness Democratic	Permissiveness Non-directive Autonomy-granting
Coercion	Restrictive overcontrolling intrusive autocratic style Strict obedience is demanded	Arbitrary control Demandingness-Responsiveness Autocratic Psychological control Inflexible rigid discipline	Intrusive control Intrusive support Strict control Over-restrictive Over-controlling Power assertion Intrusiveness

2 Instruments

In this study, the six dimensions of parenting scale by Skinner^[6] was used as the primary instrument for measuring parenting styles. After careful examination of many classical typology of parenting styles with three bipolar dimensions, the Motivational Model of Six Dimensions of Parenting (MMSDP) developed three more dimensions to explore parenting more comprehensively in a motivational perspective^[2]. The six dimensions include: a) Warmth, b) Rejection, c) Structure, d) Chaos, e) Autonomy Support, f) Coercion.

In order to make the scale more reliable and adaptive to local population in China, the scale of "Egna Minnen av Barndoms Uppfostran (own memories of parental rearing practices in childhood)" (EMBU) was referred to as a pool of items in the modification process of MMSDP scale. Being created in 1980s by C. Perris at Umea University in Sweden^[11], the EMBU scale includes 66 items measuring 11 different parents' rearing factors (6 for fathers and 5 for mothers). In the literature, the scale has been used in China ever since 1990s and is widely used to measure the impact of parental involvement in Chinese students' psychological and academic development. For each of the 6 subscales in SDP, 10 items are included in the final version with 8 original ones and 2 new items added from EMBU scale. The newly added items and their corresponding dimensions are concluded in Table 2. One more revision was separating the subscales for mother and father MMSDP, because of the well-explored different styles for maternal and paternal parenting in current literature^[3].

Table 2. Added Items List for Modified SDP Scale

Dimension	Added item 1	Added item 2
Warmth	My parents often hug me.	I feel my parents are trying to enrich my childhood.
Rejection	I feel my parents are not generous to me.	My parents usually complain my laziness and uselessness in front of others.
Structure	My parents' penalty to me are fair and appropriate.	My parents always encourage me to become excellent.
Chaos	I feel my parents are hard to get along with	My parents often lose their temper for no reason.
Autonomy Support	My parents trust me and allow me to do things all by myself.	I can feel my parents' support while facing a challenging task.
Coercion	My parents always want to know what I do in the evening.	My parents always persuade my presence and clothes.

3 Description of Participants

The data collection went very well, and a sample of 301 copies of surveys have been collected from individual college students who have gained access to the 2 top-ranking

universities in Beijing by getting a competitively high score in Gaokao. Among the participants, 40.2% of them identified as female while 59.8% as male students. The geographical distribution of participating students is very diverse with 39 students (13%) from Beijing occupying the most frequent answers while being asked for their Gaokao province information. Besides 2 copies (0.7%) missing info for school year information, the remaining 299 surveys with valid responses are composed by 115 (38.5%) freshmen, 76 (25.4%) sophomore, 72 (24.1%) junior, and 36 (12%) senior college students.

4 Ethics and Human Subject Protection

As promised in IRB application materials, the survey copies were deployed to high achieving Chinese college students through schools that the researcher has an agreement with. All participants have been provided with an informed consent form and asked to indicate consent to proceed with the survey or interview. Both the surveys and the consent forms were translated into Chinese language for the convenience of Chinese college students' understanding and responding.

5 Results

In general, items with loadings below .40 for all factors extracted were dropped from further analysis to ensure items included in each EFA shared a certain degree of common variance with other items^[4]. Specifically, one item was dropped from subscale Warmth of Mother (i.e. My mother is happy with me just the way I am), one items was dropped from subscale Rejection of Mother (i.e. I feel my mother is not generous to me.), four items were dropped from subscale Structure of Father (i.e. My father explain the reasons for our family rules; My father expects me to follow our family rules; My father's penalty to me are fair and appropriate; My father always encourages me to become excellent), five items were dropped from subscale Structure of Mother (i.e. When I wanted to do something, my mother show me how; My mother explain the reasons for our family rules; My mother expects me to follow our family rules; When my mother tell me she'll do something, I know she will do it; My mother always encourages me to become excellent), three items were dropped from subscale Chaos of Father (i. e. When I do something wrong, I never know how my father will react; A lot of times, I don't know where my father is; I never know what my father will do next), three items were dropped from subscale Chaos of Mother (i.e. When I do something wrong, I never know how my mother will react; A lot of times, I don't know where my mother is; I never know what my mother will do next), one item was dropped from subscale Autonomy Support of Mother (i.e. When my mother asks me to do something she explain why), six items were dropped from subscale Coercion of Father (i. e. My father is always telling me what to do; My father bosses me; I am not allowed to disagree with my father; My father thinks that he knows best about everything; My father always wants to know what I do in the evening; My father always persuades my presence and clothes), and seven items were removed from subscale Coercion of Mother

(i.e. My mother is always telling me what to do; My mother says “no” to everything; The only reason my mother gives is “Because I said so”; I am not allowed to disagree with my mother; My mother thinks that she know best about everything; My mother always wants to know what I do in the evening; My mother always persuade my presence and clothes).

