

Batting 300 Is Good: Perspectives of Faculty Researchers and Their Mentors on Rejection, Resilience, and Persistence in Academic Medical Careers

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Abstract

Purpose

Professional rejection is a frequent experience in an academic medical career. The authors sought to understand how rejection affects those pursuing such careers and why some individuals may be more resilient than others in a population of individuals with demonstrated ability and interest in research careers.

Method

Between February 2010 and August 2011, the authors conducted semistructured, in-depth telephone interviews with 100 former recipients of National Institutes of Health mentored career development awards and 28

of their mentors. Purposive sampling ensured a diverse range of viewpoints. Multiple analysts thematically coded verbatim transcripts using qualitative data analysis software.

Results

Participants described a variety of experiences with criticism and rejection in their careers, as well as an acute need for persistence and resilience in the face of such challenges. Through their narratives, participants also vividly described a range of emotional and behavioral responses to their experiences of professional rejection. Their responses illuminated the important roles that various factors, including mentoring

and gender, have played in shaping the ultimate influence of rejection on their own careers and on the careers of those they have mentored.

Conclusions

Responses to rejection vary considerably, and negative responses can lead promising individuals to abandon careers in academic medicine. Resilience does not, however, seem to be immutable—it can be learned. Given the frequency of experiences with rejection in academic medicine, strategies such as training mentors to foster resilience may be particularly helpful in improving faculty retention in academic medicine.

Academic medical faculty regularly face a rigorous, competitive environment in which rejection is a frequent experience. Those pursuing research-oriented careers may be particularly likely to encounter rejection because acceptance rates are under 10% at the most prestigious medical journals,^{1–3} and only a small minority of applicants receive federal grant funding.⁴ This pattern of low rates of success in key professional activities is problematic, given research suggesting that certain individuals may respond to failure with lowered persistence, diminished

productivity, and higher attrition rates.^{5,6} Growing evidence about attrition from academic medicine,^{7,8} including studies suggesting that even promising individuals may not succeed,^{9–11} necessitates further examination of the responses of academic medical faculty to the nearly universal experience of professional rejection.

Considerable psychological research has focused on the quality of resilience, or the capacity to respond adaptively to adverse experiences such as professional rejection.^{12–15} Within academic medicine, Bickel¹⁶ has championed the bolstering of this resilience among faculty as a way to promote career development and success, despite the challenges of an academic career. Further, and perhaps of greatest relevance to the current work, Manson¹⁷ has discussed the importance of understanding which factors enable “persistence in navigating the crossroads of a research career.” Still, beyond these few reports, little is known about resilience in academic medicine, including which factors may affect resilience.

Because academic medical research faculty are generally drawn from a pool of previously high-achieving individuals who may not have had much prior experience with professional rejection, evaluating their responses to rejection is particularly important and may provide great insight. To explore the issue of professional rejection and academics' responses to it, we conducted qualitative analysis of interviews with individuals who had received prestigious K08 and K23 career development awards from the National Institutes of Health (NIH); we also analyzed transcripts of interviews with some of their mentors. K08 and K23 awards are competitive grants made to individuals holding clinical doctorates that afford them protected time, mentoring, and support to allow them to develop research careers. Because recipients of these awards have demonstrated significant aptitude and commitment toward research in academic medicine but are not uniformly successful in achieving independent funding or in garnering positions of leadership,^{9–11} they constitute a particularly interesting population through which to explore our

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research questions: (1) How does rejection shape careers in academic medicine? and (2) Why are some individuals more resilient than others?

Method

Study design and sample

The University of Michigan institutional review board approved this study, which was part of a larger, grant-funded qualitative study examining the outcomes and experiences of NIH K award recipients. Two other reports in this issue of *Academic Medicine* present additional findings from this larger study.^{18,19}

