

# Parenting Styles, Thinking Styles, and Career Decision Self-efficacy in Gifted Adolescents

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## Abstract

This study examined the effects of adolescents' perceptions of their own parents' parenting styles and their thinking styles on their career decision self-efficacy. The study participants were 173 gifted high school students in 11th and 12th grade in Jakarta. The adapted Career Decision Self-Efficacy (CDSE) Scale-Short Form, Parental Authority Questionnaire, and Thinking Style Inventory were used to collect data. The data were analyzed using the multiple regression and Hayes' PROCESS simple mediation model. It was found that the CDSE was significantly influenced by authoritative and permissive parenting styles and as well as by Type 1, Type 2, and Type 3 thinking styles. Mediation testing found that the thinking style variables significantly mediated some relationships between parenting styles and the CDSE. However, there were some limitations, for which the implications for further research are given.

**Keywords:** career decision self-efficacy, gifted, adolescents, parenting styles, thinking styles

## Introductions

Featherman (1980, cited in Mortimer et al., 2002) claimed that adolescence is an important period during which young people must make critical decisions such as whether they are going to enter the workforce after completing school or continue to higher education, and what school options they will follow to set them up for their future. When making career decisions, young people need to have appropriate self-efficacy. If they lack self-efficacy, then they may have doubt regarding their career decision (career indecision); that is, the level of career indecision increases when self-efficacy is low (Betz & Voyten, 1997; Creed et al., 2006; Stărică, 2012). Jung (2017) found that gifted adolescents face difficulty with their career decisions. For them, it is not easy to choose a career path from the many preferred career options as they have many interests and various talents.

The construct of Career Decision Self-Efficacy (CDSE) was proposed by Taylor and Betz (1983). The CDSE is defined as a person's confidence in completing the tasks required for career decision making. The CDSE was developed based on both Bandura's self-efficacy theory and Crite's career maturity theory and consisted of five key areas: self-appraisal, occupational information, goal selection, planning, and problem solving.

The previous research has examined the CDSE in association with predictors such as gender, age, race, self-esteem, vocational identity, career barriers, peer support, vocational outcome expectations, career indecision, parenting styles, and thinking styles (Choi et al., 2012; Fan, 2016). However, few studies have examined specifically the influence of parenting styles on the CDSE. Parenting styles were first suggested by Baumrind (1978, 1991) to explain parental authority in childrearing, and three parenting styles—authoritative, authoritarian, and permissive—were identified. Authoritative parents set family rules but are still supportive and hold discussions with the child. Authoritarian parents set family rules that the child has to obey and do not tolerate disobedience or questioning. Finally, permissive parents tend to follow their child's demand and do not feel responsible for directing the child's behavior. These parenting styles can be based on two basic dimensions—responsiveness and demandingness (Maccoby

& Martin, 1983). Demandingness is defined as the levels parents set for a child's behavior and obedience, and responsiveness is the degree to which parents are sensitive to the needs of their children as well as the parents' sense of love, warmth, and care. Each type of parenting has been found to have different levels of responsiveness and demandingness: authoritative parents have high demandingness and high responsiveness; authoritarian parents have a high degree of demandingness, but low responsiveness; and permissive parents have low demandingness but high responsiveness.

Lease and Dahlbeck (2009) found that authoritarian parenting, especially paternal parenting style had a significant effect on the CDSE of female college students. In addition, White (2009) found that authoritative college students who perceived their parents to have an authoritative parenting style had higher CDSE levels. Based on those results, the first hypothesis in this study is that the parenting style gifted adolescents perceive significantly predicts their CDSE. However, because the results of the two studies mentioned above were different, it could be speculated that other factors mediate the relationship between perceived parenting style and the CDSE, such as the child's thinking style.

Sternberg (1997) claimed that individuals' thinking styles are influenced by their parents' parenting styles. Thinking style refers to the way individuals think about information when they study it and after they finish learning (Zhang, 2010). Sternberg (1988, 1997) proposed 13 thinking styles: legislative, executive, judicial, monarchic, hierarchic, oligarchic, anarchic, global, local, internal, external, liberal, and conservative. Zhang (2002) then grouped these 13 thinking styles into three types: Type 1, which includes legislative, judicial, liberal, global, and hierarchic; Type 2, which includes executive, conservative, local, and monarchic; and Type 3, which includes oligarchic, anarchic, internal, and external (Zhang, 2012). Fan and Zhang's (2014) research on college students found that thinking styles were influenced by the parenting style. For example, students who perceived their parents to have authoritative or indulgent parenting styles had higher scores for Type 1 (legislative, judicial, and hierarchic) and Type 3 (external) thinking styles. Students who perceived their parents to have authoritarian parenting styles had also significantly higher scores

for two Type 1 (legislative and hierarchical) thinking style factors. Students who perceived their parents to have neglectful parenting styles had significantly lower scores for the (executive) factor of the Type 2 thinking style. Therefore, the second hypothesis in this study is that the parenting style perceived by gifted adolescents significantly predicts their thinking styles.

