Are Interpersonal Strengths Associated with Academic Achievement and Interests?

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Abstract

This study examined the associations between interpersonal strengths and academic achievements and interests in a sample of 248 university students. Interpersonal strengths were assessed by the Inventory of Interpersonal Strengths (IIS), which conforms to the two-dimensional interpersonal circumplex (IPC) model of personality. Academic achievement indexed by high school GPA and SAT scores and college GPA, were correlated with the agentic (dominant—submissive) and communal (warm—cold) dimensions of interpersonal strength. Academic interests were indexed by the student's current major. Students were classified into one of four interpersonal types based on the level of their agentic and communal interpersonal strengths (Warm-Dominant; Cold-Dominant; Cold-Submissive; Warm-Submissive). Chi-square analyses were conducted to examine the distribution of student majors as a function of interpersonal strength classification.

Introduction

Young peoples' lives are constantly changing as they balance their time between school, work, family, and friends. These stressors, combined with the actual experience of attending college, negatively affect many students. Topics such as college attrition and retention rates, depression among college students, socio-economic diversity, and on-campus culture tend to dominate studies about this demographic (Freeman et. al, 2007; Wothington, & Higgs, 2003; Lackland, & Lisi, 2001). Although focusing on the ways in which college students experience stress may benefit education policy and programming designed to resolve this issue, few studies investigate how student ability relates to interpersonal strengths. Previous research has validated the importance of interpersonal relationships and self-efficacy in young peoples' lives (Martin & Dowson, 2009; Picou & Curry, 1973; Anderman & Anderman, 1999; Freeman & Anderman, 2007; Sayeed & Jain, 2000; Farsides & Woodfield, 2003; Bong, 2001). Having good interpersonal relationships gives an individual the tools to obtain assistance with tasks and challenges, receive emotional support, and experience companionship in shared activities (Martin & Dowson, 2009). Having a sense of self-efficacy gives the individual the capability to manage academic tasks and goals, and also the ability to better handle stress, anxiety and depression (Zimmerman, 2000). In the current study, both relational ability and self-efficacy are considered interpersonal strengths.

This study considers how interpersonal strengths influence college students' academic achievement and major selection. It is important to know what interpersonal factors contribute to a students' academic achievement and selection of major for at least two reasons. First, this can help student's recognize what their interpersonal strengths are, and how to best utilize their interpersonal strengths to help achieve their full potential in the college setting. This may lessen depression and student attrition rate in college students because they can select majors that best fit their interpersonal strengths. Second, this may also help Universities, as they lose money due to college students dropping out.

Gerdes and Mallinckrod (1994) found that students underestimate how difficult it is to adjust to the college environment. Individuals who had dropped out were not sure about their own academic goals, and reported to be more stressed and anxious. However, the researchers also indicated that interventions that incorporated both social and academic skills contribute to student's retention. This can give universities the tools to help their students decide which major they should pursue, and help the students achieve their full potential. Astin (1977) found that, "When we compare individual students' high school grades and college grades, we find that about one in three obtains the same grades in college as in high school, only about one in five obtain higher grades, and nearly half obtain lower grades." It is no surprise that students earn lower grades in college than they did in high school. This could be attributed to a number of factors such as classroom size and attention from faculty, stress and adjusting to the university.

Self-efficacy is also a construct that is related to student's academic success. In fact, self-efficacy has not only been correlated with academic achievement, but it is also correlated with academic choices, changes, and with other self-beliefs (Pajares, 1996). Other studies have supported these findings that self-efficacy is an important predictor of the selection of major and career (Shunk, 1989). To demonstrate how important self-efficacy is in the academic setting, not only for major selection but for achievement, (Lent et. al., 1984, 1986) study found that individuals who major in science and engineering demonstrated high self-efficacy that

influenced the students determination that is needed to uphold high academic achievement. In all, researchers have found that self-efficacy beliefs give students a sense of agency to strategize, set goals, self-monitor, and self-evaluate to improve their academic success (Zimmerman, 2000).

Examining interpersonal relationships, self-efficacy, and major selection could better helps students transition into college by fitting them with a major that best suits their interpersonal strengths, personality, and goals.

Personality, Social Functioning, Self-Efficacy, and Academic Achievement

Many studies identify personality as one of the major factors influencing the formation of interpersonal relationships (McCrae, & Costa, 1989). Personality studies using the five-factor model of personality traits demonstrate a positive relationship between students who are higher in trait Agreeableness and their academic achievement. Agreeableness is expressed as characteristics such as being sociable, even-tempered, warm, caring, receptive, and dependable (Judge & Bono, 2000; Mount et al., 1998). Farsides and Woodfields (2003) found that Agreeableness was positively correlated with better attendance at seminars and higher academic achievement. Thus, the more agreeable students scored higher on their final grades, in part due to the fact that they were less likely to skip seminars. The study also found that students who were quite high in Agreeableness might flourish when the teaching and assessment occurs through collective interaction. In other words, students who are high in Agreeableness work best in-group settings where they are able to share ideas. In contrast, students who are lower in Agreeableness work best in academic settings where students are less inclined to work together (Farsides, & Woodfield, 2003).

