



Study of Outcomes Associated with Use
of the Kuder® Career Search with Person Match at a
Public Research University in Greater Miami, Florida

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Abstract

The sample for this study is a cohort of 12,697 students who entered a public research university in greater Miami, Florida, prior to August 6, 2012. All of these students had an opportunity to complete the Kuder® Career Search with Person Match (KCS). Of this cohort, 6,506 completed the KCS. These students had the opportunity to accumulate three semesters of coursework by the summer of 2013. The primary focus of this study was on the match between students' interest inventory clusters and their selected majors, and if this degree of match – termed congruence between interests and major – is related to students' academic outcomes in terms of university Grade-Point-Average (GPA).

Notable findings are that students whose majors were congruent with their interests had higher GPAs. Specifically, if the students' majors matched any one of their top three ranked KCS interest clusters, GPA was significantly higher. The secondary focus of this study was to determine if there were differences in cumulative GPA for those students who took the KCS (despite levels of congruence) versus those who did not take it. For incoming freshmen, those who took the KCS had higher cumulative GPAs in their third semester (.136 higher than students who did not take the KCS). For transfer students, those who took the KCS had slightly lower GPAs in their third semester (.078 difference). Findings indicate that taking the KCS is most effective when it informs or affirms university major choices.

Study Introduction

Educational and career planning are salient in the career development of adults across the lifespan (Niles & Harris-Bowlsbey, 2013; Trusty, 2002). The National Career Development Guidelines (NCDG, 2004) highlight the importance of career planning and career management across people's lives, emphasizing the importance of career assessment, setting goals, and making informed choices.

The purposes and goals of Kuder® Journey™ (Kuder, 2013) are highly consistent with the purposes and goals of the NCDG (2004). Kuder Journey is an Internet-based career planning system designed for college students and adults. Journey focuses on helping adults (a) acquire self-knowledge (e.g., interests, skills, values); (b) gain knowledge of educational and vocational opportunities (e.g., educational options, knowledge of occupations); and (c) find a match between their personal characteristics and their careers, including setting goals, developing plans, and taking actions toward meeting goals. Both Kuder Journey and the NCDG focus on lifelong learning, managing career transitions, using career assessments, developing career plans, and responding to changing employment trends and situations.

A particular challenge for colleges and universities is student retention and completion rates for college degrees (Adelman, 1999, 2006; Trusty & Niles, 2004). Slightly less than half of U.S. students who enter college soon after high school with the purpose of obtaining the bachelor's degree do not attain that degree within eight years. This completion-rate challenge is greater for universities serving lower socioeconomic status and minority populations, with African American and Latino populations experiencing the lowest completion rates (see National Center for Education Statistics, 2013; Trusty, 2004).

Purpose of the Study

The primary purpose of the study was to determine if the level of congruence between interests (as indicated by the KCS) and students' current college majors was related to university grade point average (GPA) in students' first three semesters at the institution. Congruence is the degree of match between assessed interests and college major. For example, if a student's KCS assessment results show that the student is interested in architecture and construction, and if the student's major is architecture, the student is said to be congruent. In contrast, if a student's results show interests in architecture and the actual major is in education and training, the student is conceptualized as incongruent. All students had a current major at the time of the study. The secondary purpose of the current study was to examine differences in cumulative GPA for students who completed the KCS versus students who did not.

Methods

Student Data

In August of 2013, personnel in the university's division of undergraduate education provided non-identifiable data to the researcher (i.e., students were given a randomly generated identification number non-identifiable to the researcher). Data included demographics (e.g., gender, race-ethnicity, age) the type of admission (e.g., entering freshman, transfer), academic load by semester, college major data, and GPA for their first three consecutive semesters. GPA was reported on a 4 point scale and was not adjusted for the difficulty of the courses.

The Kuder Career Interests Assessment (KCS)

The KCS is an interest inventory that provides test-takers with their highest and lowest ranked interests quantified by career clusters. The 16 clusters are the same as those used in O*NET (<http://www.onetonline.org/find/career>). Descriptions of the clusters may be found at this website: <http://www.careertech.org/career-clusters/glance/careerclusters.html>. The clusters are presented in Table 1.

TABLE 1: 16 NATIONAL CAREER CLUSTERS

| | |
|--|---|
|  Agriculture, Food, and Natural Resources |  Hospitality and Tourism |
|  Architecture and Construction |  Human Services |
|  Arts, Audio-Video Technology, and Communication |  Information Technology |
|  Business, Management, and Administration |  Law, Public Safety, and Security |
|  Education and Training |  Manufacturing |
|  Finance |  Marketing, Sales and Service |
|  Government and Public Administration |  Science, Technology, Engineering, and Mathematics |
|  Health Science |  Transportation, Distribution, and Logistics |

At this institution, all students enter with a declared major. Personnel in the office of the dean of undergraduate education matched their own university majors to one of the 16 clusters. The KCS score report provides percentile scores for each of the 16 clusters. Thus, from the magnitude of the percentiles, the highest to the lowest interest areas are indicated. For the purposes of the present study, the researcher examined only the top five ranked clusters. KCS users, therefore, might have been currently in a major that matched with their 1st ranked cluster, 2nd ranked cluster, 3rd ranked cluster, 4th ranked cluster, 5th ranked cluster, or their major may not have matched any of their five top-ranked clusters. This degree of match between students' current majors and their interest clusters is the degree of congruence.