We describe the method in full detail elsewhere,¹⁸ but, in brief, we used purposive sampling to select potential interview participants from among the 5,516 individuals listed in the publicly available NIH RePORT database²⁰ who received an NIH K award between the years 1997 and 2009. We performed Internet searches to identify characteristics of interest that were not present in the database (race, current job and current professional status [e.g., associate professor, chief, industry employee], specialty, gender, institution), and we assembled lists of approximately 10 individuals to invite each week to participate in the interviews. As K award recipients accepted the invitations and scheduled interviews, we iteratively adjusted our subsequent invitation lists to ensure a reasonably balanced representation of individuals from the relevant groups listed above. We oversampled for racial and ethnic minorities. We ensured representation of individuals who remained at their original institution at the time of the K award, those who had changed institutions, and those who had left academic positions. We also included individuals who had gone on to attain further NIH funding (a sign of success) and those who had not.²⁰ Lastly, to gain insight about academic career challenges from the mentors' perspective, we interviewed some of the award recipients' K award mentors.

Data collection

We developed an in-depth, semistructured interview guide that included both closed- and open-ended questions relating to a number of domains, including the challenges academic physicians encounter in

their careers (see Supplemental Digital Appendices A–C, <http://links.lww.com/ACADMED/A120>, for the final interview protocols). For example, we asked the award recipients to discuss a low point in their career, experiences with rejection, whether they had left or considered leaving academic medicine and why, and what advice they would give to young researchers embarking on a similar career. We asked mentors to describe the situations or challenges of any of their protégés who failed to reach their potential, who struggled in academia, or who were unsure about continuing in academic medicine. We also asked mentors to discuss how they helped (or how they could have better helped) these struggling physician–investigators. Finally, we invited mentors to provide any other insights they had into why some K awardees succeed and some do not.

Between February 2010 and August 2011, we sent e-mails to approximately 500 K award recipients inviting them to participate in the one-hour semistructured telephone interviews that we were conducting to “gain insights regarding the determinants of success in academic medicine and the challenges that face those who pursue biomedical research careers.” We interviewed the recipients who accepted our invitation as well as the willing mentors to whom some of the award recipients had referred us. Participation was voluntary, all interviewees provided informed consent, and we offered a \$100 honorarium to all interviewees for their time. We conducted interviews to collect data until we achieved thematic saturation.

One of three researchers (including R.D. and D.S.) with graduate training in qualitative methods conducted the interviews, and an independent professional transcriptionist transcribed the tape-recorded interviews verbatim.

Data analysis

One of the three interviewers (including R.D. and D.S.) initially independently reviewed and thematically coded each transcript, using a thematic analysis approach, as described by Braun and Clarke.²¹ They used QSR NVivo software (version 8.0.332.0 SP4; Doncaster, Victoria, Australia).

Per standards for methodologically sound qualitative research,^{22,23} we

iteratively revised coding categories and identified quotations only after at least two of the analysts (including R.D. and D.S.) and the senior author (R.J.) had examined the data, codes, and quotations. Collectively, the analysts were diverse in their professional and personal backgrounds, which mitigated systemic bias and increased validity. We held regular meetings throughout the analysis to review the qualitative data, to arbitrate any differences in interpretations, to identify major themes, minor themes, cross-cutting themes, and recurrent patterns, and to compare and contrast quotes from different subgroups (i.e., race/ethnicity, those still in academia versus those who had left, those who held an MD versus those who held an MD/PhD or PhD, senior faculty versus junior faculty) within each emergent theme depending on the theme and the questions that we wished to explore.

Results

As reported elsewhere,^{18,19} of the 500 or so K awardees to whom we sent e-mails, 100 (about 20%) responded. All of the responses we received came from individuals who accepted our invitation to participate in the study; we did not receive any responses explicitly declining. Of the 100 K award recipients we interviewed, 69 gave us the contact information of at least one of their academic mentors. We attempted to contact all 69, and of these, 28 mentors accepted our invitation. Of the 128 participants, 54 were members of matched mentor–mentee pairs. Supplemental Digital Tables 1 and 2 (<http://links.lww.com/ACADMED/A121>) present the demographic and other characteristics of all 128 participants.

The average interview spanned 52 minutes, and the final dataset, excluding the interview questions, consisted of 513,730 words (1,108 single-spaced pages). We expected some of the codes (themes) that emerged, and some developed de novo.

