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自我概念、社會支持對職業選擇意向之研究
A Study on the Influence of Self-concept and Social
Support on Occupational Choice Intention

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指導教授：胡均立教授

中華民國一〇一年三月

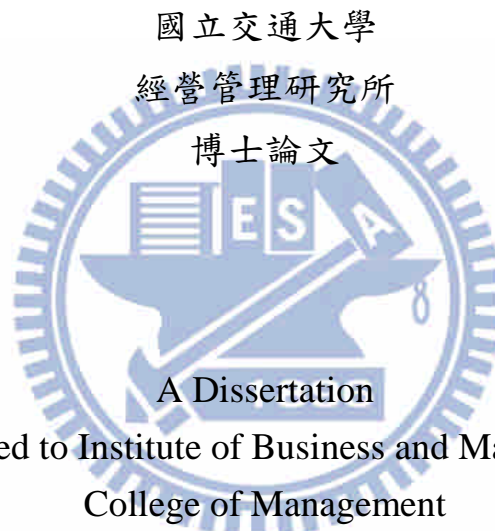
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中文摘要

當今企業紛紛提高對求職者的學歷與專業要求，而大學畢業的社會新鮮人，在面對求職門檻提高、競爭者日益增多的壓力之下，大學生就學期間的學習成果是否能符合企業界的需求，並非在畢業後才由職場競爭力來斷定，而是在學期間即須對自我專業能力的養成，有具體的瞭解與認識，並隨時充實專業知能；透過家人親友、師長與同儕間的互動，增進自我概念的提升，並具備應有的專業能力，以確立未來職業選擇之方向。本研究主要目的在探討大學生自我概念、社會支持、學業成就與職業選擇意向的影響關係，依據文獻與相關研究變數之關聯性，而建立本研究之架構，並以台灣地區大學生為研究對象進行問卷調查，回收之有效問卷為 1406 份。資料回收完成經統計檢定，利用線性結構方程模式以及多群體分析進行研究，結果顯示：由自我概念各因素之現況與差異分析發現自我概念各因素的重要程度，以父母關係在學生心中的重要程度最高；在社會支持各因素之現況與差異分析顯示，社會支持各因素的重視程度，則以同儕在大學生心中的重要程度最高。此外，社會支持對學業成就具有正向之直接影響。自我概念對職業選擇意向具有正向之直接影響。自我概念與社會支持透過學業成就的中介效果，對於職業選擇意向研究結果皆不顯著。利用多群體分析得到：學業成就在自我概念與社會支持對職業選擇意向的干擾效果上，無顯著差異。本研究依據研究分析結果，適時提供給高等教育機構，強化大學職涯教育的改善，並提供高等教育機構在調整體制、提升教學規劃、增進學生職場認知、以及培養大學生提升未來職業選擇與就業能力之參考。

關鍵詞：自我概念、社會支持、學業成就、職業選擇意向、中介效果、干擾效果

A Study on the Influence of Self-concept and Social Support on Occupational Choice Intention

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ABSTRACT

As enterprises have raised the requirements on the educational background and professional degree of job seekers, new graduates are facing raised employment requirements and ever increasing competitors, while whether their academic performance can meet the requirements of enterprises is no longer determined by their workplace competitiveness after the graduation. Rather, they need to develop a concrete understanding of cultivating professional competence, actively enrich their professional competence during school, enhance their self-concept through interactions with families, friends, teachers, and peers, and acquire the required academic performance to establish their future career options. The main purpose of this study is to investigate the correlation among college students' self-concept, social support, academic performance, and occupational choice intention. The research framework was established based on literature review and the correlation among research variables. This study conducted a questionnaire survey on college students in Taiwan, and retrieved 1,406 effective samples. The data were analyzed with statistical analysis using Amos. Linear structural equation models and multi-group analysis were also used for analysis. Analysis on the factors of self-concept and their differences found that, the importance level of relationship with parents was rated the highest by the students. Analysis on the factors of social supports and their differences showed that, relationship with peers has the highest rating. Moreover, social support has a positive and direct effect on academic performance. Self-concept has positive and direct effects on occupational choice intention. Self-concept and social support have significant effects on occupational choice intention through the mediating effect of academic performance. The multi-group analysis showed that academic performance

does not have a significant intervention effect on self-concept or social support on occupational choice intention. The research findings can serve as references for higher education institutions to improve career education in colleges, and for adjustments of educational systems in order to improve educational planning, increase students' workplace cognition, and cultivate their workplace competence for future career choices.

Keywords: self-concept, social support, academic performance, occupational choice intention, mediating effect, moderating effect



誌 謝

個人經歷職場九年工作之後，深感榮幸有機會重返校園進修，邁向進階的學術研究之途。回首過去三年的博士研究生涯充滿了挑戰與甘苦，其中的考驗超越個人過去所有淺薄的人生經歷。由於自身是大學講師，使得追求博士學位似乎成為不得不為之的職涯規劃。回想剛入學時，讓我最無法適應的是要兼顧專職工作，同時還要準備課業與報告，心情有如沉浸三溫暖般，儘管如此卻沒有因此而放棄，因為有最堅強的後盾，賜予我最大的支持與鼓勵。

博士學位得以順利完成，首先要感謝最敬愛的師長們，特別是恩師胡均立教授的指導，從博一開始不斷耳提面命，提醒學生以發表國際期刊為課題，由於胡老師在研究方向的指引與對於投稿論文鉅細靡遺的指教，使得博士生涯中耐心地等待與歷經國際期刊投稿的修改、審稿程序，現今皆已能逆來順受。修業期間除了胡老師的細心教誨外，也得到許多老師的專業薰陶，特別是楊千教授奠定了我的研究方法基礎，使得論文撰寫上，增強了方法應用的嚴謹性，也感謝曾芳代教授，經由曾老師在人力資源理論的專業指導，強化了我的知識領域；而口試委員林師模教授、陳文華教授及劉孟奇教授三位老師的學問淵博，口試時給予我多元且精闢的見解，提升了學位論文的完整性，讓我對學術研究有更深入的領悟，真是獲益良多，特別在此致上我最深的謝意。

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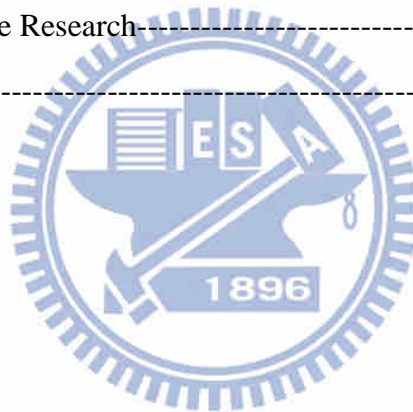
陳金足 謹誌

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Chapter 1 Introduction

1.1 Research Background

Learning opportunities in university education can cultivate and enhance students' self-competitiveness. Besides academic study, college life is also the preparation stage for students to choose the career paths. Students need to utilize the career resources and assistances provided by universities, deliberate over their short-term and long-term plans, learn about various industries and jobs, and cultivate the professional skills and competencies required for their desired occupations, in order to stay on the right career paths. On the other hand, university education should cultivate the professional knowledge and skills needed by students in order to help them making the right career choices.

The total number of universities in Taiwan increased from 30 in the 1980s to 164 in 2010, and the number of students was as high as 1,021,636. In 2005, the admission rate was 89.08%, and a total of 88,920 students were enrolled. In 2010, the admission rate was as high as 94.87%, and 71,165 students were enrolled (Department of Statistics website, http://www.edu.tw/files/site_content/B0013/overview09.xls). The data above indicate that although the admission rate increased, the total number of enrolled students decreased (see Table 1.1). The main reason is the declining birthrate. In 2008, the birthrate in Taiwan was 8.64%, which is the lowest rate in the world (Ministry of Education, Geographic Science Center Newsletter website, <http://gis.tcgs.tc.edu.tw/news/200910/#d69>). As a result, at present, nearly all students in Taiwan have an opportunity to study in universities. The professional training and cultivation have a significant influence on students' choices of occupations and career paths.

Table 1.1 The number of freshmen enrolled and admission rate of universities in Taiwan in 2001-2010

Academic year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of students enrolled by Joint Entrance Exam (department required test)	77,450	78,562	87,059	88,939	88,991	88,920	86,652	81,409	76,434	71,165
Admission rate of Joint Entrance Exam (department required test)	61.35%	80.41%	83.22%	87.05%	89.08%	90.93%	96.28%	97.10%	97.14%	94.87%

With the rapid expansion of higher education systems in various countries around the world, more and more students have the opportunity to receive higher education, and both the quality and quantity of higher education have changed dramatically. Specifically, university education has evolved from the elite education in the past to the universal education at present. The popularization of universities has mitigated the competitiveness of the Joint Entrance Exams. However, such change in the higher educational system has failed to improve students' achievements. University students are expected to be the intellectuals of the society, and possess the abilities and traits to meet the needs of the workplace. As enterprises are raising the requirements for job seekers' educational and professional backgrounds, and there is increasingly competition in the job market, the employment preparation for fresh graduates does not start after the graduation, but while the students are still in school. The students need to cultivate their professional knowledge and skills, enhance self-concept through interaction with families, friends, teachers and peers, in order to prepare for the career choices.

Eisenberger et al. (1986) suggested that, from the perspective of social support theory, if individuals obtain support in the society to which they belong, their trust in organizations will be increased to further improve the relationship quality between the individuals and system-related groups. Therefore, when individuals suggest that the

system to which they belong is reliable, cares about them and supports them, they will exhibit good behavior and performance, and be more willing to actively share knowledge with other people.

Consequently, when facing peer competition, teacher encouragement, parental expectations, and pressure from future employment, students will look forward to their academic and future achievements. The academic performance of students represents their learning outcomes and educational effectiveness of the university. This study investigated the correlation among university students' self-concept, social support, academic achievements, and occupational choice intentions. The findings are expected to serve as a reference to future teaching-related studies.

1.2 Research Objectives

After entering the higher education system, university students will perceive the importance of self-concept, social support, and academic achievement on occupational choice intentions. Based on the research background and motivations mentioned above, this study aimed to investigate the influences of self-concept, social support and academic achievement of university students on their occupational choice intentions. The research objectives are described as follows:

1. To investigate the influence of university students' self-concept on academic achievement and occupational choice intention.
2. To investigate the influence of university students' social support on academic achievement and occupational choice intention.
3. To investigate the influence of university students' academic achievements and occupational choice intentions.
4. To investigate how self-concept and social support affect occupational choice intention through the mediating influence of academic achievement.

1.3 Research Flow

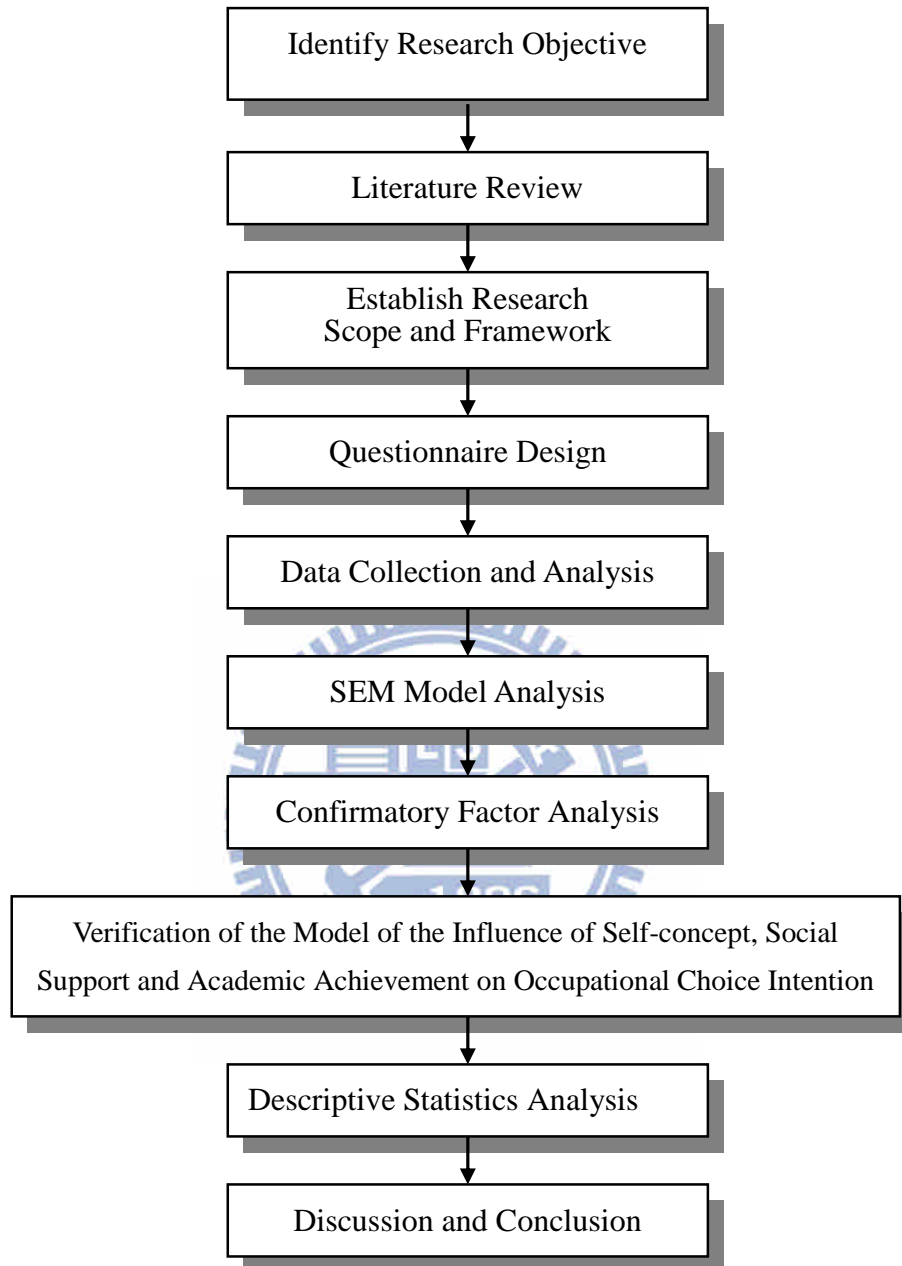


Figure 1.1 Research flow chart

Chapter 2 Literature Review

In order to investigate the correlation among university students' self-concept, social support, academic achievements, and occupational choice intentions, this study first conducted literature review on related theories for each variable.