Descriptive Statistics, Kuder Users and Non-Kuder Users

Of the 12,697 students in the pre-August, 2012 cohort, 6,505 completed the KCS; and 6,192 did not complete the KCS. Descriptive statistics for Kuder users and non-Kuder users are presented in Table 2.

TABLE 2: DESCRIPTIVE STATISTICS FOR KUDER USERS AND NON-KUDER USERS

| Variable | Kuder Users | Non-Kuder Users |
|-------------------------------|-------------|-----------------|
| Number of Students | 6,505 | 6,192 |
| <i>Gender</i> | | |
| Women | 57% | 43% |
| Men | 44% | 56% |
| <i>Student Status</i> | | |
| Beginning Freshmen | 61% | 38% |
| Transfers | 39% | 62% |
| <i>Racial-Ethnic Identity</i> | | |
| Latino | 60% | 60% |
| White | 57% | 50% |
| Black | 17% | 17% |
| Asian | 10% | 12% |
| Native American | 3% | 2% |
| Pacific Islander | 3% | 2% |
| Percent Age 25 or Younger | 90% | 72% |

Note. Students could indicate multiple racial-ethnic identities. Some percentages do not total to 100% because of rounding.

It is evident in Table 2 that there were several marked differences between those students who elected to take the KCS and those who did not. One notable difference between the two groups is that more university women, as compared to men, elected to take the KCS. Incoming freshmen took the KCS at a much higher rate than did transfers; and related to that observation, younger students took the KCS at a much higher rate than older students. The racial-ethnic composition of the two groups was similar. Current college majors (not reported herein) were similar for the two groups.

Research Questions

Research Question 1: Does GPA differ based on levels of congruence? Congruence is the degree of match between students' current majors and their interests, as indicated by the KCS. Because only Kuder KCS users had congruence data, the sample for these analyses was limited to the 6,506 KCS users. GPA was the dependent variable, and it was examined across three points in time, namely, first semester GPA, second semester cumulative GPA, and third semester cumulative GPA. Third semester cumulative GPA is the most inclusive outcome, and therefore, it was focused upon most in the analyses. Level of congruence was the independent variable, and it was composed of six categories: no match of major and one of the top five KCS clusters or a match of the major with one of five top-ranked clusters.

Research Question 2: Does GPA differ between students who took the KCS and students who did not? For this research question, all KCS users were grouped together despite congruence or incongruence between interests and major. This group of KCS completers was then compared to students who did not take the KCS. Preliminary analyses revealed that differences in GPA and KCS use were related to students' admission status, namely, whether students were entering freshmen or transfer students. Therefore, separate analyses were performed for entering freshmen and for transfer students. The socioeconomic status or first-generation status of students was not known, and thus the two groups (entering freshmen and transfers) could not be reliably matched on family socioeconomics or educational history. Given the two major limitations of the analysis for Research Question 2 (congruent and incongruent students combined, lack of socioeconomic data), findings for Research Question 2 should be interpreted with caution.

Results and Discussion

Research Question 1

A series of one-way analyses of variance (ANOVAs) was conducted to determine differences in GPA based on levels of congruence between university majors and interests, as quantified by the KCS. For these analyses, only students who had completed the KCS were used. These 6,506 students either had no match between their major and one of their top five ranked clusters, or their major did match one of the five.

Aggregated Analysis of Kuder KCS Users

Three one-way ANOVAs were conducted for each of three semesters: 1) first semester GPA, 2) second semester cumulative GPA, and 3) third semester cumulative GPA. If students were not engaged in any coursework in the given semester, they were excluded from that particular analysis. Table 3 shows the numbers of participants in each of the congruence categories and in each of the three analyses.