We identified six major thematic clusters in this work: mentoring¹⁸; negotiation and resources¹⁹; unequal treatment, conflict, and discrimination; time and balance; goals and aspirations; and rejection and persistence. In this report, we present the results that pertain to the last cluster, which comprised two

major subthemes: (1) the pervasiveness of professional criticism and rejection and the associated need for resilience in academic medicine, and (2) the role of mentoring and other environmental factors in promoting resilience.

Of all 128 respondents, 62 made comments relevant to the pervasiveness of rejection and the need for resilience, and 71 spoke to the role of mentoring and other environmental factors in promoting resilience. Except as noted below, we detected no systematic differences in responses from individuals from different subgroups in our sample (e.g., by gender, race/ethnicity, degree, specialty, seniority, or career status).

The pervasiveness of professional criticism and rejection and the need for resilience in academic medicine

Nearly half of our participants (48%) spoke of not only the professional rejection and criticism inherent to careers in academic medicine but also the emotional reactions and resulting negative behavioral effects that often accompany such experiences. Respondents identified persistence, tenacity, and perseverance in the face of rejection and criticism as characteristics or qualities that are extremely important to career development and success in academic medicine. For the purposes of this report, we define resilience as the ability to recover from or adjust easily to professional rejection and criticism; hence, we identify the need for resilience as an integral component of this theme.

For our participants, rejection was generally an expected occurrence, and K award recipients tended to acknowledge the need to resubmit applications and manuscripts—to remain persistent despite facing this type of setback.

I've had more grants rejected than I could possibly imagine ... as a scientist, you become ... hardened to the realities of rejection and failure ... you have to keep slogging at it ... you're going to get rejected a lot. (Male, K awardee)

One of my manuscripts was rejected 10 times before it was actually finally accepted ... rejection is not new to me ... if they want to become a successful researcher, first of all they have to be very persistent: persistent, persistent, persistent; never give up. (Female, K awardee)

A number of K award recipients discussed continuing on toward the

successful completion of their goals despite receiving criticism or negative feedback. To illustrate, one interviewee commented:

That's part of science—rejection.... I mean, grants don't get accepted the very first time, papers certainly don't get accepted. It certainly happens a lot. I think you need a fairly thick skin to be in academics. (Female, K awardee)

In fact, some K award recipients commented that it is this ability to continue on—rather than talent and intellect alone—that is necessary for overcoming the challenges of academic medicine:

[E]verybody at this level is smart. Success doesn't really vary with brains at this point; success is often more about perseverance. (Male, K awardee)

Many K award recipients indicated that they had persevered after a rejection even when experiencing negative emotions. Others described this ability to carry on as “grit” or “toughness.” Another recipient remarked:

It's very disheartening and discouraging when you get a rejection.... I think you have to have a certain emotional maturity and mental toughness to deal with that in order to survive in academia. (Male, K awardee)

A number of K award recipients cited the need for positive thinking to reduce feelings of frustration and stress when dealing with professional rejection and criticism:

I think you have to reframe rejection ... make it more positive rather than negative or you won't survive in our culture. (Female, K awardee)

Conversely, some K awardees identified a propensity toward giving up on a manuscript or grant submission, moving into a different research area, or leaving academic medicine altogether if overly distressed or frustrated by criticism and rejection.

I submitted a paper ... the reviews were really harsh and I was angry ... it was rejected. I probably could have revised it and submitted to another journal.... I, to this day, have not revised and resubmitted that paper. (Male K awardee)

Although both men and women described distress at rejection, one female K award recipient suggested that women in

particular are more likely to be affected emotionally by rejection or criticism and, thus, are more vulnerable to attributing these types of setbacks to their own failures.

There's this ... fairly famous sort of decreased self-confidence ... in women in general ... even things like getting those reviews ... a lot of people are able to look at them much more dispassionately ... whereas ... women in general take a much more emotional hit in terms of these things ... it affects how they feel about themselves or something like that. (Female, K awardee)

Mentors generally concurred that persistence and resilience were essential for those pursuing academic medical careers.

