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Career decision making, cognitive flexibility and perceived parental expectations among higher secondary students

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Abstract
Career decisions play an important role in how one's social, emotional and economic well-being is going to be and hence are considered one of the most important decisions in one's lifetime. In this view, the career decision making of higher secondary students, being in an important phase of deciding and planning their career and choosing a major to pursue in the immediate future, as examined. The extent to which career decision making is predicted by cognitive flexibility and perceived parental expectations is also examined here. Using convenience sampling, data collection was done on a sample of n=216 students of Class 11 and 12. On analysis of the collected data, results show that 97% of the students are tentative on career decision making, meaning they are neither decided nor indecisive. The three variables of this study are significantly correlated. Perceived parental expectations and cognitive flexibility both significantly predict career decision making and the R^2 value is.068. Career decision making differs significantly between different family types. The implications are stated.

Keywords: Career decision making, cognitive flexibility, parental expectations, higher secondary students

Introduction
Decision making is a cognitive process that involves choosing between multiple alternatives (American Psychological Association, n.d.). Career decision making is specifically applying the process of decision making to career by choosing one's job field, switching of jobs in one's career as well as planning and deciding when and how to retire, relevant alternatives and arriving at an acceptable and appropriate outcome (Kaur & Singh, 2017; Gati & Kulcsar, 2021) [23, 16].

Career decisions play an important role in how one's social, emotional and economic well-being is going to be and hence are considered one of the most important decisions in one's lifetime (Gati & Kulcsar, 2021) [16]. According to a survey by Oracle, 97% of Indians claim that they want to switch careers over the next year, however, most are held back due to factors like financial struggles, lack of growth opportunities etc. of which not knowing what career changes is meaningful to them is faced by a significant percentage of people (Vidya, 2021) [42]. Cartmell (2022) [8] has shown that career indecision can impact one's wages and job switching frequency. Thus, there is a need to understand career decision making and the factors influencing it.

The higher secondary students, i.e. students of class 11 and 12 or Pre-University College as called in some places, are generally at the phase of making an important career decision in the near future in terms of choosing a major for their career (CBSE, n.d.). Planning one's career during the school years can help in making the preparation for our career and the career in itself more effective and helps boost self-confidence (CBSE, n.d.).

Several factors influence career decidedness or indecisiveness. Some of these are the role of one's family (Fouad *et al*., 2016) [15], the role of parents in terms of their aspirations, parenting styles, their occupations (Sharif *et al*., 2019) [37], the role of teachers and the expected income and status (Sharif *et al*., 2019) [37]. Other factors include skills, abilities, competencies (Agarwala, 2008) [1], and specifically among school students, self-concept, self-fulfillment and coping with development also play an influential role in career decision making (Singh, 2020) [39]. Socio-demographic factors like awareness of one's locality, availability of college or course, parental education, family income, and mental ability also

have an impact (Braza and Guillo Jr, 2015) [5]. The present study analyzes the impact of perceived parental expectations, cognitive flexibility in career decision making. Parental expectations is defined as parents' wishes about one's offspring including their academic performance and career ambitions (Sasikala & Karunanidhi, 2011) [36]. Previous studies show contradictory results when it comes to the relationship of career decision making with parental expectations. The study done by Hussain and Rafique (2013) [21] on 200 Pakistani college students and by Qi *et al*. (2023) [35] on 2540 Chinese high school students showed that perceived parental expectations could not significantly predict career decision making. On the other hand, Leung *et al*. (2011) [28] had done a study on 1342 University students of China, showing a significant relationship which is partially moderated by cultural values. Culture seems to play a key role and the contradictory results lead to a research gap, making it important to explore the relationship between these two study variables in an Indian context.