A person's thinking style has been found to have a relationship with their CDSE level. Fan (2016) found that thinking styles had an important effect on the CDSE, with Type 1 thinking styles having a significant positive relationship with the CDSE, suggesting that in comparison with their peers, students who like to handle unstructured tasks (legislative), enjoy appraisals (judicial), prefer to see the situation as a whole (global), like to engage in new things (liberal), and tend to construct many tasks efficiently (hierarchical) are more confident in collecting occupational information, making accurate self-assessments, choosing career goals, and addressing career problems. Therefore, the third hypothesis in this study is that the thinking styles of gifted adolescents significantly predict their CDSE.

This study is important as there has been a lack of research that examines the CDSE of gifted adolescents in high school who are faced with choosing whether to attend higher education and choosing their college major. Because of the variable findings regarding the relationship between parenting styles and a child's CDSE, it is also necessary to examine the effect of parenting styles on gifted adolescent CDSE when mediated by their thinking style. Therefore, the final hypothesis of this study is that the thinking style of gifted adolescents mediates the effect of perceived parenting style on their CDSE.

## Method

This study used quantitative and non-experimental research methods to examine the relationship between CDSE, parenting styles, and thinking styles.

### Participants

The initial study participants were 1,049 students in 11th and 12th grade from three high schools in Jakarta. Before the three measuring instruments were administered, these initial participants were first screened using IST intelligence tests, task commitment measurement tools, and figural creative tests (TKF) to see whether they met the giftedness criteria of above average intelligence, a high level of task commitment, and a high level of creativity. This study used two giftedness standards from Hawadi (2002): an IQ score above 130; and a minimum IQ score of 120, a task commitment score of at least 132, and a CQ score of at least 110.

The screening process showed 173 students met Hawadi's (2002) giftedness criteria. The participants were aged 14 to 17 years old ( $M = 16.20$ ,  $SD = 0.664$ ), and 50.9% were male.

### Instruments

Three instruments were used for the data collection on the final participant group; the CDSE Scale-Short Form, the Parental Authority Questionnaire, and the Thinking Style Inventory-Revised II.

**Career Decision Self-Efficacy Scale-Short Form:** This instrument was revised by Betz, Klein, and Taylor (1996) from the original Career Decision-Making Self-Efficacy Scale (Taylor & Betz, 1983). The scale has 25 items, with five items allocated to each of the five subscales, and each item is assessed on a five-point scale ranging from "no confidence at all" (1) to "very confident" (5). The five CDSES-SF subsets are self-appraisal, occupational information, goal selection, planning,

and problem solving. In this study, a measuring instrument that was adapted by previous researchers (Sawitri, 2009) was used. Based on the results of the validity tests, four items were removed; therefore, in this study, 21 items only were assessed. The CDSE Scale instrument used in this study demonstrated excellent internal consistency reliability, for which the Cronbach's alpha was 0.901 for the 21 valid items. In this study, the instrument adapted also a 6-point Likert-type scale from "no confidence at all" (1) to "very confident" (6) to prevent the participants from choosing the middle point.

**Parental Authority Questionnaire:** This instrument was developed by Buri (1991) based on Baumrind's (1978, 1991) three parenting styles. Several studies have used two different questionnaires to measure paternal and maternal parenting style perceptions. The word "parent" here is flexible, and participants are allowed to refer to anyone they perceive to be a parent figure in their life. This instrument has 30 items, with 10 items for each parenting style, each of which are assessed on five-point Likert-type scales from "strongly disagree" to "strongly agree." In this study, the instrument was adapted for cross-cultural purposes and modified to a 6-point Likert-type scale from "strongly disagree" to "strongly agree" to prevent the participants from choosing the middle point. After the adaptation process, field trials with 188 students were conducted and the results were analyzed using the Confirmatory Factor Analysis (CFA) to ensure the standard for each item's  $t$ -value was above 1.96 and had a loading factor above 0.40 (Hair, 2009), from which 20 valid items were identified out of the 30 items for the paternal parenting style form, and 21 valid items were identified out of the 30 items for the maternal parenting style form. All the valid items had a load factor ranging from 0.40 to 0.88. This instrument showed also good internal consistency reliability, with each subscale having a coefficient Cronbach's alpha of 0.885 for the paternal authoritative parenting style; 0.710 for the paternal authoritarian parenting style; 0.648 for the paternal permissive parenting style; 0.842 for the maternal authoritative parenting style; 0.802 for the maternal authoritarian parenting style; and 0.749 for the maternal permissive parenting style.

