

My word

A group approach
to growing
as a principal
investigator

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The transition from post-doc to principal investigator (PI) leading an independent academic research laboratory is considered a major milestone for an academic career in the sciences. This transition is accompanied by new roles and responsibilities — beyond directly performing research — for which PIs are generally not trained. These new roles include hiring, managing multiple lab members and having responsibility for the professional performance of their teams. Here, we describe our experiences as early-career professors undergoing this transition. We outline a process we implemented with the guidance of an organizational psychologist to rethink these new roles and responsibilities. We identify common and systemic challenges faced by PIs at academic institutions and describe our decade-long experience in using principles from organizational psychology to help us navigate an academic medical center.

Ten years ago, most of us were in the midst of the transition from being postdoctoral fellows focused on research to becoming PIs. We independently underwent this transition, with diverse research programs, backgrounds and personalities. Yet, there were many common barriers and challenges which we similarly experienced and which we had to overcome to succeed in our roles. In retrospect, this was a transition for which we were inadequately prepared and with consequences we did not fully understand.

We had been trained in conceiving, designing, executing and publishing

research. But none of us had received guidance for our new institutional roles, including managing teams of people, navigating hierarchical roles and integrating into an organization with its own culture, structure and traditions. As new PIs setting up our labs, we were embedded in a set of responsibilities and dependencies for which we felt unprepared. Our success depended on our capacity to handle these roles as much as on our ability to guide research programs.

This challenge was compounded by a difficulty of finding help in addressing these institutional roles, or even the language and conceptual frameworks to express what we lacked and needed in our new roles. Institutional mentoring programs by senior colleagues often provided useful advice on grant writing, publishing and building relationships. But the advice, while well intended, did not address our new roles in the context of the institution and the skills necessary to manage groups of people. A shared interest in facing these new challenges brought us together in a peer-mentoring, institutionally supported junior PI group that met monthly for lunch. We invited senior colleagues to talk about how they managed the challenges of establishing a lab. At one point we invited David Berg, an organizational psychologist, who at the time was working with the Robert Wood Johnson Clinical Scholars program.

In our first meeting, David exposed us to a new way of thinking that provided a framework to understand our roles. Specifically, we were introduced to language that revealed the system we were navigating as composed of groups, social norms and roles (Box 1). Initially, some of us felt deeply skeptical about this ‘touchy

feely’ group and a view of organizations that did not put personalities at the center. We arranged to meet with the organizational psychologist regularly and are still meeting today. Seeing the organizational system around us helped us understand many of the behaviors, conflicts and decisions we encounter daily¹. Perhaps more importantly, not seeing this system carries significant costs, for us as well as for those who depend on us and for the scientific work we represent. We have learned that if we cannot carry our authority with competence, compassion and awareness, we run the risk of failing as PIs. If we cannot see the institutional forces that shape policies and practices, preferring instead to attribute those policies and practices to the whims of individuals above, below or around us in the institutional hierarchy, we risk failing in our efforts to reform those policies and practices.

Guiding structure

Our bimonthly meetings had four distinctive features: a consistent *group* of peers who chose to participate in the activities, and to invest in their relationships with each other; a commitment to a *method* of understanding organizational events, which was practiced each week; a *conceptual foundation* referred to and revisited over time; and a *facilitator* trained to see and inquire about the dynamics of human systems. There were two essential aspects to the evolution of our group: the trust in our commitment to confidentiality that grew over time and enabled us to express our vulnerabilities; and open acknowledgement of our different identities (e.g. privilege, race, gender, national origin) and the role these identities play in our experience as PIs.

Box 1. Glossary.

Relational: Concerning the connection between two or more people, departments or roles.

Systemic: Concerning the interdependent connections among parts of a larger whole.

Hierarchical: Concerning levels of authority in an organization.

Authority: The legitimate right to compel the behavior of others.

Role: The position or function one has chosen or been assigned in a relationship, organization or society.

Dissent: The expression of opinions or ideas at variance with those held by people in positions of authority.



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Figure 1. Diagnosing group and organizational issues.

Sharing our challenges (Figure 1) became an opportunity to create more meaningful relationships and exposed common vulnerabilities. The compassion with which we engaged each other’s struggles became the foundation of the group. Had we not chosen to reveal our vulnerabilities, the meetings would probably have petered out. This approach depended upon a small group of participants who were committed to consistent attendance and were willing to tackle the important challenges in their professional lives. We were not in positions that would require us to evaluate each other for promotion, grants or salary. We learned that sharing was not only necessary for growth, but that vulnerabilities and challenges could turn into opportunities for the group to learn and grow.