Cognitive Flexibility is defined as the readiness to selectively and flexibly switch and change between multiple mental processes, tasks and adapt in order to produce behavioral responses that are appropriate (Dajani & Uddin, 2015) [10]. This ability to switch between various thought processes and consider multiple options simultaneously is a core aspect of decision making and enables individuals to believe in their ability to engage in the alternative behavioral patterns (Dunleavy & Martin, 2006; Kercood *et al*., 2017) [12, 24]. Cognitive flexibility commonly is used interchangeably with cognitive set shifting and involves shifting between different sets enabling multitasking and adapting to changing environmental demands (Lange *et al*., 2007) [26].

The literature shows a significant positive relationship between cognitive flexibility and decision making in general (Laureiro-Martínez *et al*., 2009; Yildiz & Eldeleklioglu, 2021; Perpina *et al*., 2017) [27, 46, 32]. Flandermeyer (2019) [14] has shown a significant correlation of cognitive flexibility with career decision making specifically. Yildiz-Akyol and Boyaci (2020) [45] report the measure of cognitive flexibility is significantly correlated to the goals, aspirations and plans that one has for one's future career.

Studies examining the relationship of cognitive flexibility and parental expectations could not be identified. However, Jianqiong and Yuqing (2022) [22] examined the relationship between general cognitive development and parental expectations and found a significant relationship where an inverted U effect was created by parental expectation on cognitive development.

Through careful consideration of the existing literature, certain research gaps were found. Decision making and its relationship with cognitive flexibility has been studied extensively (Example: Laureiro-Martínez *et al*., 2009; Yildiz & Eldeleklioglu, 2021; Perpina *et al*., 2017 etc.) [27, 46, 32]. But except for very few studies, not many studies have explored the specific relationship of career decision making with cognitive flexibility. Existing literature shows a discrepancy in the relationship that exists between perceived parental expectations and career decision making. Not many studies that examined the relationship between the variables parental expectations and cognitive flexibility were identified. Limited studies connecting these three variables could be identified from an Indian context. The present study aims to fill the research gap through examining the relationship between career decision making, parental expectations and cognitive flexibility and examine if there is an impact of perception of parental expectations and cognitive flexibility on the career decision making of higher secondary students.

Methods

Operational Definition of Variables

Career Decision Making

The extent to which an individual is decisive or indecisive about their career as measured by the Career Decision Making Inventory (Singh, 2014) [38].

Cognitive Flexibility

How effectively an individual is able to switch between different sets as measured by scores on Berg's "Wisconsin" Card Sorting Task - Computerised Version on Pebl Software (Berg, 1948; Mueller & Piper, 2014) [3, 31].

Parental Expectation

The perception of a child about the extent of wishes or expectations from parents about himself/herself in terms of his/her personal, academic, career aspects and parental ambitions as measured by Perception of Parental Expectations Inventory (Sasikala & Karunanidhi, 2011) [36].

Objectives

1. To study the relationship between cognitive flexibility, parental expectations, career decision making.
2. To study the impact of cognitive flexibility, parental expectations on the career decision making of higher secondary students.
3. To study the differences in career decision making with respect to family type.
4. To analyze the differences in career decision making based on the birth order.
5. To examine the differences in career decision making based on the students' area/locality.
6. To understand the differences in career decision making based on gender.

Hypothesis

- **H_1:** There will be a significant relationship between cognitive flexibility, parental expectations and career decision making.
- **H_2:** There will be a significant impact of cognitive flexibility and parental expectations on career decision making.
- **H_3:** There will be a significant difference in career decision making between students from nuclear, grandparents, joint, single parent families.
- **H_4:** There will be a significant difference in career decision making of first borns, second borns, third borns, twins and single-born students.
- **H_5:** There will be a significant difference in career decision making of students from urban, semi-urban and rural areas.
- **H_6:** There will be a significant difference in career decision making between girls and boys.

Research Design

A descriptive design that gives a description of the status of career decision making and whether it is influenced by cognitive flexibility and parental expectations, without

manipulating any of the variables.

