

INTRODUCTION

Crowdsourcing Methods in Addiction Science:
Emerging Research and Best PracticesJustin C. Strickland¹, Michael Amlung^{2, 3}, and Derek D. Reed^{2, 3}¹ Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine² Department of Applied Behavioral Science, University of Kansas³ Cofrin Logan Center for Addiction Research and Treatment, Lawrence, Kansas, United States

Crowdsourcing platforms such as Amazon Mechanical Turk, Prolific, and Qualtrics Panels have become a dominant form of sampling in recent years. Crowdsourcing enables researchers to effectively and efficiently sample research participants with greater geographic variability, access to hard-to-reach populations, and reduced costs. These methods have been increasingly used across varied areas of psychological science and essential for research during the COVID-19 pandemic due to their facilitation of remote research. Recent work documents methods for improving data quality, emerging crowdsourcing platforms, and how crowdsourcing data fit within broader research programs. Addiction scientists will benefit from the adoption of best practice guidelines in crowdsourcing as well as developing novel approaches, venues, and applications to advance the field.

Public Health Significance

The following set of articles in this special issue describes best practice methods and novel applications of crowdsourcing in addiction and psychological science. These articles advance the field and present practical guidelines and open-source resources for researchers using crowdsourcing in future work.

Keywords: crowdsourcing, methods, mTurk, Prolific, validity

With the changing landscape of work amidst the global COVID-19 pandemic and increasing costs associated with collecting data from large participant samples, researchers are turning to alternative methods for recruiting participants and collecting data. Accordingly, crowdsourcing platforms such as Amazon Mechanical Turk, Prolific, and Qualtrics Panels have become a dominant form of sampling in recent years (Strickland & Stoops, 2019). These crowdsourcing platforms enable researchers to continue to collect data from large samples of human participants when face-to-face visits are challenging, cost-prohibitive, or infeasible due to other barriers (e.g., research sites at logistically prohibitive distances; social distancing requirements during COVID-19). Alongside optimism about the practical benefits that crowdsourcing may provide are uncertainties about the validity of these approaches and how they can (and cannot) be used. This special issue includes a collection of articles on best practices and emerging research using crowdsourcing for addictions research.

Articles included in this special issue emphasize that data quality and control methods are critical in crowdsourcing platforms to ensure data are reliable and valid. Jones et al. (2022) summarize the importance of this work using a meta-analysis of careless responding in crowdsourced alcohol use research and find that approximately 12% of participants are classified as careless responders. They also provide practical recommendations to address these issues to include the use of both overt and covert fidelity measures. Belliveau and Yakovenko (2022) complement these findings by providing a practical implementation guide with step-by-step instructions for screening for speeding, straight-lining (i.e., tendency to make the same response in a group of questions), inconsistent responding, nonsensical responding, and missing data. Open-source code for conducting these procedures is provided for those looking to adopt these methods in their own work. Conceptually related behavioral economic research shows the practical implications of

Justin C. Strickland  <https://orcid.org/0000-0003-1077-0394>

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Correspondence concerning this article should be addressed to Justin C. Strickland, Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine, 5510 Nathan Shock Drive, Baltimore, MD 21224, United States. Email: jstric14@jhmi.edu

these quality checks. Craft et al. (2022) find that delay-discounting data from participants failing systematicity checks did not differ from randomly generated data highlighting the importance of screening and removing data with a priori validity checks. Freitas-Lemos et al. (2022) describe how a novel check based on instructional understanding differentiated participants on consistency of cigarette use reporting, responding on a cigarette demand task, and the relationship between use behavior and demand data.

As the methods to screen for quality data have improved, so have the venues in which crowdsourcing has been applied. Historically, Amazon Mechanical Turk was the primary crowdsourcing outlet for psychological and addiction science research. Belliveau et al. (2022) describe the use of the more recently developed Qualtrics Panels resource to study behavioral addictions (video gaming and gaming disorder). They find that Qualtrics data offered a participant pool similar in demographics to a community-recruited population supporting feasibility and potential usefulness of the resource. Stanton et al. (2022) show how another novel platform, Prolific, can facilitate repeated measures data in two protocols: a 5-day daily diary protocol and a test-retest protocol. They explain across these two independent studies how Prolific-recruited participants provided valid data consistent with theoretical expectations and afforded efficient collection of longitudinal outcomes. Beyond online platforms like Amazon Mechanical Turk, Qualtrics Panels, and Prolific, Pennington et al. (2022) describe how *big team science* may efficiently crowdsource researchers with the goal of producing reproducible projects conducted across varied institutions. A review of existing work using big team, crowdsourced approaches (e.g., ManyLabs, Psychological Science Accelerator) as well as a novel approach used by the study team are described.

How crowdsourcing fits within a broader research program is ultimately varied and may include pilot projects, methods development, intervention deployment, and more. Rzeszutek et al. (2022) provide one example of how crowdsourcing may be used to evaluate novel behavioral outcomes by studying cross-drug withdrawal effects for cigarette and opioids. They use a behavioral economic framework to show that opioid withdrawal may increase cigarette valuation, thereby providing a pathway for future treatment development work to build upon. Borodovsky (2022) integrates the above work to describe differences between generalizability and representativeness. A clear and concise review of these concepts is provided along with how such differences may inform the boundary conditions under which internet-based research may (or may not) advance the literature.

Given the rapid emergence and evolution of crowdsourcing research platforms, it is safe to assume this is a method that is here to stay. This special issue highlights best practices for using crowdsourcing in addiction science while also drawing attention to important methodological and conceptual limitations. We hope that addiction

scientists continue to adhere to these guidelines while pushing the boundaries of possible work within crowdsourcing science.

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