Consistent with results for Agreeableness, studies have also examined social functioning and academic achievement. Freeman, Anderman, and Jensen (2007), found that elementary school students' sense of community was positively associated with their academic motivation. Additionally, in a sample of middle school students, they found a positive relationship between students' perceptions of belonging and a broad measure of academic motivations (Freeman et. al, 2007). The study showed that the more an individual feels as if they belong to a peer group, they are more likely to have higher achievement motivation. An earlier study by Anderman and Anderman (1997) yielded similar results. They found increased focus on academic tasks was associated with the sense of psychological belonging in school and the support of social responsibility goals (i.e., adherence to social rules and expectations). In contrast, those who did not endorse social responsibility roles, but only social goals (i.e., individuals for whom peer relationships and status are especially salient) were more self-focused and relied more on the peer group for evidence of their own academic success (Anderman, & Anderman, 1997). That is, the individuals who sought out friendships to maintain status did not care as much about their academics as the individuals who endorsed social responsibility goals.

In addition to Agreeableness and social functioning, self-efficacy also has an impact on student's academic achievement. Albert Bandura defines self-efficacy as, "…judgments of how well one can execute courses of action required to deal with prospective situations" (p. 122). There have been many studies that examine the effect of self-efficacy on a student's grades, motivation, and academic performance (Wood, & Locke, 1987). Individuals with low self-efficacy may avoid tasks that they see as challenging, and individuals with high-self efficacy will embrace task challenges (Bandura, 1977; Weiner, 1979). Zimmerman (2000) found that students who are self-efficacious work harder, persist longer, and have less negative emotional reactions than those who are less self-efficacious. He also suggested that student's belief in self-efficacy

could also emotionally influence them and decrease stress, anxiety, and depression when managing academic responsibilities. Also, when a student believes that they can successfully accomplish all of the educational requirements that are associated with the career in that major, they are more likely to choose that career than students who doubt their competence (Schunk, 1989). When an individual develops good interpersonal relationships and has a high sense of self-efficacy they are more likely to succeed in their academics and maintain a support system. However, when individuals do not have good interpersonal relationships or has low self-efficacy, there can be negative effects not only on the individual's academic achievement, but also their psychological well-being. For example, one study found that when an individual fails to form satisfactory interpersonal relationships in college it is correlated with depression, anxiety, suicide, criminality, and freshman attrition (Freeman et al., 2007).

Another important negative trait that stems from not having good interpersonal relationships and low self-efficacy, is the tendency to experience greater stress (Baumeister, & Leary, 1995). This could be because individuals who do not have stable interpersonal relationships do not receive assistance for coping and a buffer against stress (Baumeister, & Leary, 1995) and yet simultaneously do not feel up to the challenges of life (Bandura, 1977). Thus, the lack of interpersonal relationships and low self-efficacy can have a negative affect on individuals both psychologically and physically. With evidence supporting such, one can see how these negative affects may be able to carry on to impact an individual's academic life and impact them negatively.

Given the evidence reviewed, it is important to study how interpersonal relationships and self-efficacy can affect an individual in an academic setting. First, in college students, interpersonal functioning could affect the student's grades and their choice of major, depending on their particular goals and worries. Second, individuals may be more motivated and more engaged in the academic setting if individuals have good interpersonal relationships and a sense of belonging.

Social Functioning, Personality, and Academic Interests

This study will also look at the choice of major and interpersonal strengths. There are many factors that contribute to a student's choice of major such as gender and racial segregation, traditional gender roles, academic ability, and personality (Umbach, & Porter, 2006; Lackland, & Lisi, 2001; Austin, 1993). There has been a considerable amount of research examining associations between choice of major and personality traits. The most prominent theory of personality and major choice is Holland's theory of careers (Porter & Umbach, 2006). Holland's theory proposes that individuals select their major based not only on academic interests, but also based on the ability to covey their capabilities, talents, points of view and beliefs in that particular major (Brown, 2002). Based on this assumption, Holland has developed six representative environments that tell us which personality traits fit which majors. These environments consist of realistic (electrical engineering, mechanical engineering), investigative (biology, math, economics, sociology), social (political science, nursing, philosophy), enterprise (business, communications, computer science), artistic (English, architecture), and conventional (accounting) (Porter, & Umbach, 2006). A student's interpersonal relationships, preferences for social functioning, and self-efficacy are likely to be associated with which major environments (Brown, 2002).

