

Analysis of Influential Factors for High School Students' Career Choice: Evidence from Canada

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Abstract. Making a career choice is an important phase in every student's life. Before making decision, students must consider several factors. This research is supposed to investigate the factors that may affect career choice. By collecting data from Statistics Canada, anonymous experimental questionnaires, and comparing and analyzing statistical and mathematical models such as standard deviation and Inter quartile range, this paper concludes five important factors that influence students' career choices: gender, interest, personality, environment, and opportunity. By studying each factor on a case-by-case basis, it can be concluded that first, in terms of gender's influence on career choices, boys tend to choose technical positions and girls tend to choose service positions. Second, Satisfaction, Security & Motivation is the most important factor in the issue of interest influencing students' career choices; Third, among personality, environment and opportunity, these three factors, personality is the biggest factor that affect the students' career choice. These conclusions inspire education that when guiding students to employment, they should pay more attention to students to examine their own personality. For students, when observing the interest in career choices, they can start with satisfaction, security, and motivation.

Keywords: Career choice; student personality; outside environment.

1. Introduction

Making a career choice is a significant milestone in every student's life. It is closely linked to the future direction of the student and appears to be a determinant of future income levels, lifestyle and consequently build the personality, demeanor and outlook of students. According to a survey conducted by Indeed (2019), nearly 78 percent of employees feel unsatisfied with their work and about half of U.S. employees have changed their jobs over the past years in order to pursue higher income or greater flexibility, or looking for professional development [1]. It is important for students to weigh several factors before making a career choice, as this reduces the cost of trial and avoids being regretful in the future. Nowadays, the major problems of making career choice for high school students is lack of guidance. For immature high school students, making a right career choice is not an easy task, as they may go with the flow or make the wrong choice on a whim. At this time, professional guidance is particularly important. This is also an important purpose of this paper: to improve the awareness of higher education on the guidance of students' career choices, and to find the focus point by comparing and exploring the factors that affect career choices.

2. Literature Review

In recent years, scholars from different fields have done various studies on the below five factors that affect students' career choices. As for gender, an article called 'Study examines how gender affects career choices' that was published in 1997 states that gender is an important factor in students' career choices, and male students are more likely than women to choose a career in science, math or engineering [2]. For interest, Charleston and Leon used science, technology, engineering and mathematics (STEM) subjects as an example, use qualitative method found that select a career that match with the interest of students can help them improve the self-efficacy in the job, and will help them gain higher achievement in the job [3]. Also, Ko and Jun used survey data to conclude that, as one of the job motivators, interest plays an important role in motivating employees [4]. For personality, Bexelius and other five scholar conducted a questionnaire-based study of 399 students

and found that nearly 80% of students believe that personality traits are highly relevant to careers [5]. In addition, Hirschi stated that choosing a career that suits with personality will lead to proactive motivation and engagement in career behaviors [6]. Regarding environment, Aggarwal and Shrivastava conducted a study to invest the impact of different environments on students' career choice [7]. The result shows that environment and family provide intention for students in the career choice. In terms of opportunity, Raveenther used statistical methods to investigate how it is related with career choice, and concluded that it has strong relationship between opportunities, like opportunity for educational facilities and community with students' career choice [8].

3. Methodology and Research Data

3.1. Method Introduction

For gender, the data is collected from Statistic Canada. By plotting these data from Statistic Canada into a graph, divided into two groups: male and female. It directly shows the trend for both gender over the last 5 years. By using regression line, the future data can be calculated. By categorizing the major trade that male and female choosing in the year 2018 and 2019, using mean formula. It can be seen that gender differentiate over fields.

Among the influential factor: environment, opportunity and personality, the statistical methods: mean, median, standard deviation and variance are used. The outcomes are used to be compared, it showed that personality is the biggest factor among them. In order to compare students' opinions, inter quartile range (IQR) is used for calculation, which can conclude the centralization of student opinions.

3.2. Data Collection and Analysis

A study that is conducted by choosing 32 students to investigate the factors that will influence their career choice [9]. To investigate how interest affects career choice, a questionnaire has been released for 131 first year students. The amount and percentage of respondents of each factor has been calculated. For personality, environmental factor and opportunity, an anonymous survey was conducted to collect data for the research. 79 students are asked to rate the extent of agree or disagree for the factor affect career choice. According to the outcome, three bar charts can be drowned to compare and conclude the students' attitude for each factor.