**Thinking Style Inventory-Revised II:** This instrument was first developed by Sternberg and Wagner (1992) and has 104 items, with eight items to assess each of the 13 thinking styles. The first revision (TSI-R) by Sternberg et al. (2003) was used in several studies and showed good validity. The second and most recent revision (Sternberg, Wagner, and Zhang, 2007) reduced the inventory to 65 items, with five items to assess each of the 13 thinking styles, respectively. In this study, the instrument was cross-culturally adapted and modified to a 6-point Likert-type scale from "strongly disagree" to "strongly agree" to prevent the participants from choosing the middle point. After the adaptation process, field trials with 188 students were conducted, and the results were analyzed using CFA to ensure the standard for each item's  $t$ -value was above 1.96 and had a load factor above 0.40 to 0.81. This measurement showed varying internal consistency reliability. Unfortunately, the anarchic thinking style had poor internal consistency, with a Cronbach's alpha of only 0.538. The liberal thinking style had the best internal consistency with a Cronbach's alpha of 0.756.

### Research Procedure and Data Analysis

The data were collected at three schools in Jakarta. First, as explained, the 11th and 12th grade students were screened using intelligence tests, figural creativity tests, and task commitment measurement tools to identify the gifted adolescents. The 173 gifted students who were identified completed the three instruments and provided demographic data. All the participants received reward reports on their test results as well as stationary for their participation. The resulting data were