Our ability and willingness to bring our experiences to the group also evolved in parallel with our trust in each other. We are a diverse group (Box 2) and our identities exert a constant influence on how we experience our work lives and how others experience us. Our awareness of these influences became a window to understand how identities influence the lives of those around us. In the early years, our examination of these issues was

largely tentative and muted. Recently, these issues are more evident in almost every conversation we have. In addition to being more comfortable with each other, the larger world stage has placed issues of national origin, ethnicity, race and gender into our daily academic lives.

Our group had the benefit of working with an organizational psychologist. He was trained to observe and analyze systems, and to ask about the organizational roots of the issues we brought to the group. He is also an educator, which meant that he brought an intention to create a healthy learning environment, one to which we could bring our ignorance, vulnerability and insecurity without fear of judgment or evaluation. He was not an individual coach, but as we got to know him, many of us turned to him individually for advice on managing our increasingly complex institutional roles; yet, this was the exception rather than the rule. Most of our work was done together as a group, for as skilled as he was, the facilitator was only one voice, one perspective, one personality, one set of group memberships.

It is hard for us to imagine how this group could have stayed together and evolved as a learning group without

the facilitator’s consistent involvement. As new PIs we didn’t know what we needed to learn. As we progressed in our careers, the facilitator helped us expand our view of issues important for our professional development, opening the boundaries around the group to institutional level issues that affected our work and the people around us. As a result, the group remained a source of insight and support even as the issues we addressed changed over time.

Guiding method

Our meetings have a format. The central feature of this format is that the agenda is created by the group members in the first few minutes of each session. The facilitator asks what is on people’s minds, what they are struggling with, what they are curious about or what they are unsure how to handle. “*My lab members have very different levels of enthusiasm for the work. How do I give feedback to someone in my lab? A lab member came to me upset about another lab member. My lab meetings feel flat, what is that about? How do I encourage collaboration among lab members?*” In the first meetings, it was not uncommon for the group to stare at

Box 2. Essential elements of the group.**Sharing vulnerabilities — for example:**

- Worries about how to motivate lab members.
- The burden of being responsible for the work and well-being of others.
- Fears about funding and publication.
- Discomfort with handling formal authority.
- Mistakes in our relationships with students, peers and senior PIs.

Accepting our different identities — for example:

- Gender, race, age, nationality.
- Training.
- Different historical relationships to the identity group dynamics that animate life in the United States (race, gender, ethnicity, clinical training to name only four).

the psychologist with the expectation that he would create the agenda. Over the years, the agenda for each meeting arose from group discussions and collective decisions prioritizing emerging or urgent conflicts, problems or concerns.

We jointly decide on the topics of common interest and the person who brought up the selected issue gives a three or four-minute account with as many details as seem relevant. The natural tendency of the group is to offer a solution to the problem, but we learned to resist this impulse by first reporting how the story made us feel. Our initial emotional reactions to the story were important to identify and articulate because they often drove our initial understanding and they are often different across the members of the group, suggesting a variety of possible explanations. Often we were not sure what we felt or had trouble verbalizing an actual feeling, and instead felt more comfortable offering an analytical assessment of the situation. The organizational psychologist was consistent and firm in his request that we start with feelings.

After feelings, we make observations, articulating what struck us about the story: what event, piece of information or aspect of the account jumped out at us. Like the 'feelings' activity, this is rooted in the observation that our initial perception of the 'facts' is likely to frame our explanations, causing us to miss or ignore other pieces of data that might be important. And as with our feelings, we are not all struck by the same parts of the story, our diversity

again pointing toward a variety of possible explanations.

Only after having heard each other's feelings and perceptions do we allow ourselves to talk about hypotheses to explain what we heard, which then guide a discussion of what to do about the issue or situation. There is a collective attempt to consider what steps to take. It is also the time when the organizational psychologist is most likely to introduce a concept that might be useful in either understanding what is happening in the story (e.g. hierarchy tends to distort information flow) or developing action options based on that understanding (e.g. if you want to know what your post-docs are feeling, bring them together in a group, don't question one of them alone; [Figure 1](#)).

The issues that are brought to the group have evolved over time as we grow into different roles in our institution. But throughout the years, the issues have largely clustered into three general categories: relational, systemic and hierarchical ([Box 1](#)). The relational issues were more prevalent in the early years, while the systemic issues have dominated later group meetings. Hierarchical concerns were always present ([Box 3](#)).