By collecting data from Statistics Canada, it is not difficult to find the registration number of males and females in all major trades (Table 1 and Table 2).

Table 1. Total registration number for male in Canada

Year	2015	2016	2017	2018	2019
Total number	394,365	365,727	356,637	346,899	351,897

Table 2. Total registration number for female in Canada

Year	2015	2016	2017	2018	2019
Total number	61,491	51,579	49,068	45,303	45,771

Phillips and Imhoff's study show that women's career choice involves complex factors such as personalities, labor market constraints, family planning and self-efficacy [10]. This study has shown that, although gender stereotyping of occupations is decreasing, many women continued to decrease their career expectation under the pervasive socially imposed barriers. Because when women need to make career choice, they may be afraid to make as they consider numerous questions, like future job

opportunity and the unfair treatment in workplace. Therefore, this research shows that the gender is a significant factor that will impact career choice for college students.

Almon and Matsidiso selected 145 students from different business schools in Karachi to answer the questionnaire, with voluntary sampling method, however, only 120 had complete data and could be used for analysis [11]. The questionnaire assessed students' interests in subjects, how easy they are to study, financial outcomes, future job opportunities and career options. Such study shows the relationship between career choice and factors above.

All the factors can be divided into these groups: environment, personality, future opportunity. Besides, this study will also discuss how gender and interest influence career choice, and will also find out the how these factors affect career decision for students, by using data and analysis, and give objective opinion.

4. Analytical Framework

4.1. Gender and Career Choice

It is evident that in some technical major trades, the percentage of the male is larger than that of the female, like automotive service, electricians, machinists. However, in some service and educational field, the percentage of the females is bigger than that of the males, like childhood educators and assistant. The basic statistical method, mean, is used to support this observation. All the subjects listed above can be divided into: liberal arts (Early childhood educators and assistant, community and social service worker, food service); science, technical careers (automotive service, electricians, electronics and instrumentation, heavy duty equipment mechanics, machinists, metal workers, user support technicians, welders, construction workers).

In Table 3, the mean of liberal arts in 2008 is 3985, and the mean of science, technical careers is 17047. In 2019, the mean of liberal arts is 4055 and the mean of science and technical careers is 17115. It can be seen that the males are more likely to join technical and science career than liberal arts career, nearly five folds. While in Table 4, it can be seen that the females are more likely to enter liberal arts careers, nearly four folds. From the analysis, it can be concluded that gender will affect graduates' career choice. Females are likely to choose liberal arts career, while males are likely to choose science& technical career.

Table 3. The number of male registration in various major trades

Major trade	2018		2019	
	Number	Percentage	Number	Percentage
Automotive service	36,924	10.64%	37,314	10.60%
Early childhood educators and assistants	180	0.05%	144	0.04%
Community and social service workers	249	0.07%	237	0.07%
Electricians	65,592	18.91%	65,265	18.55%
Electronics and instrumentation	5,880	1.70%	5,835	1.66%
Food service	11,526	3.32%	11,784	3.35%
Heavy duty equipment mechanics	12,243	3.53%	12,657	3.60%
Machinists	7,659	2.21%	7,932	2.25%
Metal workers (other)	11,004	3.17%	11,433	3.25%
User support technicians	180	0.05%	141	0.04%
Welders	11,622	3.35%	11,235	3.19%
Construction workers (other)	2,322	0.67%	2,223	4.86%

Table 4. The number of female registration in various major trades

Major trade	2018		2019	
	Number	Percentage	Number	Percentage
Automotive service	1,878	4.15%	1,911	4.18%
Early childhood educators and assistants	3,627	8.01%	3,465	7.57%
Community and social service workers	1,461	3.22%	1,347	2.94%
Electricians	2,796	6.17%	2,910	6.36%
Electronics and instrumentation	531	1.17%	531	1.16%
Food service	7,962	17.57%	8,307	18.15%
Heavy duty equipment mechanics	312	0.69%	366	0.80%
Machinists	447	0.99%	489	1.07%
Metal workers (other)	633	1.40%	720	1.57%
User support technicians	186	0.41%	117	0.26%
Welders	1,056	2.33%	1,050	2.29%
Construction workers (other)	162	0.36%	207	0.45%

4.2. Interest and Career Choice

When explore how interest affects students' career choice, it can be discovered that the interest reason can be divided to several reason: Satisfaction, Security& Motivation, Exploration, advancement & Knowledge, Employment opportunities, information & exposure, Achievement, excelling, Influence from friends, role models, Difficult to change. These are the reasons that will affect students' interests to the career. Here is a questionnaire that surveyed 131 first year University students. According to Table 5, satisfaction, security and motivation were the top factor that influencing career interest by 63 (48.1%). Also, 41(31.3%) of the respondents said Exploration, advancement & Knowledge is responsible for influencing their career interests. In addition, 15 respondents (11.5 %) attributed their interest for jobs to employment opportunities, information and access to information. According to this table, Figure 1 can also be made to directly compare all the reasons.