Hackett and Betz (1981), has suggested that self-efficacy can help predict an individuals career options. This is predicted by the students self-efficacy for learning or performing the

various tasks that are related to the job (Hackett & Betz, 1981). More recent studies have validated this theory. Zimmerman (2000) found a strong correlation between a student's measure of self-efficacy and major selection in college. The relationship between self-efficacy and choice of major or career could be in part because individuals who are self-efficacious are more likely to persist longer and are more likely to greatly increase their ability to achieve their goals when they perceive that the extra effort will produce an outcome that they see as favorable (Weiner, 1979).

An Interpersonal Lens: Agency and Communion

In this study, I use the Interpersonal Circumplex (IPC) model of personality (Pincus & Ansell, 2013) as a lens to examine social functioning, self-efficacy, academic achievement, and academic interest. Freedman et al. (1951) were the first to publish about an interpersonal system of personality diagnosis. Their work continues to influence contemporary research about this subject because it established a standardized method for operationally defining interpersonal variables through personality traits. (Freedman et. al., 1951). Other researchers drew on Freedman et al.'s methodology and continued to develop an empirically based interpersonal system of personality diagnosis (see Leary, 1957; Chance, 1959; Benjamin, 1973; Wiggins, 1979).

In a seminal review and integration of the interpersonal nature and relevance of Bakan's (1966) metaconcepts of "agency" and "communion," Wiggins (1991, 1997a, 2003) argued that these two superordinate dimensions have propaedeutic explanatory power across scientific disciplines. "Agency" refers to the condition of being a differentiated, and self-efficacious individual, and it is manifested in strivings for power and mastery, which can enhance and protect one's differentiation. "Communion" refers to the condition of being part of a larger social or spiritual entity, and is manifested in strivings for intimacy, union, and solidarity with the larger entity. Bakan (1966) noted that a key issue for understanding human existence is to comprehend how the tensions of this duality in our condition are managed. Wiggins (2003) proposed that agency and communion are most directly related to Sullivan's theory in terms of the goals of human relationship: security (communion) and self-esteem (agency). As can be seen in Figure 1 these metaconcepts form a superordinate structure used to derive explanatory and descriptive concepts at different levels of specificity. At the broadest and most interdisciplinary level, agency and communion classify the interpersonal motives, strivings, and values of human relations (Horowitz, 2004). In interpersonal situations, motivation can reflect the agentic and communal nature of the individual's personal strivings or current concerns, or more specific agentic and communal goals (e.g., to be in control; to be close) that specific behaviors are enacted to achieve (Grosse Holtforth, Thomas, & Caspar, 2010; Horowitz et al, 2006).
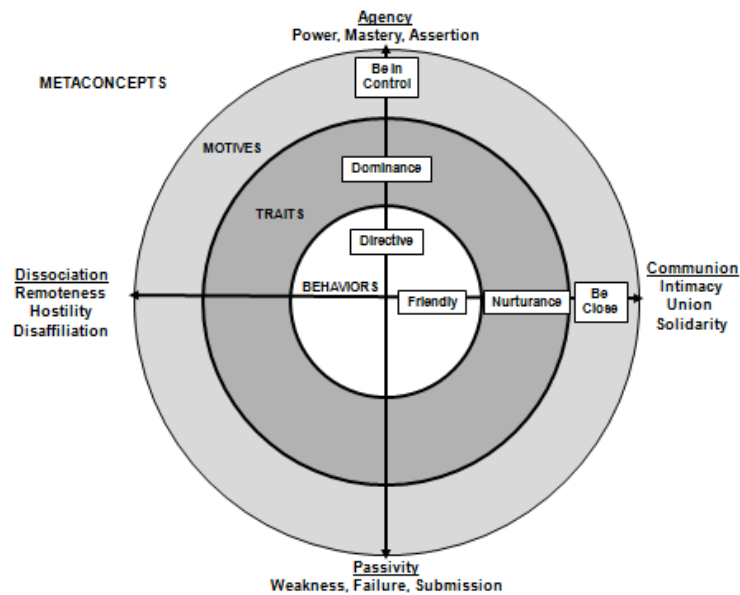
Figure 1: Agency and Communion