There are periods when people wonder if this is the right thing for them ... the publication, the grants game is tough ... some people will just decide this isn't for me and I'm going to go another path ... it takes a lot of perseverance ... to be successful. (Male, Mentor)

In sum, the overall consensus among participants was that academic medicine presents an extremely difficult career path pitted with much rejection and criticism. Participants generally perceived such obstacles as evoking emotional and psychological responses which could subsequently have negative behavioral effects and hinder the successful pursuit of their goals. Hence, academic faculty must demonstrate resilience, often observed as persistence, in the face of this certain adversity.

Mentoring and other environmental factors that affect resilience

Comments from the K award recipients themselves as well as their mentors suggested that resilience was at least somewhat mutable and associated with various individual, social, and environmental factors, including emotional support, positive thinking, finding a passion, finances, and personal circumstances. Respondents perceived mentors as having the ability to mediate the influence of a number of these elements.

Moral support and encouragement.

Our participants indicated that simple words of encouragement could mitigate the damaging effects of rejection. Specifically, some K award recipients

noted that mentors encouraged them, believed in them, and acted as personal advocates or cheerleaders.

[T]he thing about a mentor ... is ... believing in you when you don't always believe in yourself ... there are so many road blocks ... you don't know how to sort out whether that's a message that you're not capable of doing that or what.... Where mentors can be really wonderful is that ... they can ... serve as cheerleaders. (Female, K awardee)

Likewise, some mentors commented on the importance of providing young investigators with advice and emotional support when times are tough. One mentor, for example, advised,

People are going to smash you and tell you that you're terrible ... you have to kind of roll with the punches and pick yourself up and believe that you will be successful. (Female, Mentor)

And another commented:

[E]very mentee goes through some periods of doubt ... they recognize that lots of them aren't going to make it in the end ... they get kind of worried.... So they need a lot of encouragement. (Male, Mentor)

Positive thinking and adaptive mind-sets. As indicated, award recipients noted that looking at rejection from a new angle could increase resilience. Importantly, some K awardees observed that mentors can *teach* junior investigators how to approach setbacks from a more optimistic perspective.

[T]he rejection is just part of the science. I guess my mentors always taught me there's a home for every paper; you just have to be persistent. (Female, K awardee)

Similarly, some mentors discussed ways in which they would psychologically prepare their trainees so that they would have a less threatening and sometimes even a more positive view of rejection.

When a paper is rejected I say great, it's rejected ... it's a bigger triumph to overcome a rejection and keep going ... it just makes you stronger to overcome rejection. (Female, Mentor)

Notably, a few male mentors mentioned sports in the course of the discussion of rejection.

[L]ike in baseball, a good average is 300. You need to be able to have the perseverance to be submitting grants ... knowing that ... a good percent hit rate

will be like 3 out of 10 ... be aware of that and just keep trying. (Male, Mentor)

One even suggested that women who participate in sports or athletics might benefit in particular from engaging in such activities because they are more apt to learn that failure is inevitable in the realm of competition. He commented:

All three of my daughters were athletes.... I think that it's very, very healthy for a young woman to experience that kind of thing ... when you do those types of physical things ... you learn to take a bump and not take it personally.... I think it's something which is very helpful in coping. (Male, Mentor)

Finding the right focus. K award recipients sometimes indicated that focusing steadfastly on wanted goals was a source of motivation when they experienced challenges or frustrations. These recipients believed that passion fostered persistence throughout difficult times.

Find what it is that you're passionate about and stick with it; be persistent, that it's not always easy but if there's something that you really enjoy, it's incredibly rewarding. (Female, K awardee)

Several mentors referred to this as having "fire in the belly."

To be successful in research, one needs to have sort of fire in one's belly about the issue ... it needs to be one that you really care about. So when the going gets tough, you say it's so important that I'm just going to keep plugging away. (Female, Mentor)

In general, both K award recipients and mentors observed that mentors could help their protégés discover their motivations and thereby encourage them along a focused career path in pursuit of desired goals—even in the face of adverse circumstances of rejection and criticism.