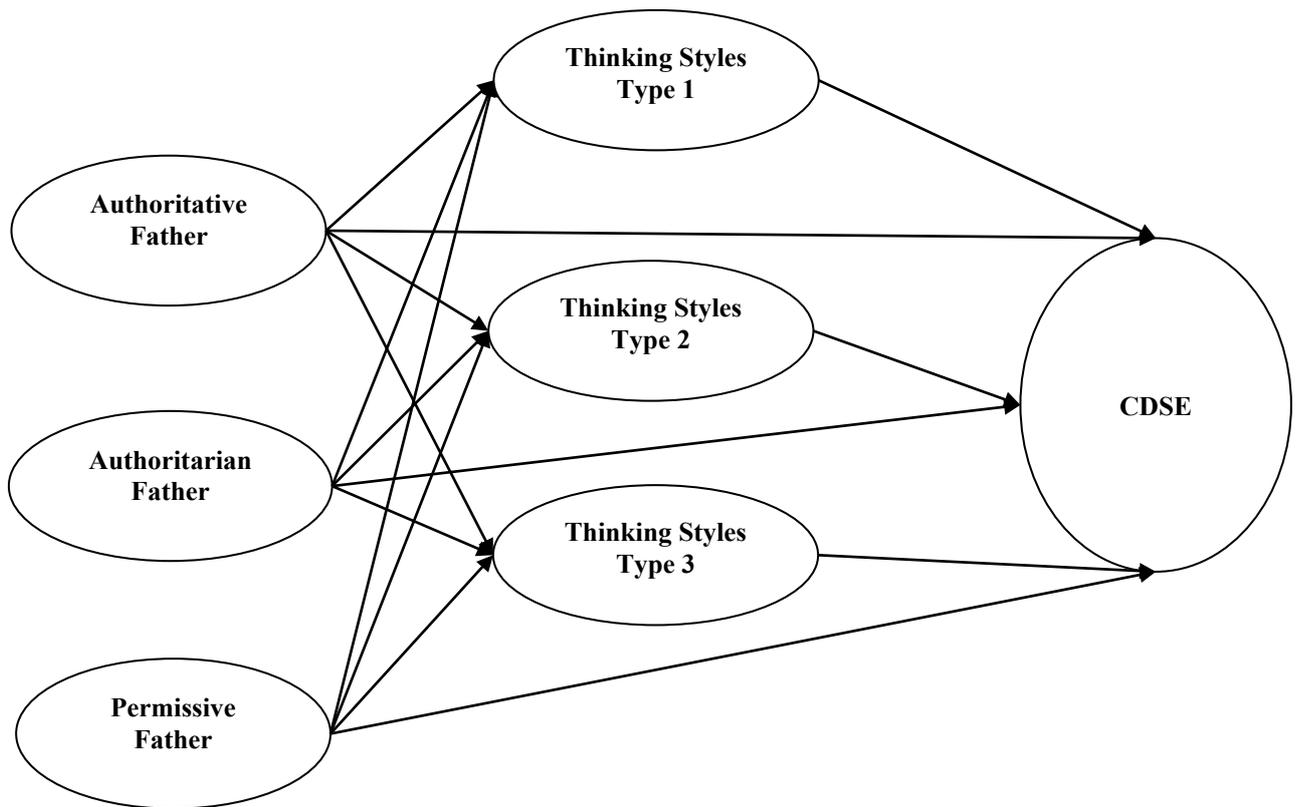


Figure 1. Paternal Parenting Styles Mediation Models

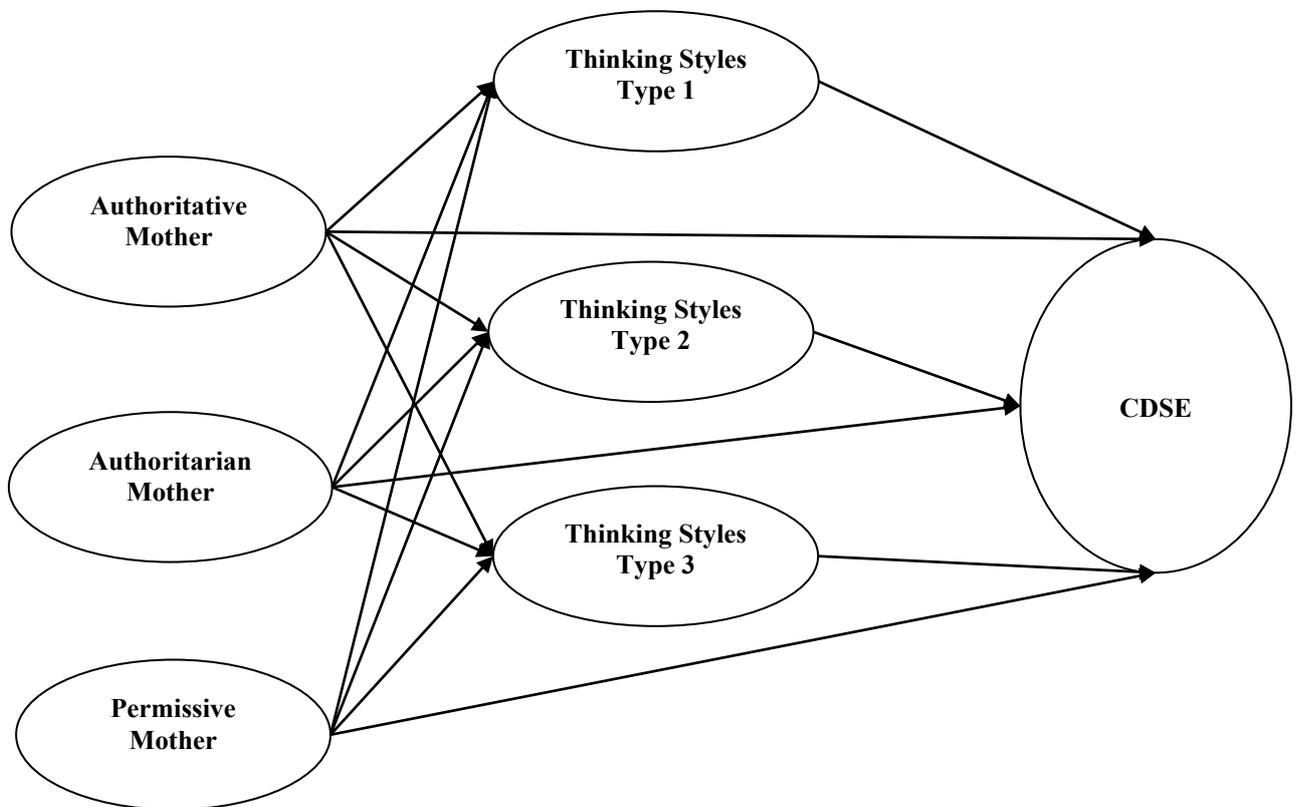


Figure 2. Maternal Parenting Styles Mediation Models

analyzed using the linear regression and multiple regression techniques conducted using Hayes' (2013) PROCESS simple mediation model. Descriptive statistics and correlational analyses were used to reveal the relationships between the variables.

## Results

### Preliminary Analyses

Table 1 gives the descriptive statistics for all the variables assessed in this study. The mean scores were generally high for

all the variables. Table 1 shows also the correlation between the variables. Overall, the correlation between the variables from Pearson's correlation revealed a significant relationship with the CDSE for each thinking style and each parenting style. The CDSE variables were positively correlated with the authoritative paternal style, permissive paternal style, authoritative maternal style, and permissive maternal style, as well as the following thinking styles: legislative, executive, judicial, monarchic, hierarchic, anarchic, global, local, internal, external, and liberal.