At more specific levels, the structure provides conceptual coordinates for describing and measuring interpersonal dispositions and behaviors (Wiggins, 1991). The intermediate level of dispositions includes an evolving set of interpersonal constructs (Hopwood et al., 2011; Locke, 2006, 2010). Agentic and communal dispositions imply enduring patterns of perceiving, thinking, feeling, and behaving that are probabilistic in nature, and describe an individual's interpersonal tendencies aggregated across time, place, and relationships. At the most specific level, the structure can be used to classify the nature and intensity of specific interpersonal behaviors (Moskowitz, 1994, 2005, 2009). Wiggins' theoretical analysis simultaneously allows for the integration of descriptive levels within the interpersonal tradition as well as expansion of the conceptual scope and meaning of interpersonal functioning. Contemporary interpersonal theory proposes that (a) agency and communion are fundamental metaconcepts of personality, providing a superordinate structure for conceptualizing interpersonal situations; (b) explicatory systems derived from agency and communion can be used to understand, describe, and measure interpersonal motives, dispositions, and behaviors; and (c) such systems can be applied equally well to the objective description of contemporaneous interactions between two or more people (e.g., Sadler, Ethier, Gunn, Duoung, & Woody, 2009) and to interpersonal situations within the mind evoked via perception, memory, fantasy, and mental representation (e.g. Lukowitsky & Pincus, 2011).

The emphasis on interpersonal functioning in Sullivan's work led to efforts to develop orderly and lawful conceptual and empirical models describing interpersonal behavior (for reviews of these developments, see LaForge, 2004; LaForge, Freedman, & Wiggins, 1985; Leary, 1957; Pincus, 1994; Wiggins, 1982, 1996). The goal of such work was to obtain an interpersonal taxonomy of dispositions and behaviors, that is, "to obtain categories of increasing generality that permit description of behaviors according to their natural relationships" (Schaefer, 1961, p. 126). In contemporary terms, these systems are referred to as structural models, which can be used to conceptually systematize observation and covariation of variables of interest. When seen in relation to the metaconcepts of agency and communion, such models become part of an illuminating nomological net.

Empirical research into diverse interpersonal taxa including traits (Wiggins, 1979), problems (Alden, Wiggins, & Pincus, 1990); sensitivities (Hopwood et al., 2011), values (Locke,

2000), impact messages (Kiesler, Schmidt, & Wagner, 1997), strengths (Hatcher & Rogers, 2009), efficacies (Locke & Sadler, 2007), and behaviors (Benjamin, 1974, 2010; Di Blas, Grassi, Luccio, & Momenté, in press; Gifford, 1991; Moskowitz, 1994; Trobst, 2000) converge in suggesting the structure of interpersonal functioning takes the form of a circle or "circumplex" (Gurtman & Pincus, 2000; Wiggins & Trobst, 1997). An exemplar of this form based on the two underlying dimensions of dominance-submission (agency) on the vertical axis and nurturance-coldness (communion) on the horizontal axis is the most common instantiation of the IPC (see Figure 2). The geometric properties of circumplex models give rise to unique computational methods for assessment and research (Gurtman & Balakrishnan, 1998; Gurtman & Pincus, 2003; Wright, Pincus, Conroy, & Hilsenroth, 2009). Blends of dominance and nurturance can be located along the 360-degree perimeter of the circle. Interpersonal qualities close to one another on the perimeter are conceptually and statistically similar, qualities at 90 degrees are conceptually and statistically independent, and qualities 180 degrees apart are conceptual and statistical opposites. Although the circular model itself is a continuum without beginning or end (Carson, 1996; Gurtman & Pincus, 2000), any segmentalization of the IPC perimeter to identify lower-order taxa is potentially useful within the limits of reliable discriminability. The IPC has been segmentalized into sixteenths (Kiesler, 1983), most commonly octants (Wiggins, Trapnell, & Phillips, 1988), and quadrants (Carson, 1969).
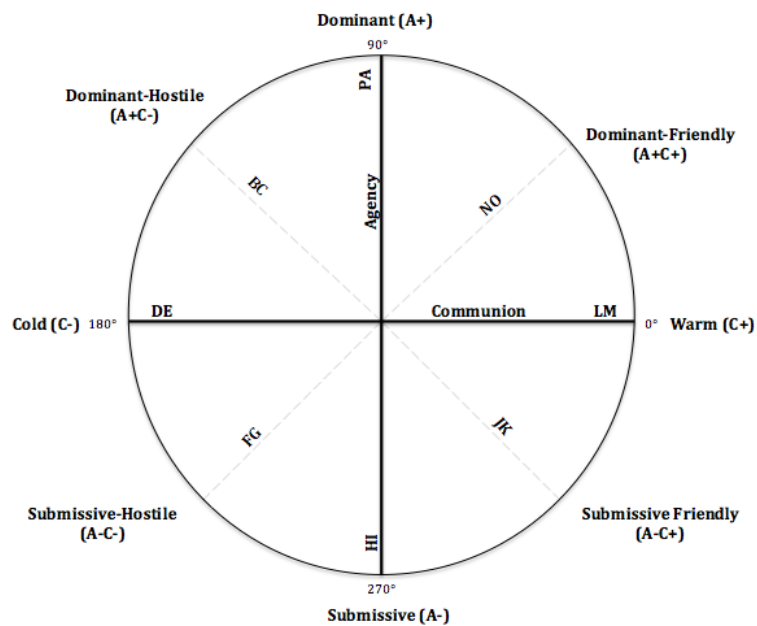

