Trends in Translational Creativity Research:

Introduction to the Special Issue

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Abstract

The rapid evolution of technology and automation today underscores the importance of understanding and facilitating human creativity. While the psychological science of creativity is a relatively young field, significant progress has been made in recent years, and researchers are increasingly translating their work from the lab to real-world settings, from schools to the workforce. The articles in this special issue outline recent trends in translating creativity science to the wild, namely: studying creativity in real-world samples and contexts; applying cognitive psychology and neuroscience perspectives beyond the lab; and understanding the environmental factors that foster creativity. These advances improve the psychological science of creativity by increasing ecological validity, strengthening our definitional understanding of creativity, and reminding us why creativity research matters.

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We live in a rapidly changing technological environment. The rise of artificial intelligence technologies in the 21st century has quickly had far-reaching impacts on the workforce as we know it: recent estimates have predicted 75-375 million jobs (3-14% of the global workforce) will become automated by the year 2030, a shift that has only accelerated in the context of the COVID-19 global pandemic (Dondi et al., 2021). During this period of swift change, it has become clear that creative thinking and innovation are among the most valuable attributes of successful individuals (Florida, 2014; Lichtenberg, Woock, & Wright, 2008) and nations (Tsegaye et al., 2019). The ability to maximize one's creative potential is expected to become even more essential for opportunity in the global economy as creativity remains the human ability least achievable by artificial intelligence (Amabile, 2020; Jennings, 2010).

The translation of creativity research to real-world settings—from education, to organizations, to the policies that govern us—has never been more important. In light of this scientific urgency, we are proud to present this special issue on recent advances in translational creativity research. The articles in this issue span both empirical studies of creativity in the wild and review articles detailing the state of the field in the context of real-world issues. This introduction provides a brief overview of these papers with an effort to contextualize them within several themes that have recently emerged in the field: utilizing novel methods in creativity interventions; using perspectives from cognitive psychology and neuroscience to form a contextually appropriate understanding of creativity; and increasing the ecological validity of creativity research by moving this work out of the lab.

Methodological novelty in creativity interventions

Facilitating the development of creativity (e.g., within the education system) is perhaps an obvious first step in meeting the societal demand for creative thinkers. To date, most interventions targeting creativity have largely been small and underpowered or operationalize creativity in a simple way that does not capture the nuances of creativity as a cognitive construct (Alves-Oliveira, 2021; Barbot, 2019). The special issue includes two intervention studies and a review that seek to refine our understanding of how to effectively increase creativity and other creativity-related outcomes in educational settings.

Zielińska et al. (2022) examined the ability of a creativity intervention to increase student engagement in creative activities. The intervention developed and tested contained daily tasks that emphasized creative thinking, creative self-efficacy, and valuing creativity. In the first week of the daily diary study, students were provided with creativity prompts each day and reported their subjective creativity, creativity across different domains, and emotions; in the second week, they were not provided any prompts but still reported on their subjective creativity, as well as creativity across different domains and emotions. Zielińska and colleagues found that on days students received creativity prompts, they felt more creative and reported more engagement with creative activities, suggesting a promising method for increasing creative engagement in the daily lives of young adults.

Stutesman et al. (2022) conducted a six-year longitudinal study examining the contributions of theatre classes to building 21st century skills (i.e., creativity, problem solving, initiative, communication, and collaboration) in theatre conservatory students aged 5 - 18. After each semester, teachers rated students on these skills. The findings indicate that for each semester enrolled in the theatre programs, students showed increases in their 21st century skills, but the rate of growth decreased as students advanced through the program. Additional

qualitative data from both teachers and students aligned with the quantitative findings—participation in theatre classes may promote the development of generalizable skills relevant for the future of work.

Applying cognitive and neuroscience perspectives

The past 50 years of creativity research have yielded many insights into the underlying cognitive and neural processes underlying creative thinking across domains (see Glăveanu, 2017; Runco, 2017). Yet, creativity researchers must strike a balance between the experimental control attainable in a laboratory setting and the ecological validity of studying creativity in the messy, uncontrolled world it usually occurs in. In a set of three review papers, Frith (2022), Beda & Smith (2022), and Lopata and colleagues (2022) highlight work from three areas that have traditionally been studied in the lab—exercise and creativity, overcoming mental fixation, and the neuroscience of learning creativity—and discuss how they might be translated into the real world beyond the lab.

In a review article, Frith (2022) explores the link between exercise and creative cognition, focusing on the trajectory of this relationship later in life. This review builds on the extant evidence linking exercise and cognitive functioning in older adulthood and discusses the potential for exercise participation to support creative thinking in older adulthood. In particular, Frith (2022) highlights neurobiological substrates (e.g., Default Mode Network) and cognitive mechanisms (e.g. executive functioning) that may bridge the connection between exercise and creativity in older adulthood. The author concludes with proposed translational recommendations to guide future research on this underexplored topic.

