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FOCUS on Research

Newsletter of the Division for Research, Council for Exceptional Children

In This Issue

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President's Message

Rethinking to Improve

Christopher J. Lemons, PhD
Stanford University

On a recent summer vacation to Hawaii, I had an experience that made me think differently about an important aspect of my life: what I eat. I had the good fortune to visit an octopus farm on the Big Island and to interact with an incredibly intelligent and amazing creature named Linda. After about an hour of learning about one another, discovering how we could communicate with one another, and realizing the very complex cognitive capacities of this creature, I decided to not eat an animal for a year. I'm not writing a piece to convince all of you to become vegetarians, but what I appreciate about this experience is that it was an opportunity for me to think again about how I approach everyday life.

Adam Grant's latest book, *Think Again*, highlights how critical it is to maintain an open mind, to have openness to reconsidering things we think we know, and to embrace both humility and curiosity as we try to understand and advance the world. Grant thinks that the ability to rethink and unlearn might hold the key to how we will make progress across many fronts in our current world.

The pandemic has exposed many inequities and problems in the U.S. education system—many of these directly rooted in how we educate children and adolescents with disabilities, from BIPOC families, and those who are from lower-income families.

I wonder if this is the perfect time for each of us to pause, rethink, unlearn, and reconsider how we could build something better, more effective, more efficient, and more sustainable than our current special education service delivery system. How could you play a role in that? How would you shift your current research priorities to address this need?

I'm hoping that the Division of Research will continue to play a leadership role in this space over the next year. Excitingly, Dr. Federico Waitoller has joined us as the chair of DR's Diversity Committee (see page 2 for more information about Dr. Waitoller). He will play a strong role in helping ensure that DR focuses on the intersections of race, class, gender, and disability. He will also continue to ensure that DR is very supportive of project 20/20. (Note: I'd like to highlight that in the previous newsletter I failed to recognize all the individuals playing a key role for this important project. Dr. Endia Lindo is the project chair. Dr. LaRon Scott, Dr. Tammy Ellis-Robinson, Dr. Joy Banks, and Dr. Robai Werunga are co-chairs for various

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CEC-DR Diversity Committee Spotlight

Federico Waitoller, PhD
University of Illinois at Chicago

My name is Federico Waitoller, and I am excited to contribute to the Division of Research as the new chair of the Diversity Committee. I was born and raised in Argentina and came to the United States with a soccer scholarship when I was 21 years old. Since early in my academic career, I have had a passion for addressing racial and class inequities for students with disabilities, which continues to be the focus of my research, teaching, and service at the University of Illinois at Chicago, where I am an associate professor. My research agenda involves two strands: (a) the experiences and outcomes of students with disabilities in the context of market-driven educational policies and (b) teacher learning and pedagogies for inclusive education. My latest book is *Excluded by Choice: Urban Students with Disabilities in the Education Marketplace* published by Teachers College Press.

As the new chair of the Diversity Committee of DR, I hope to create learning opportunities for emerging and established researchers to address inequities at the intersection of disability, race, class, and gender in education. We will be launching a series of seminars to conduct research with Black, Indigenous, People of Color (BIPOC) communities and the institutions that serve them. Stay tuned! I also want to invite you to our featured session at the CEC convention, *Researching Culturally Responsive Innovations in Schools*, in which I will be moderating a panel with Dr. Aydin Bal and community members to illustrate how to conduct research on culturally responsive innovations founded in educational equity. Members of the Culturally Responsive Positive Behavior Interventions and Supports Learning Lab (***http://www.crpbis.org/index.html***) will share their experiences collaborating with community members to inclusively resolve inequities in schools. Come and join us on Tuesday, January 18, 2022, at 9:15 a.m. ■

OPEN SCIENCE and Single-Case Design Research

Bryan G. Cook, PhD
University of Virginia

Open science reforms have the potential to strengthen the credibility of research, help address the replication crisis, and bridge the research-to-practice gap (Cook et al., 2018). *Focus on Research* is featuring a series of articles introducing prominent open science practices. Open science evolved primarily in the context of group quantitative research. However, open science has relevance for other research designs, such as single-case and qualitative methods. In this article, we consider how open science may apply to single-case design research. We briefly describe issues in single-case design research that open science reforms may address, review how core open science practices (e.g., preregistration, open data and materials, preprints) apply to and can benefit single-case research, and consider limitations and challenges for using open science in single-case design.

Issues in Single-Case Design Germane to Open Science

Contemporary open science reforms evolved, at least in part, in response to concerns about bias associated with researchers engaging in questionable research practices to obtain statistically significant results (Baker, 2016; Makel et al., 2021). For example, bias in individual studies and entire research bases may be introduced by *p-hacking* (i.e., trying many different analytic approaches until finding one that yields statistically significant results), *outcome-reporting bias* (i.e., cherry-picking or reporting only analyses that yielded significant results), and *publication bias* (i.e., studies without significant findings being published at lower rates than those with significant findings).

