

Changes in Locus of Control Orientation Across College Major Pathways

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Author Note

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Abstract

The present study seeks to better understand how feelings of control and agency impact academic decision-making. In particular, we do so by examining how locus of control changes among undergraduate students over the course of the first two years of college and how these patterns vary across different major pathways. The current student expands upon past research in three major ways. Firstly, previous studies of college student major choice more broadly compare undecided and decided students as opposed to narrower paths toward college major choice. Secondly, most previous studies of major choice examine group differences at one timepoint, rather than longitudinally. Finally, while locus of control has been extensively studied, there is a dearth of research on how locus of control changes over time, particularly among undergraduate students. Based on past studies of locus of control and decision-making as well as Baxter Magolda's (2001) theory of self-authorship, we hypothesize that across the five major pathways measured in this study (uncertain, discovery, redirect, solidification, and certain), we will observe varied longitudinal patterns of locus of control. As locus of control was measured continuously—with lower scores indicating externality and higher scores indicating internality—hypotheses were based on both orientation at Time 1 (T1) and change from T1 to Time 4 (T4). Specifically, we hypothesize that 1) students in the uncertain pathway will demonstrate stable external locus of control from T1 to T4, 2) students in the discovery pathway will demonstrate a shift from external locus of control to internal locus of control between T1 to T4, 3) students in the redirect pathway will show stable internal locus of control from T1 to T4, 4) students in the solidification pathway will demonstrate increased internality from T1 to T4, and 5) students in the certain pathway will show stable internal locus of control from T1 to T4.

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Methods

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Participants

Participants were 96 undergraduate students enrolled at a large, public university in the United States. They ranged in age from 18 to 22 years old ($M = 18.91$, $SD = 1.15$). The majority of participants identified as Asian/Pacific Islander (34.38%) and male (55.21%). Additionally, the majority (96.88%) of participants were born in the United States. A detailed summary of participant demographics is available in Table 1.

Participants were recruited through a multicultural orientation event, with the first wave of data collection occurring during their first semester of college and the final wave occurring during the second semester of their sophomore year. Participants who participated in at least three waves of the survey were included in analyses.

Materials

College Major Pathway. College major pathways were coded based on participant self-reported narratives about their path to choosing a college major. Students were assigned one of five pathways: Uncertain (uncertain of their major from T1 to T4), Discovery (undecided at T1, chose major by T4), Redirect (changed major between T1 and T4), Solidification (unsure about initial major at T1, certain about same major at T4), and Certain (certain about same major from T1 to T4).

Locus of Control. Locus of control was measured through the Internal Locus of Control subscale of the 20-item version of the Multi-Measure Agentic Personality Scale

Table 1
Sociodemographic Characteristics of Participants

Characteristic	n	%
Gender		
Male	53	55.21
Female	40	41.67
Nonbinary	3	3.12
Race		
Asian/Pacific Islander	33	34.38
Black/African American	24	25
Hispanic/Latine	16	16.67
Multiracial	12	12.5
Native American	7	7.29
Other	4	4.17
Birthplace		
Born in the US	93	96.88
Not Born in the US	3	3.12

Note. N = 96. Participants were 18.91 years old on average (SD = 1.15)

(MAPS20) (Côté, Mizokami, Roberts, & Nakama, 2016). Participants responded to five items on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with higher scores indicating higher internal locus of control.

Procedure

Data analysis

We used R (Version 4.5.1; R Core Team, 2025) and the R-packages *DescTools* (Version 0.99.60; Signorell, 2025), *dplyr* (Version 1.1.4; Wickham, François, Henry, Müller, & Vaughan, 2023), *forcats* (Version 1.0.1; Wickham, 2025a), *ggplot2* (Version 4.0.0; Wickham, 2016), *lubridate* (Version 1.9.4; Grolemund & Wickham, 2011), *papaja* (Version 0.1.4; Aust & Barth, 2025), *purrr* (Version 1.1.0; Wickham & Henry, 2025), *readr* (Version 2.1.5; Wickham, Hester, & Bryan, 2024), *stringr* (Version 1.5.2; Wickham, 2025b), *summarytools* (Version 1.1.4; Comtois, 2025), *tibble* (Version 3.3.0; Müller & Wickham, 2025), *tidyverse* (Version 2.0.0; Wickham et al., 2019), and *tinylabels* (Version 0.2.5; Barth, 2025) for all our analyses.