**Table 1.** Correlations between CDSE, Parenting Style, and Thinking Style Factors

		M	SD	1	2	3	4	5	6	7	8	9	10
1	CDSE	4.63	.51	-									
2	AVE PATERNAL	4.50	.86	.395**	-								
3	AN PATERNAL	3.72	1.01	.133	.001	-							
4	PM PATERNAL	4.21	.85	.259**	.543**	-.243**	-						
5	AVE MATERNAL	4.77	.73	.316**	.324**	.058	.224**	-					
6	AN MATERNAL	3.80	.87	.106	.087	.619**	-.028	-.201**	-				
7	PM MATERNAL	4.46	.77	.287**	.114	.046	.339**	.646**	-.257**	-			
8	LEG	4.64	.63	.427**	.267**	.021	.091	.196*	.000	.148	-		
9	EXE	4.59	.60	.192*	.148	.177*	-.029	.318**	.166*	.133	.001	-	
10	JDC	4.65	.66	.407**	.203**	.021	.083	.158*	.012	.148	.407**	.126	-
11	MON	4.40	.88	.262**	.242**	.176*	.098	.179*	.235**	.000	.109	.391**	.114
12	HRC	4.50	.66	.439**	.256**	.146	.104	.382**	.134	.215**	.364**	.508**	.426**
13	OLG	4.33	.69	.133	.090	.174*	.130	.264**	.140	.182*	-.045	.290**	.262**
14	ANC	4.08	.84	.389**	.147	.201**	.036	.087	.166*	.137	.253**	.277**	.340**
15	GBL	4.40	.64	.391**	.192*	.132	.097	.184*	.147	.195*	.402**	.025	.402**
16	LCL	4.26	.71	.313**	.217**	.197**	.143	.170*	.147	.132	.247**	.445**	.292**
17	ITL	4.16	.82	.206**	.064	.256**	.008	.037	.105	.035	.375**	.043	.069
18	ETL	4.60	.78	.346**	.245**	-.020	.144	.205**	-.044	.229**	.264**	.121	.495**
19	LBL	4.42	.76	.470**	.282**	.112	.134	.125	.125	.178*	.636**	.034	.589**
20	CNS	4.06	1.01	.058	-.008	.229**	-.109	.236**	.196*	.115	-.222**	.689**	-.169*

Note: CDSE = Career Decision-making Self-efficacy; AVE = Authoritative; AN = Authoritarian; PM = Permissive; LEG = Legislative; EXE = Executive; JDC = Judicial; MON = Monarchic; HRC = Hierarchic; OLG = Oligarchic; ANC = Anarchic; GBL = Global; LCL = Local; ITL = Internal; ETL = External; LBL = Liberal; CNS = Conservative.

\* $p < .05$ . \*\* $p < .01$ .

		M	SD	11	12	13	14	15	16	17	18	19	20
1	CDSE	4.63	.51										
2	AVE PATERNAL	4.50	.86										
3	AN PATERNAL	3.72	1.01										
4	PM PATERNAL	4.21	.85										
5	AVE MATERNAL	4.77	.73										
6	AN MATERNAL	3.80	.87										
7	PM MATERNAL	4.46	.77										
8	LEG	4.64	.63										
9	EXE	4.59	.60										
10	JDC	4.65	.66										
11	MON	4.40	.88	-									
12	HRC	4.50	.66	.417**	-								
13	OLG	4.33	.69	.147	.150*	-							
14	ANC	4.08	.84	.020	.354**	.210**	-						
15	GBL	4.40	.64	.128	.237**	.164*	.222**	-					
16	LCL	4.26	.71	.322**	.403**	.223**	.358**	-.034	-				
17	ITL	4.16	.82	.265**	.245**	-.129	.177*	.187*	.201**	-			
18	ETL	4.60	.78	-.003	.267**	.333**	.262**	.359**	.092	-.294**	-		
19	LBL	4.42	.76	.119	.413**	.079	.444**	.443**	.284**	.208**	.456**	-	
20	CNS	4.06	1.01	.334**	.255**	.233**	.125	-.122	.280**	.067	-.162*	-.205**	-

Note: CDSE = Career Decision-making Self-efficacy; AVE = Authoritative; AN = Authoritarian; PM = Permissive; LEG = Legislative; EXE = Executive; JDC = Judicial; MON = Monarchic; HRC = Hierarchic; OLG = Oligarchic; ANC = Anarchic; GBL = Global; LCL = Local; ITL = Internal; ETL = External; LBL = Liberal; CNS = Conservative.

\* $p < .05$ . \*\* $p < .01$ .

**Table 2.** Hypothesis Testing for the Simple Mediation Model

	<i>c'</i> path				<i>a</i> path				<i>b</i> path				<i>c</i> path			
	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>
X: AVE PATERNAL M: TYPE 1 Y: CDSE	0.138	0.000**	0.063	0.212	0.189	0.000**	0.106	0.272	0.512	0.000**	0.383	0.641	0.234	0.000**	0.152	0.316
X: AN PATERNAL M: TYPE 1 Y: CDSE	0.033	0.302	-0.030	0.095	0.058	0.129	-0.017	0.131	0.581	0.000**	0.454	0.701	0.066	0.086	-0.009	0.142
X: PM PATERNAL M: TYPE 1 Y: CDSE	0.112	0.003**	0.038	0.186	0.084	0.064	-0.005	0.172	0.562	0.000**	0.437	0.687	0.159	0.001**	0.071	0.247
X: AV MATERNAL M: TYPE 1 Y: CDSE	0.118	0.091	0.030	0.206	0.191	0.000**	0.091	0.290	0.517	0.000**	0.388	0.647	0.216	0.000**	0.117	0.315
X: AN MATERNAL M: TYPE 1 Y: CDSE	0.023	0.539	-0.051	0.097	0.066	0.141	-0.022	0.154	0.561	0.000**	0.434	0.689	0.060	0.181	-0.028	0.148
X: PM MATERNAL M: TYPE 1 Y: CDSE	0.106	0.013*	0.023	0.190	0.158	0.002**	0.062	0.254	0.526	0.000**	0.397	0.655	0.189	0.000**	0.094	0.285
X: AVE PATERNAL M: TYPE 2 Y: CDSE	0.212	0.000**	0.130	0.294	0.130	0.014*	0.027	0.233	0.167	0.006**	0.049	0.285	0.233	0.000**	0.152	0.315
X: AN PATERNAL M: TYPE 2 Y: CDSE	0.034	0.376	-0.042	0.110	0.156	0.000**	0.070	0.242	0.209	0.002**	0.080	0.338	0.067	0.082	-0.008	0.142
X: PM PATERNAL M: TYPE 2 Y: CDSE	0.152	0.001**	0.067	0.236	0.018	0.743	-0.088	0.124	0.219	0.000**	0.098	0.339	0.156	0.001**	0.068	0.243