Figure 2: Interpersonal Circumplex

Intermediate-level structural models derived from agency and communion focus on the description of the individual's interpersonal dispositions that, when understood in relation to their motives and goals, are assumed to give rise to adaptive and maladaptive behavior that is generally consistent across interpersonal situations (Horowitz & Wilson, 2005; Wiggins, 1997b). Thus, we can use circumplex models to describe a person's typical ways of relating to others and refer to their interpersonal style or theme. Using IPC models to classify individuals in terms of their agentic and communal characteristics is often referred to as "interpersonal diagnosis"

(Pincus & Wright, 2010; Wiggins, Phillips, & Trapnell, 1989). In this study, I use the IPC to classify participants into distinct categories of interpersonal style.

Students will be classified into one of four categories of predominant Interpersonal style based on their responses to the Inventory of Interpersonal Strengths (Hatcher & Rogers, 2012). These categories consist of dominant-friendly (A+C+), dominant-cold (A+C-), submissive-cold (A-C-), and submissive-friendly (A-C+).

Inventory of Interpersonal Strengths (IIS)

The inventory of interpersonal strengths, the IIS-32, was used to collect data from the individuals who participated in the study. This inventory encompasses positive interpersonal qualities across all areas of the interpersonal circle (Hatcher, & Rogers, 2012). Hatcher and Rogers (2009) define strengths as, "Interpersonal features that contribute to interpersonal competence, emotional stability, fewer interpersonal problems, and better relationship outcomes, among other positive indicators." The inventory is unique in that it also measures the strengths associated with low communion octants on the left side of the circle that traditionally have been considered more negative (Hatcher & Rogers, 2009).

Current Study

The current study examined the associations between interpersonal strengths and academic achievement (high school and college GPA, SAT scores) and academic interest (major, academic college) in undergraduate students. Based on their IIS scores, students were classified into one of four interpersonal strength groups (A+, C+; A+C-; A-,C-; A-C+). The study examined whether academic achievement and interests were associated with particular interpersonal strengths.

Hypotheses

The previous research has shown that a students' interpersonal situation can have a positive or negative effect on a students' achievement. Based on the literature, this study will utilize participants SAT scores and high school and college GPAs. It is proposed that communal strengths associated with effective relating and agentic strengths associated with self-efficacy and striving will both correlate positively with indicators of academic achievement (high school GPA, SAT score, college GPA).

The previous literature has shown that there are strong correlations between personality traits and choice of college major. As previously stated, Holland's Theory of Careers proposes that a students' social functioning preferences are likely to be associated with major environments that they find more attractive. According to Holland's theory, individuals who choose certain environments (e.g. realistic, investigative, artistic, social, and enterprising) will have personality traits that coincide with the environment (Brown, 2002). However, individuals may share traits from more than one environment (Brown, 2002). According to this theory, individuals in the six environments will exhibit some of the following traits: Individuals who are categorized in the *Realistic* environment have traits such as hard-headed, quite, and reserved; individuals who are categorized in the *Investigative* environment exhibit traits such as analytical, mechanical, and precise; individual's who are categorized in the *Artistic* environment exhibit traits such as power-seeking, non-conforming, and radical; individuals who are categorized in the *Social* environment exhibit traits such as friendly, sociable, and sincere; individuals who are categorized in the *Enterprising* environment exhibit traits such as aggression, dominance, and

power-seeking; last, individuals who are categorized in the *Conventional* environment exhibit traits such as shrewd, conforming, and rebellious (Brown, 2002). From Holland's theory, several hypotheses are predicted (Table 1):

- *H1*: It is predicted that individuals whose majors are in the *Social* and *Conventional* environment will both be high in agency and high in communion (A+C+).
- *H2*: Individuals whose majors are in the *Enterprising* environment are predicted to score high in Agency (A+).
- *H3*: Individuals whose majors are in the environments *Realistic, Investigative, and Artistic* are predicted to both score high in agency and low in communion (A+C-).
- *H4*: It is predicted that individuals who are undecided about their major (division of undergraduate studies) will be low in agency and high in communion (A-C+).