2.1 Self-concept

Shavelson et al. (1976) argued that self-concept is an individual's integration of experiences in the environment with other people's appraisals, self-explanation, and self-attribution to develop subjective self-opinion or self-image, namely, the method for an individual to view himself/herself, a method for an individual to describe himself/herself. Self-concept is an individual's overall evaluation on oneself. It is the responding method determined by an individual according to his/her perception, understanding and evaluation of the environment. Individuals can develop good adaptability based on self-perception, an understanding of people and objects, and the establishment of interpersonal and interactive relationships with the surrounding environment. Therefore, self-concept becomes the basis of life adjustment. A person with a clear, explicit, and aggressive self-concept can understand and please oneself, and maintain a good contact with the environment, accurately perceive the situation of the environment, evaluate the difficulty of matters, and effectively overcome and solve problems (Dusek, 1996). Plucker and Stocking (2001) suggested that the basic meaning of self-concept is an individual's opinion or series of opinions on oneself. Self-concept is the key factor for studying human behavior, and an important core for the construction of personality. To university students who are at the stage of seeking self-identification, self-concept is a particularly important aspect for their development. Zhang and Li (2010) suggested that the self-concept of university students develops a relatively stable level

during the college period. If university students can have a clear understanding of themselves, it will be significantly beneficial to their learning and career planning.

LaBenne and Greene (1969) suggested that, in a broad sense, self-concept represents an individual's self-perception. In a narrow sense, it refers to an individual's identification, attitude, and affection for his/her ability, appearance, social acceptance, emotion, and skill. Franken (1988) indicated that self-concept is not inherent, but is gradually developed after an individual is exposed to external environments and experiences through complicated interactions. Moreover, self-concept has a significant influence on an individual's motivation and action. To reduce the gap between the real self and ideal self, an individual will trigger one's strong motivation and action to realize one's inner objectives and ideas. Moreover, self-concept can be developed through learning in the self-development process. Therefore, it is the aggregation of various attitudes and thoughts of an individual toward oneself and the environment (Canfield & Wells, 1994). Pintrich and Schunk (2002) found that individuals' self-concept is correlated with their action motivation. People with a high self-concept usually possess a higher achievement motivation, and are more willing to engage in learning. However, the learning motivation and ambition of those with a low self-concept are lower.

Shavelson et al. (1976) used a hierarchical model structure to explain self-concept, and divided it into an academic self-concept and a non-academic self-concept, as shown in Figure 2.1. The former is divided into English, history, mathematics, and science, while the latter is divided into social self-concept, emotional self-concept, and physical self-concept. Social self-concept is subdivided into peers and significant others. Emotional self-concept is subdivided into particular emotional states. Physical self-concept is subdivided into two aspects, physical ability and physical appearance.

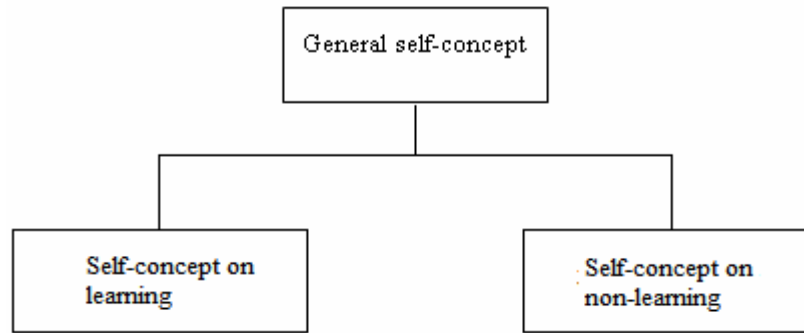


Figure 2.1 Hierarchical model of self-concept (Shavelson et al. 1976)

Shavelson et al. (1976) suggested that the existence of self-concept is similar to the intellectual ability hierarchical model proposed by Vernon (1950), and that diversified phenomena will be developed owing to the difference in domains. Moreover, similar domains will aggregate to form the self-concept of a higher hierarchy. Therefore, individuals' overall self-concept is a complicated combination. Shavelson et al. (1976) suggested that because adolescence is the key stage of development, students' personal experiences and the objects they interact with are the main causes for the differentiation of self-concept. Because school life is a very important source of experiences for adolescents and learning is the center of life during this period, the structure of self-concept can be divided from general self-concept into academic and non-academic self-concept. Academic self-concept is divided into the self-concept of language and mathematics according to the differences in subjects. Non-academic self-concept is divided into physical, emotional, and social self-concept. Moreover, these self-concept are further divided into aspects such as peers, parents, appearance and physical ability, according to the differences in life experiences and objects individuals interact with.

In recent years, considerable research has explored the role of self-concept in the academic domain (Linnenbrink, 2006; Marsh et al., 2003), demonstrating its importance with respect to self-regulated learning, achievement motivation, course enrollment, and career-related decision-making (Schutz & Pekrun, 2007; Skaalvik & Skaalvik, 2008;

Goetz et al., 2010). Pintrich and Schunk (2002) found that an individual's self-concept is significantly correlated with his/her motivation. People with a high self-concept usually possess a higher motivation and are more willing to engage in learning. People with a low self-concept usually possess a lower motivation and ambition. Strein (1993) indicated that self-concept is more than the reflection of the many behaviors and performances of an individual. A positive self-concept is also an important method for developing behavior that meets social expectations because a positive self-concept can improve individuals' behavior and performance in various aspects. Consequently, whether students' self-concept is positive significantly affects their learning motivations. The cultivation of students' positive and aggressive self-concept is not only beneficial to improving learning motivation, but also indirectly affects academic achievements.

2.2 Academic Achievement

For the pursuit of higher competitiveness, the social trend and influence of education has been widely concerned, and academic achievements are highly valued. Academic achievements refer to the ability to achieve a certain level of knowledge or skill through the learning process. Brown, Campione, and Day (1981) suggested that the definition of academic achievement is the knowledge, understanding, and skill obtained through the educational experiences of formal curricula and teaching design, or individuals' obtainment of certain information and mastery of skills through specific teaching. Academic achievement refers to certain information, knowledge or skills obtained by individuals through learning. Test scores and teacher assessments are commonly used to evaluate academic achievement. Because teacher assessments usually involve the teachers' subjective opinions and impressions, the reliability and validity of the scores are lower than test scores. As a result, if there is a need to assess students' academic performances, it is more objective to use test scores as an indicator (Yu, 1994). Some

studies have shown that the academic achievements of students are often assessed based on intellectual ability factors and the scores of standardized exams in the past in order to investigate the correlation between intellectual ability and academic achievement (Cokley et al., 2001). At present, teachers can use various achievement assessments, including paper-based tests, performance assessments, actual assessments, portfolio assessments, and dynamic assessment, to evaluate students' learning outcomes. In addition, students' performances in various fields can be used as the assessment criteria for learning outcomes. Therefore, academic achievement is the most objective and representative indicator.

Some studies have indicated that many factors affect students' academic achievements, such as gender, birth order, family socioeconomic status (Powell, 1990; Santrock, 2008), individuals' personal traits, self-concept, motivation, emotions, learning attitude, interest, value and experience, expectations and intellectual ability, social skills, family environment, social level, and the stimuli of people, matters and objects that students are exposed to (Henderson, 1994). Among these factors, family environment, personality traits and social skills are the most important ones affecting the academic achievements of adolescent students (Garzarell et al., 1993). To summarize the above, the factors affecting students' academic achievements can be generally divided into: 1) individual aspects: such as health condition, personality traits, intellectual ability, aptitude, motivation, attribution, learning attitude, learning strategy, and environmental adaptation; 2) family aspects: such as socioeconomic background, parenting style and attitude, and family atmosphere; 3) school aspects: such as the school environment, teachers' characteristics and expectations, and teaching content; and 4) social aspects: such as peer relationships, social structure and social resources. Among these factors, most scholars have suggested that factors in the individual aspect have the most significant influence on students' academic achievements (Yang et al., 1973; Yang, 1987). Among the factors in

the individual aspect, intellectual ability is a very important factor affecting academic achievement, and other non-intellectual ability-related psychological or personal traits are also key factors for predicting academic achievements.

The socio-psychological model of educational achievement of the Wisconsin model proposed by Blau and Duncan (1967) (Sewell & Hauser, 1980), as shown in Figure 2.2, explains the influence of family socioeconomic status on educational achievement. The model shows that the indicators of family socioeconomic status include the level of the father's education, the level of the mother's education, the occupation and status of the father, and the income of both parents. The research results showed that socioeconomic status directly or indirectly affects other people's expectations, and these expectations have a significant influence on students' educational achievements or occupational achievements. Therefore, as shown in the socio-psychological model of educational achievement, family socioeconomic status can directly affect students' educational achievements; and the mediating factor of others' expectations can indirectly affect students' educational achievements. Students' educational achievements may be affected by numerous direct or indirect factors, and factors such as family socioeconomic status, material conditions, parenting style, language, learning environments, parental care and expectations for children, all can affect students' educational opportunities.

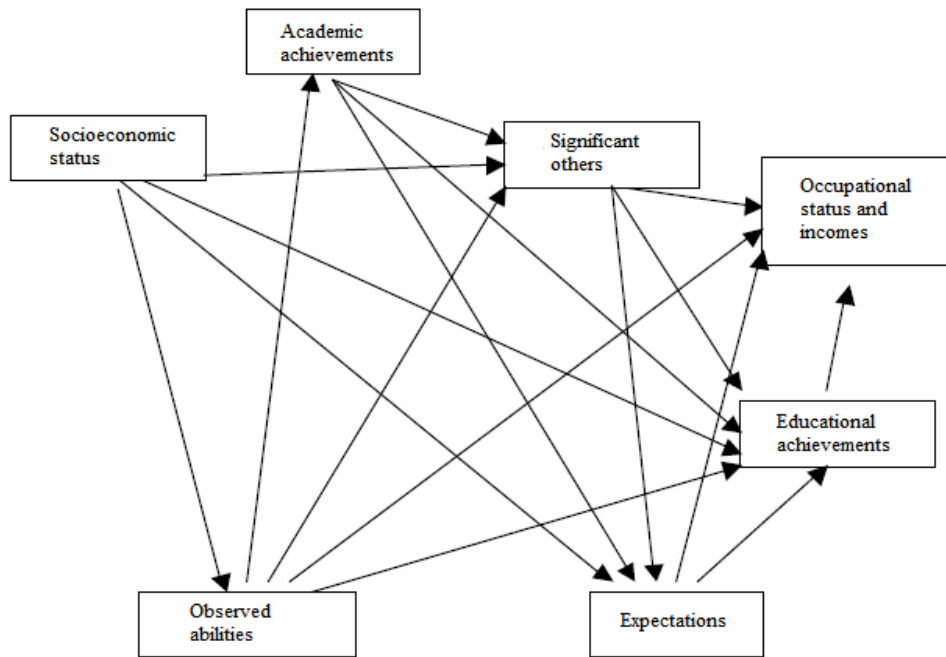


Figure 2.2 Sociopsychological model of educational achievement of Wisconsin school (Sewell & Hauser, 1980: 72)

2.3 Social Support

The concept of social support was first proposed by Caplan (1974). It refers to the reliance between individuals or between individuals and groups. Hobfoll (2002) suggested that social support provides individuals with actual assistance through social relationships, emphasizing that individuals have a sense of belonging to important social groups and believe that they are being loved and cared. Tolsdorf (1976) defined social support as the provision of a certain form of behavior or action for purposes of the persons concerned or for the needs of a certain context. Lin et al. (1986) defined social support as the relevant factors or powers that can help individuals to survive in a social environment. Moreover, it is also the assistance from social networks, close partners, and friends in the social groups perceived by individuals to obtain emotional responses. The support for actual life and emotional support are both very important. Social support is regarded as a pressure buffer to reduce individual pressure through other people's support or interactions with social networks (Glynn et al., 1999; Antonovsky, 1974). Cohen and

Lahey (2006) indicated that the functions of social support are to enhance pressure-coping performance through the supportive actions of others, and obtain supportive recognition and assessment to reduce individuals' negative explanations about stressful events, further reducing the stressful effects caused by negative evaluations. Caplan (1974) argued that social support is an individual's formal or informal obtainment of emotional, perceptual, and material support from a certain member, group, or environment, and this support enables the individual to feel that he/she can rely on someone or a group to overcome difficulties and stress. Cobb (1976) suggested that social support is an individual's obtainment of a message, which makes him/her feel that he/she belongs to a certain group and is cared about. Norbeck et al. (1981) indicated that social support is composed of various aspects, and is individuals' subjective feeling of being supported. Individuals can obtain love and care from families, friends, and significant others, as well as their recognition and approval for their behaviors or values through interpersonal exchanges. Moreover, they will provide others with symbolic or substantial assistance. Individuals can obtain assistance from interpersonal networks or social support (Colvin et al., 2002).

Shumaker and Brownell (1984) suggested that social support has both direct and buffering effects. The direct effects come from meeting an individual's needs for a sense of security, social contact and a sense of belonging, and further maintaining an individual's self-value and esteem to directly increase health and the sense of happiness. The buffering effects come from providing the information and resources required for coping with pressure. In other words, social support does not directly affect pressure or health, but it mitigates the relationship between them. In terms of the direct effects, Sarason et al. (1983) found that teachers' support for students has a direct influence on the students' satisfaction with schools. Individuals' achievements vary with social support as well. Swindle (1983) indicated that if individuals can obtain more social support, there

will be fewer physical and psychological factors affecting their lives. Therefore, social support is deemed to have buffering effects.

There is a wide range of the origins of social support, such as families, teachers, friends or classmates. Individuals may deal with life incidents more flexibly and maintain a better physical and psychological status by using the support to reduce the overreaction to pressure events (Swindle, 1983). When individuals are satisfied with the social support, they may develop a specific sense of belonging and a sense of security (Thoits, 1985). On the contrary, when individuals are dissatisfied with the social support, they may easily encounter troubles and may even fall into crises. Social support is the possibility to obtain assistance relationships and quality of assistance relationships (Leavy, 1983). As individuals encounter difficulties in a new environment, obtaining assistance from other people is beneficial to the adaptation to the new environment (Tsang, 2001). Kahn and Quinn (1976) indicated that there are three forms of social support, namely aid, affection, and affirmation. The social support from aid is the provision of relevant information and assistance in emergencies. The social support from affection is the provision of emotional support based on the relationship between the support providers and the support seekers. The social support from affirmation is the support providers' belief in the support seekers' ability and faith to deal with pressure and the provision of affirmation (Kraimer et al., 2001). Copland et al. (1975) pointed out that individuals' origins of social support include organizations, colleagues, supervisors, and friends. Among those, organizations, supervisors and families are the main social support providers for overseas staff (Aycan, 1997). Henderson et al. (1994) indicated that the performance of children whose parents frequently interact with schools is usually better. The time that parents spend on their children's education also has an important effect on the children's learning attitude, and it certainly affects their academic performance. Based on the above, the origins of social support are the generalized social network as well as the significant others in the

individual aspect. Various supports can be provided for individuals at different levels. Cassel (1976) suggested that the social support from primary groups includes families, relatives, and friends. Moreover, these origins of social support are crucial to an individual. Social support can meet individuals' substantial needs and provide them with energy and resources. Therefore, it is regarded as the key resource in the context of pressure (Hobfoll & Shirom, 2000). However, the definitions concerning the content included in social support are inconsistent. Therefore, the aspects of social support are usually analyzed and explained through different methods (e.g. emotional and substantial support), different origins (e.g. spouse, families and friends), different aspects, and different forms. As the main purpose of this study was to investigate the influence of social support on university students' academic achievements, this study probed into the three main origins of social support for university students, namely, families and relatives, teachers, and classmates.