Note: CDSE = Career Decision-making Self-efficacy; AVE = Authoritative; AN = Authoritarian; PM = Permissive.

\**p* < .05. \*\**p* < .01.

	<i>c'</i> path				<i>a</i> path				<i>b</i> path				<i>c</i> path			
	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>	<i>B</i>	<i>P</i>	<i>LLCI</i>	<i>ULCI</i>
X: AVE MATERNAL M: TYPE 2 Y: CDSE	0.179	0.001**	0.078	0.281	0.242	0.000**	0.123	0.360	0.147	0.022*	0.022	0.272	0.215	0.000**	0.116	0.313
X: AN MATERNAL M: TYPE 2 Y: CDSE	0.025	0.576	-0.063	0.113	0.176	0.001**	0.075	0.278	0.203	0.002**	0.075	0.331	0.061	0.172	-0.027	0.148
X: PM MATERNAL M: TYPE 2 Y: CDSE	0.168	0.001**	0.075	0.261	0.094	0.115	-0.023	0.211	0.186	0.003**	0.066	0.306	0.185	0.000**	0.091	0.280
X: AVE PATERNAL M: TYPE 3 Y: CDSE	0.174	0.000**	0.098	0.251	0.125	0.001**	0.050	0.201	0.472	0.000**	0.324	0.620	0.233	0.000**	0.152	0.315
X: AN PATERNAL M: TYPE 3 Y: CDSE	0.000	0.994	-0.069	0.069	0.120	0.000**	0.056	0.184	0.554	0.000**	0.396	0.711	0.067	0.082	-0.008	0.142
X: PM PATERNAL M: TYPE 3 Y: CDSE	0.119	0.003**	0.040	0.197	0.070	0.077	-0.008	0.149	0.523	0.000**	0.374	0.672	0.156	0.001**	0.068	0.243
X: AVE MATERNAL M: TYPE 3 Y: CDSE	0.142	0.003**	0.050	0.233	0.153	0.001**	0.064	0.243	0.478	0.000**	0.327	0.630	0.215	0.000**	0.116	0.313
X: AN MATERNAL M: TYPE 3 Y: CDSE	0.016	0.688	-0.063	0.095	0.084	0.033*	0.007	0.162	0.532	0.000**	0.380	0.685	0.061	0.172	-0.027	0.148
X: PM MATERNAL M: TYPE 3 Y: CDSE	0.114	0.012*	0.026	0.202	0.146	0.001**	0.061	0.231	0.487	0.000**	0.334	0.640	0.185	0.000**	0.091	0.280

Note: CDSE = Career Decision-making Self-efficacy; AVE = Authoritative; AN = Authoritarian; PM = Permissive.

\**p* < .05. \*\**p* < .01.

## Hypothesis Testing

To test the research hypothesis, a simple mediation model from Hayes' (2013) micro PROCESS model was used. A summary of the results of the hypothesis testing is shown in Table 2.

**Parenting Styles and CDSE (path c):** The results of the regression analyses on paternal parenting style showed that the CDSE was significantly and positively influenced by the authoritative paternal parenting style ( $F(1,170) = 31.51, p = 0.000 < .05, R^2 = .16$ ) and permissive paternal parenting style ( $F(1,170) = 12.68, p = 0.001 < .05, R^2 = .07$ ). The regression analyses on the maternal care measures showed that the CDSE was significantly and positively influenced by an authoritative maternal parenting style ( $F(1,166) = 18.69, p = 0.000 < .05, R^2 = .10$ ) and a permissive maternal parenting style ( $F(1,166) = 15.41, p = 0.000 < .05, R^2 = .09$ ). For the authoritarian parenting style, neither parent showed significant results for predicting the CDSE.

