

Addressing Barriers to Career Development Awards for Early Career Women in Pediatric Psychology

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Abstract

Objective To provide person and system-level recommendations for supporting early career women in the field of pediatric psychology in writing and submitting National Institutes of Health (NIH) Career Development Award (K award) applications. Recommendations are provided in the context of common barriers, with a focus on practical solutions. **Methods** Publicly available NIH reporter data were compiled to examine rates of funding for Society of Pediatric Psychology (SPP) members. Barriers that women face when initiating programs of research are described and applied to the field of pediatric psychology. **Results** Of current SPP members, 3.9% (n = 50) have ever received an NIH K award. Approximately 88.5% of SPP members identify as women, including 89.0% of SPP K award recipients. A table of person- and systems-level recommendations is provided to offer strategies for mentees, mentors/sponsors, institutions, and national organizations to address the barriers discussed. **Conclusions** By addressing gender-specific barriers to submitting K award applications, we hope to increase the number of women K awardees and support the scientific advancement of pediatric psychology.

Key words: diversity equity and inclusion; gender stereotypes; professional and training issues; women's health.

Acknowledgement of Intersectional Identities

This commentary outlines the literature on common barriers women face in pursuing early career research funding. We also present several recommendations that have the potential to reduce barriers for pediatric psychologists who identify as women and are interested (or potentially interested) in submitting National

Institutes of Health (NIH) Career Development Awards (K awards). Consistent with Simon et al. (2021), within this article we use gender-identity terms (e.g., woman) as opposed to sex-related terminology (e.g., female) to be inclusive of gender and sexual minority individuals and to denote that the barriers and recommendations discussed herein apply to any

individual who identifies as a woman. Further, we believe it is important to acknowledge that many women also have complex intersectional identities that add to and amplify existing barriers.

Women with diverse gender identities, disabilities, minoritized racial or ethnic identities, economic marginalization, or other diverse identities may face additional discrimination and systemic barriers to success. For example, there is a prominent and problematic double bind for Black women (Ginther et al., 2016), who are already underrepresented in academic medicine. Among NIH grants, only 2% of R01s go to Black scientists. Black applicants are more likely to propose approaches, such as community interventions, and topics, such as health disparities, adolescent health, and fertility, that receive less competitive scores from reviewers (Hoppe et al., 2019). Although the role of systematic racism and inequity must be considered to understand these disparities, it is also important to acknowledge that many women also hold diverse identities that are not as visibly apparent as race may be (e.g., history of homelessness, foster care, eligibility for free or reduced lunch, or firstgeneration college students; NIH, 2019). As such, there is often less systematic data on how these less visible identities may impede women from obtaining K awards. Indeed, many of the studies cited in this commentary did not consider additional intersectional barriers or distinguish transgender or gendernonconforming individuals. Nevertheless, acknowledge that centering the conversation on White, cisgendered, heterosexual women may add to the disparities affecting women who do not fall neatly into these categories. We recognize that there are also many individuals who do not identify as women, but still may be impacted by similar barriers (e.g., nonbinary or other gender diverse individuals), and we hope that much of this commentary holds relevance for supporting these individuals as well.

Positionality of Authors

We briefly describe our own positionality to promote transparency regarding how our identities as authors relate to the topic. All of the authors identify as women, and three authors hold identities that are underrepresented in medicine beyond identifying as women (NIH, 2019). All authors hold doctoral degrees in clinical psychology and conduct research related to the health and wellbeing of children. Three authors have been principal investigators on NIH K awards, two authors are in the process of revising K award applications, and two authors have served as senior mentors on multiple funded K award applications. All authors are Society of Pediatric Psychology (SPP) members, one author is a

past president of SPP, and one author is presidentelect of SPP.