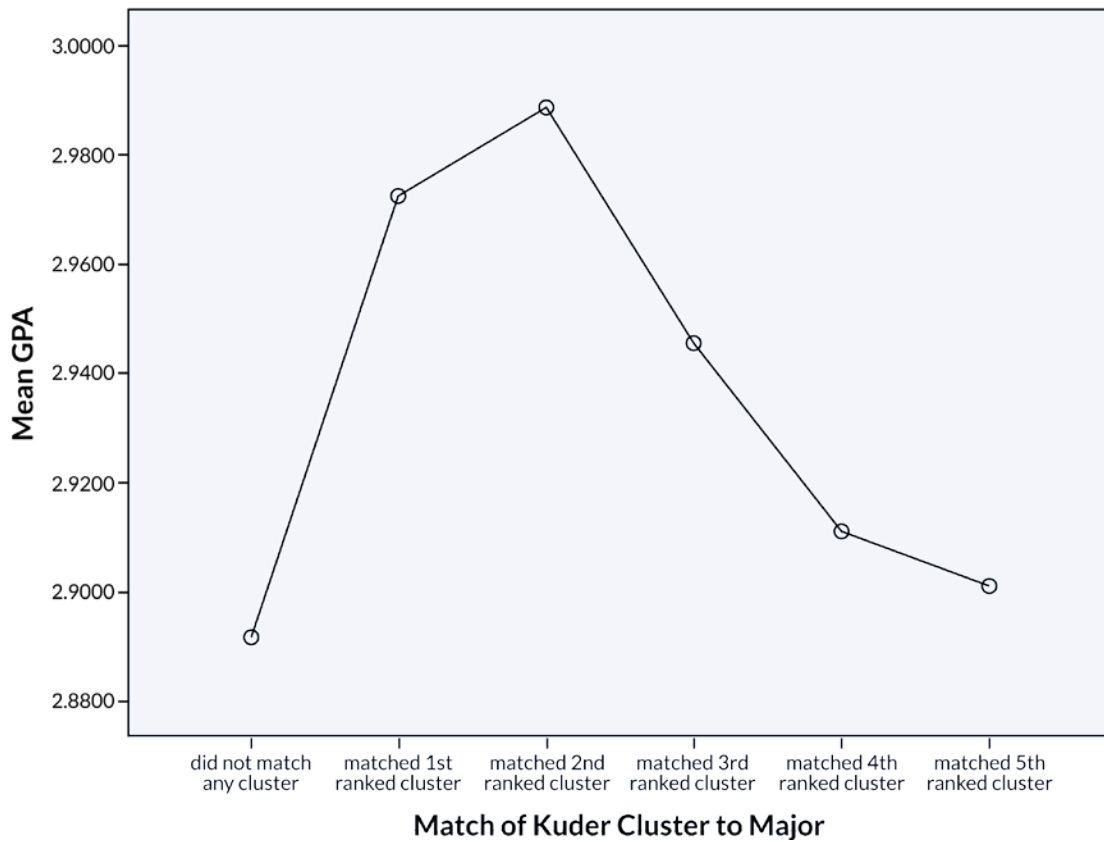
TABLE 3: NUMBERS OF KCS USERS AND THEIR LEVELS OF CONGRUENCE BY SEMESTER

| | Semester 1 | Semester 2 | Semester 3 |
|-------------------------------|------------|------------|------------|
| Did not match any top cluster | 2,877 | 2,705 | 2,052 |
| Matched 1st ranked cluster | 1,123 | 1,077 | 814 |
| Matched 2nd ranked cluster | 867 | 806 | 618 |
| Matched 3rd ranked cluster | 665 | 629 | 467 |
| Matched 4th ranked cluster | 516 | 492 | 366 |
| Matched 5th ranked cluster | 458 | 426 | 325 |
| Total | 6,506 | 6,135 | 4,642 |

Note: Students were included if they had taken the KCS and if they were actively taking courses in the given semester.

The one-way ANOVA for Semester 1 was statistically significant, $F(5, 6500) = 2.335$, $p = .040$, indicating that mean GPA did differ depending on the level of congruence between the KCS cluster (interests) and the chosen major. The results for Semester 1 are presented in Figure 1.

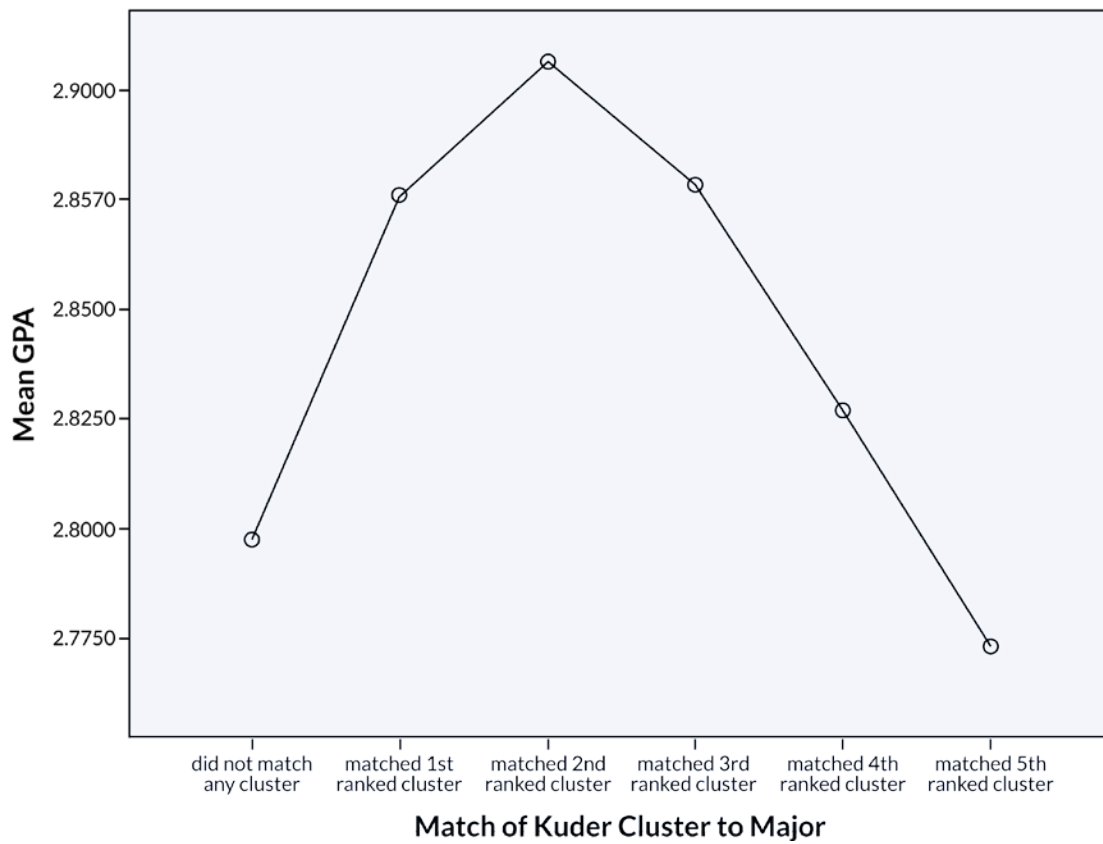
Figure 1: Semester 1 Mean GPA by Congruence Level



Students whose majors matched the first- and second-ranked Kuder clusters had the highest GPAs in Semester 1. Students whose major matched their third ranked cluster were somewhat lower in GPA; and those who matched their fourth or fifth ranked cluster and those who did not match any cluster had the lowest GPAs at the end of their first semester.