Table 5. Different reasons that will affect students' interest to career

Reason	No. respondents	Percentage
Satisfaction, Security& Motivation	63	48.1
Exploration, advancement & Knowledge	41	31.3
Employment opportunities , information& exposure	15	11.5
Achievement excelling	6	4.6
Influence from friends, role models	5	3.8
Difficult to change	1	0.8
Total	131	100

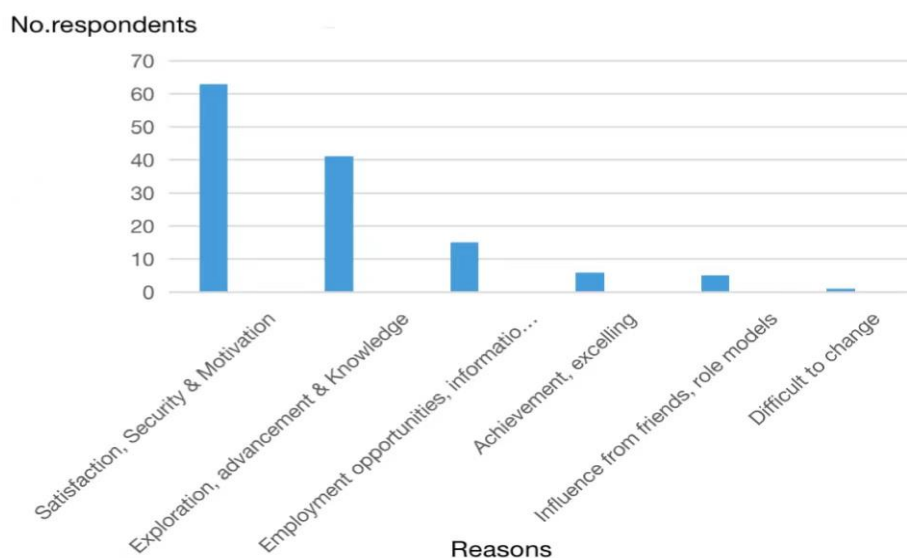


Fig. 1 Different reasons that will affect students' career interest

Here can be found that the mode (is the value that occurs the most often in a set of data) is satisfaction, security& motivation, with a percentage of 48.1%. The outlier is "Difficult to change", with only 0.8% student choose. As Satisfaction, security & motivation is the most significant reason for students' interest on subjects. It can be known that developing a positive attitude toward career can be described as a way of improving or changing the job performance. A research by Farenga and Joyce indicates that students' poor performance at work is due to a decline in positive attitudes

[12]. Also, a research by Reynolds showed that students' performance in subjects determined the choice of high school curriculum and further affected the access to higher education and career opportunities [13]. Similarly, when a career's positive attitude declines, the interest of the career will decline at the same time.

The analysis reveals that students' interests on a career are mostly influenced by their Satisfaction, Security& Motivation on this career, which means if a career can satisfy students, give their enough job security (salary is stable, the probability of being fired is low), and the more motivation it can be obtained from the job, the easier the careers can be chosen.

4.3. Personality and Career Choice

Personal factors that may affect career choices such as studying attitude, awareness of the value of working, doing career research. Anonymous surveys are used to collect data to find out how students think about that the personal factors impact their career choice. Figure 2 shows the mode of the data is 3 and 3.5, with 1.3% students strongly disagree and 7.6% students shows totally agree. On a scare of 3-4 (hold the opinion of agree including slightly agree and strongly agree), there are 69.8% students in this interval. This indicated that more students agree that personal factors (including studying attitude, awareness of the value of working, doing career research) is important when making the career choice.