Researchers do not traditionally evaluate hypotheses in single-case design studies using p-values and tests of statistical significance but instead examine the presence

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Open Science (continued from page 2)

of functional relations between independent and dependent variables through visual analysis of graphed data. Although single-case researchers may not, then, seek to obtain statistically significant results, we suspect single-case research is not immune to many of the broader issues that precipitated open science reforms (Cook, Johnson, et al., 2021). For example, reviews have shown that single-case studies with larger effects are more likely to be published (i.e., publication bias; Dowdy et al., 2020; Sham & Smith, 2014), some single-case researchers reported they would drop cases with small effects from a study before submitting for publication (i.e., outcome-reporting bias; Shadish et al., 2016), and visual analysis is often conducted subjectively (Ninci et al., 2015). Thus, single-case researchers may feel studies with large effects and functional relations are more likely to be published, influencing how they conduct and report their research. Moreover, like other published scholarship, many single-case studies are behind a paywall, inaccessible to many stakeholders (e.g., teachers, parents).

Applications of Open Science Practices to Single-Case Design

Cook, Johnson, et al. (2021) suggested that core open science practices (e.g., preregistration, open data, and materials, preprints) can be applied to increase the transparency, credibility, and accessibility of single-case design research. *Preregistration* involves researchers specifying and publicly registering key study elements (e.g., hypotheses, variables, outcome measures, data analysis) before conducting the study (Gehlbach & Robinson, 2018). In addition to providing transparency regarding the research process, preregistrations make many questionable research practices (e.g., p-hacking, outcome-reporting bias) possible to identify. Johnson and Cook (2019) provided a rationale and guidelines for preregistering single-case studies, especially those designed to test a priori hypotheses regarding the effects of a predetermined intervention on one or more specific outcomes. Preregistration of critical elements of single-case studies such as hypotheses, participants, outcome measures, and criteria for conducting visual analyses may heighten the credibility of single-case studies.

Open data involve publicly sharing one's data so that other researchers can check published analyses, examine whether reported findings are robust across different analytic choices, and investigate novel research questions. Open data are often accompanied by shared analysis code, allowing other researchers to reproduce reported analyses exactly. Outcome data in single-case studies are displayed graphically and, therefore, are already shared in some sense. However, sharing raw data saves time and reduces potential errors by eliminating the need to extract data values. Moreover, single-case researchers can share data not typically graphed (e.g., social validity data, fidelity data). Finally, single-case researchers can share code for any statistical analyses conducted, such as computing effect sizes. Single-case researchers can also share study materials (i.e., open materials) such as intervention protocols and stimuli, outcome measures, and fidelity checklists to facilitate (a) other researchers replicating the study and (b) practitioners implementing study procedures (Cook, Fleming, et al., 2021). Open materials seem especially relevant for single-case researchers given the applied nature of most single-case studies.

Preprints involve authors posting non-copyrighted versions of manuscripts on freely accessible registries (e.g., ***https://edarxiv.org***; Fleming & Cook, 2021). Much of the published research base, including single-case studies, is behind a paywall and can only be accessed by paying the publisher (either individually or through institutional subscriptions). This means that many of the desired end-users of single-case design studies (e.g., teachers, parents) cannot access the research. Especially given the highly applied nature of most single-case studies, posting preprints that anyone with internet access can access freely seems like an important step in bridging the gap between research and practice.

Limitations and Challenges

Engaging in open science practices, no matter the type of research, takes time and effort on the part of the researchers. Preregistration, for example, requires thoroughly thinking through and documenting one's plans for an entire study before data are even collected. Moreover, engaging in open science practices is not an established norm among special education researchers. Additional awareness of and supports for engaging in

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Open Science (continued from page 3)

open science are needed in the field generally and may be especially important for single-case researchers given that open science reforms have traditionally targeted group research. Finally, although some open science practices play out the same for all research designs (e.g., preprints), others will play out in unique ways that are still being determined for single-case research. For example, preregistration of study procedures may be antithetical to some single-case researchers who seek to employ inductive reasoning to develop study procedures after beginning data collection (Johnson & Cook, 2019). Alternatively, because some decisions in most single-case studies are response-guided (e.g., when to end the baseline phase), preregistration of many single-case studies are likely possible but will involve additional procedures (e.g., decision trees) to specify under what conditions researchers will take specific actions (Cook, Fleming, et al., 2021). In sum, the specifics of how some aspects of open science will be applied in single-case research are not yet firmly established. ■

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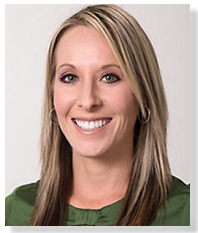
CEC-DR Families Research Spotlight

Shana Haines, PhD
University of Vermont

We have had a shift in leadership for the Committee on Families Research. I have served in this capacity for almost six years, and we have decided that Kathleen Kyzar, associate professor at Texas Christian University, and Tracy Gershwin, professor at the University of

Kathleen Kyzar



Tracy Gershwin

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CEC-DR Families Research Spotlight (continued from page 4)

Northern Colorado, will co-chair this committee. In addition, we welcomed Dezi Maier, a student at the University of California, Santa Barbara, as our student member. Please reach out to Tracy and Kathleen if you would like to be involved in our collaborative work!