The one-way ANOVA for cumulative GPA in Semester 2 was statistically significant, $F(5, 6129) = 2.530$, $p = .001$, indicating that mean GPA did differ depending on the level of congruence between the KCS cluster (interests) and the chosen major. The results for Semester 2 are presented in Figure 2.

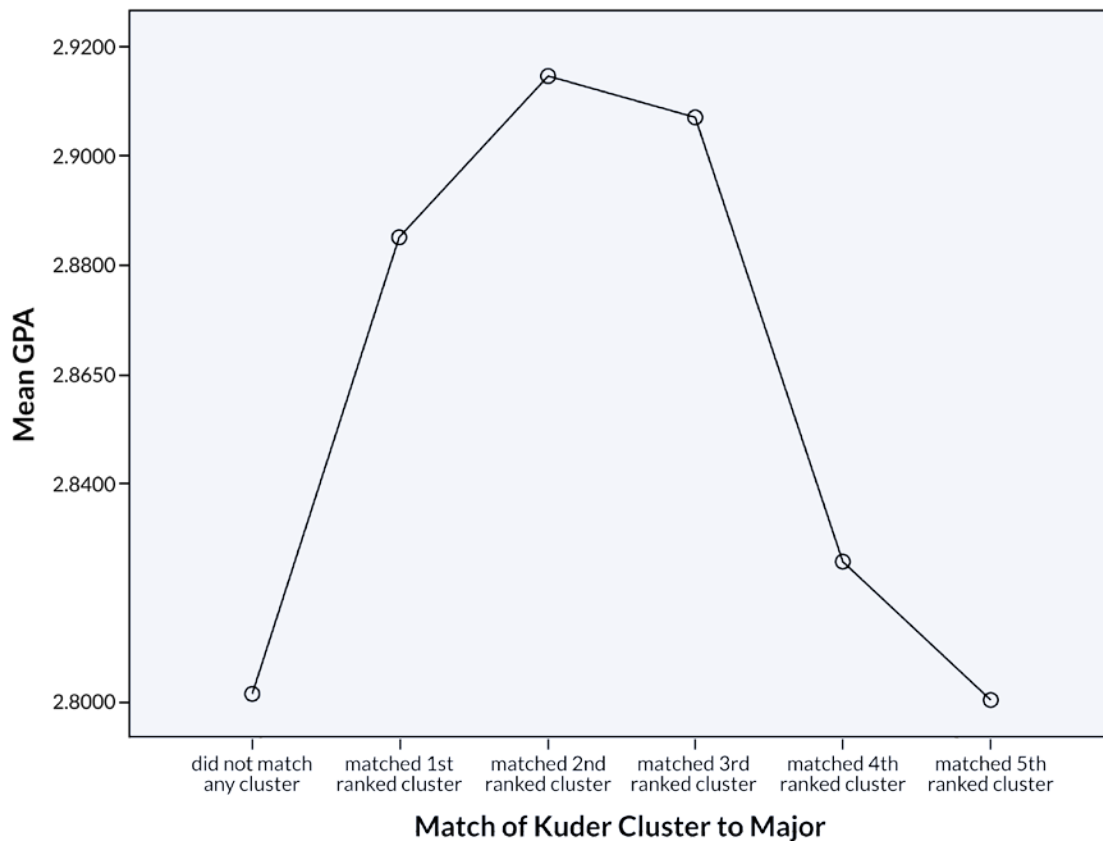
Figure 2: Cumulative Semester 2 Mean GPA by Congruence Level



Students whose majors matched their first-, second-, or third-ranked Kuder cluster were higher in cumulative GPA in their second semester; whereas students whose majors did not match or matched less well had lower cumulative GPAs.

The one-way ANOVA for cumulative GPA at the end of Semester 3 was statistically significant, $F(5, 4636) = 4.511, p < .0005$, indicating that mean GPA did differ depending on the level of congruence between the Kuder cluster and the major. The results for Semester 3 are presented in Figure 3.

Figure 3: Cumulative Semester 3 Mean GPA by Congruence Level



Students whose majors matched one of their top three ranked clusters were higher in mean GPA, as compared to their counterparts who did not match any Kuder cluster or who matched their fourth or fifth ranked cluster. Among those who matched one of their top three, there were only small differences between the first, second, and third.

Across the three points in time (Semester 1, Semester 2, Semester 3), the mean differences grew larger, suggesting that the degree of congruence has a cumulative or compounding effect on GPA. This finding seems logical. That is, if a student's interest/ major match is congruent, the student is likely more dedicated to classes, being more likely to possess the personal initiative and exhibit the effort required to achieve. It seems that if students' interests and actions are consistent, classes have more meaning and achievement is higher.

Across the three analyses, it appears that there are few and only small differences between a match with top-ranked, second-ranked, and third-ranked clusters. However, there are significant differences between Clusters 1, 2, and 3 (taken together) and either no match or a match with Cluster 4 or 5. This finding is important for advisors of these students. That is, it is important, in terms of GPA outcomes, that students are in a major that matches their first-, second-, or third-ranked cluster.

Disaggregated Analyses for Kuder Users

From the set of Kuder users who were actively taking courses in Semester 3 (N = 4,642), analyses were done for select demographic groups. These analyses were done by genders, by entry status (entering freshmen and transfers), and for the Latino ethnic group. The Latino group was large enough for analysis, whereas cell sizes were judged to be too small for other groups (e.g., Native American, Asian, African American).