In another review article, Beda and Smith (2022) summarize existing literature on mental fixation in creative problem solving, describing practical solutions to mitigating this cognitive

barrier to creativity. The authors frame their review around the "forgetting fixation" theory, which outlines methodologies for alleviating mental fixation. Beda and Smith (2022) review research on both the causes and cures of mental fixation in the context of conceptual design and brainstorming activities, suggesting key memory mechanisms that may support "forgetting fixation" in these contexts. Lastly, the authors provide practical advice that educators, trainers, and other professionals can use to alleviate mental fixation and enhance creative thinking across many domains.

In a review article, Lopata et al. (2022) apply recent laboratory findings from the network neuroscience of creativity to the real-world classroom. The authors focus on the brain's Default Mode Network and the Executive Control Network, using dual-process theories of creativity to explore the functional role of these brain networks in different processes involved in creativity (e.g., idea generation and evaluation, Type 1 and Type 2 cognitive processing, and associative and analytic modes of thought). Lopata and colleagues (2022) argue that these findings have important educational implications, and that different modes of creative thought, such as idea generation and idea evaluation, are legitimate and important learning objectives for the modern classroom. The authors conclude with recommendations for educational practice and future research in this emerging area of study.

Creativity "in the wild": Moving beyond the lab

One frequent criticism of empirical creativity research is that traditional laboratory-based assessments of divergent thinking do not reflect the nuanced dimensions of creative processes and individual potential (Dietrich, 2019), and often fail to reliably predict creativity in the real world (Zeng et al., 2011). The bulk of lab-based creativity research has also been conducted in samples of Western, educated, industrialized, rich, and democratic (WEIRD), college-aged

participants (see Snyder et al., 2019). This work unfortunately overlooks diverse, global perspectives (Jones, 2021), despite numerous studies which suggest cultural background is an important predictor of many aspects of creativity (de Vries & Lubart, 2017; Fürst & Grin, 2017; Hawlina et al., 2017; Tsegaye et al., 2019; Wang et al., 2016). To address these issues, ecological assessment in creativity research is becoming more common in the field, allowing researchers to study creativity in more diverse contexts and samples (Cotter & Silvia, 2019; Glăveanu, 2019). This special issue contains numerous examples of the effective use of novel methods to assess creativity in the real world.

Creative problem-solving is an increasingly important skill for organizations in a rapidly changing world (Amabile, 2020). Indeed, it is particularly necessary for leaders to facilitate creative problem-solving within their teams. Leone and Reiter-Palmon (2022) review existing work on the three core processes of creative problem-solving (problem construction, idea generation, and idea evaluation) in the context of team leadership and management. Using the findings of this research, the authors present recommendations for team leaders to increase their team's performance at each step of the creative problem-solving process.

While computer science is often conceived as a creative discipline—requiring individuals to solve problems in innovative, flexible ways—no research to date has tested whether creativity predicts success in this increasingly important field. Daker and colleagues (2022) ask whether several measures of creative ability and self-efficacy predict success in lower- and upper-level university computer science courses. The authors find that individual differences in analogical reasoning performance, as well as differences in the extent to which students view computer science as a creative field, predicted computer science grades. These results held true even when

controlling for scores on tests of divergent and convergent thinking. The results of this study provide new insight into the importance of fostering creativity in computer science training.

Upshaw et al. (2022) explored the association between creativity and social media and smartphone usage in a sample of college students. This study examined two forms of creativity—divergent thinking and real-life creative accomplishments—and three forms of social media and smartphone use—active social media use (e.g., expressing ideas, creating content), passive social media use (e.g., browsing, viewing content created by others), and smartphone addiction. Divergent thinking was associated with less active social media use and lower smartphone addiction, while real-life creative accomplishments were related to more frequent active social media use. These findings suggest that laboratory measures of creative thinking and behavior are differentially predictive of real-world technology engagement and social media usage, complimenting other recent research related to sharing creative work on online platforms (Ceh & Benedek, 2021).

In a final review article, Kaufman et al. (2022) offer a strong argument for creativity's role in driving changes in equity and social good, with an appeal for the creativity research community to increase focus on communication with policymakers. This review draws upon themes from the last 20 years of creativity research to renew *why* creativity matters for real people: it is a driver of innovation, an equalizer on the academic playing field, and it increases individual well-being via identity development and meaning-making. The review concludes with a call for the field to further develop assessment tools in terms of both "form" (precision and reliability) and "meaning" (applicability to the real world).

Conclusion

This special issue provides a snapshot of innovative translational research in the psychological science of creativity. As a field, creativity research has matured to a point of applying robust laboratory discoveries and theoretical advances to real-world settings. Going forward, we encourage researchers to continue to strike a balance between ecological validity and experimental rigor. We also urge the field to prioritize diversity, not only in the contexts that are explored but also the samples that are studied. After all, creativity is complex and multi-faceted, so it requires a big tent and a wide lens to capture its many expressions.

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