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FOCUS on Research

Newsletter of the DIVISION FOR RESEARCH COUNCIL FOR EXCEPTIONAL CHILDREN

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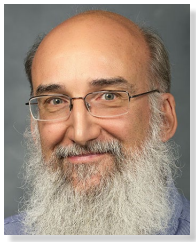

President's Message

Disruption, Correlated Constraints, and Adaptation During Troubled Times: The Role of Research When All Other Things Are Not Equal

Thomas Farmer, *University of Pittsburgh*

In the spring newsletter, I indicated that my final message would center on a developmental systems perspective of special education research. When I wrote that, the coronavirus was just beginning to impact the United States, and the most recent acts of institutional discrimination, racial violence, and social injustice had not yet come to the forefront.

Much has changed in a few months. We are experiencing health, economic, and social turmoil across the nation. Turmoil that differentially impacts communities, families, and persons. Differences that tend to vary by race, education, geographic, and disability factors. Current circumstances warrant the attention of researchers to not only help in response to the pandemic but to use this time to learn about the needs and adaptation of students with exceptionalities and their families when their lives are disrupted and to recognize that their experiences and opportunities are not the same as those afforded others. Clarifying the adaptation of individuals in context is central to developmental systems research.

My spring message centered on limits of the general linear model and large-scale cluster-randomized trials for special education research. I suggested that findings based on the general population might not be relevant for our students. Karen Harris contacted me and pointed out two factors that qualified my message. First, evidence-based research in special education is often conducted with samples composed of students with exceptionalities or students who need intervention. Second, special education research often involves single case experimental designs that are not based on the general linear model. Dr. Harris was quite right in pointing out these issues. I need to make it clear that my message is that evidence-based practices are important and necessary, but they are often a starting point. It is also necessary to understand how other factors influence the impact of intervention and to have data and expertise to individualize evidence-based strategies to the needs of specific students, contexts, and circumstances.

That brings us to the point of today's message. Experimental research and research based on the general linear model often operate under the assumption that, except for the intervention, all other things should be equal. We design studies through sampling or statistical procedures to control for differences and focus on the impact of intervention. However, disruptions caused by COVID-19 and social injustices clearly show us that in the real world all other things are not equal.

As Bronfenbrenner (1996) suggests, children develop as a dynamic system of

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OPEN SCIENCE in Special Education: Registered Reports

Jesse I. Fleming, Bryan G. Cook, &
William J. Therrien, *University of Virginia*

Open science *is an umbrella term that encompasses varied practices aiming to make science more open and transparent. Although some have argued that open science can make research more trustworthy, impactful, and efficient in special education (Cook et al., 2018), there is a lack of clarity in the field about what open-science practices are, their primary benefits and potential obstacles, and how to access resources for implementing them. To help inform the special education research community, we are featuring a series of articles in the Division for Research newsletter on prominent open-science practices. In this article, we discuss registered reports.*

What Are Registered Reports?

Registered reports are empirical studies in which the Introduction and Method sections (i.e., Stage-1 manuscript) are peer reviewed prior to the collection of data (Chambers, 2019; Kiyonaga, & Scimeca, 2019). After one or more rounds of peer review, if reviewers and journal editor agree that a Stage-1 manuscript asks important questions and plans to apply rigorous methods to evaluate those questions, the manuscript is granted in-principle acceptance. *In-principle acceptance* means the editor agrees to publish the complete manuscript after the study is conducted, so long as researchers (a) do not deviate from the accepted research plan, or any deviations are clearly identified and justified; and (b) results are appropriately reported and discussed. Stage-2 review occurs after the completion of the study, and involves reviewers evaluating adherence to the original research plan. Importantly, the paper cannot be rejected in Stage-2 review because of the direction, magnitude, or perceived importance of the findings (see Figure 1; Center for Open Science, n.d.a).