Guiding concepts

At our initial lunch, the organizational psychologist illustrated our tendency to attribute the cause of organizational events to individuals, ignoring other relational and systemic explanations. We analyzed a case demonstrating this point: a disrupted lab meeting was

initially and persistently explained in terms of an individual lab member's behavior, even though there was a lot of evidence for other factors. Throughout our subsequent meetings, the organizational psychologist introduced a variety of ways of thinking about organizational events to augment the individual level of analysis, and thereby expand our choices about how to manage them² ([Figure 2](#)).

Beyond personality

The most common explanation for events in organizations is the personality of one or more organizational members. Sometimes we talk about style or approach when we mean a personal characteristic that is the cause of what we see and experience. But organizational roles are created, in part, to reduce the potential impact of individual variation (personality). Performing the function of a lab manager, or a nurse, or a department chair should not depend solely on the 'personal characteristics' of the individual involved. In fact, many different personalities successfully fill such roles because of their training, the expectations of their supervisors and the norms of their profession, regardless of their personal characteristics. Too often, when we struggle to understand what is happening in our organizations, we do not pay enough attention to these powerful and ever-present organizational factors. Instead, we focus on personality because it is familiar to us and we think we know what to do about it (replace one personality with another or throw up our hands because personality cannot be changed).

What would looking at a system-level explanation mean? Instead of just noting the personality of a division chief, we might ask why that person has been in the role for ten years. This question raises more difficult, but potentially more organizationally meaningful hypotheses to explain how organizational culture, values and roles might underlie conflicts and tensions. Similarly, instead of assuming that someone is incompetent or overwhelmed, we might ask if they lack key resources or face unrealistic expectations. Instead of assuming that the chair or dean or chief medical

officer is “out of touch” or “in over their head”, we might consider the financial or reputational concerns they struggle with daily. While this analysis is more complex and less intuitive at first, when it aligns with the real cause of the conflict, it improves the quality of possible interventions and of our choices about how to act. In addition, these questions reduce the potential harm to individuals who are carrying out organizational roles.

Hierarchy affects everything

A position in a hierarchy brings with it dynamics that are often underestimated or ignored, reducing individual and organizational effectiveness. Researchers who move from post-doc to PI, for example, might think that their new role will not impact their relationships with lab members, senior faculty or peers. However, this change in role always changes these relationships.

What are some of these changes? First, hierarchy distorts communication. Information moving up a hierarchy is often softened, sanitized or skewed toward the positive. Good news, it is universally believed, is what a senior person wants to hear. Perhaps more relevant, bad news can have negative consequences for the messenger, such as loss of confidence. Information moving down the hierarchy skews in the other direction. Senior colleagues often see their role as providing corrective feedback and as a result are often experienced as critical.

Second, communication up the hierarchy often goes unheard either because the subordinate role softens the message out of respect for authority or because the senior person did not think the message was important. Communication down the hierarchy often has a much greater impact than intended. A suggestion is treated as a directive or a question is experienced as a criticism. Finally, the structural vulnerability that is represented by a hierarchy of authority (the ‘boss’ sets salary, assigns work, determines authorship, conducts annual reviews) leads subordinates to be cautious. In a team environment where communication across levels is essential, the distortions of hierarchy in communications can have detrimental effects, particularly in new labs. A suggestion by a PI is experienced as a directive that should

Box 3. Issues and challenges addressed with the method.

Relational issues

- How do we handle conflict between lab members?
- What motivates different people and how can we make the lab a place in which people are motivated and excited about scientific discovery?
- When lab personnel come to us with personal concerns, what is our role?
- How do we manage collaboration *and* competition in the lab?
- How does my style as a PI shape the lab culture and well-being of lab members?
- How do I give and take critical feedback?

Systemic issues

- When I serve on committees, am I there to represent my interests (lab, area, department, school) or the mission of the committee?
- What do I do when I observe bad policy or destructive actions by people with institutional leadership roles?
- How do I bring my societal values (e.g. racial equity, gender equity, institutional transparency) to my various organizational roles?
- How do I obtain the support I need to be successful in an administrative role I have been offered?
- What is the role of dissent in a system I am part of?