2.4 Occupational Choice Intention

University student are at the stage of exploration, and the main task during this period is to explore career choices in order to gain an understanding of the workplaces and choose the direction of future career path. Occupational choice intention refers to fresh graduates' decision-making attitudes or behaviors in deciding their preferences before entering the job market. In terms of groups and society, occupational choice intention refers to whether the integration and allocation of human resources in society are appropriate. Therefore, occupational choice intention is not only the decision-making process that meets individuals' aptitudes, abilities and interests, but also their behavioral responses of self-growth and adaptation for the changes in the overall social, political, and economical environment. Holland (1985) suggested that individual career choice is the extension of personal traits. The process of career choice can reflect individuals' personal traits. If the fitness between personal traits and work environment is higher,

individuals' job satisfaction will be higher and they will not easily change their jobs.

Career choice is the response exhibited when individuals face important career decision-making by combining their understanding with their judgment of education and external factors (Fouad et al., 2006). Herr and Cramer (1992) indicated that university students are at the key stage of career development, and have to face many major decisions concerning their future development, such as seeking jobs, thinking about life value, and getting married. The results of a national survey on the career needs of university students in the United States showed that more than 100,000 university students have a sense of uncertainty, and they need the instruction and assistance concerning career and education decision-making from schools (Luzzo, 1991). Moreover, a study indicated that university students are still uncertain about their future career direction at school, and they encounter barriers when making career choices, suggesting that it is important for schools to help students understand their personal traits and self-interests to make future career choices (Betz, 1994).

Previous studies have suggested that the main factors affecting occupational choice intentions can be divided into gender, academic achievements, professional skills and abilities, working experience, level of education of the parents, occupations of the parents, and the expectations of the parents. Farmer (1995) indicated that with the change of time and the efforts made by school education, the influence of gender on career choice has been reduced. However, it still has an influence. Hollender (1971) pointed out that the factors affecting adolescents' career choices are relevant to their academic performances at school. Sharf (1997) suggested that when facing career choices, interest is the most important factor. Chen (2000) conducted a study on the employment intentions of vocational high school students, and found that internship or work-study experience has an influence on career choices. In addition, 48.3% of the students suggested that it has a positive effect, but only 5.7% of them suggested that it has a negative effect. Monica

(2002) argued that adolescents' stability of future choice is significantly correlated with the occupations of their parents, and that their parents' occupations and social status particularly have significant effects on their career choices. Otto (2000) studied senior high school students in the graduating class, and found that most adolescents share the same idea as their parents in terms of future career choice. Therefore, parents have an influence on the career choices of adolescents.

Occupational choice intention is also known as the career development tendency. The concept originates from career choice. It refers to individuals' decision-making attitudes to seek their preferences for various types of jobs after trying for a long period of time in various aspects, such as self-development, learning, family and jobs, and after accumulating experiences (Chang, 2000). Schein (1996) first proposed the concept of occupational choice intention. The studies from 1978 to 1990 suggested that individuals' occupational choice intention can be divided into the following types, including:

1. Technical/functional competence: People with this tendency are inspired by the jobs they engage in, and what they care about is their professional field, including the techniques, functions and the job content, instead of the management process. If they are assigned to other fields, their satisfaction will decrease and they will try to return to the fields of their expertise.
2. General managerial competence: People with this tendency like rapid promotions. They have the three competitive advantages, namely analytical ability (the ability to confirm, analyze, and solve problems in situations with uncertainty or insufficient intelligence, the ability to stabilize emotions (the ability to pull themselves together when encountering emotional or interpersonal crises or the ability to bear heavy responsibilities without collapsing), and interpersonal ability (the ability to affect, supervise, manipulate and control personnel of various levels in an organization).
3. Security/stability: People with this tendency attach importance to long-term job safety

and stability; hence, they tend to form a close relationship with an organization and become organization members. They are willing to accept the arrangement of an organization. To these people, it is usually more important to keep a stable and guaranteed job than to aggressively seek other promising jobs. Other people with this tendency intend to develop only in a specific area; hence, they only change jobs within this area.

4. Entrepreneurial creativity: People with this tendency enjoy taking adventures and trying new projects. They have a strong desire to create or establish their own empire, in order to prove themselves.
5. Autonomy/independence: People with this tendency care about the feeling of independence and autonomy, and they prefer making decisions on their own instead of relying on others. As these people concurrently possess strong technical/functional competence, they often decide to act as consultants, work independently or run smaller enterprises on their own.

Schein (1996) suggested that occupational choice intention is developed at the early stage of an individual's development. It guides and controls the value of the entire life of aggressive thinking. This factor will determine an individual's career choice. Five main factors affecting people's occupational choice intentions are listed below: 1) technical intentions; 2) management intentions; 3) security and stability intentions; 4) creativity intentions; and 5) independence and autonomy intentions. This study used these five factors as the basis to investigate university students' occupational choice intentions.

2.5 Theoretical Background

2.5.1 Self-concept and Academic Achievement

According to Chien et al. (2008), the relationship between self-concept and academic achievements can be generally divided into three models, namely the skill

development model, the self-enhancement model, and the reciprocal effects model. The scholars supporting the skill development model suggest that students' academic performance or performance in academic fields will affect their self-concept (Pottebaum et al., 1986). The self-enhancement model investigates the effects of self-concept on academic achievement (Wigfield & Karpathian, 1991). The reciprocal effect model (REM), supported by most scholars, suggests that self-concept and academic achievement have a reciprocal cause and influence (Guay et al., 2003). Self-concept is molded by ability and performance, and it is also an important variable affecting learning achievement (Pajares & Schunk, 2001).

DeFraine et al. (2007) proposed that the causal direction of academic self-concept and achievement will vary with age. The academic self-concept of younger students is more likely to be influenced by school performance. By the time when students enter higher grades, their academic self-concept and achievement are more likely to be influenced by each other. Marsh and Köller (2004) proposed the Unification Model to examine the reciprocal causality between academic performance and self-concept. The research results showed that the self-concept in a field can improve academic achievement; however, the self-concept in different fields can mildly inhibit academic achievement. Goldberg and Cornell (1998) found that students' intrinsic motivation and self-concept have a significant and correlated influence on academic achievement. Goldberg and Cornell developed a feedback model among the academic achievements, self-concept, and motivation of students. When students have an aggressive self-opinion, they can obtain higher achievements. When students' achievements are higher, their self-concept and motivation can increase. As a result, these variables form a feedback loop. Purkey (1970) indicated that an individual's role in a group, regarding whether he/she is valued, accepted and easily approached, possesses leadership, as well as his/her achievements in class and academic performance from the perspective of other students,

tends to leave a scar that may not easily disappear in his/her self-image. To students, the overall self-concept has a significant influence on academic achievement. Academic achievements and self-concept have a reciprocal cause and effect. The smoothness of academic learning can increase students' self-esteem and self-confidence. Moreover, the feedback influence can lead to a better performance in various aspects. It can be inferred that self-concept is closely related to academic achievement. Marsh and Yeung (1997) found that students' academic self-concept will affect their future academic achievements, and academic achievements will also significantly affect their academic self-concept. Therefore, self-concept and academic achievement affect each other.

2.5.2 Social Support and Academic Achievement

Previous studies have both suggested that social support is a very important variable with many positive effects. Widoff (1999) conducted a study on the learning experiences of 397 college and graduate school students, and found the origins of support for adult students to be peers, friends and families. Among these, peers and friends provide encouragement or substantial assistance and play the role of helping students relieve their emotions. Students could provide instructions on learning, suggestions on course selection, and advising professor selection.

Numerous studies have indicated that social support is related to academic achievement among university students. The study by Roman et al. (2008) presents an initial step into the analysis of the influence of self-esteem, peer and teacher expectations, as well as the effects of family support on academic achievement through learning approaches. Data were gathered from 553 university students from different departments of a Spanish university. The analysis, through structural equation modeling, provided support for the positive effects of self-esteem and family support in university students' learning and achievement. Peer and teacher expectations increased both surface learning

and applied effort. Hymel et al. (1996) provided evidence that peer support may also contribute to children's achievement because it has a profound influence on their day-to-day behavior at school. Frenzt et al. (1991) showed that students who are rejected by their peers have lower academic scores than do more popular students. Another study found that the perceptions of supportive relations with teachers are related to greater academic achievement, higher levels of student engagement, less problematic behaviors, and more positive peer relations (Hamre & Pianta, 2001; Skinner et al., 2008).

2.5.3 Academic Achievement and Occupational Choice Intention

To many university students, seeking a good job is the main objective after graduation. A good education provides students with more employment opportunities and cultivates students' abilities to make significant contributions to their chosen fields (Chuang et al., 2009). According to the Wisconsin model developed by Sewell and Hauser (1980), for students with better academic performances, the expectations from parents and teachers are higher, and this increases their education and career ambitions. The better the academic performance is, the higher the ambitions for education and career will be. One factor for career and educational planning that may overlap with a problem's severity is a student's educational and occupational aspiration level. This issue is expressed in the sense that the higher a student's aspirations are, the more challenging it will be to successfully attain those aspired careers and education levels (Raviv et al., 2000; Sheffield et al., 2004). Therefore, students' expectations and ambitions for career are correlated with their education levels.

2.5.4 Self-concept, Social Support and Occupational Choice Intention

According to Betz (1994), Super's theory of career development is the notion of self-concept. Self-concept is basically how individuals picture themselves (Super, 1957).

The development of the career stage is the development and practice of self-concept. It is defined as “the constellation of self attributes considered by the individual to be vocationally relevant” (Super, 1963, p. 20). Super (1963) suggested that individuals attempt to implement their self-concept through career choices. Given the breadth of Super's construct (Betz, 1994), one's self-concept may also include beliefs about one's image, personal appearance, and physical attractiveness. Perceptions of one's image may influence beliefs about which occupations will allow for the implementation of the self-concept.

Super (1980) proposed the career development model, which emphasizes the continuity of career development. The career development of an individual is divided into five stages: growth, exploration, establishment, maintenance, and declination. Context-associated adaptive behaviors will be developed at each stage. The growth stage is the initial stage of career development, where individuals start to develop a self-concept through the recognition from and interactions with significant others, such as parents and friends. With the increase in age, individuals gradually take into account the meaning of interests and abilities through the actual participation in various events and the accumulation of experiences. The exploration stage includes adolescence and adulthood, and it covers the college period. Individuals explore themselves, roles, and careers through schools, work experiences and interpersonal interactions, in order to further develop a sense of preference for career and gradually realize their objectives. The establishment stage is the stage to confirm stability. After individuals find an appropriate career, they tend to become stabilized in the career, start to approve of it and seek for progress in it, in order to establish a professional status and increase the opportunity for promotion.

A consistent conclusion of the correlation between social support and occupational choice intention has not been reached in relevant studies. The amount of received social

support (e.g., information/advice, encouragement, feedback from worksite supervisors, school staff, mentoring) during the school years is vital to students, as decisions concerning educational and career pursuits may appear daunting and confusing (Hoy & Miskel, 2001).

The career development theory proposed by Super (1994) provides a conceptual framework to investigate the process of human career development. According to the theory, the college period is the late period of the exploration stage of career development, and the main task is to increase self-perception through various exploratory activities to further clarify the direction of career development, establish specific career planning, develop self-concept and occupational concept, and prepare for entry into the job market. However, the abilities and personality traits required by each career are different, allowing individuals to engage in different careers and allowing people with different personalities to engage in the same career. During the college period, because students are planning to enter the job market, they will attach more importance to the challenges of the real society, and further intend to fulfill their individual self-concept, establish accurate occupational concepts, cultivate an accurate working attitude, and increase their specific understanding of the working world.

Chapter 3 Research Method

The main objective of this study was to investigate the correlation among self-concept, social support, academic achievement and occupational choice intention, and to propose a hypothetical model where self-concept and social support are the independent variables, academic achievement is the mediating and moderating variable, and occupational choice intention is the dependent variable. The model is expected to clarify the correlation among self-concept, social support, academic achievement, and occupational choice intention.

3.1 Research Framework and Hypotheses

Based on the research purposes and literature review, this study developed conceptual framework, as shown in Figure 3.1 and 3.2.