Introduction

Supporting early career women is critical to the growth of science within pediatric psychology. Among the 71% of 2023 SPP members who reported their gender upon membership registration or renewal, 88.5% identified as women. Among these women, most identified as White (67%) with limited selfreported representation of Black (4%), Hispanic/ Latino (3%), Asian Indian (2%), Korean (1%), Chinese (1%), Filipino (1%), and Mixed or Other Races (21%). The high percentage of women in SPP is reflective of the large and growing proportion of women in psychological science overall with limited racial and ethnic diversity (Gruber et al., 2021; Roberts et al., 2020). Still, intersecting ecological systems of privilege and oppression differentially allocate resources and restrictions, largely to the benefit of cisgender, wealthy, educated, and straight white men. These systems of oppression cause inequities based on gender, including within the SPP community (Simon et al., 2021). While women represent the majority of SPP members, they are disproportionately represented at lower academic ranks (i.e., assistant and associate professors) and underrepresented at higher ranks (i.e., full professor; Brosig et al., 2017). In the broader field of psychology, women achieve early publication success as first authors, but are cited less, publish less, and have fewer first and senior author publications than men (Odic & Wojcik, 2020). Women submit fewer NIH applications than men, and women of color submit even fewer compared to White women (Ginther et al., 2016: Lauer & Roychowdhury, 2021). Current socio-political events, including the COVID-19 pandemic and the overturn of Roe v. Wade, have further exacerbated challenges for many women, especially those from underrepresented groups (APA, 2022; Davis et al., 2022; NASEM, 2022). The 2022-2026 Strategic Plan for SPP includes four goals, one of which is to support and disseminate evidence-based research and practice in pediatric psychology. This goal will only be actualized by supporting individuals who identify as women entering research careers in pediatric psychology, as they represent the majority of SPP membership and its research workforce. This places SPP at a critical crossroads to determine how to support women as they face unique barriers in their effort to advance the science of pediatric psychology.

1 2023 SPP membership registry data, including total number of members and de-identified gender data, were collected through communication with the SPP Board and Associate Management Company (P. Rushizky, personal communication, January 23, 2023).

Supporting women in overcoming the barriers to submitting their first NIH grant may be a critical first step towards addressing barriers that women face in pediatric psychology, and academic medicine more broadly. Although women submit fewer NIH grant applications than men, they are as successful as men in obtaining NIH funding after submission (Ley & Hamilton, 2008) and have comparable long-term funding longevity (Hechtman et al., 2018). While not the only mechanism for early career funding, NIH Career Development Awards (K awards) are highly valuable grant mechanisms for early career researchers who seek to establish externally funded programs of research. K awards are designed to launch early career scientists into independent lines of research through support for ongoing mentorship, specialized training, and research funds for up to 5-years (often providing >75% salary support for research and career development activities). Obtaining NIH K awards increases an individual's likelihood of future NIH R01 funding by approximately 24% (Nikaj & Lund, 2019), thereby bringing them into the fold for an independent NIH-funded research career.

We reviewed data on K awards granted to current members of SPP through cross-referencing the SPP membership list with the NIH Reporter system. Since 2000, 50 SPP members have received NIH K awards. This represents only 3.9% of eligible members (i.e., those who hold a doctoral degree). This small percentage may reflect a limited number of SPP members being interested in research careers, and/or the fact that our membership is made up of predominantly women. Notably, 89% of SPP members' K awards have gone to individuals who publicly identify as women,² which is an exciting and impressive finding given how well this aligns with SPP membership demographics. However, this does not detract from the overwhelming, and intersecting systemic barriers (e.g., sexism, racism) confronting women who consider pursuing these awards. Additionally, it remains unknown how the recent exacerbation of gender disparities by the COVID-19 pandemic and restricted access to reproductive healthcare will impact the future of women in SPP as it pertains to obtaining K awards (APA, 2022; Krukowski et al., 2021; Woitowich et al., 2021). Thus, a failure to address the barriers women face in submitting applications for early career funding, including K awards, could have a profoundly

2 Our team determined the gender identify of NIH K-awardees by reviewing publicly available information about each recipient, including but not limited to university website and Twitter bios. If a recipient's bio utilized she/her/hers pronouns, we coded the individual as a woman. If a recipient's bio utilized he/him/his pronouns, we coded the individual as a man. We did not identify any awardees who utilized they/them/theirs or other pronouns. Data available upon request. negative effect on the future of scientific advancement of the field of pediatric psychology.