I think a good mentor pulls out from the mentee the path that the mentee wants to travel and then helps the mentee sort of figure out how to stay on that path and move ahead. (Female, K awardee)

The hard part for a mentor is to help them [protégés] stay focused on the work. And then it's work that they're so dedicated to and committed to and they love so much, and just helping them find that and stay focused on that so they can slog through it and get to the other end. (Male, Mentor)

Financial challenges: Obtaining resources and advice. In addition to the elements that helped them overcome rejection, participants discussed additional stresses which they believed made being resilient and persisting in academic medicine even more difficult. Financial considerations were particularly important, and some K award recipients discussed the challenges of maintaining continued grant funding:

There just wasn't enough money to go around and they just couldn't fund everything ... after 10 tries and no funded ones, I just got very discouraged and said I don't want to keep doing this. (Female, K awardee)

As mentors could promote positive, adaptive behaviors, they could also help their protégés with more tangible resources. One mentor, for example, observed that mentors often have the assets and influence to be able to assist young investigators whose funds and resources are limited:

We often have a capacity to help them solve a problem that's making them feel like they want to quit or give up. And we can often have access to resources that might get them through the crisis. There have been times when grants didn't come through and we could find bridge funds. (Male, Mentor)

Some K award recipients expressed their appreciation of a mentor's willingness to share staff, supplies, and other resources. They acknowledged that their mentor's assistance helped them to remain productive so that they could continue to pursue independent funding.

I didn't know what I was going to do and I basically went to someone and I said I would like to work on a project with you and collaborate.... I have no money, but this is my idea. And he provided tech time, supplies ... that's kind of what helped pull me out of the trenches—and that's actually what I wrote the [grant] on. (Female, K awardee)

Frankly, I wouldn't have been able to get the R award if I didn't have a lot of resources ... from my mentor that I could use ... he had a very large lab and I was able to use a lot of his people and a lot of his reagents to help me get to the point where I could get an R award. (Male, K awardee)

Others found particularly helpful the mentors who would teach them funding strategies and grant writing techniques or the mentors who would use their

experience, expertise, and influence to promote more favorable outcomes.

When I was writing this grant, I really was kind of in the dark ... [mentor] just sat down with me and we wrote it ... it was just this side-by-side writing of the grant that was eventually well scored and we got funded ... if that grant had not been funded, it may have been a very different outcome for my career. (Male, K awardee)

I've never been funded on the first round. I have several grants that have been funded on the third round, and that's one of those things that I was talking about—that initially the support and advice and guidance of senior folks and colleagues, being in settings where people share their summary sheets and their war stories, and it makes you not personalize it. It's really, really helpful because otherwise you're like, "Oh, my ... they hate us" ... in my last setting, we created grant reviews and things like that for junior faculty ... people shared their experience and their wisdom about strategy ... that worked really well. (Female, K awardee)

Personal financial issues also had an impact on K award recipients' ability to outwait professional adversity or rejection. Several K award recipients expressed that those who depend on a stable income to support their family or to pay off debt were not in a position to remain in a harsh academic environment.

I am lucky that I have a family environment and situation that allows me to persist in academic medicine. There are people who maybe are in a one-income family.... They can't persevere even if they wanted to because the harsh financial reality of it wouldn't allow them to persevere. (Male, K awardee)

Some perceived mentorship as vital to ensuring continued progress and success in the face of personal financial struggles. One K award recipient observed that young trainees are in need of mentors who can teach them how to manage their personal finances.

I do think that where we don't have good help is teaching young faculty to make choices that are financially sound for them.... I have lost fellows because they say, "I have to go out and make money".... I also have residents who have no idea how to balance their financial life. They don't know how to get their 403 started, stuff like that. I do think that we are very weak in that and there could be a special arena directed for encouraging

scientists to stay in science.... I think we lack financial mentors. (Female, K awardee)

Family and personal life circumstances: Finding role models. Several respondents also noted that family and personal life circumstances beyond financial considerations may influence the ability to overcome career adversity. Some K award recipients expressed difficulty with having to juggle parental responsibilities in addition to an already-demanding academic career. Respondents observed that this particular challenge may be especially damaging to the career resilience of young female investigators.

I think women are at more of a disadvantage because then you're talking about working ... and trying to care for your kids ... and that seems to affect women more than fathers ... you have to do it but you're going to still try to get the grant ... then it's sort of a tipping point and then people kind of give up. (Male, Mentor)

Some suggested that women might be particularly vulnerable to being discouraged by failure because they may feel like failures both at work and at home.