Hierarchical issues

- When do I assert my authority (e.g. to make authorship decisions, to allocate work) and when do I involve others?
- How do I evolve my relationships with former mentors into collegial relationships that allow the independence I need?
- What are the elements that go into being a good mentor?
- Do I mentor for today or the future, i.e. do I advise people to fit into the current *status quo* or do I encourage them on how to change the existing norms of the community?
- How do I express dissent in a hierarchical organization when such dissent could have implications for my advancement along the academic path?

have been evaluated alongside other suggestions but was “followed” instead. Or a suggestion by a lab member is not heard by a PI, leading to a missed opportunity for the lab.


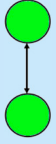
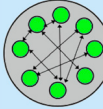
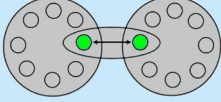
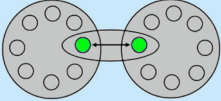
Scapegoating

Scapegoating is the process by which a social system acts as if a shared characteristic, anxiety or concern is located only in one part of the system. In a group, the scapegoat is usually an individual. Scapegoating protects the rest of us from experiencing something uncomfortable when we come to believe that these uncomfortable feelings are not in us but *only* in one other person³. There are at least two negative consequences of this process. The first is that scapegoats can be mistreated as others in the

group believe they embody something undesirable. The second is that the shared issue (competence, insecurity, ignorance) remains unacknowledged in the group, and thus cannot be addressed. Transitioning into new roles, such as the role of PI, we are especially susceptible to scapegoating as blaming the scapegoat avoids confronting our own insecurities.

We are multitudes

It can be said that an individual is the intersection of all the groups that they belong to, beginning with the family group and extending backwards in time into cultural, national and historical groups as well as forward in time into the various groups we choose⁴. These group memberships are always with us, influencing the

<p>Beyond personality</p>  <p>Explaining organizational events due to the personal characteristics of an individual</p>	<ul style="list-style-type: none"> ○ Ask why the person is in the role ○ Ask if the person lacks key resources or faces unrealistic expectations ○ Consider financial or reputational concerns
<p>Hierarchy affects everything</p>  <p>Hierarchy distorts communication</p>	<ul style="list-style-type: none"> ○ Information moving up a hierarchy is often softened, sanitized or skewed toward the positive ○ Information moving down the hierarchy skews toward the negative as senior colleagues see their role as providing feedback ○ Communication moving up the hierarchy often goes unheard ○ Communication moving down the hierarchy often has much greater impact than intended
<p>Scapegoating</p>  <p>A social system acts as if a shared characteristic, anxiety or concern is located only in one part of the system</p>	<ul style="list-style-type: none"> ○ Scapegoats can be mistreated since others in the group believe they embody something undesirable ○ The shared issue (competence, insecurity, ignorance) remains unacknowledged in the group, and if it is unacknowledged it cannot be addressed
<p>We are multitudes</p>  <p>An individual is the intersection of all the groups that they belong to</p>	<ul style="list-style-type: none"> ○ Group memberships are always with us, influencing the way we see the world and the way the world sees us ○ Many of our <i>interpersonal</i> relationships are also <i>intergroup</i> relationships since we are always both individuals and members of groups ○ It is often difficult to talk about and manage the intergroup aspects of our experience in organizations because there is a great deal of awkwardness surrounding this topic
<p>Boundaries</p>  <p>Organizational boundaries differentiate entities from their environment</p>	<ul style="list-style-type: none"> ○ Were we making the boundaries (concrete and psychological) too closed, impermeable to the resources (ideas, human, financial) the lab or department needed? ○ Were boundaries too open or loose, allowing boundaries to become so permeable that energy, focus and personnel were constantly being lost? ○ For some people firm boundaries support their effectiveness ○ For others, highly permeable boundaries provide them with the flexibility to succeed

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Figure 2. Levels of analysis for understanding organizational events.

way we see the world and the way the world sees us. In other words, many of our interpersonal relationships are also intergroup relationships as we are always both individuals and members of groups. It is often difficult to talk about and manage the intergroup aspects of our experience in organizations because there is a great

deal of awkwardness surrounding this topic. Is it appropriate to ask about a person's group memberships? Might we offend someone by noticing one or more of the groups we think they belong to? Is it evidence of prejudice against a group to be curious about it? Is it legal to be curious about group memberships, to talk about them in the

workplace? Even the choice to pose, explore or answer such questions is an expression of the groups to which we belong and their relationship to other groups in our world. In an international group of scientists working in the United States, for example, how does one explore the feelings stirred when COVID is referred to as the 'China virus'?