Procedure
Various CBSE and state board schools were approached and schools that were willing to allow in person data collection during the school hours were identified. Then consent forms to be signed by the parents were distributed through the school to the parents. Students who were willing to participate and whose parents had signed in the Informed Consent sheet were taken as participants. A noise free and distraction free environment conducive for assessments was chosen. The informed assent sheets were explained and were given to the students to be signed. The socio-demographic details and the career decision making questionnaire and parental expectations questionnaire were administered in groups with clear instructions. The PEBL software version of BCST was administered in small groups of 4-5 students, again with clear instructions.

Sampling
Convenience sampling was employed to obtain the sample of n=216 higher secondary students (130 females and 86 males) of Chennai, Coimbatore and Bangalore.

Inclusion Criteria
Students currently pursuing class 11th or 12th in Tamil Nadu or Karnataka.
Students studying in English medium schools.

Exclusion Criteria
Students studying in an international board.

Tools
Career Decision Making
The 18 item Career Decision Making Inventory (Singh, 2014) [38] was used. It has 2 subscales - career decidedness and career indecision. It is an Indian scale standardized on class 10, 11, 12 students and developed in the state of Punjab. It is a 3-point Likert scale. The combination of the two scales is taken as the score of career decision making and students are categorized as "decided", "tentative" or "undecided" based on their scores. It takes around 10-15 minutes. The scale has a test-retest reliability of 0.97 & 0.94 respectively for career decision and career indecision subscales.

Parental Expectations
The 30 item Perception of Parental Expectations Inventory (Sasikala & Karunanidhi, 2011) [36] is a scale to measure parental expectations and the fulfillment of parental expectations. It has 4 subscales namely personal expectation, career expectation, academic expectation and parental ambitions and the fulfillment of each of the items on these subscales. It is an Indian scale standardized on class 9-12 students and developed in the state of Tamil Nadu. It is a 5-point Likert type scale. The scale takes around 10-15 minutes. The scale has an inter-item reliability of 0.90 and test-retest reliability values of 0.83, 0.79, 0.68, 0.72 for the 4 subscales respectively.

Cognitive Flexibility
A computerized 64 card version of the Wisconsin Card Sorting Task (WCST) on the software PEBL- Psychology Experiment Building Language (Berg, 1948; Grant & Berg, 1948; Mueller & Piper, 2014) [3, 17, 31] was used to assess cognitive flexibility. It is shown as BCST on the software. The test-retest reliability value is 0.41 (Piper *et al*., 2015). The WCST has multiple outcomes and in this study, perseverative errors which are inversely related to cognitive flexibility, are used to measure cognitive flexibility as supported by previous studies (Kercood *et al*., 2017; Lange *et al*., 2017; Miles *et al*., 2021, Tchanturia *et al*., 2012) [24, 26, 30, 41].

Data Analysis
The collected data was entered and coded in MS Excel and data analysis was done on IBM SPSS Statistics Version 23.

Ethical Considerations
Informed consent and assent were obtained from the parents and students respectively. Confidentiality of the data was ensured and students were given the freedom to withdraw if need be. No physical or mental harm was caused to any of the participants.

Results
Table 1 displays the demographic details of participants. The sample has 39.81% males and 60.18% females. The participants' mean age was 16.5 ± 0.82 (15-19) years. 54.16% of the students were in Class 11, 45.84% were in Class 12. 57.87% were studying in a CBSE curriculum and 42.13% were in a State Board curriculum. Data was collected from students studying in Science (43.98%), Commerce (47.68%) and Arts (8.34%) stream.