There have been plenty of times where I've wondered ... is it worth killing myself to carry on?... You don't want to be a failure with your children and then there are times when you feel you're a failure at work, too, if you don't get a grant or if you get a paper rejected. (Female, K awardee)

A number of female K award recipients discussed the value of having female mentors who can act as role models for how to successfully manage family life and child rearing alongside an academic career.

I'm also a mother ... it has been extremely important to have somebody who ... has shared their experiences of how they have navigated early childhood and early stages of an academic medical career and really maintained success in both of those arenas. (Female, K awardee)

In general, the results suggested that resilience was at least somewhat mutable and associated with or even dependent on various individual, social, familial, financial, and environmental factors. Mentors appeared to have the ability

to mediate the influence of these elements by providing moral support and encouragement, teaching adaptive mind-sets, helping protégés find the right focus, and, at times, making funding and other resources available. Moreover, a number of participants described certain advantageous circumstances related to financial and personal life stability that made persisting in the face of challenges and opposition easier. For example, some viewed outside financial support or lack of parental responsibilities as advantageous.

Discussion

The current analysis demonstrates not only the prevalence with which academic medical researchers encounter criticism and rejection in their careers but also their acute need for persistence and resilience in the face of such obstacles. Through their narratives, our participants vividly described the range of emotional responses and behaviors they experienced after suffering a rejection, as well as the important role played by various factors, including mentoring and gender, in shaping the ultimate influence of such rejection on their own careers and on the careers of those they had mentored.

Of particular importance is our observation that resilience is unlikely to be an immutable characteristic. Our findings show that a number of elements appear to affect resilience either positively (e.g., encouragement, positive thinking) or negatively (e.g., financial constraints). Researchers^{12,14} have used terms such as *protective factor* and *vulnerability factor* to refer to a condition that could modify the effects of adversity. Individuals exposed to the same adverse situation may experience different outcomes, either positive or negative, depending on their own unique set of vulnerability and protective factors; for example, two individuals may both experience professional rejection (vulnerability), but only one might have a supportive mentoring relationship (protective). Indeed, prior research suggests that numerous individual, social, and environmental factors may influence long-term persistence, resilience, and productivity in a research career¹⁷ or, in academic medicine specifically.²⁴ Our findings provide an additional, nuanced

understanding of such protective and vulnerability factors.

Our study also provides strong evidence to support previous research^{16,24,25} indicating the need for resilience-building strategies to help faculty overcome barriers to advancement. Providing researchers with such tools seems likely, in turn, to improve faculty retention in academic medicine.

A key finding is that good mentoring seems to bolster resilience. Prior researchers have recommended that professional education include resilience-building coping strategies, such as actively seeking out supportive mentoring relationships.²⁶ In fact, Bickel¹⁶ suggests that faculty resilience in academic health centers rests on a “supportive ecology” in which trainees can access a network of mentors when in need of advice, guidance, or emotional support. Our findings support the argument that any future resilience-building interventions should use the mentor–protégé relationship and should include, if not already present, an extended mentoring support system or a mentor network.¹⁸

Our findings illustrate several specific ways in which mentors can support resilience in their protégés. So that protégés do not feel inordinately dejected, mentors can offer moral support and encouragement, and they can promote positive thinking and a more adaptive mind-set as a means of emotion regulation. Further, mentors can help their protégés identify a research focus that stirs their passion, and they can inspire hope in their protégés by modeling their own successes. Mentors can help their protégés through difficult times and alleviate the stress of financial worry by teaching financial management skills as well as by, very practically, providing access to shared funds, equipment, and resources. Finally, mentors can and *should* guide their protégés through the academic system by explicitly discussing the prevalence of rejection and criticism and the need for persistence.