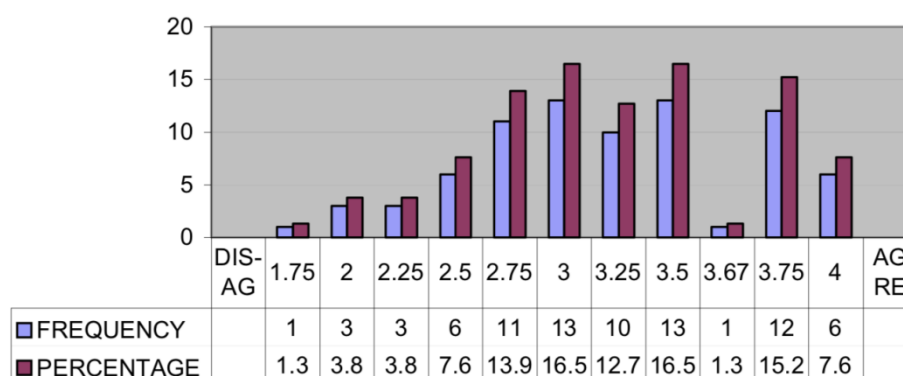


Fig. 2 Personal factors affecting career choice

4.4. Environment and Career Choice

Although career decision is the responsibility of students, however, the environmental factors from people surrounding students also affect the students' choice. The group asked parents, friends, teachers, counselors or other family members if they had any influence in the career selection process. The problem with the study is to try to determine the amount of external environmental influence that is important for students' career choices. The anonymous survey was used to collect data for the research component of the study. The survey was designed to allow those students who thought that the environment had influenced their career choices more likely to say "slightly" or "strongly" agree. The answers were rated between 3.0 and 4.0. 1.0 equals strong disagreement.

Figure 3 showed that the mode is 2, with the percentage of 16.5%, on a scale of 1-4, showing a mutual attitude. Also, 7.6% students strongly disagree that environment will impact their career choice. However, the highest score for disagree was 3.33, which represents "mildly agree", with only 1.3%. These results show that environmental factors do not influence greatly on students' career choice. Therefore, when students are making career choice, they may not likely affected by the environmental factors.

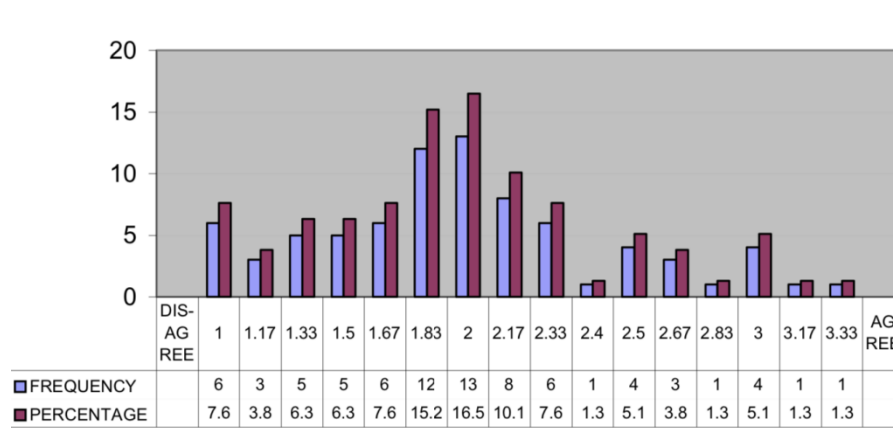


Fig. 3 Environmental factors affecting career choice

4.5. Opportunity and Career Choice

Statements include questions like funding, the availability of education in the region, the awareness of the education system, the choice of a four-year academic university, the choice of working for a period of time to participate in training course, and the choice of working in a family enterprise. These questions are put together to form the opportunity group. This study below is conducted to explore how students think the opportunity factors affect their career choices.

As shown in Figure 4, 79 Students were asked to rate the extent that the opportunity do affect to career choices. On a scale of 1-4, it can be seen that the mode is 2.56 and 2.89. It can be seen that on

a score of 3-4, 35.4% students rated on this interval, while on a score of 1-2, only 1.3% students rated on this interval. It represents that more students choose agree (including slightly and strongly agree) than choose disagree (including slightly and strongly disagree). The results show that most students think that opportunity has a great influence on their career choice, it means that when students need to make career decision, they may concern much on the opportunity factors like the future work opportunity.

