

## **Concreteness, Concretely**

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Concreteness has long been central to psychological theories of learning and thinking, and increasingly has practical applications to domains with prevalent natural language data, like advice and plan-making. However, the literature provides diffuse and competing definitions of concreteness in natural language. In this paper, we develop a concrete definition of concreteness, to understand how concreteness is expressed during social goal pursuits. We review several proposed algorithms for detecting concreteness. In Study 1, we systematically compare these algorithms across datasets with ground truth concreteness labels from several domains, including written advice (9 studies, 4,608 participants). In Study 2, we estimate concreteness in a single large-scale dataset, from open-ended plan-making in online courses (151 classes, 78,544 students). These results generate simple guidelines for automated concreteness detection within and across domains, which we roll into a new R package `doc2concrete`.