UNDERGRADUATE BPC LITERATURE DATABASE
Frequently Asked Questions

What criteria were used to determine which articles would be included in the literature database?

The literature database includes articles that are peer-reviewed manuscripts published between January 2005 and March 2022. The review focused on articles that center on undergraduate students in computing in the United States. As such, no long-form manuscripts, book chapters, conference presentations, or other white papers were included; publications focused on international postsecondary computing education were similarly excluded.

How were "underrepresented[1]" students defined when searching for articles?

In alignment with NSF definitions, "underrepresented" populations in computing include: "women, minorities (African Americans/Blacks, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, Native Pacific Islanders, and persons from economically disadvantaged backgrounds), and persons with disabilities." Articles discussing the participation of other historically minoritized and understudied subgroups in computing (e.g., trans*/genderqueer students, LGBQ+ students, first-generation college students) were also included.

How was "computing" defined when searching for articles?

Articles addressing computing, either as the field broadly defined or speaking to specific computing subfields (e.g., data science, computer engineering, computer science), were included in the literature database. The matrix's focus on computing means that it does not include articles centering broadening participation in STEM generally or broadening participation in STEM disciplines outside of computing.

How did you identify work that "broadens participation in computing"?

We included articles that either 1) examined the impact of specific BPC intervention(s), 2) explored the factors contributing to inequitable outcomes in undergraduate computing, and/or 3) advanced theory or frameworks that could better inform the ways researchers think about broadening participation in computing.

We considered how scholars addressed broadening participation throughout their work, including: their framing of the study, use of theoretical and conceptual frameworks, descriptions

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[1] We reference the term "underrepresented" as a reflection of the terminology used by the NSF in designating minoritized populations, as well as the terminology used in much of the research included in the database. The *Momentum* team agrees with critiques of this terminology (Williams, 2020) and instead will name individual groups or employ the term "historically minoritized" to refer to these groups in the aggregate in this document.

of demographics and positionality, as well as interpretation of findings and implications. It is important to note that inclusion in the matrix necessitated BPC as a central focus of manuscripts; articles were not included in the final matrix in instances where BPC was merely mentioned as opposed to shaping the core focus of the paper's aims.

How did you find the articles?

With the assistance of UCLA research librarians, we developed and executed a systematic search protocol for the articles in this literature database. We first developed and tested search terms that would yield the most relevant articles. We then selected 12 databases across disciplines to maximize the breadth of our searches. In each search, all articles were stored in Zotero, a bibliographic database. Across all 12 databases our search terms and filtering process ultimately yielded 234 articles. The full technical report provides further explanation of the databases surveyed; for a visual representation of this process that further elucidates the various stages of review, please view Appendix A of the technical report.

How were articles reviewed?

We uploaded the final screening samples to Abstrackr, a free online software designed by researchers at Brown University to aid the screening of articles for systematic reviews and meta-analyses. Using this software, we assigned our team of doctoral student researchers batches of articles to review, requiring them to read the titles and abstracts of each assigned article and determine whether it fit the parameters of the literature database, indicating "Yes," "No," or "Maybe." Each article was reviewed by at least two team members, and we had periodic check-ins to review any discrepancies between reviewers. Articles were eliminated from the literature database for several reasons but most often because they were beyond the scope of computer science education entirely, were about K-12 computer science education, or because they made no or tangential reference to broadening participation in undergraduate computing.

We collected PDFs for the final articles and developed a database of the bibliographic information (title, abstract, date of publication etc.), which we turned over to our data science consultant, Dr. Jane Stout. Dr. Stout subsequently developed a customized Python script that processed the title, abstract, item type, and full article text for each record; the script then produced a datafile with fields containing binary indicators of article categories of interest for the final matrix (e.g., Methodological Approach, Analytic Approaches, Participant Population, etc.). Our research team reviewed 20% of these entries for accuracy and narrowed the list of articles for inclusion. Additional accuracy checks were carried out by the team to ensure articles were correctly reported on the matrix; this process resulted in the exclusion to reach the final included articles for the matrix.

What if I don't see an article I believe should be included in the matrix?

If you believe that an article should be included in the literature database, please check to see that it meets the criteria as detailed in the technical report. Subsequently, please submit your request using the contact form located on the literature database website. When submitting inquiries, please include a full citation of the journal article you would like to be reviewed for inclusion. Recommendations for new content are reviewed periodically, as funding allows, by the *Momentum* and CRA teams.

What could I use the literature database for?
We developed this centralized database of recent BPC research to assist PIs and research teams in computing who are developing Broadening Participation Plans as part of their grant applications for the NSF. As the database centralizes extant recent research on BPC, the matrix is a great place to begin finding scholarship related to BPC and diversity, equity, and inclusion efforts in undergraduate computing. As such, this literature may inform individual and departmental BPC plans. The literature database can similarly aid computing education researchers as they embark on BPC-related inquiry beyond the drafting of NSF grant applications.

Where can I get more information about your process for creating the Literature Database?
Please download the Technical Report for detailed information about the design and execution of this project, including our team's use of systematic literature review tools and natural language processing.