Table 1: Holland's Theory of Careers

Environment	Major	Hypotheses
Realistic: Disciplines that, "…focus on concrete practical activities that often use machines or tools" (Porter, & Umbach, 2006).	Electrical Engineering Mechanical Engineering Information Science and Technology Security Risk Analysis Chemical Engineering	It is predicted that individuals whose major is in the *Realistic* environment will score high in agency and low in communion (A+C).
Investigative: Disciplines that, "…the acquisition of knowledge through investigation and problem solving" (Porter, & Umbach, 2006).	Biology Math Sociology Forensic Science Bio behavioral health Civil Engineering Kinesiology Chemistry Meteorology Biochemistry and Molecular Biology Earth and Mineral Science Veterinary and Biomedical Science Animal Science	It is predicted that individuals whose major is in the *Investigative* environment will score high in agency and low in communion (A+C-).
Social: Disciplines that, "…emphasize the acquisition of interpersonal competencies" (Porter, & Umbach, 2006).	Political Science Nursing Education Human Development and Family Studies Rehabilitation and Human Services Criminology Philosophy Pre-Med Athletic Training Nutrition Health and Policy Administration Communication Sciences and Disorders	It is predicted that individuals whose major is in the *Social* environment will be high in agency and high in communion (A+C+).
Enterprising: Disciplines that,"…emphasize leadership development and reward popularity, self-confidence and aggressiveness" (Porter, & Umbach, 2006).	Marketing Labor Employment and Relations Public Relations Hotel, Restaurant, and Institution Management Management Hospitality Management Advertising Computer Science Communication	It is predicted that individuals whose major is in the Enterprising environment will score high in Agency (A+).
Artistic: Disciplines that, "…encourage the acquisition of innovative and creative competencies" (Porter, & Umbach, 2006).	Art Architecture	It is predicted that individuals whose major is in the *Artistic* environment will score high in agency and low in communion (A+C-).
Conventional: Disciplines that, "…emphasize a conventional outlook and are concerned with orderliness and routines" (Porter, & Umbach, 2006).	Accounting Economics Finance	It is predicted that individuals whose major is in the *Conventional* environment be high in agency and high in communion (A+C+).

Methods

Participants

This study used previously collected data for analysis. The sample consists of a total of 248 college students (126 men, 122 women) from a large public university. The mean age of the participants was 19.3 years ($SD = 1.41$).

Measures

Participant's academic achievement was assessed with multiple measures (high school GPA [0-4], college GPA [0-4], and SAT scores (0-2400). Academic interests were assessed by the students' declared major.

Majors categorized into specific environments according to Holland's Theory of Careers. These environments consist of *Realistic* (which included electrical engineering, mechanical engineering, information science and technology, security and risk analysis, and chemical engineering), *Investigative* (which included biology, math, forensic science, bio behavioral health, sociology, economics, civil engineering, kinesiology, chemistry, meteorology, biochemistry and molecular biology, earth and mineral sciences, veterinary and biomedical science, and animal science), *Social* (which include political science, nursing, education, philosophy, human development and family studies, rehabilitation and human services, criminology, pre-med, athletic training, nutrition, health and policy administration, communication sciences and disorders (speech pathology), and animal science), *Enterprising* (which include marketing, labor employment and relations, public relations, hotel, restaurant, and hospitality management, management, hospitality management, advertising, computer science, communication, journalism, and supply chain management), *Environment* (which include art and architecture), and *Conventional* (which included accounting, economics and finance). Holland's Theory fails to acknowledge undecided major and so The *Division of Undergraduate Studies* (undeclared majors) was not categorized into any environments and was not used in this study.

Interpersonal strengths were assessed using the abbreviated version of Inventory of Interpersonal Strengths (IIS-32; Hather & Rogers, 2012). The IIS consists of eight octants (Dominant, Extraverted, Warm, Unassuming, Submissive, Introverted, Cold, and Arrogant), which measure an individual's positive interpersonal characteristics. Based on their IIS scores, participant's will be classified into one of 4 interpersonal styles based on the quadrants of the IPC reflecting their blend of agentic and communional strengths.

Analyses

The association between interpersonal strength classification and academic achievement will be examined in two ways. First, the 3 continuous scores for SAT, high school GPA, and college GPA will be correlated with participant scores on agentic and communal strengths. Second, these same indicators of academic achievement will be compared across the 4 groups of students classified by their predominant interpersonal strengths. Analysis of variance will be used to examine mean differences in GPAs and SAT scores across groups.

Because college major is a categorical rather than a continuous variable, a Chi-Squared statistical analysis will be used to determine the relationship between interpersonal strength classification and academic interests via major and college. This analysis evaluates whether

majors are distributed randomly across the 4 groups of students classified by their predominant interpersonal strengths or exhibit specific associations with particular interpersonal strengths.

Results

In order to examine the relationship between high school GPA, college GPA, and SAT scores, and agentic and communal strengths, a one-tailed Pearson's Correlation Coefficient was computed between variables (Table 2). As expected, the results yielded a positive correlation between high school GPA and agentic strengths ($r = .12$, $p = .030$) but, unexpectedly, there was no correlation between high school GPA and communal strengths. Inconsistent with hypotheses, college GPA did not correlate with agentic or communal strengths. Finally, as hypothesized, SAT scores were positively correlated with both agentic ($r = .22$, $p = .000$) and communal ($r = .11$, $p = .050$) strengths.