The Semester 3 mean cumulative GPA was higher for women (2.89) than for men (2.74). However, there were no systematic differences between women and men with regard to the effect of congruence on GPA. That is, differences in GPA by congruence levels were similar for women and men.

There were significant differences by entry status groups. For students who transferred to this institution, differences in GPA by congruence levels were nonsignificant. In contrast, U.S. students who entered the institution as freshmen did differ in Semester 3 cumulative GPA by congruence levels, $F(5, 2724) = 2.816, p = .015$. These differences are presented in Figure 4.

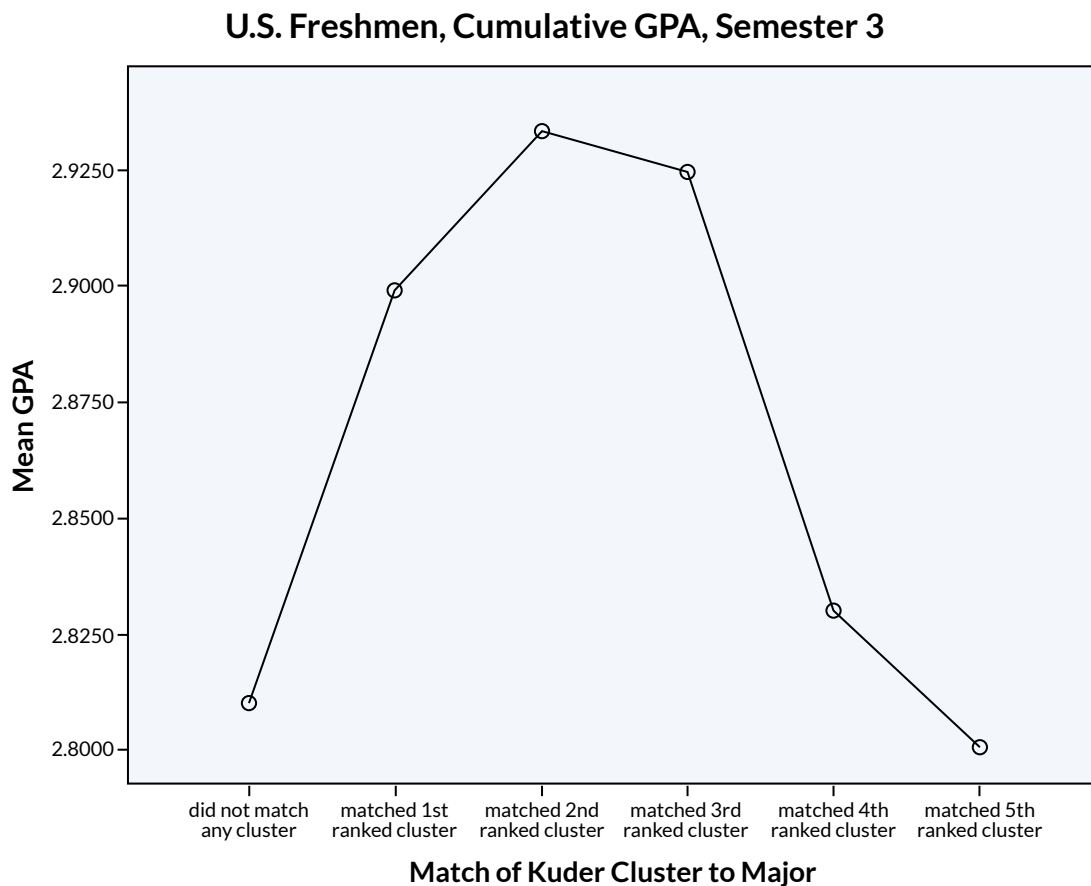
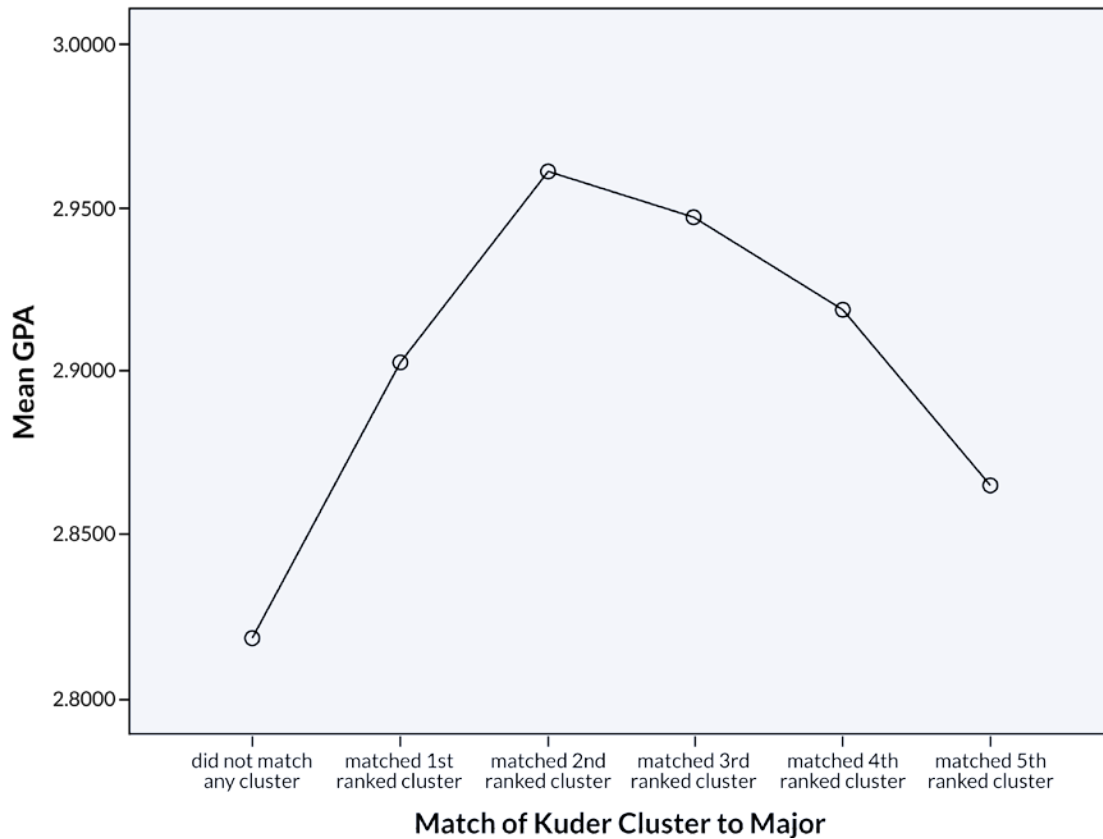