Primary Benefits of Registered Reports

Primary benefits of registered reports include reducing the likelihood of questionable research practices (QRPs), enabling reviewers to provide constructive input to improve studies before they are conducted, and reducing publication bias. QRPs, such as selective reporting of results, hypothesizing after results are known (HARKing), and collecting additional data after checking to see if results are significant (data peeking), negatively impact the quality and credibility of research (Makel et al., 2019; Simmons et al., 2011). Registered reports may mitigate QRPs, and thus improve the quality and credibility of research, by ensuring researchers delineate all variables, procedures, planned analyses, and hypotheses before conducting their study. As a result, researcher flexibility is limited and decisions in the research process that have not traditionally been transparent are unmasked (Nosek et al., 2018). For example, under the traditional approach to publishing, researchers may explore multiple approaches to analyzing data (p-hacking) and retroactively hypothesize those results (HARKing) but report the study such that it appears hypotheses were made in advance and only one set of analyses was conducted. Under registered reports, such practices would be discoverable and would result in rejection of the manuscript in Stage-2 review (see Figure 2; Center for Open Science, n.d.b). Importantly, registered reports remove the incentive to engage in these

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Figure 1. Main steps in registered reports.

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types of QRPs to obtain positive findings to improve the likelihood that a study will be accepted for publication. Indeed, one of the only ways for a paper to be rejected at Stage-2 review is to unjustifiably deviate from accepted research plans.

Registered reports also present peer reviewers with the opportunity to provide constructive feedback and refine the study's theoretical basis, research questions, and methodological rigor before the study is conducted (in Stage-1 review). In contrast with traditional peer review, which involves reviewers critiquing a completed study, reviewers of registered reports can be directly involved in improving research studies.

Another benefit of registered reports is the reduction of publication bias. Publication bias negatively impacts the field of special education because reported intervention effects for students with disabilities may be inflated due to the lack of null and negative results in the published literature (Gage et al., 2017). Publication bias is due, at least in part, because (a) some reviewers and editors may be less likely to accept studies with null finding for publication, and (b) researchers perceive that studies with null findings are unlikely to be accepted for publication. Registered reports combat publication bias because in-principle acceptance occurs before study results are known. Not surprisingly, registered reports are associated with significantly higher rates of studies with null findings than traditional publications (Allen & Mehler, 2019; Scheel et al., 2020).

Potential Obstacles to Registered Reports

It is important to recognize that not all research can or should be published as registered reports (Chambers, 2019). Registered reports are appropriate for a range of research designs when studies examine one or more hypotheses using methods determined before the study is conducted. Purely exploratory studies and studies that may develop in unpredictable ways are likely not appropriate as registered reports. In these types of studies, authors are not able to clearly describe study methods in advance such that reviewers can meaningfully evaluate study quality. Additionally, the Stage-1 review process entails a lag between when the study is fully conceptualized and when it can be implemented. Because the review process may involve multiple rounds of review, this lag can be many months and is difficult to predict. As such, time-sensitive studies (e.g., studies addressing dangerous student behavior, examining perceptions of a topical issue, needing to be implemented quickly to meet a funder's requirements) may not be appropriate as registered reports.

The time and change in workflow associated with registered reports also pose important challenges for researchers. Although researchers often plan many study elements before collecting data, they traditionally do not plan and document all study methods in advance. Accordingly, for most researchers, the workflow required for registered reports is different and may, at least initially, be challenging. However, the extra work devoted to planning before data collection is likely to reduce the workload during and after the study is conducted, as researchers will have a clear blueprint to follow for major study decisions. Nonetheless, because registered reports involve two stages of review, one before and one after the study is conducted, they require greater time and work from authors, reviewers, and editors.

