

# Discretion in the Loop: Human Expertise in Algorithm-Assisted College Advising

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## Abstract

As algorithm-assisted decision making becomes more common in high-stakes domains, understanding how humans interact with these tools is critical. In higher education, many schools use algorithmic alerts to flag at risk students in order to deliver advising at scale. College advisors combine algorithmic predictions with their own judgment and contextual knowledge to make intervention decisions. While much research has focused on evaluating algorithmic predictions, relatively little is known about how discretionary interventions by human experts shape outcomes in algorithm-assisted settings. We study this question using rich quantitative and qualitative data from a randomized controlled trial of an algorithm-assisted advising program at Georgia State University. Taking a mixed-methods approach, we examine whether and how advisors use “non-algorithmic” information—context unavailable to an algorithm—to guide interventions and influence student success.

We develop a causal graphical framework to define and audit for human expertise in the interventional setting, extending prior work on discretion in purely predictive settings. We then test a necessary condition for discretionary expertise using structured advisor logs and student outcomes data, identifying several interventions that may be targeted using non-algorithmic information. Accordingly, we estimate that 2 out of 3 interventions taken by advisors in the treatment arm were plausibly “expertly targeted” to students. Systematic qualitative analysis of advisor notes corroborates these findings, showing that advisors incorporate diverse forms of contextual information—such as personal circumstances, financial issues, and student engagement—into their decisions. Finally, we document heterogeneity in advising styles, finding that one style elicits more holistic information about students and is associated with improved graduation rates. Our results offer both theoretical and practical insight into the real-world effectiveness of

algorithm-supported college advising, and underscore the importance of accounting for human expertise in the design, evaluation, and implementation of algorithmic decision systems.

For more details, see <https://arxiv.org/abs/2505.13325>.

## Keywords

AI in education, human-AI decision making, discretion in algorithmic decision making, data-driven college advising, student success, evaluating algorithm-assisted decision making, translating predictions to interventions, causal inference, mixed-methods research

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