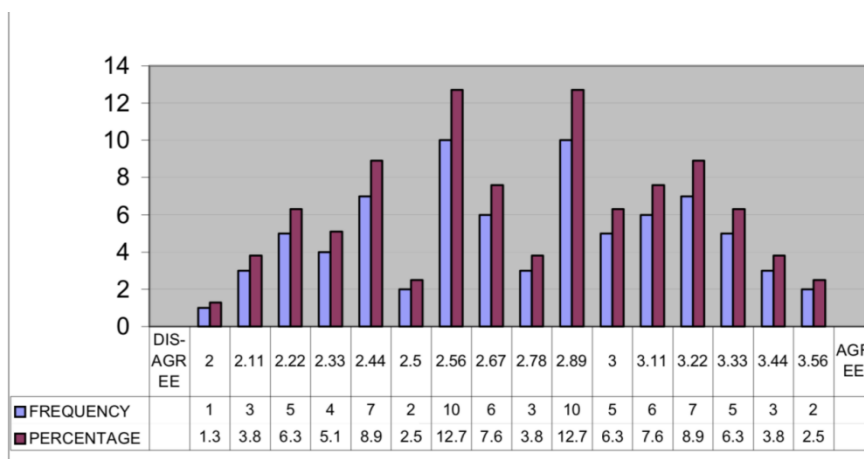


Fig. 4 Opportunity factors affecting career choice

4.6. Comparison of Different in Fluencing Factors

To figure out the most significant factors among environment, opportunity, personality, statistical methods of mean, median, standard deviation and variance can be adopted directly. In Table 6, The mean of environment, opportunity and personality is 1.9586, 2.7848 and 3.1572 respectively. It represents average students strongly disagree that environment is important to make career choice. With 2.78 score, the mean of the opportunity shows most student hold a neutral attitude to the influence of opportunity to the career choice. The average of personality yields 3.1572 score, which represents the average student hold a “slightly agree” that the personality will influence students’ career choice. The mean of each three factors also show the same trend(environment<opportunity<personality). The standard deviation and the variance is a measure that is used to quantify the variation or dispersion of a set of data. The larger the variance and standard deviation value is, the more obvious the data fluctuation amplitude is. Therefore, the graph can show that the largest one is environment, followed with personality and the opportunity. It means that the most of data in group “opportunity” are accumulated around 2.77~2.78, which represent the neutral attitude.

According to the comparison, it is not difficult to find that personality is the biggest factor that affect the career choice in students’ minds, it means that when students are making career choice, they may spend the most time on considering their personality.

Table 6. Mean, median, standard deviation and variance for three factors

	Environment	Opportunity	Personality
Mean	1.9586	2.7848	3.1572
Median	2	2.7778	3.25
standard deviation	0.5505	0.3967	0.5495
Variance	0.30305025	0.15737089	0.30195025

In order to compare students’ opinions on the three factors (environment, personality and opportunity), calculating their IQR and compare them is necessary. IQR (interquartile range) is the

measurement of difference between the third and the first quartile. The formula is $Q3-Q1$. Some calculation below and the outcomes are listed in Table 7.

The IQR excludes the influence that may brought by outlier. Among these three IQR, personality has the smallest IQR (0.67), which means that students' opinions on personality are more collective relatively, which means most of students hold the similar statement: personality is important in their career choice.

Table 7. IQR for three factors

Factor	Environment	Personality	Opportunity
IQR	0.745	0.67	0.75

5. Conclusion and Implication

By the data collected from Statistics Canada, it shows that many factors may affect students' career choice, such as the gender. By doing a further calculation to gain their means, it can be found that in some technical major trades, the percentage of the male is larger than that of the female, like automotive service, electricians. However, in some service and educational field, the percentage of the females is bigger than that of the males. By a study that conducted a questionnaire which surveyed 296 first year University students, it shows that interest is also a important factor for career choice, and students' interest to a career is influenced by many reasons, the most one is Satisfaction, Security and Motivation. According to a survey that conducted in Germantown Senior High School student, the results show that personality, environment and opportunity are all the significant factor for career choice. And by calculating and comparing their mean, median, variance and standard deviation, it shows that personality will affect students' career choice to the largest extent. By comparing their IQR, it can be concluded that students' opinions on these factors is different: personality are more collective relatively.

What these experimental results teach us? There are two inspirations: Firstly, career choice is related to the future path of everyone, and students need to make a careful decision so that they will not be regretful. By analyzing how the factors influence students' choice, students can better weigh factors before they make job decision: as they can put more effort on the relatively important factor, like the personality. This inspires that: before making a career choice, students should deeply explore their personality to help make right choice. Secondly, according to the analysis on how interest influences career choice, it shows that the Satisfaction, Security& Motivation is the most important factor. This suggests that if students want to find a career that they are truly passionate about, and can start with satisfaction, security and motivation.

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