**Parenting Styles and Thinking Styles (path a):** The regression analyses revealed that the Type 1 thinking style was significantly and positively influenced by the authoritative paternal style ( $F(1,170) = 20.18, p = 0.000 < .05, R^2 = .11$ ), authoritative maternal style ( $F(1,166) = 14.22, p = 0.000 < .05, R^2 = .08$ ), and permissive maternal style ( $F(1,166) = 10.46, p = 0.001 < .05, R^2 = .06$ ). The Type 2 thinking style was significantly and positively influenced by the authoritative paternal style ( $F(1,171) = 6.23, p = 0.01 < .05, R^2 = .04$ ), authoritarian paternal style ( $F(1,171) = 12.95, p = 0.000 < .001, R^2 = .07$ ), authoritative maternal style ( $F(1,167) = 16.16, p = 0.0001 < .001, R^2 = .09$ ), and authoritarian maternal style ( $F(1,167) = 11.69, p = 0.0008 < .001, R^2 = .07$ ). These results indicated that children who perceived their father and mother to be authoritative or authoritarian tended to have Type 2 thinking styles. Type 3 thinking styles were found to be significantly and positively influenced by the authoritative paternal style ( $F(1,171) = 10.67, p = 0.001 < .05, R^2 = .06$ ), authoritarian paternal style ( $F(1,171) = 13.81, p = 0.000 < .001, R^2 = .07$ ), authoritative maternal style ( $F(1,167) = 11.41, p = 0.001 < .001, R^2 = .06$ ), an authoritarian maternal style ( $F(1,167) = 4.61, p = 0.03 < .05, R^2 = .03$ ), and a permissive maternal style ( $F(1,167) = 11.49, p = 0.001 < .05, R^2 = .06$ ).

**Thinking Styles and CDSE (path b):** From the results of the separate linear regression analyses, it was found that the CDSE was significantly and positively influenced by Type 1 thinking styles ( $F(1,171) = 85.39, p = 0.000 < .05, R^2 = .33$ ), Type 2 thinking styles ( $F(1,171) = 12.66, p = 0.000 < .05, R^2 = .07$ ), and Type 3 thinking styles ( $F(1,171) = 52.35, p = 0.000 < .05, R^2 = .23$ ).

**Thinking Styles as a Mediator Between Parenting Styles and CDSE:** From the three main variables and the respective dimensions, the perceptions of parenting styles (paternal and maternal authoritative, paternal and maternal authoritarian, paternal and maternal permissive), thinking styles (Type 1, Type 2, Type 3), and CDSE, 18 research models were obtained to test the influence of the thinking style mediation variable on the parenting style relationship with the CDSE. In all the models, significant mediation effects were found for the three thinking styles.

From the results of the mediation test in the first research model, the paternal authoritative parenting style with IV, CDSE with DV, and Type 1 thinking styles as the mediation variable, it was found that path a, path b, and path c were significant. Path c' was also significant but had a lower coefficient than path c, which indicated that the x variable was lessened when predicting the y variable and the mediation variable had a bigger effect. It can be concluded that from this research model that Type 1 thinking styles partially mediated the effect of paternal authoritative parenting styles on the CDSE.

In the fourth research model, with maternal authoritative parenting styles with IV, CDSE with DV, and Type 1 thinking styles as the mediator variable, it was found that path a, path b, and path c were significant. Path c' was not significant, which meant that the x variable no longer predicted the y variable and the mediator variable had a bigger effect. It can be concluded from this research model that Type 1 thinking styles fully mediated the effect of maternal authoritative parenting styles on the CDSE.

Similar to the first model, in the sixth research model, with maternal permissive parenting styles with IV, CDSE with DV, and Type 1 thinking styles as the mediating variable, it was found that path a, path b, and path c were significant. Path c' was also significant but had a lower coefficient than path c, which meant that the x variable was lessened when predicting the y variable and the mediator variable had a bigger effect. It can be concluded from this research model that Type 1 thinking styles partially mediated the effect of maternal permissive parenting styles on the CDSE.

These results were similar in some research models; the seventh research model indicated that Type 2 thinking styles partially mediated the effect of paternal authoritative parenting styles on the CDSE; the 10th research model indicated that Type 2 thinking styles partially mediated the effect of maternal authoritative parenting styles on the CDSE; the 13th research model indicated that Type 3 thinking styles partially mediated the effect of paternal authoritative parenting styles on the CDSE; the 16th research model indicated that Type 3 thinking styles partially mediated the effect of maternal authoritative parenting styles on the CDSE; and lastly, the 18th research model indicated that Type 3 thinking styles partially mediated the effect of maternal permissive parenting styles on the CDSE.

## Discussion

This study gave an overview of the relationships between CDSE, parenting styles, and thinking styles. The first hypothesis testing showed that authoritative and permissive parenting styles significantly predicted the CDSE, from both the paternal and maternal sides. These results supported findings in previous studies (White, 2009) in which respondents who perceived their parents to have an authoritative parenting style had higher CDSE levels. Authoritative parenting styles could be seen as a more adaptive parenting style as there is a balance between demandingness and responsiveness; that is, while authoritative parents establish clear rules and boundaries, they allow for a democratic discussion of these rules. Permissive parents allow their children greater freedom; it was found that gifted adolescents in less constrained and less-regulated family environments had higher career decision-making confidence levels.