Funding Mechanism Considerations

Importantly, K awards are not the only path to early career funding, and the optimal grant mechanism may be specific to an individual or institution. Certain positions may be less suited to K award funding; for example, early career researchers with significant teaching responsibilities may be unable to dedicate the minimum 0.75 FTE to K award activities. In certain situations, startup funds may be sufficient to secure pilot data to support independent federal applications (e.g., R21 or R01 mechanisms). Alternatively, internally managed federal support programs, such as KL2 or K12 programs, may meet an individual's training, career development, and research support needs, and are typically for a shorter duration of time than an NIH K award. Moreover, foundations such as PCORI (AHRQ, 2021), and others have career development mechanisms that could provide a good fit for early career researchers studying specific populations. Finally, collaborations with senior researchers (e.g., through Diversity Supplements; NIH, 2019) can provide additional opportunities for early career funding at the federal level, particularly for individuals with backgrounds that are underrepresented in science. While this commentary focuses on NIH K awards, many of the barriers and solutions discussed are applicable to early career women pursuing a range of types of early career funding.

Barriers to Securing K Awards for Women

Mentorship and Sponsorship

Early career women in pediatric psychology need strong mentors and sponsors who can help them navigate challenges and create opportunities as they work to secure early career funding. As part of most K applications (including the K08 and K23 mechanisms), applicants must identify established research mentor(s) who will provide content and methodological expertise and invest in the training of the applicant. While a mentorship relationship typically involves sharing knowledge and providing guidance, sponsorship takes this relationship a step further with the mentor becoming an advocate for the mentee. Sponsors utilize their own place of power and seniority to expand their mentee's visibility within their organization and involve them in experiences that will support their career advancement (Omadeke, 2021). There is some evidence that gender concordance between mentor and mentee leads to increased comfort, communication, and positive role-modeling in the mentoring relationship (Kao et al., 2014). However, women are underrepresented in positions of power and influence (Gruber et al., 2021), including lower rates of promotion (Brosig et al., 2017) and fewer appointments to chair positions (Richter et al., 2020), resulting in fewer available senior mentors or sponsors who have lived experiences traversing the early career years as a woman (Bates et al., 2016; Davis et al., 2022). Moreover, the fact that mentors on funded K award application are not provided with salary support adds potential unpaid burden and limits the mentoring capacity of senior scientists. This may be particularly challenging for those working in academic medical centers, which often do not have salary support for teaching (Gunderman, 2004).

Men are also more likely to serve as standing reviewers and chairs of NIH review panels, whereas women are more likely to have temporary affiliations and serve on study sections with lower total funding and research grants awarded (Volerman et al., 2021). Thus, women may have fewer opportunities to learn from the grant review process and are less able to influence the nation's research agenda (Volerman et al., 2021). Indeed, given that only 3.9% of current SPP members (n = 50) have ever received a K award, there are a limited number of mentors (of either gender) who have direct experience with the mechanism in our field. This shortage of qualified mentors in pediatric psychology is further impacted by the limited federal funding directed toward pediatrics and mental health (NIH, 2022). Psychologists working at institutions with smaller research programs may encounter more challenges accessing mentors, and institutions themselves may have varying experience with K award applications. While national meetings, such as the SPP Annual Conference (SPPAC), may help with networking, these opportunities have been limited over the past several years due to the COVID-19 pandemic (Woitowich et al., 2021). Ultimately, women need sponsors that recognize their value within the organization and potential to contribute by bringing diverse perspectives to the table, and who use their positions to open doors to make this happen. This requires access to potential mentors who are in positions of power and are invested in creating opportunities for early career women.

Caregiving Expectations

Societal expectations for women's caregiving may also impact work productivity, including grant submissions. For many women, submitting a K award when fellowship training is nearly complete or recently completed corresponds with a time that they may also be having children or considering starting a family. Women in academic medicine, including those with K awards, are more likely to have a spouse or domestic partner that is employed full time compared to male faculty (Jolly et al., 2014). Still, women report taking