Table 1: Sociodemographic Characteristics of Participants

Characteristic	n	%
Gender		
Female	130	60.18
Male	86	39.81
Class		
11	117	54.16
12	99	45.84
Board		
CBSE	125	57.87
State-board	91	42.13
Group/Subject		
Science	95	43.98
Commerce	103	47.68
Arts	18	8.34

Shapiro-Wilk test was done to test for normality and the data was found to be not normally distributed. Hence, non-parametric tests were used.
Correlation analysis was done using Spearman Correlation. Table 2 displays the results of correlation between the scores of career decidedness, career indecision, perceived parental expectations, parental expectations fulfillment and perseverative errors. As shown, career indecisiveness has a significant positive correlation with perceived parental expectations r =.254, p<.01 as well as with perseverative errors r =.193, p<.01. Career decisiveness has a significant negative correlation with parental expectations fulfillment r = -.195, p<.01 and with career indecisiveness r=.368, p<.05. Perceived parental expectations have a significant positive correlation with perseverative errors r =.138, p<.05.

Table 2: Correlations between the Study Variables

Variable	M	SD	1	2	3	4	5
1.Career Decidedness	12.13	1.99	-				
2.Career Indecision	23.42	5.09	-.368**	-			
3.Perceived Parental Expectations	124.49	14.32	.009	.254**	-		
4.Parental Expectations Fulfillment	109.67	14.32	-.195**	-.009		-	
5.Perseverative Errors	9.82	6.06	.026	.193**	.138*	.045	-

* p<.05, ** p<.01

Table 3 shows the results of hierarchical regression analysis to predict career decision making. Under step 1, the R^2 value of.053 shows that perceived parental expectations explain 5.3% of the variance seen in career decision making with F (1,214) = 11.932, p<.01. Under step 2, the R^2 value of.053 shows that perceived parental expectations and parental expectations fulfillment explain 5.3% of the variance in career decision making with F (2,213) = 5.941, p<.01.

Under step 3, the R^2 value of.068 shows that perceived parental expectations, parental expectations fulfillment and perseverative errors explain 6.8% of the variance in career decision making with F (3,212) = 5.158, p<.01. The ΔR^2 value of 0 in step 2 revealed 0% change in the variance of model 1 and 2 with ΔF (1,213) =.005, p<.01 indicating parental expectations and parental expectations fulfillment together influence career decision making to the same extent as parental expectations alone. The ΔR^2 value of.015 in step 3 revealed 1.5% change in the variance of model 2 and 3 with ΔF (1,212) = 3.456, p>.05. This indicates that perseverative errors alone account for 1.5% variance in career decision making.

Table 3: Results of prediction based on Hierarchical Regression Analysis

Predictor Variable	B	β	t	R^2	ΔR^2	F
Step1				.053**	.053	11.932
Perceived Parental Expectations	.076	.230	3.454			
Step 2				.053**	.000	5.941
Perceived Parental Expectations	.076	.229	3.377			
Parental Expectations Fulfillment	.002	.005	.072			
Step 3				.068**	.015	5.158
Perceived Parental Expectations	.070	.212	3.121			
Parental Expectations Fulfillment	.002	.005	.073			
Perseverative Errors	.098	.124	1.859			

** p<.01

Table 4: Gender difference in career decision making

Variable	Logistic Parameter	n	Mean Rank	U	p
Career Decision Making	Male	86	112.92	.847	.397
	Female	130	105.58		

Table 4 shows the results of Mann Whitney U Test conducted to compare career decision making scores of boys and girls. No significant difference was found in the scores of males (M = 112.92, n = 86) and females (M =105.58, n= 130); U =.847, p =.397.

Table 5 shows the results of Kruskal-Wallis test. A significant difference between the four observed family types was found in career decision making H(3) = 10.56, p<.05. Post hoc analysis shows differences between nuclear and single parent families (H= -3.102, p<.05) and grandparents and single parent families (H= -2.876, p<.05).

The Kruskal-Wallis test with birth order as an independent variable shows that students with different birth order do not differ with respect to career decision making H (6) = 6.117, p>.05. The Kruskal-Wallis test with the group/stream chosen by the students as an independent variable shows that students from different streams/groups do not differ in career decision making H (2) = 2.505, p>.05. The Kruskal-Wallis test with the area/locality of the students as an independent variable shows no significant difference is seen in career decision making between participants from different areas/localities H (2) = 4.697, p>.05.