One common concern with registered reports is that they are perceived as stifling researchers' creativity by disallowing exploration of data sets beyond analyses specified in Stage-1 manuscripts. This would be a

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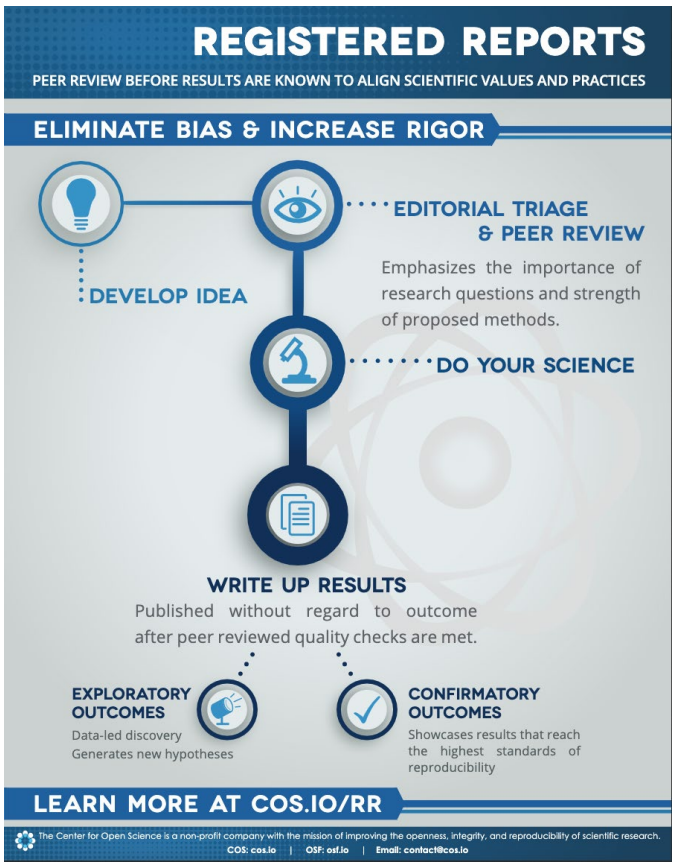

Figure 2. Center for Open Science's registered reports infographic.

Open Science (continued from page 3)

major limitation, as many important scientific advances occurred through happenstance and exploration of data collected for other purposes (Winters, 2016). Fortunately, registered reports in no way prohibit or even discourage exploration of one's data (Chambers, 2019). Rather, registered reports provide a clear distinction between confirmatory (planned) and exploratory (unplanned) procedures and analyses (see Figure 2; Center for Open Science, n.d.b). Exploratory analyses can and should be included in Stage-2 manuscripts, they just need to be clearly identified as exploratory so that research consumers do not confuse them with confirmatory analyses.

How to Submit a Registered Report

Registered reports are submitted to journals in two stages. While specific requirements vary by journal, Stage-1 submissions typically entail an Introduction and Method sections, including study rationale, research hypotheses, sampling plan, full description of independent and dependent variables, power analysis (if appropriate for proposed design), data analysis plan, and a brief discussion on how results will be interpreted if hypotheses are confirmed or rejected. Journal reviewers, in turn, evaluate the importance and salience of the research proposed to the overall aims of the particular journal and the suitability of the proposed methods and analysis plans for answering the research questions. Core to reviewers' evaluation of Stage-1 manuscripts is that the authors make a case that the study will be valuable regardless of the results (Kiyonaga & Scimeca, 2019).

The phases of Stage-1 review follow a pattern similar to that of typical journal manuscript submissions: manuscripts can be rejected or revisions can be requested with additional rounds of review conducted as necessary. However, because the study has yet to occur, reviewers of Stage-1 manuscripts have the opportunity to propose changes to the design and conduct of the study, instead of merely pointing out flaws in a study that has already been completed. Once the study is complete, authors update their Method section if and as needed, highlighting and providing rationales for any changes to the originally submitted protocol; write up the Results; and add a Discussion section. This paper is then resubmitted to the journal as a Stage-2 registered report. The review process in Stage 2 centers on whether the authors conducted the study as proposed, or justified any consequential deviations, and reported and discussed findings appropriately. If the answer is yes, the manuscript is accepted for final publication in the journal regardless of whether the authors' hypotheses were confirmed.