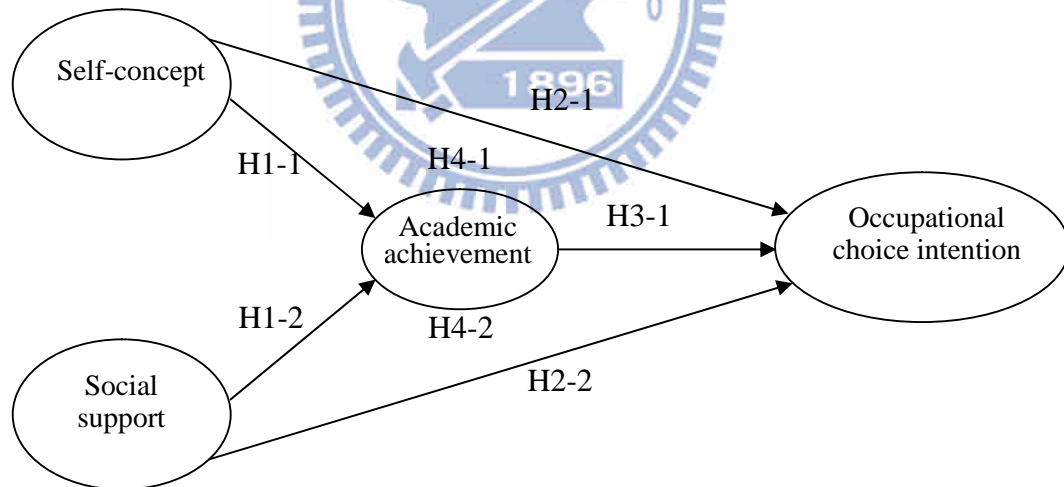


Figure 3.1 Research framework

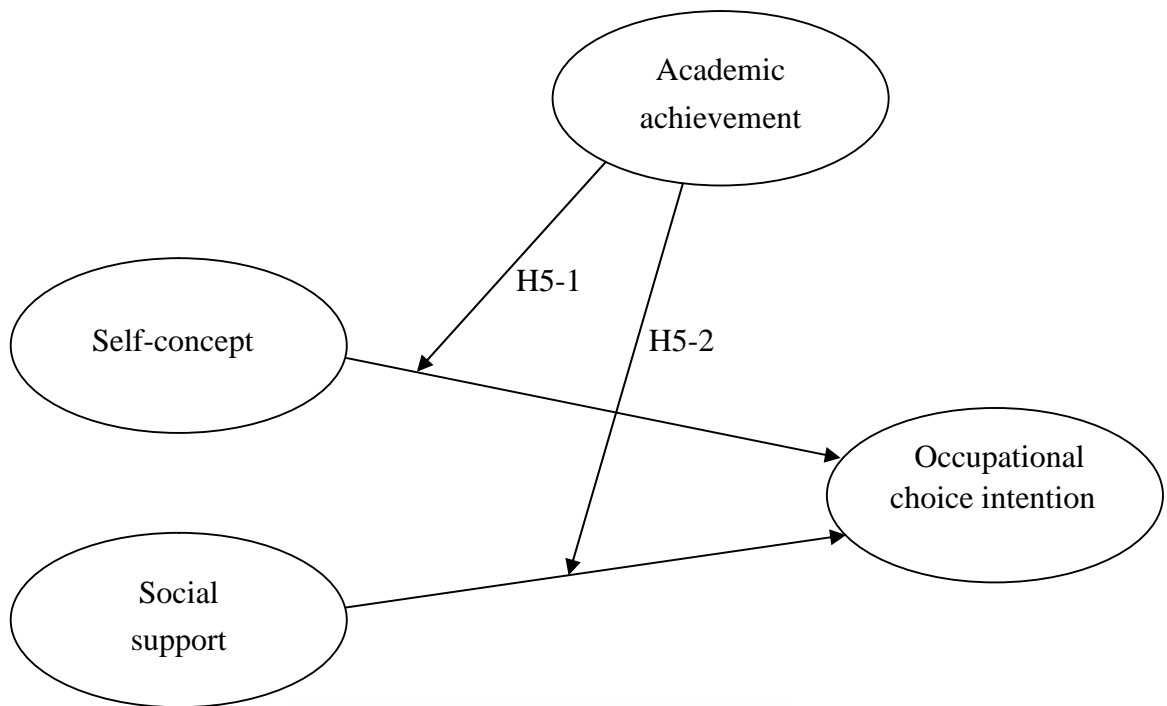


Figure 3.2 Research framework – moderating effect

3.2 Research Hypotheses

The hypotheses in this study were derived from theories in the literature, and follow-up data analysis verified the accuracy of these hypotheses. Based on the research purpose, literature review, and research framework, this study proposed the following hypotheses according to the relationships between the dimensions, and then conducted empirical research.

H 1: Self-concept and social support have a positive influence on academic achievement.

H 1-1: Self-concept has a positive influence on academic achievement.

H 1-2: Social support has a positive influence on academic achievement.

H 2: Self-concept and social support have a positive influence on occupational choice intention.

H 2-1: Self-concept has a positive influence on occupational choice intention.

H 2-2: Social support has a positive influence on occupational choice intention.

H 3: Academic achievement has a positive influence on occupational choice intention.

H 3-1: Academic achievement has a positive influence on occupational choice intention.

H 4: Self-concept and social support affect occupational choice intention through the mediating influence of academic achievement.

H 4-1: Self-concept has a positive influence on occupational choice intention through the mediating influence of academic achievement.

H 4-2: Social support has a positive influence on occupational choice intention through the mediating influence of academic achievement.

For the overall model, it was necessary to understand whether the correlations among self-concept, social support, academic achievement, and occupational choice intention would be applicable to students in higher education institutions; thus this study further explored whether academic achievement was a moderating variable. The following research hypotheses were established:

H5: Academic achievement has a moderating effect on the positive influence of self-concept and social support on occupational choice intention.

H5-1: Academic achievement has a moderating effect on the positive influence of self-concept on occupational choice intention.

H5-2: Academic achievement has a moderating effect on the positive influence of social support on occupational choice intention.

3.3 Operational Definitions of Variables

The explanations about the operational definitions of aspects in this study, such as self-concept, social support, academic achievement, and occupational choice intention are given as follows:

3.3.1 Self-concept

Self-concept is an individual's sum of the perception of various aspects of themselves. It is a feeling or concept developed after individuals interact with other people and the environment. It includes the attitude toward physical traits, the attitude toward personality traits, the attitude toward self-competence and achievements, the attitude to accept the external world, and opinions on value systems, beliefs, and emotions (Canfield & Wells, 1994).

3.3.2 Academic Achievement

Students' academic achievement refers to the learning outcome obtained by students at the end of a semester, after learning and taking assessment tests at school, namely, academic grading. Academic achievement in this study referred to students' academic performance in the spring semester of 2011, and the average grade during college period was used as the indicator of academic achievement. The academic grading of the students in this study was divided into five levels as follows: >90 points, 80-89 points, 70-79 points, 60-69 points, and <60 points.

3.3.3 Social Support

This study defined social support as the use of emotional, instrumental, and information support to help individuals adapt well to the context of stress. In addition, it is the buffer for individuals to respond to stress. Its origins may be families, teachers or peers. In order to investigate the influence of social support, this study used the following three main aspects proposed by scholars as the measurement indicators (Sarason et al., 1983; Colvin et al., 2002).

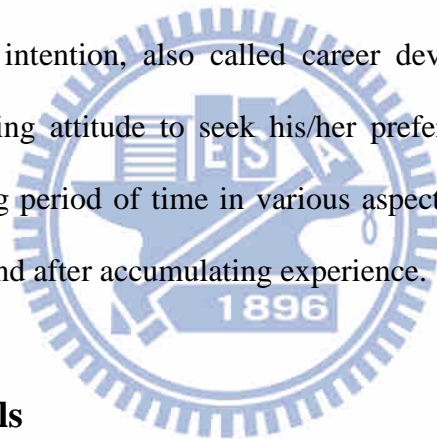
1. Support from families: the care and support from parents, spouse, siblings, relatives, etc.

2. Support from teachers: the respect, attention, assistance, and care obtained from teachers during the college period.
3. Support from classmates and friends: the mutual experience sharing, assistance, encouragement, and care between peers.

A Likert 5-point scale was applied to the social support scale, and the students ticked the checkboxes (ranging from “no expectation” to “extremely high expectation”) meeting their conditions according to the descriptions of the items. The items were given a score of 1 to 5.

3.3.4 Occupational Choice Intention

Occupational choice intention, also called career develop tendency, refers to an individual’s decision-making attitude to seek his/her preference from various types of jobs after trying for a long period of time in various aspects, such as self-development, learning, family and job, and after accumulating experience.



3.4 Measurement Tools

This study used the “Questionnaire on Self-concept, Academic Achievement, Social Support, and Occupational choice intention of University Students” as the research tool. The questionnaire included four parts: a self-concept scale, a social support scale, an academic achievement scale, and an occupational choice intention scale. Explanations about the scales are given as follows:

3.4.1 Self-concept Scale

The self-concept scale was developed according to previous literature. Moreover, the self-concept scale for vocational school students compiled by Chen (1996) was applied to this scale. This scale is mainly applicable to vocational/senior high school students and

university students, and included a total of 14 aspects. After the content was amended according to the needs of this study, it included a total of 11 aspects: the self-concept of mathematical, the self-concept of language, the self-concept of specialized subjects, the self-concept of emotion, the self-concept of physical ability, the self-concept of friends, the self-concept of parent-child relationships, the self-concept of teacher-student relationships, the self-concept of problem-solving, the self-concept of morality and integrity, and the self-concept of career planning. The measurement was based on a Likert 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A higher total score indicates a higher self-concept.

3.4.2 Social Support Scale

The social support scale was compiled based on previous studies on social support and Cheng's (2000) self-edited "Questionnaire on Married Graduate Students' Need for Social Support." This study divided the origins of social support into three origins: support from teachers, support from classmates and friends, and support from families. After the questionnaire was amended, there were a total of 20 items. The measurement was based on a Likert 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A higher total score indicates greater social support.

3.4.3 Academic Achievement Scale

The academic achievement scale was developed by the researcher according to various assessment methods currently used to assess students' learning outcomes, and it was used as a method for assessing academic achievement. Three items were established, including: 1) the average academic score during the college period; 2) the average academic score of the last semester; 3) the ranking in class during the last semester. Students' academic grades were divided into five levels for assessment.

3.4.4 Occupational Choice Intention Scale

The main aspects of this scale were the five types of occupational choice intention proposed by Schein (1996), including: 1) technical intention; 2) management intention; 3) safety and stability intention; 4) creativity intention; and 5) independence and autonomy intention. The measurement was based on a Likert 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

3.5 Research Subjects and Data Collection

The subjects of this study were junior and senior university students in Taiwan. It was difficult to control the actual size of the population. An adequate sampling method was used to select samples according to the theoretical foundation of sampling and statistics. Sample characteristics can be used to infer the population, and the results can be used to rationally infer and explain the population. Therefore, this study used convenience sampling and selected schools as the sampling unit to select limited samples for statistical analyses. Junior and senior university students from the 2011 Spring Semester in 15 colleges across Taiwan were selected as the subjects for the questionnaire survey. A total of 1,500 questionnaires were distributed in May 2011, and 1,440 questionnaires were returned, with a return rate of 96%. After the questionnaires were encoded, there were 1,406 valid questionnaires, showing a valid return rate of 93%.

3.6 Analysis Method

This study used the statistical package software SPSS 12.0 for windows and AMOS 17.0 as the data analysis tools to analyze the valid questionnaires. SEM (structural equation modeling) was used for the analysis, because traditional statistical methods regard variables as observable data without dealing with potential variables and they assume there is no measurement error. SEM can be used to deal with unobservable

constructs. The analysis on the model of observable variables can be used to estimate various parameters as well as test and estimate measurement errors. Moreover, errors can be included in the analysis process and can even be used to assess the reliability and validity of the measurements (e.g., factor analysis), in order to integrate the concept of reliability into the statistical decision-making of path analysis. The following statistical analysis methods were used to test the research hypotheses:

3.6.1 Confirmatory Factor Analysis

The statistical package software AMOS 17.0 was used to perform confirmatory factor analysis, test the fitness of the overall model, and confirm the reliability and validity of the research tools.

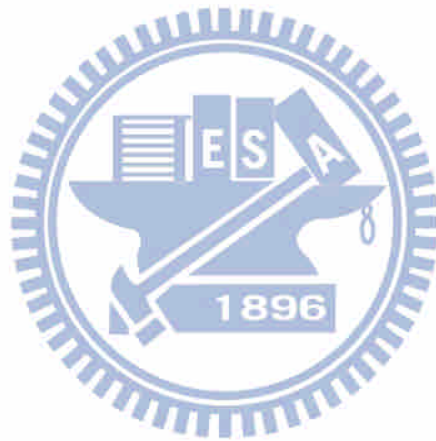
3.6.2 Structural Equation Modeling

SEM can be used to deal with the relationships of several independent variables and several dependent variables concurrently. Therefore, this study used SEM to investigate how the variables affect one another. To understand the operation of the overall model, this study used AMOS 17.0 to analyze the SEM and investigate the linear structure of each aspect. This study used SEM to test the overall SEM paths of self-concept, social support, academic achievement, and occupational choice intention, and further revise the original framework and model according to the indicators provided.

3.6.3 Descriptive Statistical Analysis

This study used descriptive statistical analysis to analyze the mean and variance of each variable. A Likert 5-point scale was applied to the questionnaire. After the data were encoded and a quantification analysis was performed, the mean and standard deviation of each item were calculated. The mean represented the subjects' opinion on the item.

Moreover, the means were used to compare subjects in different aspects. A higher mean indicates a higher level of importance attached to the item or a higher level of satisfaction with the item. Standard deviation was used as the indicator of consistency to assess subjects' opinions on the items. A smaller standard deviation indicates a more consistent opinion on the item.



Chapter 4 Data Analysis

Before using AMOS to perform statistical analysis, it was necessary to fully understand the characteristics of the data to ensure it conformed to the SEM hypothesis and to prevent the data from affecting the estimation of the model and the test results.

4.1 Confirmatory Factor Analysis on the Self-concept Scale

As shown in Table 4.1, in terms of the skewness and kurtosis of 15 observed variables in the modified self-concept scale, the absolute value of the skewness was between 0.01 and 0.48, which was not greater than 3, the extreme value of skewness (Kline, 1998). The absolute value of kurtosis was between 0.01 and 0.48, which was less than 10, the deviation value of kurtosis (Kline, 1998). These results implied that using the estimation method of normal distribution did not significantly affect the integrity of the estimation. Therefore, this study used the method of maximum likelihood (ML) for estimating the model.

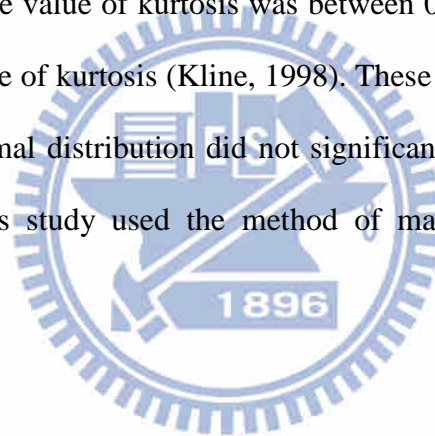


Table 4.1 Distribution of skewness and kurtosis of the observed variables of the self-concept scale

Observed Variables	Mean	SD	Skewness	Kurtosis
X1: I am very interested in specialized subjects.	3.58	0.78	-0.17	0.30
X2: I can bring out my talents in specialized subjects.	3.45	0.75	-0.03	0.28
X3: I am willing to make an effort in specialized subjects.	3.41	0.75	-0.10	0.48
X4: My mood is happy most of the time.	3.73	0.82	-0.48	0.38
X5: When I encounter frustration, I can face it calmly.	3.55	0.76	-0.31	0.03
X6: My emotions are usually calm and relaxed.	3.47	0.80	-0.24	-0.14
X7: I perform well in most physical activities.	3.39	0.90	-0.21	-0.15
X8: I like to engage in physical activities.	3.44	0.96	-0.29	-0.32
X9: I can easily make friends.	3.50	0.80	-0.10	0.05
X10: I am very satisfied with my interpersonal relationships.	3.46	0.80	-0.22	0.31
X11: I get along well with my parents and our relationship is very close.	3.80	0.87	-0.37	-0.11
X12: I like my parents and I often actively shown concern over them.	3.64	0.81	-0.04	-0.17
X13: My parents understand and respect me.	3.66	0.84	-0.21	-0.01
X14: I am satisfied with my current career planning.	3.08	0.81	0.04	0.30
X15: I am aggressively preparing for my future career plans.	3.38	0.87	-0.01	0.01

4.1.1 Violation of Estimation Testing

When comparing the overall goodness-of-fit of the model, in terms of the analysis on the individual models, it was necessary to understand whether the statistical results obtained from the model were inadequately interpreted. Inadequate interpretation is a type of violation of estimation (Huang, 2007). In general, the following violations frequently occur: 1) the existence of negative error variables or the existence of meaningless variance errors in any construction; 2) the factor loading is greater than or is close to 1 (0.95 is the threshold value); and 3) the standard error is too large.