Table 5: Results of Kruskal Wallis H test for differences in Career Decision Making

Measure	Logistic Parameter	n	H	p
Family Type	Nuclear	138	10.56*	.014
	Grandparents	42		
	Joint	17		
	Single-Parent	19		
Birth Order	First born	82	6.117	.410
	Second born	72		
	Third born	12		
	Single child	38		
	Others (Incl. Twins)	12		
Groups/Streams	Science	95	2.505	.286
	Commerce	103		
	Arts	18		
Area/Locality	Urban	132	4.697	.096
	Semi-urban	44		
	Rural	40		

* p<.05

Several important socio-demographic factors like family income, father and mother's education and occupation, sibling's education and occupation were included in the data

collection. However, due to numerous missing data, these factors were not analyzed.

Discussion

The primary aim of the present study is to examine the career decision making, cognitive flexibility and perceived parental expectations of higher secondary students in an Indian context. Career decisions being one of the most vital decisions in one's life and Higher Secondary schooling being one of the important stages in which career decisions are made, these variables were explored in this population in an Indian context. The data was collected from 216 Higher Secondary students of Chennai, Coimbatore and Bangalore.

The score on Career Decision Making Scale reflects the level of career decidedness or indecision. The mean value of Career Decision Making was 35.546±4.753 (25 - 50) and 97.2% of the students were tentative in their career decision making, i.e., they were neither decided nor indecisive. This finding is highly consistent with the Oracle's report of poor career decisiveness among Indians (Vidya, 2021) [42]. Lack of career decisiveness has been related with state anxiety as well as trait anxiety (Brown & Strange, 1981; Kimes & Troth, 1974) [7, 25] and an impact on wages and job-switching frequency (Cartmell, 2022) [8]. Thus, this study's result shows that there is a need to provide intervention to improve career decisiveness of higher secondary students.

The relationship between career decision making, parental expectations and cognitive flexibility and the impact of cognitive flexibility and parental expectations on career decision making are majorly examined in this study.

Firstly, according to the present study, career decidedness is negatively correlated with fulfillment of parental expectations while career indecision is positively correlated with perceived parental expectations. Specifically, career indecision was found to be positively correlated with career and academic expectations from parents and parental ambitions. From this, it can be said that the greater the parental expectations and the greater the attempts to fulfill their expectations, the more indecisive one may be in terms of their career. In this way, parental expectations, if unregulated, might play a negative role in a student's career decisiveness. The results also show that parental expectations and the fulfillment of parental expectations, both individually and together, account for 5.3% of the variance seen in career decision making. These results are consistent with the results of Leung *et al*. (2011) [28] and Sharif *et al*. (2019) [37] who report that parental aspirations and the perceived parental expectations impact career decision making. However, the current study contradicts the findings of Hussain and Rafique (2013) [21] and Qi *et al*. (2023) [35] who report that perceived parental expectations do not influence career decision making. Differences in parental expectations are seen across racial or ethnic groups and cultures (Yamamoto & Holloway, 2010) [44]. As supported by Leung *et al*. 's (2011) [28] report, cultural differences might be an important factor for the contradictions in the results of different studies. According to the current study, parental expectations do seem to influence career decision making significantly in the South Indian context.

The results of this study show that career indecision and perseverative errors are significantly positively correlated. Previous studies on cognitive flexibility using WCST have shown that cognitive flexibility and perseverative errors are inversely related (Kercood *et al*., 2017) [24]. Thus this study shows that career indecision and cognitive flexibility are significantly negatively correlated, i.e., lesser the cognitive flexibility, greater the career indecision. The results also show that cognitive flexibility, when added with perceived parental expectations can account for 6.8% of the variance shown in career decision making. Individually, cognitive flexibility alone can account for 1.5% of the variance. This is in line with the findings of several previous studies (Laureiro-Martínez *et al*., 2009; Yildiz & Eldeleklioglu, 2021; Perpina *et al*., 2017) [27, 46, 32]. The findings especially align with Flandermeyer's (2019) [14] report that cognitive flexibility and career decision making are associated and that improving cognitive flexibility can improve career decision making.