Figure 4: Cumulative Semester 3 Mean GPA by Congruence Level, U.S. Freshmen Only

For the race-ethnicity variable, students were instructed to indicate all racial-ethnic groups with which they identify. Of the 4,642 students who had taken KCS and who were actively taking courses in their third semester, almost half (49%) indicated identity with multiple racial-ethnic heritages. Regarding the Latino heritage, 61% of the 4,642 students indicated this identity.

For Latinos, there were statistically significant effects of congruence on GPA, $F(5, 2848) = 4.115, p = .001$. These findings are presented in Figure 5.

Figure 5: Cumulative Semester 3 Mean GPA by Congruence Level, Latinos only



It is evident in Figure 5 that the effect of congruence on GPA is somewhat different for Latinos as compared to other groups. That is, it seems that for Latinos, matching the major with the first-, second-, third-, or fourth-ranked cluster is related to higher GPA.

Overall, findings for disaggregated groups were similar to findings for the entire group of Kuder users with a few exceptions. Findings did not differ for women and men. That is, although women did have higher GPAs than men, the effects of congruence on GPA were similar across genders. Whereas the effect of congruence on GPA was nonsignificant for transfer students, it was significant for U.S. entering freshmen. For Latino students, matching the major to Clusters 1, 2, 3, or 4 produced higher cumulative GPA in Semester 3.

Conclusions and Implications for Research Question 1

In viewing all the aggregated and disaggregated analyses for Research Question 1, some general conclusions emerge.

- First, it appears that when students are in majors congruent with one of their top three interest clusters, their achievement is better. It seemed to matter little which of the top three clusters matched the major.
- Second, it seems that the effects of congruence compound over time. That is, GPA differences between those in a major congruent with one of their top three interest clusters and those in a major less congruent grew wider over the first three semesters. In the case of incoming freshmen, this finding seems noteworthy because many or most of these students are taking general education courses at this time, and not taking courses precisely in their majors.
- Third, the effects of congruence seem to be equally strong for men and women and for Latinos, as compared to other racial-ethnic groups. The effects of congruence did differ based on admission status. For entering freshmen, GPA was higher if students were in a major congruent with one of their top three interest clusters; the effect of congruence on GPA, however, was nonsignificant for transfer students.

Whereas the GPA differences by congruence level were not large, the differences were consistent, and differences were evident for all groups except for transfer students. It should be noted that there are many and varied influences on GPA. These influences include course variables (e.g., difficulty of courses, pertinence to the major), instructor variables (e.g., instructor effectiveness, instructor grading practices), and student situational variables (e.g., family concerns, economic concerns). In short, there are numerous influences on GPA at any given time, and with congruence being only one of those influences, it would not be expected to be the predominant one. For example, it would be reasonable to expect that students' economic situations might have a greater influence at times.

The findings for Research Question 1 carry implications for advising and student support at the institution. First, and perhaps most basic, many students who took the KCS were not in a major congruent with one of their top three interest clusters (see Table 3). For example, 59% of students in Semester 1 were not in a major congruent with one of their top three interest clusters. It seems unreasonable to expect that near 100% would have interest/major congruence, but it does seem reasonable to expect that more than 41% would have congruence. Advisors, instructors, and other personnel at this institution should be informed of the findings of this study, and these employees should find systematic ways to advise students in their major-selection process. Students should know that selecting a major congruent with their interests is productive in terms of GPA, at least in the short term (the first three semesters), but likely in the long-term.

It seems to matter little whether the interests/major match is to the first-, second-, or third-ranked interest cluster; and this fact provides flexibility for student advisors and students. Whereas students can use the KCS to narrow the universe of majors at this institution it will not be overly narrowed when the top three clusters are considered as equally viable. Again, students should be made aware of findings, namely, that a major congruent with either of their top three clusters is viable, at least in terms of early GPA.