on greater household and childcare responsibilities than men, including spending 8.5 more hours per week on domestic or caregiving activities in comparison to their male partners (Jolly et al., 2014). Additionally, women in academic medicine report being more likely to take time off during disruptions of usual childcare arrangements, to take a salary cut, and to scale back or discontinue work altogether, in comparison to their male partners (Ferns et al., 2021; Jolly et al., 2014). Caregiving expectations have dramatically increased since the COVID-19 pandemic began, thereby exaggerating already-existing challenges for many women (Davis et al., 2022; NASEM, 2022). Unsurprisingly, women have been less likely than men to submit grants and publish manuscripts during the pandemic, and this disparity was exacerbated for women of color (Krukowski et al., 2021; Roubinov et al., 2022; Staniscuaski et al., 2021). Moreover, studies show that many faculty members with children have considered leaving their careers during the pandemic, and not surprisingly, women with children are more likely to consider leaving than their male counterparts (Davis et al., Matulevicius et al., 2021).

Finally, the 2022 overturning of Roe v. Wade in the United States now limits access to abortion as reproductive healthcare in many states. Women in academic medicine are at higher risk for infertility and pregnancy complications than the general population, likely due to delaying pregnancy during extended training (Lai et al., 2023). The overturning of Roe v. Wade therefore may have a significant impact on early career women's bodily autonomy, as they navigate challenges with becoming pregnant, childbearing, and childrearing (APA, 2022). New restrictions in reproductive rights, combined with the burden of caregiving responsibilities that disproportionately fall on women and the impact of the COVID-19 pandemic, make this a time of high risk for the wellbeing and careers of women in the United States (Davis et al., 2022), including women in pediatric psychology. There are NIH supports for investigators and trainees who have caregiving responsibilities, such as suspending or reducing percent effort on a funded grant for family situations, including parental leave and childcare, or increasing administrative support (NIH, 2020). However, these supports only exist once the award is funded, and do not alleviate the caregiving barriers that women may face as they work toward submitting applications for funding.

Inequitable Access to Tangible Resources

Systemic issues, including disparate starting salaries (Catenaccio et al., 2022; American Psychological Association, 2019; Kichler et al., 2020) and startup packages (Sege et al., 2015) provide unequal access to

resources that support early grant funding success. This barrier may be particularly challenging for pediatric psychologists who desire to submit a Career Development Award, as most K-series grants require the applicant to have secured a faculty position to receive an award. Federal grants, including K awards, typically require multiple submissions to achieve a fundable score (Hechtman et al., 2018), thus initial position characteristics, including startup support, amount of dedicated research time, and salary, play a critical role in facilitating an individual's capacity to revise and resubmit applications. This can lead to a "catch-22" as women pediatric psychologists, who may be navigating the transition to faculty without external funding, may feel that they have limited leverage to negotiate their starting salary, startup package, or protected research time. Yet, these negotiable aspects of a first faculty position can be foundational to writing an NIH K award and launching an independent research career. For women who serve as caregivers, protected time for research is critical as they often have limited capacity to write grants on nights and weekends. Disparities in starting salaries can also affect women's abilities to pay for reliable childcare (Kichler et al., 2020; Sege et al., 2015). Without protected time and sufficient salary support, women may struggle to balance grant writing with their familial responsibilities.

Gender-Based Stereotypes

Gender-based role expectations, ranging from implicit bias to discrimination, may present another barrier to women's early career funding (Gruber et al., 2021). Gender stereotypes are prominent in the workplace, as evidenced by women's disproportionate representation within clinical, non-tenured positions compared to tenure-track faculty positions (Jagsi et al., 2021). Women engage in more mentoring activities than men (O'Brien et al., 2014), often without time bought out for these tasks. Moreover, evidence suggests that women, especially women of color, engage in more non-academic service and "invisible" labor than men (Hirshfield and Joseph, 2012; Porter et al., 2022; Social Sciences Feminist Network Research Interest Group, 2017). Attempts to increase the representation of diverse faculty on institutional committees may further increase the risk for women of color to experience systemic racism in the form of "tokenism". This occurs when such policies place a disproportionate level of service demand on a smaller group of individuals, which may have negative impacts on academic productivity, and/or place sole responsibility for ensuring equity and diversity considerations on those individuals (Gruber et al., 2021; Heilman & Chen, 2005; Porter et al., 2022). On an everyday basis, women also experience subtle forms of gender bias,