Table 4.2 is a summary table of the parameter estimation of the self-concept scale. As seen, the factor loading of self-concept was between 0.71 and 0.92, which was not

greater than or close to 1 (0.95 was the threshold value). The standard error was between 0.08 and 0.15, suggesting that the overall measurement error was small and there were no negative variance errors. In other words, there was no violation of estimation. Therefore, the overall model goodness-of-fit could be further assessed.

Table 4.2 Assessment on the self-concept scale violation of estimation

Observed variables	Factor loading	Standard error	t value
X1	0.77	0.08	30.30
X2	0.92	0.08	36.34
X3	0.74	0.08	28.98
X4	0.75	0.10	17.41
X5	0.75	0.09	17.41
X6	0.71	0.09	17.07
X7	0.92	0.15	21.23
X8	0.69	0.11	23.12
X9	0.75	0.10	18.35
X10	0.77	0.10	18.16
X11	0.71	0.09	24.30
X12	0.73	0.09	24.88
X13	0.78	0.09	26.04
X14	0.77	0.11	21.06
X15	0.76	0.11	21.14

4.1.2 Goodness-of-fit Test on the Overall Model

This study used a primary hypothetic measurement model to test whether there were six potential factor aspects in the self-concept scale. Moreover, a covariance matrix of the self-concept scale was used to extract the initial model. To obtain a better modified model, the items with poor individual reliability (less than .50) were deleted. The scale was modified, and the modified model is shown in Table 4.3. The validation indices were: $\chi^2=300.33$ ($p=.00$), RMR=0.03, RMSEA=0.04, GFI=0.97, AGFI=0.96, NFI=0.96, NNFI=0.96, CFI=0.97, RFI=0.95, IFI=0.97, PNFI=0.77, PGFI=.68. As for the modified

model, other than χ^2 , the indices all met the standard.

Table 4.3 Goodness-of-fit test on the self-concept scale model

Statistical tests		Standard or threshold value of goodness-of-fit	Initial model	Modified model	Judgment of model goodness-of-fit
Absolute goodness-of-fit test	χ^2	Chi-square value: the smaller the better ($P \geq \alpha$ value)	No, 2973.87 (P=0.00)	300.33 (P=0.00)	No
	χ^2 / df	Between 1~5	No, 5.42	3.58	Yes
	GFI	> 0.8	Yes, 0.87	0.97	Yes
	RMR	At least < 0.1	Yes, 0.05	0.03	Yes
	RMSEA	<0.05: excellent, 0.05~0.08: good	Yes, 0.06	0.04	Yes
Incremental goodness-of-fit test	AGFI	> 0.9	No, 0.86	0.96	Yes
	NFI	> 0.9	No, 0.82	0.96	Yes
	NNFI	> 0.9	No, 0.83	0.96	Yes
	CFI	> 0.9	No, 0.85	0.97	Yes
	RFI	> 0.9; > 0.95: perfect goodness-of-fit	No, 0.80	0.95	Yes
	IFI	> 0.9	No, 0.85	0.97	Yes
Simplified goodness-of-fit test	PNFI	> 0.5	Yes, 0.76	0.77	Yes
	PGFI	> 0.5	Yes, 0.76	0.68	Yes

4.1.3 Assessment on the Internal Structure of the Model

(1) Reliability assessment

Table 4.4 is a summary table of the reliability and convergent validity of the self-concept scale. As shown, the individual reliability of the self-concept scale was between 0.50 and 0.85, and the construct reliability of each factor was between 0.73 and 0.85. The variance extracted from each factor was between 0.54 and 0.66, suggesting that the reliability of the scale was acceptable.

(2) Validity assessment

Convergent validity

Table 4.4 is a summary table of the reliability and convergent validity of the self-concept scale. As shown in the table, the factor loading of each item of the self-concept scale was between 0.71 and 0.92, and the construct reliability of each factor was between 0.73 and 0.85. The variance extracted from each factor was between 0.54 and 0.66, suggesting that the convergent validity of the scale was acceptable.

Table 4.4 Summary of the reliability and convergent validity of the self-concept scale

Potential variables	Observed variables	Factor loading	Individual reliability	Construct reliability	Variance extracted
Specialized subjects				0.85	0.66
	X 1	0.77	0.59		
	X 2	0.92	0.84		
	X 3	0.74	0.54		
Resistance to stress				0.78	0.54
	X 4	0.75	0.56		
	X 5	0.75	0.56		
	X 6	0.71	0.50		
Physical capacity				0.79	0.66
	X 7	0.92	0.85		
	X 8	0.71	0.50		
Friends				0.73	0.58
	X 9	0.75	0.56		
	X10	0.77	0.59		
Parents				0.78	0.55
	X11	0.71	0.51		
	X12	0.73	0.54		
	X13	0.78	0.61		
Career planning				0.74	0.56
	X14	0.77	0.59		
	X15	0.76	0.58		

Discriminant validity

Table 4.5 is a summary table of the discriminant validity of the self-concept scale. As shown in Table 4.5, the square root of the average variance extracted from each potential variable of the model was greater than the correlation coefficients among the aspects,

suggesting that there was discriminant validity among the six potential variables.

Table 4.5 Correlation coefficient matrix and square root of the average variance extracted (AVE) of the self-concept scale

Potential variables	Specialized subjects	Resistance to stress	Physical capacity	Friends	Relationship with parents	Career planning
Specialized subjects	0.81					
Resistance to stress	0.34	0.74				
Physical capacity	0.26	0.42	0.81			
Friends	0.26	0.62	0.38	0.76		
Relationship with parents	0.25	0.42	0.26	0.46	0.74	
Career planning	0.39	0.43	0.27	0.37	0.38	0.75

Note: The correlation coefficients are specified at the lower bottom of the matrix and the square roots of the AVE are specified on the diagonal.

4.2 Confirmatory Factor Analysis on the Social Support Scale

4.2.1 Selection of Estimation Method

As shown in Table 4.6, regarding the skewness and kurtosis of 11 observed variables of the social support sub-scale, the absolute value of the skewness was between 0.12 and 0.63, which was not greater than 3, the extreme value of skewness (Kline, 1998). The absolute value of the kurtosis was between 0.29 and 1.21, which was less than 10, the deviation value of kurtosis (Kline, 1998). These results implied that using the estimation method of normal distribution did not significantly affect the integrity of the estimation. Therefore, this scale used the method of maximum likelihood (ML) for estimation.

Table 4.6 Distribution of the skewness and kurtosis of the observed variables of the social support scale

Observed variables	Mean	SD	Skewness	Kurtosis
X1: My family will encourage me and respect my decisions.	3.87	0.77	-0.48	0.45
X2: My family is willing to listen to me explain my pleasure and frustration in learning.	3.84	0.78	-0.47	0.39
X3: My family believes that I have problem-solving abilities.	3.83	0.75	-0.55	0.74
X4: My family can provide me with spiritual support.	3.93	0.79	-0.54	0.29
X5: My teacher can understand my feelings.	3.22	0.74	-0.13	0.85
X6: My teacher will respect my thoughts.	3.47	0.71	-0.18	0.64
X7: My teacher will approve of my effort and performance.	3.47	0.71	-0.12	0.55
X8: My classmates/friends will console and support me in a timely manner.	3.89	0.71	-0.50	0.84
X9: My classmates/friends are willing to listen to me explain the secrets in my mind and share their experiences with me.	3.96	0.71	-0.59	1.21
X10: My classmates/friends will help me analyze problems and provide me with adjustment methods.	3.85	0.71	-0.47	0.94
X11: My classmates/friends will encourage one another mutually.	3.98	0.73	-0.63	1.18

4.2.2 Violation of Estimation Testing

Table 4.7 is a summary table of the parameter estimation of the social support scale. As shown in the table, the factor loading of social support was between 0.70 and 0.88, which was not greater than or close to 1 (0.95 was the threshold value). The standard error was between 0.08 and 0.10, suggesting that the overall measurement error was small, and there were no negative variance errors. In other words, there was no violation of estimation. Therefore, the overall model goodness-of-fit could be further assessed.

Table 4.7 Assessment on the social support scale violation of estimation

Observed variables	Factor loading	Standard error	t value
X1	0.86	0.09	26.49
X2	0.88	0.09	26.79
X3	0.71	0.08	23.02
X4	0.76	0.09	24.41
X5	0.70	0.08	22.88
X6	0.83	0.08	25.87
X7	0.80	0.08	25.67
X8	0.83	0.10	18.78
X9	0.88	0.10	19.12
X10	0.79	0.09	18.39
X11	0.76	0.09	18.27

4.2.3 Goodness-of-fit Test on the Overall Model

This study used a primary hypothetic measurement model to test whether there were three potential factor aspects in the social support scale. Moreover, this study used the covariance matrix of the social support scale to extract the initial model. To obtain a better-modified model, the items with poor individual reliability (< 0.50) were deleted. The scale was modified, and the modified model is shown in Table 4.8. The validation indices were: $\chi^2=118.19$ ($p=.00$), RMR=0.01, RMSEA=0.04, GFI=0.98, AGFI=0.98, NFI=0.99, NNFI=0.99, CFI=0.99, RFI=0.98, IFI=0.99, PNFI=0.73, PGFI=0.61. As for the modified model, other than χ^2 , the indices all met the standard.

Table 4.8 Goodness-of-fit test on the social support scale model

Statistical tests		Standard or threshold value of goodness-of-fit	Initial model	Modified model	Judgment of model goodness-of-fit
Absolute goodness-of-fit test	χ^2	Chi-square value: the smaller the better (P $\geq \alpha$ value)	No, 2056.66 (P=0.00)	118.19 (P=0.00)	No
	χ^2 / df	Between 1~5	No, 12.32	2.88	Yes
	GFI	> 0.8	Yes, 0.85	0.98	Yes
	RMR	At least < 0.1	Yes, 0.03	0.01	Yes
	RMSEA	<0.05: excellent; 0.05~0.08: good	Yes, 0.09	0.04	Yes
Incremental goodness-of-fit test	AGFI	> 0.9	No, 0.82	0.98	Yes
	NFI	> 0.9	No, 0.87	0.99	Yes
	NNFI	> 0.9	No, 0.86	0.99	Yes
	CFI	> 0.9	No, 0.88	0.99	Yes
	RFI	> 0.9, > 0.95 perfect goodness-of-fit	No, 0.85	0.98	Yes
	IFI	> 0.9	No, 0.88	0.99	Yes
	Simplified goodness-of-fit test	PNFI	> 0.5	Yes, 0.77	0.73
PGFI		> 0.5	Yes, 0.68	0.61	Yes

4.2.4 Assessment on the Internal Structure of the Model

(1) Reliability assessment

Table 4.9 is a summary table of the reliability and convergent validity of the social support scale. As shown in the table, the individual reliability of the social support scale was between 0.50 and 0.78, and the construct reliability of each factor was between 0.84 and 0.90. The variance extracted from each factor was between 0.64 and 0.70, suggesting that the reliability of the scale was acceptable.

(2) Validity assessment

Convergent validity

Table 4.9 is a summary table of the reliability and convergent validity of the social

support scale. As shown in the table, the factor loading of each item of the social support scale was between 0.70 and 0.88, and the construct reliability of each factor was between 0.84 and 0.90. The variance extracted from each factor was between 0.64 and 0.70, suggesting that the convergent validity of the scale was acceptable.

Table 4.9 Summary of the reliability and convergent validity of the social support scale

Potential variables	Observed variables	Factor loading	Individual reliability	Construct reliability	Variance extracted
Families	X1	0.86	0.74	0.89	0.68
	X2	0.88	0.77		
	X3	0.71	0.50		
	X4	0.76	0.58		
Teachers	X5	0.70	0.49	0.84	0.64
	X6	0.83	0.68		
	X7	0.80	0.65		
Peers	X8	0.83	0.68	0.90	0.70
	X9	0.88	0.78		
	X10	0.79	0.62		
	X11	0.76	0.58		

4.2.5 Discriminant Validity

Table 4.10 is a summary table of the discriminant validity of the social support scale. As shown in the table, the square root of the average variance extracted from each potential variable of the model was greater than the correlation coefficients among the aspects, suggesting that there was discriminant validity among the three potential variables.

Table 4.10 Correlation coefficient matrix and square root of the average variance extracted (AVE) of the social support scale

Potential variables	Families	Teachers	Peers
Families	0.82		
Teachers	0.36	0.80	
Peers	0.44	0.42	0.84

Note: The correlation coefficients are specified at the lower bottom of the matrix and the square roots of the AVE are specified on the diagonal.

4.3 Confirmatory Factor Analysis on the Academic Achievement Scale

4.3.1 Selection of Estimation Method

As shown in Table 4.11, regarding the skewness and kurtosis of three observed variables of the academic achievement scale, the absolute value of skewness was between 0.27 and 0.5, which was not greater than 3, the extreme value of skewness (Kline, 1998). The absolute value of kurtosis was between 4.21 and 8.44, which was less than 10, the deviation value of kurtosis (Kline, 1998). These results implied that using the estimation method of normal distribution did not significantly affect the integrity of estimation. Therefore, this scale used the method of maximum likelihood (ML) for estimation.

Table 4.11 Distribution of skewness and kurtosis of observed variables of academic achievement scale

Observed variables	Mean	SD	Skewness	Kurtosis
Cumulative mean	3.10	0.83	-0.55	-8.44
Mean of the first semester	3.26	0.89	-0.43	-6.6
Ranking in class	2.50	1.14	-0.27	-4.21

4.3.2 Violation of Estimation Testing

Table 4.12 is a summary table of the parameter estimation of the academic achievement scale. As shown in the table, the factor loading of academic achievement was between 0.66 and 0.90, which was not greater than or close to 1 (0.95 was the threshold value). The standard error was between 0.09 and 0.13, suggesting that the

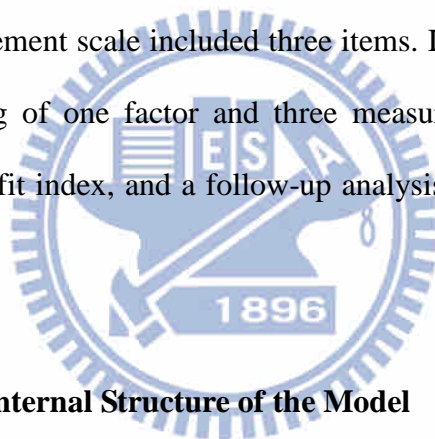
overall measurement error was small, and there were no negative variance errors. In other words, there was no violation of estimation. Therefore, the overall model goodness-of-fit could be further assessed.