At this time, we know of only two special education journals that have adopted registered reports as a regular submission option: *Exceptional Children* and *Gifted Child Quarterly*. However, other journals in the field (e.g., *Learning Disability Quarterly*, *Remedial and Special Education*) have special issues slated on the topic. We encourage authors to submit registered reports to these journals, as well as to reach out to editors of other journals to see if they are willing to entertain a registered report submission.

Resources for Registered Reports

- Center for Open Science resources for registered reports – ***https://www.cos.io/rr***
- Seven easy steps to publishing a Registered Report – ***https://authorservices.wiley.com/asset/Registered-Reports-Seven-Easy-Steps-to-Publish.pdf***
- Overview of Registered Reports by Kiyonaga and Scimeca – ***https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(19)30124-9***
- List of published registered reports – ***https://www.zotero.org/groups/479248/osf/collections/KEJP68G9***
- Registered reports submission checklist – ***https://mfr.osf.io/render?url=https://osf.io/93znh/?direct%26mode=render%26action=download%26mode=render***

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DR Diversity Spotlight

For this issue of the newsletter, the DR Diversity Committee's Spotlight features a nominated resource by ***Dr. Federico Waitoller****, an associate professor in the Department of Special Education at the University of Illinois at Chicago. Dr. Waitoller's research focuses on urban inclusive education and racial inequities for students with disabilities. With his submission, Dr. Waitoller describes the significance of participatory action research for students of color with disabilities.*

Racial inequities in special education are as old as special education itself and continue to be a contested and controversial topic. Researchers continue to debate whether students of color are over- or under-represented in special education or whether students of color with disabilities receive more severe disciplinary sanctions and are placed in more restrictive environments than their white peers. Researchers also continue to discuss if frameworks such as Response to Intervention or School Wide Positive Behavior Support plans have any positive impact on students of color with disabilities. Hidden behind the noise of these critical debates and the words of hundreds of research papers there is a profound silence: the voices of students of color with disabilities.

The work of **Taucia Gonzalez** at the University of Arizona and colleagues addresses such problematic absence. In the EquiLearn Virtual Table organized by the Midwest & Plains Equity Assistance Center, Dr. Gonzalez shares a project based on participatory action research with Latinx and Hmong students both with and without disabilities. This virtual round table will provide you with ideas and inspiration to involve youth of color with disabilities not just as participants but as essential members of the research team (*see reference list*). The project centers the experiences and cultural repertoires of youth of color with disabilities to create more equitable and inclusive learning spaces. I encourage you to check it out! ■

Dr. Federico Waitoller

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Call for Nominations

2020–2021 CEC-DR Doctoral Student Scholars

The Division for Research invites nominations for outstanding doctoral student scholars to participate in the **2020–2021 Doctoral Seminars in Special Education Research**. Selected student researchers will participate with peers in generative discussions and professional development led by distinguished researchers recognized for making outstanding scientific contributions in special education. Three virtual seminars and online forums will be held during this coming academic year along with a colloquium that brings students and researchers together in a session dedicated to graduate student development at the 2021 CEC convention in Baltimore, Maryland.

Nominees should be outstanding doctoral students in special education seeking careers in research. ***Nominees must have substantially completed their courses and be in the process of formulating a dissertation proposal or conducting dissertation research.*** Advanced doctoral students are nominated as *CEC-DR Doctoral Student Scholars* by a faculty member who can attest to the quality of their scholarship. Students submit an abstract and a research summary. Members of the planning committee conduct a blind review of nominations to judge the quality of the student's research and capacity to gain from and contribute to the seminars. Invitations will be issued to 10 doctoral students, who will be invited by the end of October 2020. **Nomination packets must be submitted no later than September 30, 2020.** The full Call for Nominations, including the nomination form and directions, can be found at ***www.cecdr.org***.