known as "everyday sexism," that may impact productivity and grant writing. Expectations to be "unfailingly helpful" (Heilman & Chen, 2005) encourage women to put aside writing or other blocked time for clinical, mentorship, or servicerelated tasks. Indeed, women may feel guilty for setting boundaries that protect their research time. Moreover, studies suggest that violating these gender stereotypes comes with a significant professional risk, as women are often evaluated negatively for exhibiting assertive personality styles that violate gender norms (Cecchi-Dimeglio, 2017; Heilman, 2012). These risks may be exacerbated for women with intersectional or minoritized identities as they intersect with racism, heterosexism, ableism, and other forms of oppression (Heilman, 2012). Qualities such as leadership, agency, assertiveness, and boundary-setting are essential to achieving a successful long-term research career, however these characteristics are disincentivized for women and may risk negative feedback.

Recommendations for Pediatric Psychology

We offer two types of recommendations in Table I. First, we summarize recommendations that guide systemic, top-down change at the national and institutional level. Second, we summarize person-level recommendations that are meant to guide women in overcoming barriers to submitting a K award and pursuing a research career, as well as their mentors. Consistent with other literature in this area, we believe that both system-level change and person-level supports are essential to promote gender equity (Bates et al., 2016; Davis et al., 2022; Gruber et al., 2021; Simon et al., 2021). We hope these recommendations will help women "get a foot in the door" with federally funded research programs and serve as a call to action for the leaders in our field and to change systems that have oppressed women and their opportunities when pursuing research careers.

In addition to the broadly applicable content within the table, we would like to highlight several specific initiatives that could be readily adopted and managed by SPP to promote early career women who are interested in writing K awards or other similar applications. Society of Pediatric Psychology could expand resources available to early career women entering research careers in pediatric psychology through a variety of mechanisms. Offering freely available workshops around writing career development awards could greatly disseminate mentorship and expertise in this area to individuals across institutions who are members of SPP. Within or separately from such a workshop, SPP could develop resources that outline ways to find K mentors across institutions within the SPP network. Society of Pediatric Psychology could

Table I. Recommendations to Support Early Career Women in Pediatric Psychology in Applying for Career Development Awards and Other Early Career Funding

	System-level considerations		Person-level considerations	
Recommendation	National	Institutional	For mentors	For early career women
Inclusive mentorship and sponsorship of women	support for mentors of early career scientists, including salary support for K-award mentors • SPP advocacy for policies that support the health and well-being of women and girls, including reproductive rights	 Increase the number of women in positions of power so that they can elevate the next generation (Gruber et al., 2021) Invest in start-up funding opportunities for early career faculty who are in the pipeline to submit a NIH K award Invest in leadership training to improve the leadership gap for women, targeting inclusive mentorship practices in senior faculty and supporting leadership capacity in early to mid-career faculty 	Seek and receive continuing education in inclusive leadership practices (e.g., Women in Medicine Summit) Understand the difference between mentorship and sponsorship; If you have institutional influence, use it to sponsor women Practice reflexivity and foster a sense of community among mentees	 Understand the difference between <i>mentorship</i> and <i>sponsorship</i>; Seek mentors and sponsors, within or outside of your organization. Consider seeking additional sponsors outside of psychology as this can be instrumental in accessing more resources or funding (e.g., through cancer centers, heart centers) Initiate relationships with faculty who have shared interests (e.g., via email, SPP listsery); Schedule a call, zoom, or coffee meeting to learn more about their work and discuss your emerging research and career goals Network with peers (e.g., through the SPP Early Career Affinity Group) for additional support (e.g., copies of funded K applications Consider virtual supportive environment initiatives to supplement institutional or societal supports (Hallet al., 2018; Javier et al., 2021)
Support women who disproportionately assume caregiving responsibilities	Friendly initiatives for all early career investigators, including childcare support and increasing access to administrative supplements (Davis et al., 2022) Expand programs to support and retain researchers with caregiving responsibilities, such as the Fund to Retain Clinical Scientists (Jagsi et al., 2022) SPP Advocacy for policies that support	 Invest in essential caregiving resources for women and their families (Davis et al., 2022), including paid parental leave, paid sick leave, paid family leave, on-site childcare, and affordable health coverage for families (including fertility treatment) Encourage foundations and donors to provide funding for initiatives to support faculty impacted by caregiving demands (Davis et al., 2022) Provide extensions of the promotion "clock" as needed, and allow women to pursue promotion without extensions when ready (Davis et al., 2022) 	 Model management of caregiving responsibilities and provide mentorship and support for managing roles in the home and workplace (including setting boundaries and reasonable expectations) When possible, promote mentee autonomy in deciding where and when work can occur Connect mentees with peer allies who have recent/current experience balancing caregiving and research roles 	et al., 2021)