The results also reveal that perceived parental expectations and cognitive flexibility are significantly positively correlated. According to Jianqiong and Yuqing (2022) [22], parental expectations have an inverted U effect on cognitive development in general, again emphasizing the importance of regulating parental expectations.

Significant differences in career decision making were seen between students from different family types, especially between those from nuclear families and single parent families and between those from grandparents families and single parent families. Several studies have reported that family influences career decision making, specifically family support (Dina & Putra, 2022) [11], family social class (Wang *et al*., 2022) [43], family functioning (Li, 2021) [259], and overall family influence (Fouad *et al*., 2016) [15]. However, studies on differences in family types specifically could not be identified.

Girls and boys did not differ in terms of career decision making. Several studies have shown a significant impact of gender on career decision making, specifically gender perception (Hadi & Aryani, 2023) [19] and gender discrimination (Pillay, 2022; Tian & Hou, 2023) [33, 40], with Böhmer & Schinnenburg (2020) [4] reporting that Indian women "rebel" against the expectations of family and the society. The contradictions in the results of the present study could be because of differences in participants' age, sample size.

Career decision making did not differ in terms of the students' birth order and areas/localities. Previous studies have shown the role of birth order on career decision making and career choices (Bradley & Mims, 1992, Grinberg, 2015; Herndon, 2011) [6, 18, 20]. Braza and Guillo Jr (2015) [5] show the impact of one's locality on career decision making. This study contradicts these results and this could be because of the differences in the population, culture, sample size.

Significant differences did not occur in career decision making in terms of the group/stream chosen by the students. This finding is in line with the findings of Dwatra and Adri (2023) [13].

In addition, a Mann Whitney U test showed that students who reported satisfaction with current academic performance differed significantly in career decision making from students who did not feel satisfied with their current academic performance. This report on satisfaction was obtained through a simple yes/no question.

This study, however, has certain limitations. Some of the limitations include the sampling technique and the sample size. Another limitation is that many students were not

aware of some of their basic details which limited the factors that could be taken for data analysis.

Implications

This study mainly helps understand the level of career decisiveness or indecision in higher secondary students and some of the factors that can be worked on to improve career decidedness of these students. Having shown that a majority of the students are not decided regarding their career, this study emphasizes the need to provide interventions for enhancing career decision making. Understanding the influence of cognitive flexibility and parental expectations can help in giving career counseling and family counseling accordingly. Future studies can focus on the types of interventions to enhance cognitive flexibility and handle parental expectations, which can further help in enhancing career decision making of individuals. This study reveals the importance of including parents in career counseling as regulating their expectations seems to be an important factor in career decisions. Improving career decision making can help in having good socio-emotional and economic well-being on the whole.

Conclusion

The aim of this research is to understand the status of career decision making of higher secondary students and examine the relationship between one's career decision making, cognitive flexibility and perceived parental expectations. The impact of cognitive flexibility and perceived parental expectations on one's career decision making and some of the socio-demographic factors influencing career decision making were also examined. A descriptive research design was used. Convenience sampling was used to collect data from 216 Higher Secondary students (117 studying in 11th Std. and 99 in 12th Std.). Career Decision Making Inventory, Perception of Parental Expectations Inventory and Wisconsin Card Sorting Test- computerized version were used to collect data. Spearman correlation, hierarchical regression, Mann Whitney U Test, Kruskal Wallis H Test were employed for data analysis. A significant relationship exists between the study variables and both perceived parental expectations and cognitive flexibility have a significant impact on career decision making. 97% of the students are tentative in career decision making, emphasizing the importance of providing interventions to improve career decision making. Limitations would include sampling technique and sample size.

Declaration

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