The Research on Families Committee has three goals:

1. to develop and propose mechanisms for including individuals with disabilities and their families in research and dissemination processes;
2. to promote ongoing communication among research, family, and practitioner communities by assisting the research community in understanding critical issues for families of individuals with disabilities and by assisting families in accessing and interpreting research outcomes related to individuals with disabilities; and
3. to foster a research agenda that addresses critical issues regarding families of individuals with disabilities.

Toward these goals, the CEC-DR Families Research Spotlight highlights articles (nominated by DR members) that address critical issues affecting families with disabilities. Send your nominations to Zachary Rossetti (***zsr@bu.edu***) or Shana Haines (***shana.haines@uvm.edu***) with the subject line "CECDR Families Research Spotlight," provide the citation for and a brief explanation of your nomination, and attach a PDF of the article. Our committee will evaluate nominations based on this ***rubric***. Please send nominations whenever you read a great article that would qualify!

Featured Research Spotlight

Lo, L., & Bui, O. (2020). Transition planning: Voices of Chinese and Vietnamese parents of youth with autism and intellectual disabilities. ***Career Development and Transition for Exceptional Individuals, 43*****(2), 89–100.** ***https://doi.org/10.1177/2165143419899938***

Because family engagement in transition planning continues to be a challenge in special education, Lo and Bui examined the experiences of Chinese and Vietnamese families of youth with disabilities in planning for transition to adulthood. They designed a mixed-methods study to research the perceptions of 25 Chinese and Vietnamese parents of youth with disabilities concerning (a) the transition planning activities school professionals discussed with them, (b) which planning activities they felt were important, and (c) their experiences regarding transition planning. Results of the survey and open-ended interviews suggested that participants were enthusiastic about engaging in transition planning, as they wanted to ensure that their youth were equipped with skills for a successful and independent adult life. A major barrier to parent engagement in the transition planning process was the lack of information they received from schools about services and resources. A major practical implication of this study is the importance of schools working collaboratively and proactively with community and state agencies to connect them with Chinese and Vietnamese families. First, the authors note that schools could create a community resource directory to help families and individuals with disabilities understand available services and supports. Second, schools can offer transition planning sessions in concert with community and state agencies.

In addition to its insights, this article was nominated because it is a great example of practical and collaborative research aimed at understanding a critical and current issue in the field. The research team was composed of a researcher (lead author), a research assistant, and a family service coordinator of a nonprofit organization. The author team worked with two family resource centers and two parent support groups to recruit participants. As such, this study is a great example of the goals of CEC-DR Research on Families Committee. ■

Friends of IES Update

Elizabeth Talbott, PhD
William and Mary School of Education

Elizabeth Talbott, CEC-DR's public policy chair and professor of special education at William & Mary, was one of three speakers who participated in a briefing for members of Congress and their staff on Oct. 14, 2021, on the topic of *Research that Informs Resilient Education Systems: The Role of the Federal Investment in IES*. In addition to Dr. Talbott, featured speakers for the briefing included Catherine Bradshaw from the University of Virginia and Fiona Helsel from the Regional Educational Laboratories Northwest. The briefing was moderated by Felice Levine, executive director of the American Educational Research Association.

Professor Talbott provided an overview of some of the major accomplishments of research funded by IES's National Center for Special Education Research (NCSER), highlighting stories showing the impact of research conducted by DR members. These stories are particularly valuable for members of Congress, as they demonstrate the role of federal dollars in improving the lives of children with disabilities, their educators, and families. We would like to thank the DR members who have provided their stories to demonstrate the impact of IES-NCSER funded research along with the vital need to increase funding to at least $70 million annually.

We need more stories from our members showing the vital contribution of special education research. It's easy! Submit yours today using the ***Research Matters*** template on our website.

Tune into the ***Friends of IES website*** to view a recording of the briefing. A summary of the briefing follows:

"The federal investment in the Institute of Education Sciences (IES) has resulted in research-based interventions, statistics, and evidence-based tools that support teachers, students, administrators, and families. As the nation continues to recover from the unprecedented challenges borne by the COVID-19 pandemic, the role of research and data to support teaching and learning is even more critical to address persistent and emerging needs in education. This briefing will highlight the importance of IES-supported initiatives in driving evidence-based decision making in education, leveraging research–practice partnerships, and scaling up promising programs." ■

President's Message *(continued from page 1)*

project goals. These five individuals are providing amazing leadership to this vital project.)

We as a division are also continuing to make progress in focusing on connections across divisions, thinking about ways to enhance the usability of our research and to advance advocacy efforts. Additional details and information on playing a role in these efforts will be forthcoming. If you are interested in playing a leadership role in these areas, please let me know (***chris.lemons@stanford.edu***).

For today, I'm hoping a little story about an octopus changing the mind of a BBQ-loving Texas native might give you pause to reflect on how you might think again about your research, your impact, and ways you could do something differently to elevate the impact of your work to enhance the outcomes of the children and adolescents who we entered this field for.

Thanks, Linda. ■