Table I. (continued)

	System-level considerations		Person-level considerations	
Recommendation	National	Institutional	For mentors	For early career women
Promote equitable access to resources	Survey the SPP work-force on a regular basis (e.g., every 2–3 years) to elucidate inequities in pay and promotion within our field	 Engage in consistent institutional audits of salaries and re-alignments to promote gender pay equity (Gottlieb & Jagsi, 2021) Provide financial counseling as a standard benefit to employees (Kalet et al., 2022) Reduce implicit bias through use of decision architecture for promotion and award committees (Gruber et al., 2021) Appoint an "equity advocate" to hiring and promotion committees to attend to diversity outcomes and document impact over time (Gruber et al., 2021; Kalev et al., 2006) 	Be flexibly available during critical time periods (e.g., position negotiation, grant submission) to provide additional support, mentorship, and advocacy as your mentee navigates critical conversations Promote mentees in their applications for awards, positions of leadership, and funding	 Seek mentorship around optimal timing of writing and submitting a K award application in the context of transition to a faculty appointment Seek mentorship and advice on institutional negotiation (including salary, start-up, remote work flexibility) Survey peers about salaries and obtain copies of their start-up requests Leverage negotiations from a position of strength with other grant funding (e.g., postdoctoral grants, internal KL2 grant) and/or an external job offer
Address sexism and other inequities	 Provide NIH reviewers with mandatory training to understand the implicit bias and discrimination that occurs in the funding process and ways to mitigate this Revise K-award scoring criteria to explicitly recognize advocacy and service as a part of the "Candidate" score 		 Engage in open communication with your mentee about experiences of sexism and how to navigate them Speak up for your mentee (with their permission) when you suspect sexism or other forms of discrimination, as mentees may face barriers to reporting these concerns Connect your mentee with mentors and/or training activities that speak to combatting sexism and discrimination in the workforce 	Resist the cultural urge to downplay your accomplishments/ career aspirations goals when preparing your K application (Gruber et al., 2021) Understand your promotion criteria; Service opportunities provide opportunities to give back to the institution/department, but may not have the same tangible benefits for your career as other activities

develop resources on K training opportunities that are specific to pediatric psychology (e.g., compiling a list of leading researchers in the field that would agree to offer opportunities for others to join their research meetings, workshops, or other career development opportunities). Society of Pediatric Psychology could

offer a source of funding to support attendance at various training workshops (e.g., providing travel funds, stipends, or costs to offset time off). Mentors within SPP could develop trainings of presentations that teach skills of time management, balancing competing demands, and how/when to say yes/no to

opportunities that are presented during the early career stage. Finally, SPP and leaders within our organization can advocate for fair psychology reimbursement at our institutions, as well as support for hiring to meet clinical demands. With better reimbursement of clinical services, and increased investment in providers to deliver clinical services, protected research time would become more available.

Call to Action

This commentary is intended to serve as a timely call to action for leaders in our field to advocate for systemic changes to reduce barriers to early career women in their pursuit of external funding, particularly career development awards. Moreover, we hope to start a discussion within our field around ways that pediatric psychologists can advocate for themselves, their colleagues, and their mentees who are in the early stages of a research career. The field of pediatric psychology possesses unique strengths, including a tight-knit community, high engagement from faculty across career stages, and strong professional development and networking opportunities, many of which can be leveraged to overcome the barriers discussed herein. By utilizing these resources to support the advancement of early career women in our field, we will simultaneously support the next generation of scientists and the advancement of pediatric psychology.

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