Table 4.12 Assessment on the academic achievement scale violation of estimation

Observed variables	Factor loading	Standard error	t value
Cumulative mean	0.90	0.09	39.38
Mean in the first semester	0.88	0.09	38.04
Ranking in class	0.66	0.13	26.56

4.3.3 Goodness-of-fit Test on the Overall Model

The academic achievement scale included three items. It was inferred that this was a saturated model consisting of one factor and three measurement variables. Therefore, there was no goodness-of-fit index, and a follow-up analysis would be performed on the three items only.



4.3.4 Assessment on the Internal Structure of the Model

(1) Reliability assessment

Table 4.13 is a summary table of the reliability and convergent validity of the academic achievement scale. As shown in the table, the individual reliability of the self-concept scale was between 0.43 and 0.82, and the construct reliability was 0.86. The variance extracted was 0.67, suggesting that the reliability of the scale was acceptable.

(2) Validity assessment

Convergent validity

Table 4.13 is a summary table of the reliability and convergent validity of the academic achievement scale. As shown in the table, the factor loading of each item of the academic achievement scale was between 0.66 and 0.9, and the construct reliability was

0.86. The variance extracted was 0.67, suggesting that the convergent validity of the scale was acceptable.

Table 4.13 Summary table on the reliability and convergent validity of the academic achievement scale

Potential variables	Observed variables	Factor loading	Individual reliability	Construct reliability	Variance extracted
	Cumulative mean	0.90	0.82	0.86	0.67
Academic achievement	Mean in the first semester	0.88	0.78		
	Ranking in class	0.66	0.43		

4.4 Confirmatory Factor Analysis on the Occupational Choice Intention Scale

4.4.1 Selection of Estimation Method

As shown in Table 4.14, regarding the skewness and kurtosis of 3 observed variables of the occupational choice intention scale, the absolute value of the skewness was between 0.16 and 0.23, which was not greater than 3, the extreme value of skewness (Kline, 1998). The absolute value of the kurtosis was between 0.03 and 0.11, which was less than 10, the deviation value of kurtosis (Kline, 1998). These results implied that using the estimation method of normal distribution did not significantly affect the integrity of estimation. Therefore, this scale used the method of maximum likelihood (ML) for estimation.

Table 4.14 Distribution of the skewness and kurtosis of the observed variables of the occupational choice intention scale

Observed variables	Mean	SD	Skewness	Kurtosis
X1: I am willing to accept various opportunities and challenges at work.	3.80	0.72	-0.16	0.09
X2: I suggest that the cultivation of self-competence is the focus of workplace	3.93	0.71	-0.21	-0.03
X3: I am willing to bear responsibilities and be authorized in future workplaces.	3.87	0.72	-0.23	0.11

4.4.2 Violation of Estimation Testing

Table 4.15 is a summary table of the parameter estimation of the occupational choice intention scale. As shown in the table, the factor loading of occupational choice intention was between 0.76 and 0.82, which was not greater than or close to 1 (0.95 was the threshold value). The standard error was 0.08, suggesting that the overall measurement error was small, and there were no negative variance errors. In other words, there was no violation of estimation. Therefore, the overall model goodness-of-fit could be further assessed.

Table 4.15 Assessment on the occupational choice intention scale violation of estimation

Variables	Factor loading	Standard error	<i>t</i> value	Individual reliability
X1	0.76	0.08	30.74	0.58
X2	0.82	0.08	33.25	0.67
X3	0.79	0.08	32.21	0.63

4.4.3 Goodness-of-fit Test on the Overall Model

This study used a primary hypothetic measurement model to test whether there were three potential factor aspects in the academic achievement scale. Moreover, this study used a covariance matrix of the academic achievement scale to extract the initial model. To obtain a better-modified model, the items with poor individual reliability ($< .50$) were

deleted. After the scale was modified, only three items remained in the academic achievement scale. It was inferred that this was a saturated model consisting of one factor and three measurement variables. Therefore, there was no goodness-of-fit index, and follow-up analysis could only be performed on the three items.

Table 4.16 Goodness-of-fit test on the occupational choice intention scale model

Statistical tests		Standard or threshold value of goodness-of-fit	Initial model
Absolute goodness-of-fit test	χ^2	Chi-square value: the smaller the better ($P \geq \alpha$ value)	No, 2056.66 (P=0.00)
	χ^2 / df	Between 1~5	No, 12.32
	GFI	> 0.8	Yes, 0.85
	RMR	At least < 0.1	Yes, 0.03
	RMSEA	<0.05: excellent, 0.05~0.08: good	No, 0.09
Incremental goodness-of-fit test	AGFI	>0.9	No, 0.82
	NFI	>0.9	No, 0.87
	NNFI	>0.9	No, 0.86
	CFI	>0.9	No, 0.88
	RFI	>0.9, > 0.95 perfect goodness-of-fit	No, 0.85
	IFI	>0.9	No, 0.88
Simplified goodness-of-fit test	PNFI	>0.5	Yes, 0.77
	PGFI	>0.5	Yes, 0.68

4.4.4 Assessment on the Internal Structure of the Model

(1) Reliability assessment

Table 4.17 is a summary table of the reliability and convergent validity of the occupational choice intention scale. As shown in the table, the individual reliability of the occupational choice intention sub-scale was between 0.58 and 0.67, and the construct reliability of the factor was between 0.83. The variance extracted was 0.63, suggesting

that the reliability of the scale was acceptable.

(2) Validity assessment

Convergent validity

Table 4.17 is a summary table of the reliability and convergent validity of the occupational choice intention scale. As shown in the table, the factor loading of each item of occupational choice intention sub-scale was between 0.76 and 0.82, and the construct reliability of the factor was 0.83. The variance extracted the factor was 0.63, suggesting that the convergent validity of the scale was acceptable.

Table 4.17 Summary of the reliability and convergent validity of the occupational choice intention scale

Potential variables	Observed variables	Factor loading	Individual reliability	Construct reliability	Variance extracted
Occupational choice intention	X1	0.76	0.58	0.83	0.63
	X2	0.82	0.67		
	X3	0.79	0.63		

Chapter 5 Structural Equation Model Estimation

5.1 Data Description

This study selected junior and senior college students in Taiwan as the research population to conduct a questionnaire survey. A total of 1,406 valid questionnaires were returned. This study used the statistical package software SPSS for Windows 12.0 to analyze the demographic variables. The results of the descriptive statistics analysis are shown in Table 5.1. There are 621 male subjects (44.2%) and 785 female subjects (55.8%), suggesting that the proportion of female subjects is higher than that of the males. As for other demographic information, the proportion of general private universities or colleges is the highest (41.7%), and most of the students are junior college students (70.9%). Moreover, most of them are aged 21-22 (65.9%), have joined student clubs (64.4%), and have part-time working experiences (79.9%).

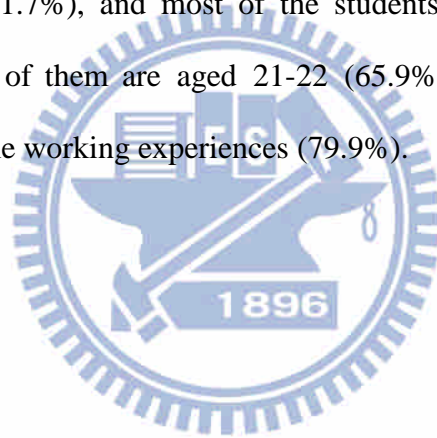


Table 5.1 Analysis on demographic variables (n = 1,406)

Item	Group	Number of people	Percentage (%)
Gender	Male	621	44.2%
	Female	785	55.8%
School Type	General public university/college	369	26.2%
	General private university/college	587	41.7%
	Public technological university/college	101	7.2%
	Private technological university/college	349	24.8%
Year	Junior	997	70.9%
	Senior	384	27.3%
	Above senior	25	1.8%
Age	19 ~ 20 years old	336	23.9%
	21 ~ 22 years old	927	65.9%
	23 ~ 24 years old	109	7.8%
	24 years old and above	34	2.4%
Club Experience	Yes	906	64.4%
	No	500	35.6%
Part-time working Experience	Yes	1124	79.9%
	No	282	20.1%

5.2 T- test and One-way ANOVA

This study conducted independent t-test and one-way ANOVA on demographic variables, including gender, school type, part-time job experience, and monthly family income, in order to discuss the differences among the construct of self-concept, social support, academic achievement, and occupational choice intentions. Finally, Multivariate Analysis of Variance was conducted for discussion.

The analytical results of independent t-test on the constructs and factors of gender are as shown in Table 5.2. As seen, in terms of self-concept, gender has a significant difference in the factors of resistance to stress, physical capacity, and relationship with parents, but it does not have a significant difference in the factors of specialized subjects, friends, and career planning. In terms of social support, gender has a significant

difference in the factors of family support and peer support, while there is no significant difference in teacher support. Moreover, genders have a significant difference in academic achievement; however, it does not have a significant difference in occupational choice intentions.

Table 5.2 T-test on different genders on the constructs

Construct	Factor	Average		F value	T value	P value
		Male N=621	Female N=785			
self-concept	specialized subjects	3.52	3.45	0.22	1.88	0.06†
	resistance to stress	3.63	3.55	1.57	2.25	0.02*
	physical capacity	3.62	3.26	4.57	8.27	<0.01**
	friends	3.52	3.45	0.00	1.67	0.10
	relationship with parents	3.6	3.77	1.67	-4.48	<0.01**
	career planning	3.23	3.24	6.30	-0.31	0.76
social support	families support	3.78	3.93	3.47	-4.30	<0.01**
	teachers support	3.39	3.39	0.67	-0.06	0.96
	peers support	3.76	4.04	19.06	-8.55	<0.01**
academic achievement		2.99	3.52	23.08	-12.17	<0.01**
occupational choice intention		3.86	3.87	1.85	-0.11	0.92

†<0.10; *P<0.05 ; **P<0.01

The analytical results of one-way ANOVA and multivariate analysis of variance on the constructs and factors of school type are as shown in Table 5.3. As seen, in terms of self-concept, school type has a significant difference in the factors of resistance to stress, physical capacity and relationship with parents, but it does not have a significant difference in the factors of specialized subjects, friends and career planning. In terms of social support, it has a significant difference in the factors of social support, family support and peer support, while there is no significant difference in teacher support.

Moreover, school type has a significant difference in academic achievement and occupational choice intentions. According to Scheffe post-hoc comparison, school type has a significant difference in physical capacity, peer support, and academic achievement.

Table 5.3 Analysis of variance on school type

Construct	Factor	school type		
		F value	P value	Scheffe
self-concept	specialized subjects	0.85	0.49	
	resistance to stress	3.03	0.02*	
	physical capacity	3.36	0.01*	1>2
	friends	1.06	0.38	
	relationship with parents	3.54	<0.01**	
	career planning	0.72	0.58	
	families support	3.78	<0.01**	
social support	teachers support	1.72	0.14	
	peers support	7.86	<0.01**	3>1 , 3>2 , 3>4
	academic achievement	4.72	<0.01**	3>2
occupational choice intention		2.50	0.04*	

*P<0.05 ; **P<0.01

The analytical results of independent t-test on the constructs and factors of part-time working experience are as shown in Table 5.4. As seen, in terms of self-concept, part-time job experience has a significant difference in the factors of specialized subjects, resistance to stress, physical capacity, and friends, and it does not have a significant difference in relationship with parents. It has not a significant difference in social support, but there is a significant difference in academic achievement and occupational choice intentions.

Table 5.4 T-test on part-time working experience on different constructs

Construct	Factor	Average		F value	T value	P value
		Yes N=1124	No N=282			
self-concept	specialized subjects	3.50	3.38	2.45	2.85	<0.01**
	resistance to stress	3.61	3.49	1.56	2.71	<0.01**
	physical capacity	3.44	3.32	0.00	2.07	0.04*
	friends	3.50	3.40	5.47	2.06	0.05*
	relationship with parents	3.69	3.71	7.41	-0.42	0.66
	career planning	3.25	3.15	5.86	2.08	0.03*
	families support	3.88	3.81	0.11	1.67	0.10
social support	teachers support	3.39	3.37	0.08	0.61	0.54
	peers support	3.93	3.86	0.04	1.90	0.06†
academic achievement		3.32	3.16	4.86	2.90	<0.01**
occupational choice intention		3.91	3.70	0.03	4.96	<0.01**

†<0.10; *P<0.05 ; **P<0.01

The analytical results of one-way ANOVA and multivariate analysis of variance on the constructs and factors of monthly family income are as shown in Table 5.5. As seen, in terms of self-concept, monthly family income has a significant difference in the factor of friends, and career planning, and it does not have a significant difference in the factors of specialized subjects, resistance to stress, physical capacity, and relationship with parents. In terms of social support, monthly family income has a significant difference in the factor of peer support, but no significant difference in the factors of family and teacher support. Moreover, monthly family income has no significant difference in academic achievement and occupational choice intentions. The Scheffe post-hoc comparison finds that the constructs are not significantly different with respect to family income.

Table 5.5 Analysis of variance on monthly family income

Construct	Factor	Monthly Family Income		
		F value	P value	Scheffe
		(1) NT\$ 15000 and less; (2) NT\$15001~30000; (3) NT\$30001~40000; (4) NT\$40001~60000; (5) NT\$60001~80000 (6) NT\$80001~100000; (7) NT\$100000 and more.		
	specialized subjects	0.74	0.64	
	resistance to stress	1.86	0.07†	
self-concept	physical capacity	0.63	0.73	
	friends	2.27	0.03*	
	relationship with parents	1.53	0.15	
	career planning	2.16	0.04*	
social support	families support	1.32	0.23	
	teachers support	0.90	0.51	
	peers support	2.63	0.01*	
academic achievement		1.60	0.13	
occupational choice intention		1.43	0.19	

†<0.10; *P<0.05 ; **P<0.01

5.3 Current Status and the Differences among the Self-concept and Social Support

5.3.1 Current status and differences of factors relating to self-concept and social support

The purpose of this analysis was to understand the factors of self-concept. The scale contained six factors, including: Specialized subjects, stress tolerance, physical strength, friends, relationship with parents, and career planning. The mean and standard deviation of each factor are shown in Table 5.6. As seen, the mean score for Specialized subjects was 3.48, that for stress tolerance was 3.58, that for physical strength was 3.42, that for friends was 3.48, that for relationship with parents was 3.70, and that for career planning was 3.23.