		DOM1_IIS	LOV1_IIS
GPAhs	Pearson Correlation	.12[*]	.06
	Sig. (1-tailed)	.030*	.182
	N	245	245
GPAcollege	Pearson Correlation	.07	.06
	Sig. (1-tailed)	.204	.240
	N	128	128
SAT	Pearson Correlation	.22[**]	.11*
	Sig. (1-tailed)	.000*	.050*
	N	237	237

Table 2. Correlations
*. Correlation is significant at the 0.05 level (1-tailed).
**. Correlation is significant at the 0.01 level (1-tailed).

Majors were categorized into Holland's Theory of Career environments. Each separate major was categorized into one of six environments *Realistic* (N=24), *Investigative* (N = 53), *Social* (N=108), *Enterprising* (N= 17), *Artistic* (N = 3), and *Conventional* (N = 9). A contingency table was created to summarize the categorical data (Table 3). The contingency table consists of the six Holland environments (rows) and the four interpersonal circumplex quadrants (columns). The table shows the amount of individuals in a specific quadrant when separated by environment. Within the rows, percentages are given of how many individuals are in one of the four quadrants within the specific environment and what percentage the group makes up within the quadrant. A Chi-Square test of independence was performed to investigate the relationship between major and the four interpersonal circumplex quadrants (Dominant-Friendly, Dominant-Hostile, Hostile-Submissive, and Friendly- Submissive). The relationship between major and the four IPC four quadrants was not significant, X^2 (15; N = 214) = 7.024, P > .05 (see Table 4).

Holl_NewMajor * Quadrant Crosstabulation

			Quadrant				
			Dominant-Friendly	Dominant-Hostile	Hostile-Submissive	Friendly-Submissive	Total
Holl_NewMajor	Realistic	Count	10	12	1	1	24
		% within Holl_NewMajor	41.7%	50.0%	4.2%	4.2%	100.0%
		% within Quadrant	16.9%	9.0%	6.7%	16.7%	11.2%
		% of Total	4.7%	5.6%	0.5%	0.5%	11.2%
	Investigative	Count	12	33	6	2	53
		% within Holl_NewMajor	22.6%	62.3%	11.3%	3.8%	100.0%
		% within Quadrant	20.3%	24.6%	40.0%	33.3%	24.8%
		% of Total	5.6%	15.4%	2.8%	0.9%	24.8%
	Social	Count	29	70	6	3	108
		% within Holl_NewMajor	26.9%	64.8%	5.6%	2.8%	100.0%
		% within Quadrant	49.2%	52.2%	40.0%	50.0%	50.5%
		% of Total	13.6%	32.7%	2.8%	1.4%	50.5%
	Enterprise	Count	4	12	1	0	17
		% within Holl_NewMajor	23.5%	70.6%	5.9%	0.0%	100.0%
		% within Quadrant	6.8%	9.0%	6.7%	0.0%	7.9%
		% of Total	1.9%	5.6%	0.5%	0.0%	7.9%
	Artistic	Count	1	2	0	0	3
		% within Holl_NewMajor	33.3%	66.7%	0.0%	0.0%	100.0%
		% within Quadrant	1.7%	1.5%	0.0%	0.0%	1.4%
		% of Total	0.5%	0.9%	0.0%	0.0%	1.4%
	Conventional	Count	3	5	1	0	9
		% within Holl_NewMajor	33.3%	55.6%	11.1%	0.0%	100.0%
		% within Quadrant	5.1%	3.7%	6.7%	0.0%	4.2%
		% of Total	1.4%	2.3%	0.5%	0.0%	4.2%
Total		Count	59	134	15	6	214
		% within Holl_NewMajor	27.6%	62.6%	7.0%	2.8%	100.0%
		% within Quadrant	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	27.6%	62.6%	7.0%	2.8%	100.0%

Table 3: Contingency table displaying Holland's environments and IPC quadrants.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.024[a]	15	.957
Likelihood Ratio	7.658	15	.937
Linear-by-Linear Association	.064	1	.801
N of Valid Cases	214		

Table 4. Chi-Square Tests

Three hypotheses regarding academic achievement and interpersonal strengths were supported. First, high school GPA was positively correlated with agentic strengths ($r = .12$, $p = .030$), and SAT scores were positively correlated with both agentic ($r = .22$, $p = .000$) and communal ($r = .11$, $p = .050$) strengths. However, I did not find an expected correlation between high school GPA communal strengths, nor was college GPA correlated with dimensions of interpersonal strength. Hypotheses regarding academic interests and interpersonal strengths were not supported.