Further, our data suggest that gender differences in resilience and persistence are important to consider when examining the gap between men and women in rates of attrition from academic medical careers. Existing studies

suggest that even women who remain dedicated to scientific careers throughout their education and training and who embark on careers as academic medical faculty may nevertheless ultimately fail to persist and succeed at the same rates as their male peers.^{8–11,27} Seminal theoretical work by Cole and Singer⁵ has suggested how differences in responses to rejection might lead to gender disparities such as those observed in academic medicine. They proposed a model in which slightly dissimilar patterns of positive, negative, or neutral events; small differences in reactions to these events; and existing social and psychological differences could interrelate and gradually accumulate into a more substantial disparity over time. For example, they noted that manuscript and grant rejections are negative events that not only differ in frequency for different individuals but also produce differing reactions in a way that may ultimately lead to a productivity differential between men and women scientists.⁵ Our findings are consistent with this theory. Our participants suggested that dissimilar reactions to rejection are at least somewhat related to individual differences in psychological traits and gender socialization (as well as to varying factors associated with mentoring, finances, and family circumstances). Moreover, those who were persistent in academic medicine seemed to have benefited from the combined, cumulative effects of their own resilience in the face of rejection, good mentoring, and advantageous circumstances.

Therefore, we believe that improving the quality of mentoring and of social support networks may be particularly important for bolstering resilience and persistence among female faculty.^{28–31} These resources are crucial because women may be particularly vulnerable to believing that rejection indicates a lack of ability, which, in turn, may lead to negative emotion, concern about social disapproval, and future avoidance of challenging situations.³² Furthermore, our participants described how women, to avoid feeling like failures in both their personal and professional lives, may be more likely to give up or reduce their efforts when they face career adversity if, at the same time, they are experiencing competing demands at home. Indeed, prior researchers have suggested that women faculty experience significant

obstacles related to family responsibilities and child rearing.³³ Our findings suggest a particular need for senior faculty mentors who can model resilience in the face of the inevitable professional failures that may be even more challenging and pervasive for those trying to juggle both career and family.^{16,34,35}

This study (like its counterparts^{18,19}) has a number of strengths, including a dataset of rich narrative comments, our well-reasoned participant selection (using purposive sampling), our appropriate and thorough data collection (employing multiple interviewers, all with training in a range of social scientific disciplines), and our robust analytic approach (including triangulation among the aforementioned interviewers who also independently and iteratively analyzed the data).^{22,23} Collectively, our participants were able to provide a deeper understanding of the ways in which academic medical faculty react after rejections. This study does, of course, sacrifice some degree of breadth for depth, but our sample size of 128 participants and the quantity of the data we analyzed were both substantial.³⁶ Of note, to minimize concerns about generalizability, we not only used purposive sampling to ensure a wide range of perspectives but also continued to accrue participants until we achieved thematic saturation. We did limit our focus to individuals who had received (or mentored) prestigious K series awards; therefore, the results may not be generalizable to those who have different capabilities or career focus. However, academic medical faculty are generally a select and capable group that are unlikely to have encountered rejection frequently before embarking on their faculty careers, and we believe that the insights gained from this select population have broad relevance and face validity.

A particularly unique contribution of this study is our observation that resilience is unlikely to be an immutable characteristic. Future studies should explore the role of mentoring as well as institutional and/or public policies in order to identify protective factors that can promote resilience in an academic medical career. For instance, future researchers should investigate the outcomes of formal mentoring programs in academic medicine that incorporate resilience-building strategies

into their agenda. It may also be useful to explore whether K award recipients are better able to persist in research careers if they receive additional support from institutional funds set aside for new investigators or if they participate in NIH loan repayment or reentry programs. In addition, future studies should investigate whether K award recipients are more resilient if their institutions openly encourage the use of institutional resources meant to alleviate the additional stresses of family life, such as events and programs addressing work–life balance in academic medicine and options for flexible schedules.

Conclusions

In sum, this qualitative study provides a rich, nuanced understanding of not only the pervasiveness of rejection and the need for resilience in academic medical research careers but also what contributes to resilience, persistence, and ultimately success in that competitive field. Our findings strongly support the need for resilience-building interventions in academic medicine, and they suggest that such interventions should focus on teaching coping strategies such as adaptive mind-sets and positive thinking, which can lead to better emotion regulation and increased persistence. Such interventions appear important to promote the career success of all young medical faculty members, particularly women. Most important, our findings emphasize the critical role that mentoring plays in promoting the resilience of young faculty investigators in academic medicine.

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