Table 5.6 Summary of current status of self-concept

Factors	<i>M</i>	<i>SD</i>
Specialized subjects	3.48	0.66
Stress tolerance	3.58	0.66
Physical strength	3.42	0.84
Friends	3.48	0.71
Relationship with parents	3.70	0.70
Career planning	3.23	0.75

After obtaining the mean scores of the various self-concept factors, this study used repeated measures of ANOVA to analyze the level of importance attached to those factors, in order to determine whether there were any significant differences among them. As shown in Table 5.7, the *F* value was statistically significant, suggesting that there was a significant difference among various factors of self-concept. This study further used the least significant difference (LSD) to conduct a post hoc comparison.

Table 5.7 Summary of ANOVA on self-concept factors

Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Subject <i>SSs</i>	173.56	4.66	37.28	92.76*
Independent Variable <i>SSa</i>	2628.00	6541.43	0.40	
Error Variable <i>SSsa</i>	1779.15	1405.00	1.27	

* $p < 0.05$

According to the LSD post hoc comparison, the level of importance of various self-concept factors is shown in Table 5.8. The students are most concerned about the relationship with their parents, followed by stress tolerance, specialized subjects, friends, and physical strength. The level of importance of career planning is the lowest among the factors.

Table 5.8 Summary of LSD post hoc comparison on self-concept factors

Factors	<i>M</i>	Specialized subjects	Stress tolerance	Physical strength	Friends	Parents	Career planning
Specialized subjects	3.48	-	*		*	*	*
Stress tolerance	3.58		-	*	*	*	*
Physical strength	3.42			-	*	*	*
Friends	3.48				-	*	*
Parents	3.70					-	*
Career planning	3.23						-

* $p < 0.05$

5.3.2 Current status and difference of social support factors

The purpose of this analysis was to understand the current status of factors of social support. This scale contained three factors, including families, teachers, and peers. The mean and standard deviation of the factors are shown in Table 5.9. As seen, the mean score for families was 3.87, that for teachers was 3.39, and that for peers was 3.92.

Table 5.9 Summary of current status of social support

Factors	<i>M</i>	<i>SD</i>
Families	3.87	0.66
Teachers	3.39	0.62
Peers	3.92	0.62

After the mean scores of the social support factors were obtained, this study further used repeated measures of ANOVA to analyze the level of importance attached to them, in order to determine whether there are any significant differences among the factors. As shown in Table 5.10, the *F* value was statistically significant, suggesting that there was a significant difference among the various factors of social support. This study used LSD to conduct a post hoc comparison.

Table 5.10 Summary of ANOVA on social support factors

Source of Variation	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Subjects <i>SSs</i>	242.47	1.98	122.14	474.96*
Independent Variable <i>SSa</i>	717.25	2789.16	0.26	
Error Variable <i>SSsa</i>	963.73	1405.00	0.69	

* $p < 0.05$

According to the LSD post hoc comparison, the level of importance attached to the factors of social support is shown in Table 5.11. The students attached the highest level of importance to their peers, followed by their families. The lowest level of importance was attached to their teachers.

Table 5.11 Summary of LSD post hoc comparison on social support factors

Factors	<i>M</i>	Families' support	Teachers' support	Peers' support
Families' support	3.87	-	*	*
Teachers' support	3.37		-	*
Peers' support	3.92			-

* $p < 0.05$

5.4 Path Analysis on the Overall Model of Self-concept, Social Support, Academic Achievement, and Occupational Choice Intention

This study explored whether self-concept and social support would affect academic achievement and occupational choice intention. Structural equation modeling (SEM) was used to perform analyses and test whether the goodness-of-fit between the hypothetical model and the collected data is acceptable. This study intended to establish a correlation model to understand whether self-concept and social support would affect academic achievement and occupational choice intention. Various indices were used to test the model's goodness-of-fit and investigate the cause-and-effect relationship among various potential variables.

SEM was used to test the overall model on its the goodness-of-fit between the

theoretical hypotheses and the empirical data, and to further test the goodness-of-fit level. The indices for the overall goodness-of-fit assessment, the absolute goodness-of-fit statistics, the incremental goodness-of-fit statistics and the parsimony goodness-of-fit statistics were mainly used as the bases for measurement and assessment.

Table 5.12 is a summary of the goodness-of-fit indices for the overall model. The absolute goodness-of-fit statistics for the overall theoretical model were: $\chi^2 = 831.22$ ($p = .00$), GFI = 0.92, RMR = 0.03, and RMSEA = 0.08. The incremental goodness-of-fit statistics for the overall theoretical model were: AGFI = 0.89, NFI = 0.89, NNFI = 0.87, CFI = 0.90, RFI = 0.86, and IFI = 0.90. The parsimony goodness-of-fit statistics for the overall theoretical model were PNFI = 0.71 and PGFI = 0.72. The above indices showed that only the values of χ^2 , AGFI, NFI, NNFI, and RFI failed to meet the standard, while the other seven indices all met the standard. The results met the requirement of majority rule as proposed by Huang (2007); namely, the model would be acceptable as long as at least half of the indices met the standard.

The results of the goodness-of-fit assessment showed that at least a half of the indices met the standard, suggesting that the goodness-of-fit between the overall hypothetical model (the model of self-concept, social support, academic achievement and occupational choice intention) and the empirical data was good. Therefore, there was no need to amend the model. Verification of the hypotheses for the SEM model, and the direct, indirect and total effects among the variables could therefore be investigated.

Table 5.12 Summary of the goodness-of-fit indices of the overall model

Assessment Items	Standard or threshold value of goodness-of-fit	Assessment result	Test of result
Test of absolute goodness-of-fit			
χ^2	Chi square value: the smaller the better ($P \geq \alpha$ value)	831.22 (P=0.00)	Unacceptable
χ^2 / df	Between 1~5	9.90	Unacceptable
GFI	> 0.8	0.92	Acceptable
RMR	At least < 0.1	0.03	Acceptable
RMSEA	< 0.05: good; 0.05~0.08: excellent	0.08	Acceptable
Test of incremental goodness-of-fit			
AGFI	> 0.9	0.89	Unacceptable
NFI	> 0.9	0.89	Unacceptable
NNFI	> 0.9	0.87	Unacceptable
CFI	> 0.9	0.90	Acceptable
RFI	> 0.9, 0.95 perfect goodness-of-fit	0.86	Unacceptable
IFI	> 0.9	0.90	Acceptable
Test of parsimony goodness-of-fit			
PNFI	> 0.5	0.71	Acceptable
PGFI	> 0.5	0.72	Acceptable

5.5 Verification of the SEM Hypotheses

The hypothetical model of self-concept, social support, academic achievement, and occupational choice intention, developed according to the relevant literature, is as follows:

H-1-1: Self-concept has a positive effect on academic achievement.

H-1-2: Social support has a positive effect on academic achievement.

H-2-1: Self-concept has positive effect on occupational choice intention.

H-2-2: Social support has a positive effect on occupational choice intention.

H-3-1: Academic achievement has a positive effect on occupational choice intention.

H-4-1: Self-concept positively affects occupational choice intention through the mediating

effect of academic achievement.

H-4-2: Social support positively affects occupational choice intention through the mediating effect of academic achievement.

H-5-1: Academic achievement has a moderating effect on the positive influence of self-concept on occupational choice intention.

H-5-2: Academic achievement has a moderating effect on the positive influence of social support on occupational choice intention.

The analysis was performed using the statistical package software Amos 17.0, and the results are shown in Tables 5.13 and 5.14. Figure 5.1 is a diagram of the overall path of self-concept, social support, academic achievement, and occupational choice intention. The subjects in this study were divided into the two groups of high academic achievement and low academic achievement, according to their academic performance. The verification results are as follows, and as shown in Table 5.15:

H-1-1: *Self-concept has a positive and direct effect on academic achievement.* The completely standardized coefficient was -0.47 and was statistically significant. Therefore, the research hypothesis of path H1-1 was not supported.

H 1-2: *Social support has a positive and direct effect on academic achievement.* The completely standardized coefficient was 0.73 and was statistically significant. Therefore, the research hypothesis of path H1-2 was supported.

H 2-1: *Self-concept has a positive and direct effect on occupational choice intention.* The completely standardized coefficient was 0.34 and was statistically significant. Therefore, the research hypothesis of path H2-1 was supported.

H 2-2: *Social support has a positive and direct effect on occupational choice intention.* The completely standardized coefficient was 0.19 and was statistically significant. Therefore, the research hypothesis of path H2-2 was not supported.

H 3-1: *Academic achievement has a positive and direct effect on occupational choice*

intention. The completely standardized coefficient was 0.03 and was statistically significant. Therefore, the research hypothesis path of H3-1 was not supported.

Table 5.13 Comparison of the research hypotheses and the empirical results

Research Hypothesis	Relationship	Parameter estimation	<i>t</i> value	Result
H1-1: Self-concept has a positive and direct effect on academic achievement.	--	-0.47	-2.49*	Not supported
H1-2: Social support has a positive and direct effect on academic achievement.	+	0.73	3.81*	Supported
H2-1: Self-concept has a direct and positive effect on occupational choice intention.	+	0.34	2.27*	Supported
H2-2: Social support has a positive and direct effect on occupational choice intention.	+	0.19	1.25	Not supported
H3-1: Academic achievement has a positive and direct effect on occupational choice intention.	+	0.03	0.82	Not supported

* $p < 0.05$

H 4-1: *Self-concept positively affects occupational choice intention through the mediating effect of academic achievement.* The result showed that $Z = -0.64 < 1.96$ ($p > 0.05$) and was not statistically significant. Therefore, the research hypothesis of path H4-1 was not supported.

H 4-2: *Social support positively affects occupational choice intention through the mediating effect of academic achievement.* The result showed that $Z = 0.66 < 1.96$ ($p > 0.05$) and was not statistically significant. Therefore, the research hypothesis path H 4-2 was not supported.

Table 5.14 Summary of the Sobel Test

Path	a	b	Sa	Sb	Test of Statistics (Z)	Hypothesis
H4-1: Self-concept → academic achievement → occupational choice intention	-1.01	0.41	0.02	0.03	-0.64	Not supported
H4-2: Social support → academic achievement → occupational choice intention	1.19	0.31	0.02	0.03	0.66	Not supported

Note: a is the unstandardized path coefficient between the independent variable and the mediating variable; b is the standard error between the mediating variable and the dependent variable; Sa is the standard error of unstandardized path coefficient a; and Sb is the standard error of unstandardized path coefficient b.

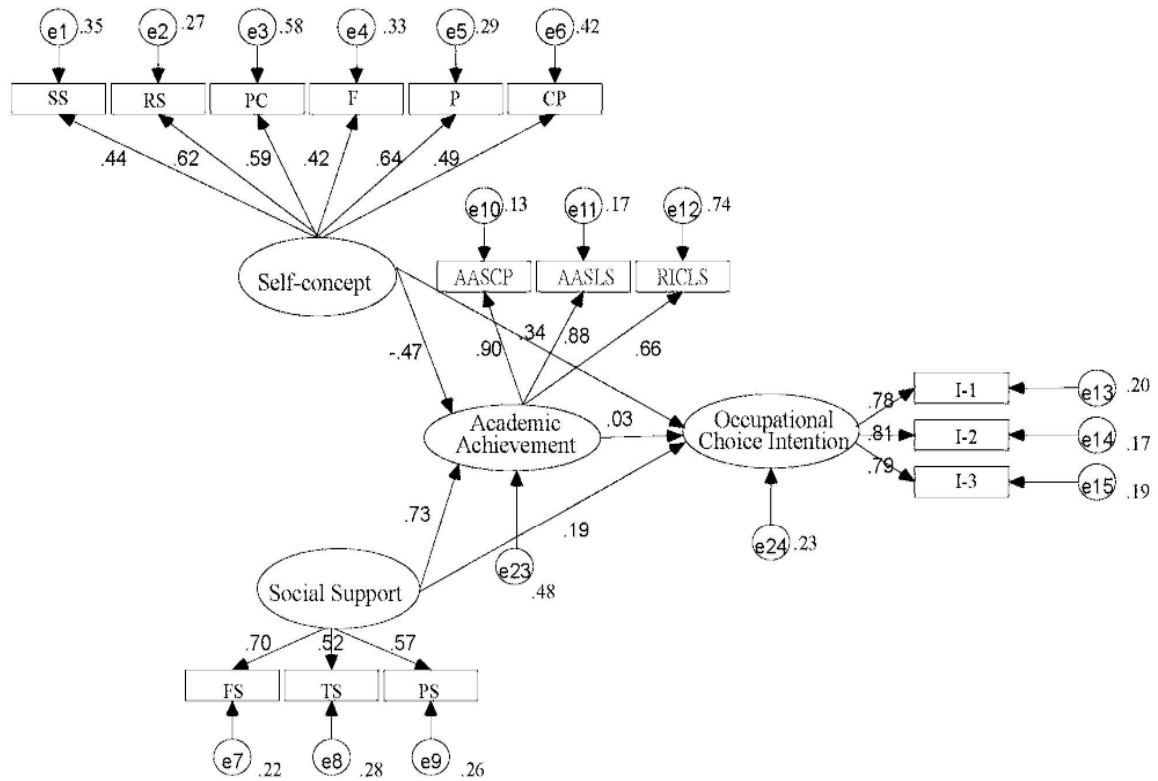


Figure 5.1 Overall model of self-concept, social support, academic achievement, and occupational choice intention and path diagram of standardized parameters and correlation

H 5-1: *Academic achievement has a moderating effect on the positive influence of self-concept on occupational choice intention.* The result showed that $\Delta \chi^2 =$

0.24 ($p > 0.05$), and there was no statistically significant difference. Therefore, the research hypothesis of path H5-1 did not have a moderating effect.

H 5-2: *Academic achievement has a moderating effect on the positive influence of social support on occupational choice intention.* The result showed that $\Delta \chi^2 = 0.17$ ($p > 0.05$), and there was no statistically significant difference. Therefore, the research hypothesis of path H5-2 did not have a moderating effect.