Internal consistency reliability of the 12 subscales for SDP scale was checked by Cronbach’s alpha values, in order to evaluate whether a group of items were measuring the same latent construct consistently. Among these subscales, all items were validated as one factor for subscales Warmth of Father, Rejection of Father, and Autonomy Support of Father. As shown in Table 3, the total percentages of variance explained by items within each factor ranged from 50% (Autonomy Support of Father) to 78% (Coercion of Mother).

Table 3. Percentages of Variance Explained and Cronbach's Alpha Coefficients for Each Factor

Factor	% of Variance	Cumulative % of Variance	n	Cronbach's Alpha	# of items
Warmth of Father	52.206	52.206	294	.894	10
Rejection of Father	56.375	56.375	292	.907	10
Structure of Father	52.936	52.936	293	.818	6
Chaos of Father (Factor 1)	47.810	47.810	294	.826	5
Chaos of Father (Factor2, not use in further analysis)	18.021	65.831	Only 2 items, Cronbach's Alpha Not Calculated		
Autonomy Support of Father	50.496	50.496	290	.889	10
Coercion of Father	58.132	58.132	294	.750	4
Warmth of Mother	53.191	53.191	295	.883	9
Rejection of Mother	55.502	55.502	295	.890	9
Structure of Mother	55.370	55.370	294	.799	5
Chaos of Mother (Factor 1)	45.230	45.230	289	.656	5
Chaos of Mother (Factor 2, not used in further analysis)	17.982	63.211	Only 2 items, Cronbach's Alpha Not Calculated		
Autonomy Support of Mother (Factor 1)	47.796	47.796	295	.829	6
Autonomy Support of Mother (Factor 2)	11.711	59.506	293	.767	3
Coercion of Mother (Not used in further analysis)	78.010	78.010	Only 2 items, Cronbach's Alpha Not Calculated		

Principal factor axis extraction method with Eigenvalues greater than 1 and Oblimin rotation were used to identify factor structure, since the dimension of parenting are supposed to be correlated with each other. Missing values were replaced by variable mean, due to no patterns detached for the missing data. Factor loadings for the factor matrix were listed in tables for subscales loading on one single factor, while factor loadings for the pattern matrix were reported in tables for subscales loading on more than one factor. Missing values for each variable were replaced by the variable mean, and factor loadings less than 0.3 were suppressed.

Using the extraction method of Principal Axis Factor, two factors were extracted for two subscales as follows, i.e., Chaos of Father, Chaos of Mother, and Autonomy Support of Mother. For each of the three subscales, the first factor explained 48%, 45%, and 48% of the total subscale variance, respectively. The second factor of subscales Chaos of Mother/Father only consisted of two items, so both secondary factors were dropped and only the first factors of these two subscales were retained to represent the latent constructs for them. Similar rubrics applied to the subscale of Coercion of Mother with only two items left after Exploratory Factor Analysis so that the factor for that subscale was not used in further analysis neither.

Furthermore, two factors were extracted from subscale Autonomy Support of Mother, with three items falling in Factor 2 of Maternal Attention and Encouragement and seven items falling in Factor 1 of Maternal Trust and Respect. These two factors explained 12% and 48% of the total variance for the subscale Autonomy of Mother, respectively. The Cronbach's Alpha values for each factor ranged from .66 to .91, indicating the internal consistency of these factors extracted were relatively satisfactory (Cronbach's Alpha values $>.6$). Thus, these two factors will be retained and examined further in confirmatory factor analysis procedures.

6 Conclusion

The study conducted exploratory factor analysis (EFA) on a parenting scale to identify underlying factors. Cronbach's alpha was used to assess internal consistency reliability. The Cronbach's Alpha values for each factor indicated satisfactory internal consistency, reinforcing the reliability of the extracted factors.

Results for validity showed that all items in Warmth of Father, Rejection of Father, and Autonomy Support of Father subscales validated as one factor, indicating that these three paternal subscales are validated in the exploratory factor analysis. Chaos for mother/father and Coercion of Mother have been modified by deleting two items for each subscale to satisfy internal validity, while Autonomy of Mother has been divided into two new subscales, i.e. Maternal Trust & Respect and Maternal Attention & Encouragement.

These findings are inspiring for further studies on the systematic organization of parenting categorization, and will be confirmed in the confirmatory factor analysis for the modified SDP parenting scale data.

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