CEC-DR Families Research Spotlight Nomination

The Research and Families of Individuals with Disabilities Committee of CEC-DR needs your help! We want to shine a spotlight on the best research relating to families of children with disabilities here in this newsletter and through other CEC-DR platforms. We are planning to highlight current peer-reviewed articles on this topic quarterly and again at our Business Meeting, and we are hoping you will help us by nominating great articles. Aside from the topic, the only requirement is that the nominator is a member of CEC-DR (self-nominations are welcome). The nomination process is simple and will only take you a few minutes. Simply send an email to Shana Haines (***shana.haines@uvm.edu***) with the topic line of CEC-DR Families Research Spotlight Nomination, provide the citation of your nomination and a brief explanation of your nomination in the text, and attach a PDF of the article. Our committee will accumulate nominated articles and evaluate them based on this rubric: ***https://tinyurl.com/ybv8yp9b***, using the categories of Focus on Family, High-Quality Research, and Innovation. We will consider nominations for each quarter on these dates: February 15th, May 15th, August 15th, and November 15th. Please send Shana any questions you have. We look forward to reading your nominations!

Advocating for Federal Research for Children and Youth with Disabilities

Elizabeth Talbot, *William and Mary School of Education*

This is a critical year for special education legislative advocacy, given the budget crisis public schools face as a result of COVID-19 and Secretary Betsy DeVos' efforts to divert public funds (including COVID stimulus funds) into private education, which is disastrous for students with disabilities. We need all hands on deck this year to advocate for keeping public funds in public education, and as always, increasing funding for the National Center for Special Education Research to $70 million. The more knowledgeable we are, the better, especially during this election year.

CEC hosted a free virtual legislative summit from July 13th through the 24th. All sessions were recorded. For questions about the recordings, please email ***sels@cec.sped***.org. For those DR members who were able to attend, please share what you learned with your colleagues. Be informed and ready to contact your congressional representatives on behalf of students with disabilities and the vital research we do.

A Word from Our Student Reps

Developing Writing Habits

Haya Abdellatif and Sally Fluhler


Haya (pictured on the left) is a doctoral student in the USES (Urban Special Education Scholar) program at the University of Pittsburgh, and Sally (pictured on the right) is a second-year doctoral student in the special education program at Peabody College of Vanderbilt University. This article was written by Sally.

In my first year of my doctoral program, I was told by multiple faculty members to make space for writing every day. I want to start this habit in graduate school when I have more unstructured time in my day than I will likely have as a faculty member or academic researcher. Taking one of the tips that we shared in our previous newsletter, I start every day with making a to-do list. One thing that has been on my to-do list every day is "write." It's written just that simply as well!

Then when I get to that item on my to-do list, I admittedly sometimes get stuck! If I don't have a writing project started up, how do I start? If I do have a project going, how do I pick up where I left off? Or should I start in a different area of the paper? Should I dive into the introduction or wrap up that discussion section? If I have a project with other people, are my contributions the best they can be? How can I make those sections better?

So what did I do? Read about writing! There have been a few books that I have found helpful and a couple more on my bookshelf waiting to be read. We wanted to share some general tips on writing up research that we have found helpful to kick-start our writing this summer.