Table 5.15 Test of significance of the moderating effect of path coefficients of academic achievement

Path coefficient	Academic Achievement		Test of difference between coefficient $\Delta \chi^2$	Corresponding hypothesis	Result
	High academic achievement	Low academic achievement			
self-concept and occupational choice intention	0.25*	0.25*	0.24	H5-1	Not supported
social support and occupational choice intention	0.31*	0.33*	0.17	H5-2	Not supported

* $p < 0.05$

The research results showed that among the five paths of the overall path structure model of self-concept, social support, academic achievement and occupational choice intention, the research hypotheses of H1-2 and H2-1 were supported, while those of H1-1, H2-2, and H3-1 were not supported. The research hypotheses of H4-1, H4-2, H5-1, and H5-2 were also not supported.

5.6 Analysis and Discussion of the Effect of Various Paths

According to the results of the parameter estimation and verification of the above path hypothesis, this study further tested the direct, indirect, and total effects of various variables. This study used the t value (> 1.96) to test whether the significance level of 0.05 was met. Chiou (2003) indicated that the direct effect is the direct relationship between

two variables, the indirect effect is the effect of mutual influence through a mediating variable, and the total effect is the sum of all significant and insignificant direct and indirect relevant effects among the variables. The hypotheses of H1- 2 and H2- 1 were supported, while those of H1-1, H2- 2, and H3-1 were not supported, as shown in Figure 4.2. The results of the direct effect, indirect effect, and total effect are summarized in Table 5.16.

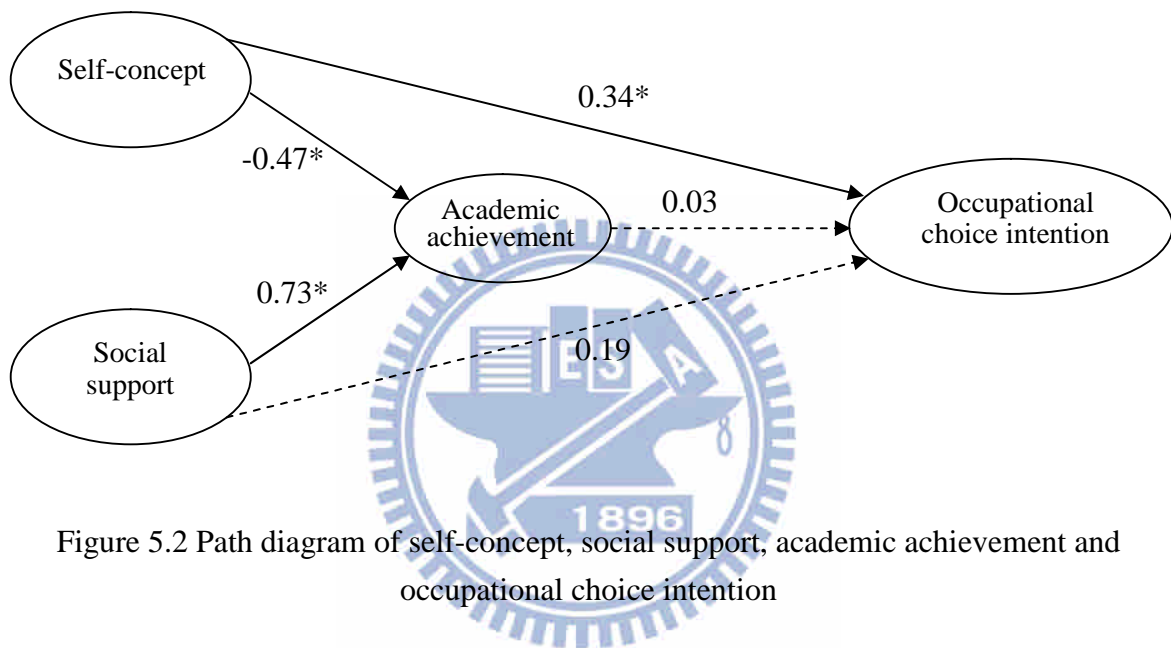


Figure 5.2 Path diagram of self-concept, social support, academic achievement and occupational choice intention

The direct effect of self-concept on academic achievement was -0.47 ($t = -2.49$), and the significance level of 0.05 was met. Because there was no mediating variable between these two variables, there was no direct effect between them. The total effect was also -0.47.

The direct effect of social support on academic achievement was 0.73 ($t = 3.81$), and the significance level of 0.05 was met. Because there was no mediating variable between these two variables, there was no indirect effect between them. The total effect was also 0.73.

The direct effect of self-concept on occupational choice intention was 0.34 ($t = 2.27$), and the significance level of 0.05 was met. Because there was a mediating variable

between these two variables, the indirect effect was -0.01. The total effect was 0.33.

The direct effect of social support on occupational choice intention was 0.19 ($t = 1.25$), and the significance level of 0.05 was not met. Because there was a mediating variable between these two variables, the indirect effect was 0.02. The total effect was 0.21.

The direct effect of academic achievement on occupational choice intention was 0.03 ($t = 0.82$), and the significance level of 0.05 was not met. Because there was no mediating variable between the two variables, there was no indirect effect. The total effect was also 0.03.

Table 5.16 Summary of the analysis on the effect of various paths in this study

Path	Standardized coefficient	<i>t</i> value
Path between self-concept and academic achievement		
Direct effect	-0.47	-2.49*
Indirect effect	---	
Total effect	-0.47	
Path between social support and academic achievement		
Direct effect	0.73	3.81*
Indirect effect	---	
Total effect	0.73	
Path between self-concept and occupational choice intention		
Direct effect	0.34	2.27*
Indirect effect	-0.01	
Total effect	0.33	
Path between social support and occupational choice intention		
Direct effect	0.19	1.25
Indirect effect	0.02	
Total effect	0.21	
Path between academic achievement and occupational choice intention		
Direct effect	0.03	0.82
Indirect effect	---	
Total effect	0.03	

* $p < 0.05$

Chapter 6 Conclusion and Discussion

Based on the analysis on research samples, this study gained an understanding of the effects of various factors, such as self-concept, social supports, and academic performances on occupational choice intentions, as well as the indirect effects of self-concept and social supports on occupational choice intentions through the mediating variables of academic performance. The results were validated by SEM. According to the research purposes and results, this study proposed conclusions and suggestions as references for future studies on self-concept, social support, academic performance, and occupational choice intention.

6.1 Conclusion

According to the results of statistical analyses, this study reached the following conclusions. The results of confirmatory factor analysis showed that, in terms of the level of agreement with the six factors of specialized subjects, stress tolerance, physical strength, friends, relationship with parents, and “career planning, the level of agreement with relationship with parents was the highest, indicating that college students suggested that it is important for parents to understand and respect their children. In terms of interaction, the students like to show their care about their parents in order to maintain the intimate relationship with them. The next-highest level of self-concept is stress tolerance. The research results showed that the subjects usually have a calm and relaxed emotional status, can steadily face setbacks, and are usually in a delightful mental state. From the level of agreement with the self-concept of specialized subjects, it is inferred that the students are interested in the specialized subjects they are learning, and feel that the subjects could bring out their inner talents. Moreover, they are willing to make more effort in the learning of specialized subjects. As for the level of agreement with the

self-concept of friends, the students are satisfied with their interpersonal relationships and interactions, and they also suggest that it is very easy for them to make friends. The level of agreement with the self-concept of physical strength shows that individuals perform well in physical strength-related activities, and they also like to engage in physical strength-related activities. The level of agreement with the self-concept of career planning is the lowest. The reason may be that the students are still studying, and cannot specifically plan their future careers. They can only prepare for the future by having an aggressive attitude.

The results of the confirmatory factor analysis on the constructs of social support showed that, in terms of the level of agreement with three factors, families, teachers, and peer, the level of agreement with peers was the highest, indicating that college students suggested that friends would provide them with consolation and support at the right moments, and are willing to listen and share experiences. The students would encourage one another and help analyze problems when they encounter difficulties. The level of agreement with families is lower. The results showed that families would encourage the students and respect their personal decisions. Families are also willing to listen to the joys and frustrations they face during the learning process, and could provide the students with spiritual support. The level of agreement with teachers is the lowest. The results showed that although teachers are seen as playing the role of someone who could understand students' feelings, respect their ideas, and approve their effort and performance. The overall level of agreement with teachers is still lower than that for the other factors.

In terms of the level of importance of social support, this study found that degrees of importance, from the highest to the lowest, are in the following order: peers, families, and teachers. This finding is consistent with Cho (2010). Most students only attach importance to interactions with peers. Therefore, this study suggested that, in addition to maintaining good interactions with peers, college students should also be encouraged to

frequently participate in learning activities and be exposed to various learning opportunities where they can closely interact with advisors and school teachers, as teachers are the one responsible for course planning, teaching activities, and interacting with students. Consequently, teachers should be encouraged to interact with the industries to understand industrial practices and developmental trends, establish interactive platforms to assist students in increasing employability, and timely and effectively improve students' employability in the process of formal school education (Lio, Chiou and Hu, 2006). By such actions, students' learning of professional competence and skills can be improved. Moreover, it will be beneficial to their future life planning, expansion of social and interpersonal resources, conveyance of experiences, and maintenance of good relationships with teachers, which may substantially benefit their cultivation of future employability.

Based on the statistical analysis on the overall model, the following conclusions are proposed. There is a significantly negative relationship between the self-concept and academic performance of college students. Based on literature review, in terms of students' individual factors, some scholars suggested that stronger self-concept and self-esteem of students lead to better academic performance (Ko1sa, 1989; Melnick, 1992). Based on the above, students' self-concept is a factor affecting their academic performance; however, this study also found a significantly negative relationship between students' self-concept and academic performance. An inferred result is that there are many college students that do not care about academic performance; and some students suggested that self-concept and academic performance are not important, which may explain why self-concept has a significantly negative effect on academic performance.

Social support has a positive effect on college students' academic performance. Among the factors of social support, the importance of support from peers is the highest, followed by the support from parents. William and Kristan (2006) indicated that peers are

very important resources of social support. The social capital of peer network involves the establishment of mutual habits and influence. Good peer interactions can allow students to help each other solving academic problems, and even entering colleges. Brooks (2007) found that during the stage of college education, college students are strongly influenced by peer relationships in the aspects of academic performance and extracurricular activities. This study found that friendships with peers could provide college students with mutual emotional support. In addition, experiences other than academic activities would affect students' college education. Therefore, it is necessary to provide college students with adequate encouragement and support.

Self-concept has a positive effect on occupational choice intention. Previous studies have seldom investigated the influence of self-concept on occupational choice intention. However, this study verified that the basic cognition of students' self-concept is preliminarily developed at the college stage. As a result, it is reasonable that self-concept has an effect on the short-term occupational choice intention of college graduates. Therefore, college education should cultivate students' professional workplace competence in a timely manner in order to ensure that they can select appropriate directions for career choices.

6.2 Implication for Practice

College education is no longer for the elite. With the prevalence of college education, vocational and technical colleges attaching importance to practices and skills can help develop a journey of professional learning to improve students' academic performance, as well as to cultivate their skills and explore their potentials. Previous studies have found that educational background, school of graduation, and academic performance are important screening criteria for enterprises to recruit employees. However, many enterprises also use aptitude tests to help obtain information of potential employees'

personality and attitudes. Moreover, probationary periods are used to determine whether graduates possess sufficient core employability. Therefore, educational background, school of graduation, and academic performance seem to serve as criteria for graduates who are entering the workplace. On the contrary, core employability usually determines college students' post-graduation work performance. Consequently, the importance of a proactive cultivation of occupational choice intentions during college life increases with students' career development process (Lio et al., 2006). The results of this study showed that self-concept has a positive and direct effect on occupational choice intention. Therefore, colleges should provide students with more activities concerning self-concept, career exploration, and life exploration through student counseling. For example, colleges can provide students with tests that assist them in understanding themselves, their degree of competence, and value. Colleges can also host forums, inviting teachers, scholars, or alumni to serve as role models for the students. Other activities, such as field visits, keynote speeches on career planning, career consultation, and group counseling can be provided to improve students' self-concept and decision-making abilities for occupational choice intention.

Regarding course planning, colleges should open courses of career planning in the general education program. The course contents can include self-career development and planning, exploration of self-interests and aptitude, and workplace environments, so as to assist students preparing for future employment. For junior and senior college students, it is necessary to place particular emphasis on career planning, including an understanding of career interests and values, information on further education and employment, career decision-making skills, writing of resume and cover letter, and interview skills to enable them to fully understand future potential career planning, develop specific objectives, take actions, and successfully move forward from a school education into the labor market. Therefore, in addition to the instruction of professional knowledge and skills, it is

also necessary to guide students in establishing accurate values for future workplaces, experience practical functions of school education, and connect themselves with industrial circles at the right moment to implement the theories and practices they have learnt. This study mainly analyzed college students' occupational choice intentions, and provided the analysis results as reference for higher education institutions in Taiwan to meet students' needs for future employment after they enter professional fields, as well as to meet the needs of employment markets. In sum, current college students are deficient in concepts of career choices. In addition to enabling students to gain professional knowledge, college education should help them cultivate diverse career cognition and employability to prevent them from facing unemployment after graduation.

6.3 Limitation and Future Research

Freshmen and sophomores were excluded from this study, as they are still in the process of adapting themselves to the college life and learning. This study selected junior and senior students as the subjects, as they have lived school life for more than two years, and are preparing to enter workplaces. Moreover, students at in-service programs and further education programs were also excluded from this study, as their ages were widely varied and some had work experience, meaning that occupational choice intention was no longer the most important objective of career development. Consequently, this study only selected junior and senior students as the subjects, thus, the research results may not be extended to a larger scope. Regarding limitations of research variables, as this study investigated the relationships among college students' self-concept, social supports, academic performances, and occupational choice intentions, it did not probe into other variables affecting students' further education or employment intentions. Regarding the limitations of research methods, due to the limitations of time, financial resources, and manpower, this study used a quantitative questionnaire as a research tool to analyze and

interpret the results, and declined further investigation using qualitative approaches.

In terms of research methods, as this study only used a higher statistical analysis approach, SEM, for analysis and did not use any qualitative approach, the results may not be fully analyzed or interpreted. Therefore, future studies are advised to use qualitative interviews, observation methods, in-depth interviews, etc. to further understand the predictive power and status of college students' self-concept, social supports, and academic performances to occupational choice intention. Moreover, it is advised to use action research to assist students in developing mature decision-making skills and certainty in career choice.

In terms of research contents, this study simply investigated students' self-concept, social support, academic performance, and occupational choice intention. Therefore, the explanatory power of the overall self-concept, and its aspects regarding occupational choice intention, were not high, suggesting that many affecting factors remain to be investigated. Moreover, this study presumed that because self-concept covers various aspects, its effect on occupational choice intention may be lower. If the relationships between various aspects and occupational choice intentions are investigated, the explanatory power of occupational choice intention may be higher, which could be explored in future studies.

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