Discussion

The present study aimed at identifying if interpersonal strengths are associated with academic achievements and interests. Hypothesis regarding interpersonal achievement in relation to interpersonal strengths were supported. However, hypotheses regarding academic interests and interpersonal strengths were not supported. The present findings provide several important conclusions. First, there was a positive correlation between high school GPA and Agentic strengths, and between SAT scores and Agentic and Communal strengths, indicating that being able to connect with others (communal strengths) and direct oneself (agentic strengths) promote better academic achievement, at least in high school. The unexpected failure of college GPA to correlate with interpersonal strengths may be due to a lack of reliability. Most participants were in their first or second semester at university, thus almost half ($N = 117$) had no college GPA to report and the participants who did provide one ($N = 128$) were typically reporting their GPA for their first semester at university. First semester college GPAs may not be a reliable predictor of academic success.

With regard to academic interests, the present findings found no relationship between chosen majors and the four interpersonal circumplex quadrants (Dominant-Friendly, Dominant-Hostile, Hostile-Submissive, and Friendly- Submissive). One possible reason that there was no relationship found between these two variables is that there were not many individuals in certain major environments. For example, there were only three individuals in the *artistic* environment, and only 9 individuals in the *conventional* environment as opposed to 108 individuals in the *Social* environment. This could contribute to their not being enough people in certain majors to show an effect. Therefore, a larger sample size should be used to see if there may be an effect. Another possible reason for this lack of association again lies with the first-year status of the majority of participants. Although most identified a declared major, it is possible that it does not represent their ultimate choice and will change over time, as it is common to switch majors in college. Associations between major at the time of graduation and interpersonal strengths might be stronger than the major selected in the first year at university.

Overall, the findings for academic achievement are quite consistent with previous studies that identified good social relationships, a sense of belonging, and higher levels of Agreeableness (i.e., communal strengths), as well as self-efficacy (i.e., agentic strengths) as significantly related to higher academic motivation and achievement (e.g., Farsides & Woodfields, 2003; Freeman et al., 2007; Zimmerman, 2000).

Findings for major selection were not consistent with the past literature. The previous literature suggested that individuals choose majors that are consistent with their personality and that can adequately convey their capabilities. However, my findings suggest there is no association between choice of major and interpersonal strengths or social functioning preferences.

Limitations and Future Directions

There are some limitations to this study that need to be addressed. First, it is important to note that the data used was self-report. This could reflect a response bias on the part of the participant. Second, this study looked at first and second semester college students. This presents a problem when individuals were asked to report their college GPA. Many students did not report their GPA because they may not have had one at the time. Also, first year college GPA as a predictor of academic success may not be reliable due to the fact that many students are adjusting to university life and their initial grades may not be representative of their overall undergraduate performance. Third, the study only took into consideration a student's major; this study did not take into consideration an individual's minor or if they double majored. If a student was a double major the first major listed was the one that was selected for data analysis. Also, as previously stated individuals tend to switch majors during their college career and the current data may not accurately represent the student's ultimate choice of major. Fourth, as previously stated the sample size did not sufficiently represent all environments in Holland's theory of careers. Some of the environments had a large amount of student's (as many as 108) and a very small amount of students (as little as 3). Last, this study did not take into consideration of the individuals whose major was undeclared. Individuals whose major is major is undeclared should be examined in future studies as these individuals may show different interpersonal traits than those who have a declared major (e.g., engineering, psychology).

Despite these limitations this study shows that there is a relationship between self-report measures of interpersonal strengths and objective measures of academic achievement such as high school GPA and SAT scores. This is important for several reasons. First, college admissions can use the information to help students who are struggling with their academics. By using the Inventory of Interpersonal Strengths, colleges can determine what would help students best succeed and implement programs designed to help the individuals who are struggling. This may also help the students who are doing well stay on track. Having this could help reduce a student's stress and worry, especially in their first year of college when most of the adjustment occurs. This could help reduce attrition rates, and raise retention rates for colleges. This could also possibly lower student's depression and help students make the transition to a University setting less stressful. Third, this study shows an interesting correlation between objective measures and self-report.

Future directions of this study should include surveying students who are seniors in college. By doing so a more accurate college GPA is likely to be reported and it will also reflect what major the individual ultimately chooses and will graduate with. A larger sample would also be desirable for this study. Future studies may want to take into consideration student's double

major and minors. Perhaps this may show differences in agentic and communal strengths between those who double major or have a minor and individuals who only have one major. The relationship between interpersonal strengths and major selection warrants more attention. Larger samples of graduating seniors may show that there is in fact a relationship between interpersonal strengths and academic interest. Future research could greatly improve a student's college experience. Using the Inventory of Interpersonal Strengths and traits that are consistently associated with certain majors, admissions may be able to make suggestions to the student about which major may be most suitable for them. This could prevent a loss of time switching majors, and may also prevent students from dropping out since they may be matched with a major that best suits them.

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