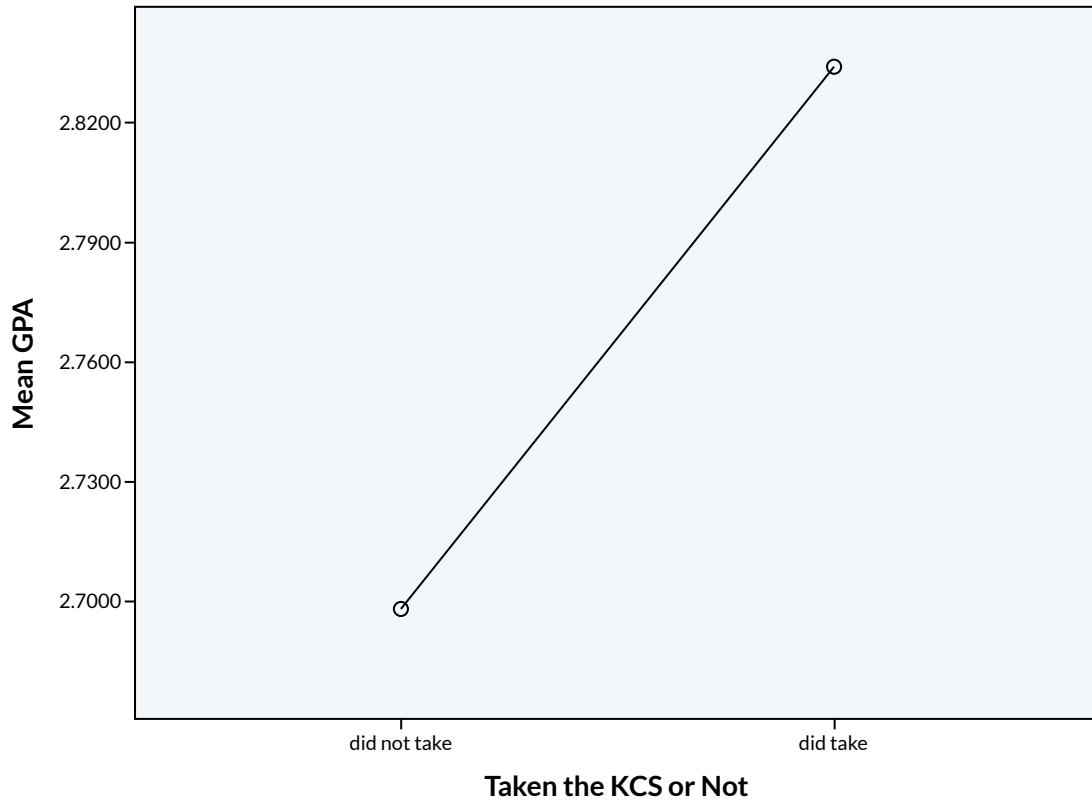
The finding that the congruence/GPA relationship was more consistent for incoming freshmen than for transfer students is not surprising. Transfer students were, on average, older; and therefore much more variable in terms of their life situations (e.g., spouses, children, economic responsibilities). It is likely that these variables confounded the congruence/GPA relationship. Thus, the findings in this study should not lead professionals at this institution to assume that congruence is not important for transfer students.

Research Question 2

Two one-way ANOVAs were conducted to examine mean differences in third semester cumulative GPA for KCS users versus non-KCS users. In the first analysis, data from only U.S. incoming freshmen were used. For the second analysis, data from transfer students were used. For these two analyses, all KCS users were combined into one group despite congruence or incongruence.

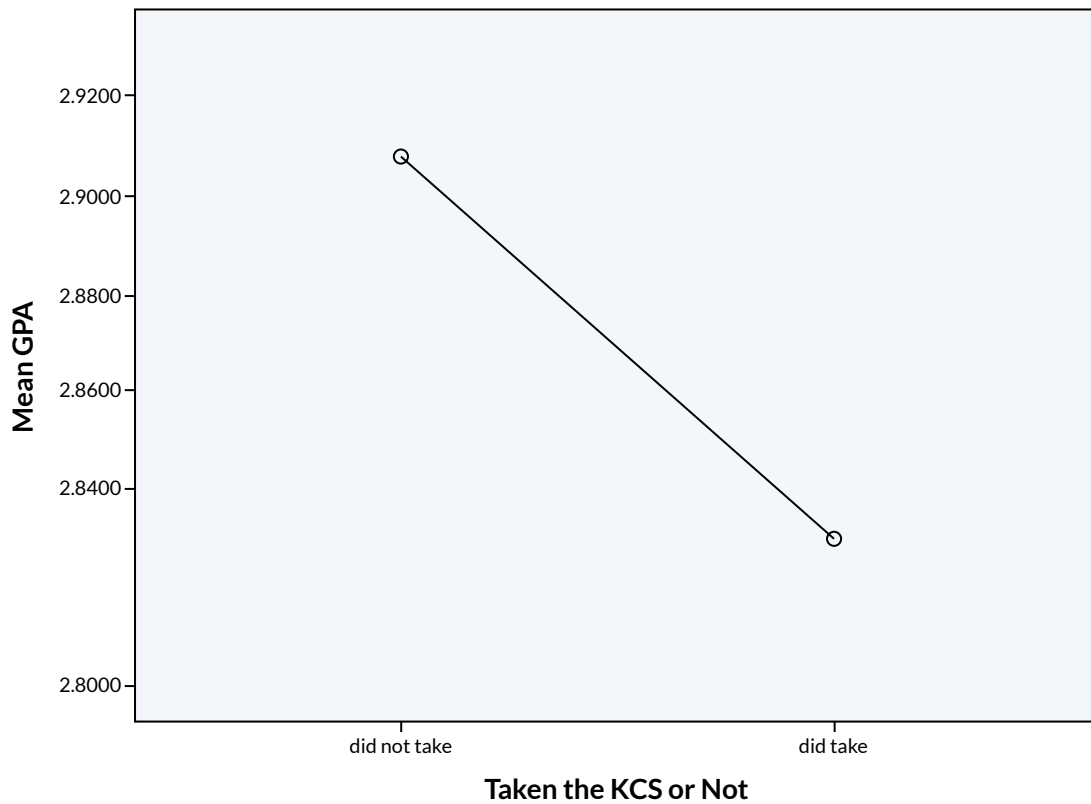
Findings were statistically significant for U.S. freshmen, $F(1, 4373) = 41.661, p < .0005$. Entering freshmen who took the KCS had a third semester cumulative GPA .136 higher than students who did not take the KCS. These findings are presented in Figure 6.