- **Read journal articles:** This one may seem simple, but it has been a tip that has helped with multiple stumbling blocks. Reading articles from the journal you are submitting to can be helpful for recognizing patterns in the style of articles that are accepted. Reading recent journal articles in your area of interest could provide citations for the introduction you have been stuck on. Reading journal articles from different journals, and possibly across your different areas of interest, can provide you with a variety of styles and tones of writing that can be inspiring for your own writing. This endeavor can also be overwhelming, so starting small with a few articles a week is a great way to begin!
- **Be concise:** Writing research is different from writing for creative outlets. We want to be concise within sentences and paragraphs. Breaking larger paragraphs into smaller paragraphs makes it easier for readers to digest the information (enter the power of white space). Personally, I think that is the easier part. Making sentences concise is tough! Paul Silvia (2015) discusses two tips in his book *Write it Up: Practical Strategies for Writing and Publishing Journal Articles*: choose shorter words and drop words from the sentence that are unnecessary. You can replace words that may sound more academic with shorter words to convey the same meaning. Even something as simple as replacing the word *individuals* with *students*. You went from a five-syllable word to a two-syllable word, which can make your sentence *feel* shorter (even if the letter count is almost the same). You can also drop words from sentences that do not add to the comprehension of the sentence. I think about the show *Project Runway*; one of the judges always says "edit, edit, edit." Of course the judges are referring to accessories or ruffles on dresses, but the same applies here. Take a look at your sentences and see if you can drop a word or two without losing meaning. Edit!
- **Recap, connect, and resolve:** A helpful structure for discussion sections! I struggle with the discussion section, because I do not have a structure like I do in the intro or methods sections. *Recap* involves restating the purpose of your study, the central findings, and how those results connect to your introduction. *Connect* your research by placing it in the context of other theories and findings. Finally, *resolve* and confront any of the awkward findings or limitations to your project. By doing this, you are being transparent with your reviewers (and eventually readers) without dwelling on the portions that could have gone better. The recap, connect, and resolve structure is loose enough to be adaptable but structured enough to give direction (Silvia, 2015).

We could not fit all our tips in this newsletter issue, so we will continue to share throughout the year!

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President's Message (continued from page 1)

individual factors (e.g., biophysical, behavioral, cognitive, emotional) bi-directionally linked to each other and to a system of ecological factors (e.g., family, peers, community, culture, socio-political). Because these factors are organized as a dynamic system, they operate as correlated constraints that influence each other as they coactively contribute to the functioning and growth of the child (Cairns, 2000). When a child's developmental system involves strengths across multiple factors, problems in one factor are likely to be mitigated (i.e., constrained) by the strengths of other factors to foster adaptation. When correlated constraints involve multiple risks, difficulty in one factor is likely to promote difficulties in other factors, and this contributes to maladaptive outcomes.

With recent disruptions in society, we see correlated constraints in action. COVID-19 revealed disproportionate rates of risk and mortality for African Americans and people with underlying health issues, as well as other groups. The differential impact of this pandemic brings to the forefront socio-political factors, including economic opportunity, housing, healthcare, food security, transportation, and myriad other factors that impact the well-being of children and their families. For some groups, strengths across these factors mean lower risk. For others, correlated risks across these factors mean increased risk for contracting the virus and for potential serious health problems and death. The same is true with social injustice. Although they may be sitting in the same classroom, some of our students have to negotiate a very different set of factors and circumstances than their peers. All other things are not equal.

Also, the developmental timing of a disruption can differentially affect the outcomes of youth. In *Children of the Great Depression*, Elder (1999) describes disruptive historical events and the effect on different cohorts of youth. Children who transitioned to adulthood during the Depression had different life course experiences than children who were much younger during that time. Not only did they experience few work prospects, their lives were disrupted by World War II in ways that constrained educational opportunities, work, and family processes. Younger children had less interruption in their development and experienced greater educational and work opportunities. We can expect differential cohort effects for youth during the pandemic depending on their age and how these circumstances affect their learning and subsequent opportunities.

A developmental systems perspective helps us understand the way forward when all other things are not equal. Building on the concept of correlated constraints, we can identify individual pathways and contextual factors that may be leveraged during intervention to foster adaptation and positive outcomes that are meaningful to students and their families. This involves a person-centered approach that clarifies the factors that matter for youth who have similar characteristics, experiences, and ecological circumstances. From this foundation, it is possible to determine how specific factors operate together as a system to contribute to a student's functioning, how these factors can be changed in relation to each other to enhance the student's experiences, and how we can create supports in the student's ecology to promote adaptation and positive outcomes.

This is special education. As we move forward with research during and beyond these troubled times, we need to view disruptions as a time to learn about the differential experiences of the youth we serve and use this knowledge to enhance their opportunities. Through research, we need to ensure that we see each child, their families, their neighborhoods, their hopes, their strengths, their fears, and the obstacles they experience and overcome each day. This is the science of special education. Science when all other things are not equal. ■

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