From the second hypothesis testing, it was found that Type 1 thinking styles significantly predicted the CDSE level of a gifted adolescent, which was consistent with the results of previous research (Fan, 2016) in which respondents who had Type 1 thinking styles were found to have high CDSE levels. Type 1 thinking styles included five sub-styles (legislative, judicial, global, hierarchic, and liberal) related to cognitive complexity, creativity, and adaptability, which are closely related to the characteristics of highly creative gifted adolescents; that is, the higher the tendency toward a Type 1 thinking style, the higher the CDSE level. Although Type 2 thinking styles predicted the CDSE also significantly, the effect was not as great compared to the other thinking styles as a Type 2 thinking style tends to comply with existing norms and regulations. Even though a Type 2 thinking style can improve self-efficacy in career decision making, the effect is smaller than for Type 1. Type 3 thinking styles were also found to significantly predict CDSE.

However, Zhang (2005) claimed that Type 3 thinking styles (internal, external, oligarchic, and anarchic) do not have a fixed relationship pattern and can be included as in Type 1 or Type 2 thinking styles. Therefore, further research is needed to clarify these relationships.

From the third hypothesis testing, it was found that authoritative parenting styles significantly predicted Type 1 thinking styles, which was consistent with previous research findings (Fan & Zhang, 2014) showing that respondents who perceived they were living with authoritative parents had Type 1 thinking styles. From the correlation test results, it was found that authoritative maternal and paternal parenting styles were positively related to legislative, judicial, hierarchical, global, and liberal thinking styles, which are characteristic of Type 1 thinking styles. This suggests that supportive and democratic maternal parenting styles may result in a cognitively complex child who is willing to face new situations. Type 2 thinking styles were also significantly and positively predicted by both authoritative and authoritarian maternal and paternal parenting styles. The results of the correlation test found also that authoritative and authoritarian paternal and maternal parenting styles had a positive relationship with the executive, monarchic, local, and conservative thinking styles characteristic of Type 2 thinking styles, which suggests that adolescents raised by authoritative or authoritarian parents tend to follow the rules, focus on one thing at a time, and prefer to deal with concrete tasks or problems.

From the fourth hypothesis mediation test for the thinking style variables, several significant mediators were found that mediated the influence of the parenting style on the CDSE levels, with all three types of thinking styles found to mediate some research models. The Type 1 thinking style mediated the effects of an authoritative maternal and paternal parenting style and the effect of a maternal permissive parenting style on the CDSE. These results tend to suggest if both parents have an authoritative parenting style or the mother has a permissive parenting style, the child tends to have a Type 1 thinking style and, therefore, a high level of self-efficacy when making career decisions.

Type 2 thinking styles were also found to mediate the effects of authoritative maternal and paternal parenting styles, which suggests that if both parents had authoritative parenting styles, their child would have a Type 2 thinking style and, therefore, a high level of self-efficacy when making career decisions.

Finally, a Type 3 thinking style was found to mediate the effects of maternal and paternal authoritative parenting styles and the effect of a maternal permissive parenting style, which suggests that if both parents had authoritative parenting styles or the mother had a permissive parenting style, their child would have a Type 3 thinking style and a high CDSE. However, it is unusual for Type 3 thinking styles to have a significant relationship as a Type 3 thinking style has been claimed to be a combination of Type 1 and Type 2. Therefore, this Type 3 mediation result may have been influenced by the sample characteristics of the gifted adolescents; some gifted adolescents have unstable emotional characteristics, and the thinking styles in Type 3 tend to be related to an individual preference for working on the task or problem at hand and emotion.

## Limitations and Conclusions

This study has several limitations. The first limitation is the size of the sample; unfortunately, the characteristics of gifted adolescents mean that it is often difficult to find adequate research samples. The absence of accelerated classes in the research area meant that a screening process involving hundreds of students from three schools

was required to produce the sample in this study. It is hoped that in future research, the scope of the schools may be increased for sampling so that the results can be more easily generalized to the intended population.

The next limitation is the faulty implementation time in the data retrieval in two of the three schools. In two out of the three schools, the researchers collected data in the final hour of the school day when the students were exhausted and less focused; therefore, some of the answers were inaccurate and could not be used. In addition, the use of Likert-type scales was a constraint because the answers the students gave were not completely accurate. Further research should ensure that data collection is done in the morning when the students are refreshed and able to concentrate. Other methods besides questionnaires, such as interviews or observations, could also be used to obtain more accurate research results.

Another limitation is this study did not compare the gifted students to non-gifted students. Comparing these two groups may offer greater insight into their differences. Further research can use a control group (non-gifted students) to obtain comparable and comprehensive results.

In conclusion, this study found that the CDSE was significantly influenced by authoritative and permissive parenting styles and was also significantly influenced by Type 1, Type 2, and Type 3 thinking styles. Moreover, the thinking style variables significantly mediated some relationships between parenting styles and the CDSE. These findings can serve as a foundation to develop interventions concerning CDSE among gifted students.

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