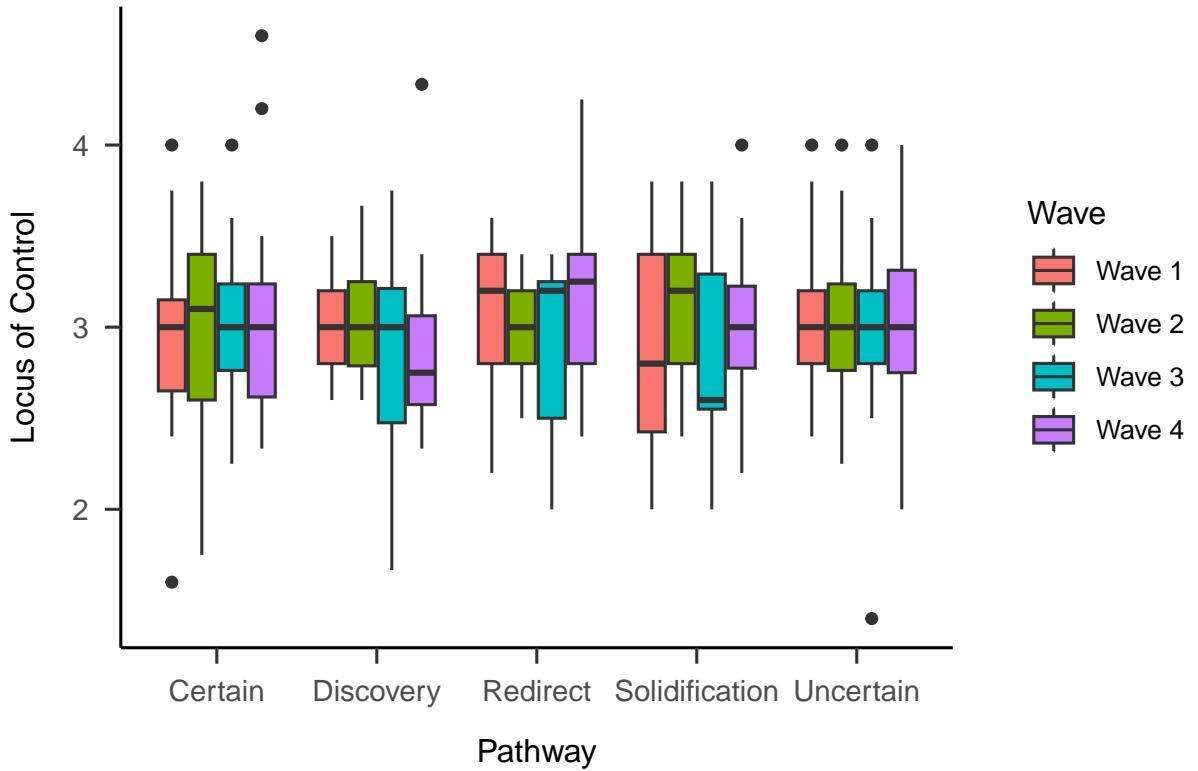
Locus of control scores at each timepoint were calculated by averaging scores across the five items on the Internal Locus of Control subscale. Repeated-measures ANOVAs were conducted for each pathway to examine differences in locus of control orientation between time points. Additionally, Tukey's Honestly Significant Difference (HSD) post-hoc tests were conducted to examine differences between waves.

Results

Repeated-measures ANOVAs were conducted to test the hypotheses. ANOVAs compared locus of control scores across all four waves of data collection for each pathway. It was found that there were no significant differences between locus of control scores across timepoints for any of the pathways. Uncertain students showed no significant

differences in levels of locus of control across waves ($F = 0.05, p = .984$). Similarly, no significant differences were found between any waves for the Discovery ($F = 0.67, p = .575$) or Redirect ($F = 0.91, p = .443$) pathways. There were also no significant differences found in locus of control scores for students in the Solidification pathway ($F = 0.98, p = .407$) or the Certain pathway ($F = 0.24, p = .865$). Results are shown in Figure 1.

Figure 1: Changes in Locus of Control Over Time by Pathway



References

- Aust, F., & Barth, M. (2025). *papaja: Prepare reproducible APA journal articles with R Markdown*. <https://doi.org/10.32614/CRAN.package.papaja>
- Barth, M. (2025). *tinylabes: Lightweight variable labels*.
<https://doi.org/10.32614/CRAN.package.tinylabes>
- Comtois, D. (2025). *Summarytools: Tools to quickly and neatly summarize data*.
<https://doi.org/10.32614/CRAN.package.summarytools>
- Côté, J. E., Mizokami, S., Roberts, S. E., & Nakama, R. (2016). An examination of the cross-cultural validity of the Identity Capital Model: American and Japanese students compared. *Journal of Adolescence*, 46(1), 76–85.
<https://doi.org/10.1016/j.adolescence.2015.11.001>
- Grolemund, G., & Wickham, H. (2011). Dates and times made easy with lubridate. *Journal of Statistical Software*, 40(3), 1–25. Retrieved from
<https://www.jstatsoft.org/v40/i03/>
- Müller, K., & Wickham, H. (2025). *Tibble: Simple data frames*.
<https://doi.org/10.32614/CRAN.package.tibble>
- R Core Team. (2025). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from
<https://www.R-project.org/>
- Signorell, A. (2025). *DescTools: Tools for descriptive statistics*.
<https://doi.org/10.32614/CRAN.package.DescTools>
- Wickham, H. (2016). *ggplot2: Elegant graphics for data analysis*. Springer-Verlag New York. Retrieved from <https://ggplot2.tidyverse.org>
- Wickham, H. (2025a). *Forcats: Tools for working with categorical variables (factors)*.
<https://doi.org/10.32614/CRAN.package.forcats>
- Wickham, H. (2025b). *Stringr: Simple, consistent wrappers for common string operations*.
<https://doi.org/10.32614/CRAN.package.stringr>

- Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L. D., François, R., ...
- Yutani, H. (2019). Welcome to the tidyverse. *Journal of Open Source Software*, 4(43), 1686. <https://doi.org/10.21105/joss.01686>
- Wickham, H., François, R., Henry, L., Müller, K., & Vaughan, D. (2023). *Dplyr: A grammar of data manipulation*. <https://doi.org/10.32614/CRAN.package.dplyr>
- Wickham, H., & Henry, L. (2025). *Purrr: Functional programming tools*.
<https://doi.org/10.32614/CRAN.package.purrr>
- Wickham, H., Hester, J., & Bryan, J. (2024). *Readr: Read rectangular text data*.
<https://doi.org/10.32614/CRAN.package.readr>
- Wickham, H., Vaughan, D., & Girlich, M. (2024). *Tidyr: Tidy messy data*.
<https://doi.org/10.32614/CRAN.package.tidyr>