Figure 6: U.S. Freshmen, Differences in Mean GPA for KCS Users Versus Non-Users



Findings were statistically significant for transfer students, $F(1, 4614) = 12.187, p < .0005$. In contrast to freshmen, transfer students who did take the KCS had slightly lower GPAs (.078 lower) than transfers who did not take the KCS. Findings for transfer students are presented in Figure 7.

Figure 7: Transfer Students, Differences in Mean GPA for KCS Users Versus Non-Users



Note that the comparison of KCS users to non-users may be, in multiple ways, a non-tenable comparison. First, those students who took the KCS and were in a major congruent with their interests were combined with those students who were not congruent, and on average, had lower GPAs related to their incongruence. Additionally, the two groups (users and non-users) were different in age and gender, and these may have been confounding variables. And perhaps more importantly, because no socioeconomic data were available, the two groups could not be equated along family economic or family educational variables.

Despite the shortcomings of this comparison, results may be informative. Perhaps entering freshmen who take the KCS, despite congruence or incongruence, display more initiative and personal agency in systematic career planning, and thus, they have higher GPAs. Perhaps transfer students who elect to take the KCS are more uncertain and less committed to a major, and thus a lack of commitment results in lower slightly lower GPAs. Do note that the GPA differences were greater for incoming freshmen (.136 higher for KCS users) than for transfer students (.078 lower for KCS users).

The inconsistent findings for Research Question 2 suggest that incoming freshmen and transfer students may elect to take the KCS for different reasons. Perhaps transfer students take the KCS because they have experienced indecision and frustration; perhaps incoming freshmen take the KCS for more goal-oriented reasons. In any case, the results of this study seem to indicate that there are very different processes at play for incoming freshmen as compared to transfer students.

Summary of Findings

This study was conducted using data from a cohort of 12,697 students who were new to a public research university in greater Miami, Florida, prior to August of 2012. In this study, the researcher examined the effects of congruence between students' interests (as measured by the KCS) and their university majors. Congruence was quantified as the match of the individual student's university major to one of the top five ranked KCS clusters: the student's first-ranked (top) cluster, the second-ranked cluster, third-ranked cluster, fourth-ranked cluster, or the student's fifth-ranked cluster. The outcome variable was university GPA (Research Question 1). The researcher also compared KCS users versus non-KCS users on GPA (Research Question 2).

The major findings of this study are the following:

Research Question 1 Findings:

- Students whose majors matched any one of their top three ranked clusters had higher GPAs in their first three semesters.
- Positive differences in GPA for students with a top-three ranked cluster match grew larger across the first three semesters.
- The positive effects of congruence were consistent for female and male students, Latinos, and entering freshmen.
- The positive effects of congruence were not evident for transfer students.
- Only 41% of new students who took the KCS were in a major that matched one of their top three interest clusters.

Research Question 2 Findings*:

- KCS user (versus non-user) and GPA were related to students' admission status (freshmen versus transfer students).
- For incoming freshmen, KCS users' mean GPAs were .136 points higher (four-point scale) than GPAs of non-KCS users.
- For transfer students, KCS users' mean GPAs were .078 points lower than GPAs of non-KCS users.

The findings for Research Question 2 may be untenable for several reasons. Socioeconomic data were not available for this cohort; thus, the groups could not be equally matched, and variables such as parents' educational levels could not be controlled. Additionally, the two groups differed in several basic ways, including age, gender, and admission status. Finally, the KCS user group included students who were congruent and students who were incongruent, and thus, congruence was ignored in this analysis.

The findings of this study, and particularly those for Research Question 1, show that the KCS is most effective when students use their results to either determine their majors or to affirm their choices. It is not known how many students used KCS results to inform their choice of major versus those who had already made a choice — and perhaps used the results to affirm their choices. In any case, congruence between KCS results and university major is related to better academic performance.

Student advisors and others who work to support students should strongly encourage students to complete the KCS and to use it as a tool in career planning. Advisors should facilitate students in choosing a major that is congruent with one of their top three interest clusters. Findings indicate that it seems to matter little which of the top three is a match to the major.

The positive effects of congruence were evident for students overall, for university women and men, for those who identified Latino heritage, and for incoming freshmen. Effects were not evident for transfer students. It seems reasonable to assume that more transfer students have decided on a major before taking the KCS. Several findings in this study suggest differing career development processes for incoming freshmen and transfer students; thus, these two groups should be researched separately.

The positive effects of congruence compounded as semesters accumulated, and it seems reasonable to expect that the effects of congruence will grow as students progress through their majors. For example, in the case of incoming freshmen, it is likely that most in this study were taking only a few or no courses directly in their majors. As students progress through their second, third, and fourth years when they are taking an increasing percentage of courses in their majors, it seems that congruence between interests and major will become more important to students' success.

*These findings should be interpreted with caution because of the non-equivalency of groups.

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