These are difficult and important questions. The silence that too often characterizes our approach to group memberships may reduce awkwardness in the moment, but ultimately may make it impossible to understand the impact group memberships have on people's lives. Without understanding, it is impossible to address the impact. Does a female PI experience that role differently from a man in the same role? Do the people around her experience her the same way they would experience a man in the same role? Does a post-doc from another country experience being stopped for not obeying a traffic sign the same way a citizen does? The irony is that we are quite comfortable talking about some group memberships — usually our organizational groups such as professional role, educational status or departmental affiliation — but not others, such as our identity groups of age, race or gender. Just as effective and responsive organizations depend on managing organizational groups, so too our willingness and ability to talk about identity groups has an impact on how organizations function and on how people function in organizations.

Boundaries

Organizational boundaries differentiate entities (labs, departments, ranks) from their environment and the others in that environment⁵. These boundaries also regulate what comes in and what goes out from these entities. The concept of an organizational boundary helped us examine the ways in which our labs or departments were 'starved' or 'nourished by our choices as PIs. Were we making the boundaries (concrete and psychological) too closed, impermeable to the resources (ideas, human, financial) the lab or department needed? Or were we being too open or loose, allowing boundaries to become so permeable that energy, focus and personnel were constantly being lost?

This concept had practical implications. For some people, firm boundaries support their effectiveness. For others, highly permeable boundaries provide them with the flexibility to succeed. We learned how to recognize and adjust these boundaries so that individuals, our labs and our institution could function more effectively.

Outcomes

The creation of this peer group of PIs that met regularly with an organizational psychologist across many years became valuable to us in a number of ways and conferred benefits (Box 4):

Confidence in the quality of our organizational competence, allowing us to be contributing members of the groups to which we belong (e.g. committees, labs, departments).

A source of advice and counsel on a range of important organizational issues (e.g. relationships with lab members, challenges and opportunities associated with working with other senior scientists and with scientists at other institutions).

A place to *begin* difficult conversations (e.g. about race and gender, about ambition and insecurity and about ethical dilemmas).

A feedback mechanism on how to approach stressful conversations (e.g. salary, promotion process, conversations with our chairs).

A way to reflect on the tensions and stressors inherent to our roles (from personnel decisions to funding anxiety, to all forms of rejection), enabling us to acknowledge patterns and more effectively focus on areas we could change.

A sense of belonging, even in the context of our differences, which led to greater empathy and commitment to each other, to our institutions and to science itself.

A framework for diagnosing organizations and a language that enabled us to conceptualize interventions and make choices about how to act in our new and

Box 4. Things we learned.

- It is never just about the individual.
- Hierarchy impacts every interaction.
- Diagnose a problem before solving it.
- If you are worried that a conversation will be difficult, acknowledge the difficulty at the beginning.
- Don't assume that people come away from a conversation understanding it the same way.
- When in doubt, tell more of the truth than you are comfortable with. Disclosure enhances trust. Even when uncomfortable, present all of the truth as you understand it.
- A group made of diverse memberships magnifies your growth as a PI.

evolving roles as academic scientific investigators.

Knowledge of approaches to communicate effectively up and down the hierarchy, with empathy and respect.

Implementation

For those who would like to create the type of group described in this paper we recommend the following key elements.

Acquire resources

We envision a day when all NIH budget requests include funds to support the PI's development in leadership roles. This investment would strengthen both lab work and institutional practices, which, in turn, also support science. Until that day comes, the existence of the group we described requires funds to pay for the facilitator/consultant. Initially we received these funds from the administration of our school which conferred a legitimacy to our work. When we decided to continue the group beyond the initial three-year support from the school, we took on the costs. In hindsight, we believe that financial support for this kind of group is an institutional investment worth making from inception for as long as the group continues to meet.

Find an organizational psychologist near you

We did not know what an organizational psychologist was when we first invited one to talk with us. That role became crucial to the success of the group. The key characteristic of this individual is the professional ability to see and speak about the role of groups and systems in the behavior of individuals. Many psychologists

focus primarily on individual behavior.

An organizational psychologist brings contextual factors (hierarchy, historical groups, roles, patterns of collective behavior) to the discussion of organizational events.

No mandatory meetings, but meet regularly

Start with people who want to be part of a group. This does not mean that people have to be true believers. There were many among us who brought a healthy skepticism to our first meetings. In our experience requiring people to participate in a group like this rarely results in meaningful learning. We recommend that group members make a shared commitment to attend on a regular basis. This commitment is best made verbally or in writing rather than assumed tacitly. Consistent membership and attendance make the exploration of important and sometimes sensitive topics possible.

Given the many demands on a PI's time, it may be tempting to meet irregularly (at different times on different days) or infrequently (once a month). We advise new groups to meet at the same time for at least one hour at least every other week. A standard time makes it more likely that the meetings become part of a professional routine. More frequent meetings mean that there is less warm up each time and more continuity across both topics and relationships.

Conclusion

Most of us received no training or education in managing our various organizational roles before we became PIs. At best we observed how the people we worked for ran their labs

Box 5. An example.

The account

Kristina, a third-year faculty member, describes her most recent lab meeting to the group of fellow PIs: Miriam, Peter, Jose and Teesha. There are five other lab members present (a post-doc, a part-time lab manager, a graduate student and two post-bacs). She introduces the topic for the meeting: authorship guidelines for the lab.

Within the first few minutes, John, the post-doc, a man somewhat older than the others in the lab, starts to ask 'nit-picking' questions that Kristina thinks are more annoying than enlightening. He also makes jokes that elicit giggles from the rest of the lab members. The meeting seems unproductive and combative.

Kristina asks: "What the hell was going on in there? And what should I do about it?"

Feelings

Miriam: "I'm just really frustrated."

Peter: "I'm furious at John."

Jose: "I'm curious. Is that a feeling?"

Teesha: "I don't know why but I'm feeling anxious, worried."

Observations

Miriam: "I thought John acted like a jerk. If he has something to say, just say it."

Jose: "John is older than the rest of the lab."

Teesha: "I noticed that you Kristina are a young, relatively new PI and this is an older man disrupting your lab meeting."

Peter: "I wondered about the rest of the lab, they were giggling at John's jokes."

Miriam: "What were you trying to talk about Kristina? Authorship is a tricky, often difficult subject. That's what struck me."

Hypotheses

Peter: "I still think John's a jerk. You should talk to him about his behavior in the lab meeting."

Jose: "Perhaps the whole group is nervous about the authorship discussion and John, the older and most secure member of the lab, is speaking for them."

Teesha: "Maybe John, as an older man, has trouble being subordinate to a female PI. Wouldn't be the first time!"

Peter: "John could be showing off for one of the post-bacs. Anybody pairing up in the lab?"

Teesha: "We need more information to evaluate our hypotheses. Can we ask questions now?"

and departments. But our view of the work of our mentors and trainers, beyond the science, was obscured or obstructed by our role relationships. As graduate students or post docs we did not often get to talk with our mentors about the issues described above. As a result, the work of this group gave us a place and a structure to systematically talk about and analyze our managerial challenges. It continues to inform our choices about how to approach evolving challenges as our institutional roles (and the institutions themselves) evolve. It helps us translate understanding into action.

Perhaps even more importantly, this platform resulted in a space in which vulnerabilities could be expressed and advice on sensitive issues sought (Box 5). The group has become a place in which ideas and feelings are welcome. Academic life is not devoid of both ideas and feelings, and our regular meetings have become a vehicle for exploring these spaces and learning how to navigate them, for ourselves and for our institutions and communities. Somewhat paradoxically, we learned in the process that the fears of occupying the positions which we

occupy, fears which many of us first interpreted as individual insecurities or individual failures, represent shared experiences rooted in our shared roles and responsibilities in the world of academic science. The ability to discuss this with a diverse group with shared experiences has been an invaluable experience.

REFERENCES

- Oshry, B. (2007). *Seeing Systems* (San Francisco, CA: Barlett-Kohler Publishers).
- Berg, D.N. (2015). Levels of analysis: Diagnosis and intervention, <https://studylib.net/doc/8393657/levels-of-analysis--diagnosis-and-intervention>.
- Wells, L. (1980). The group-as-a-whole: A systemic socioanalytic perspective on interpersonal and group relations. In *Advances in Experiential Social Processes, Volume 2*, C.P. Alderfer and C.L. Cooper, eds. (John Wiley & Sons: New York), pp. 165–200.
- Rice, A.K. (1969). Individual, interpersonal, and intergroup processes. In *Organizational Systems: General Systems Approaches to Complex Organizations*, F. Baker, ed. (Homewood, IL: Richard D. Irwin), pp. 341–362.
- Alderfer, C.P. (2011). *The Practice of Organizational Diagnosis* (New York: Oxford University Press).

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