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Simple heuristics to run a research group

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Abstract

Collaboration between researchers has become increasingly common, enabling a level of discovery and innovation that is difficult if not impossible to achieve by a single person. But how can one establish and maintain an environment that fosters successful collaboration within a research group? In this case study, I use my own experience when directing the ABC Research Group at the Max Planck Institute for Human Development in Berlin. I first describe the heuristic principles for setting up a research group, including (i) common topic and multiple disciplines, (ii) open culture, (iii) spatial proximity, and (iv) temporal proximity. Then I describe heuristics for maintaining the open culture, such as setting collective goals, including contrarians, distributing responsibility, making bets, the cake rule, and side-by-side writing. These heuristics form an "adaptive toolbox" that shapes the intellectual and social climate. They create a culture of friendly but rigorous discussion, embedded in a family-like climate of trust where everyone is willing to expose their ignorance and learn from the other members. Feeling accepted and trusted encourages taking the necessary risks to achieve progress in science.

KEYWORDS

heuristics, leadership, Max Planck institutes, research culture, research group, trust

Collaboration between researchers has become increasingly common in psychology and other social sciences. Between 1980 and 2013, for instance, the average number of authors on a paper roughly doubled in psychological journals (Henriksen, 2013). That puts the social sciences between the humanities, where the single-authored publication is still the ideal, and the natural sciences, where the number of authors can be huge: a 2015 article on the Higgs boson listed 5,153 authors (Aad et al., 2015). Collaboration occurs between institutes worldwide, a practice that goes back to 1887 when observatories from Helsinki to Sydney began to map millions of stars (Daston, 2017). Collaboration also occurs on a smaller scale, when the members of a research group work and publish together instead of pursuing careers individually. The increase in collaboration requires reflection about how to make it productive. In this article, I focus on a question that is rarely asked: How can one establish and maintain an environment that fosters successful collaboration in a research group? I will use my own experience as a case study. For 22 years, I directed the ABC Research Group at the Max Planck Institute (MPI) for Human Development in Berlin, and before that at the MPI for Psychological Research in Munich. "ABC" is short for Center for Adaptive Behavior and Cognition. The initialism also reflects the fact that we were exploring the ABCs of heuristic decision-making under uncertainty.

I begin with a remark on the philosophy of the Max Planck Institutes (MPIs). It is embodied in a set of heuristic principles that any institution could implement. Yet some institutions are more open than others about rethinking what they are doing and willing to imitate good models. For instance, when I visited the Chinese Academy of Sciences in 2005, the first question the dean asked me upfront was: "What should we do to become as successful as the MPIs?" In short, there are three principles. First, research is built up solely around the world's leading researchers, that is, around a person, not a field. The person is absolutely free to develop a research agenda. It is called the *Harnack Principle*, named after the first president of the Society in 1911 (originally named the Kaiser Wilhelm Society, and renamed the Max Planck Society in 1948). Academies and universities, in contrast, typically select a field and then hire the best person they can get in this area. The second principle is to take risks and ideally create new fields, rather

than merely excelling in the existing fields. If a research group succeeds in creating a new field that eventually becomes established worldwide, the research group has done its job and may be closed down. The idea is not to invest in what is established and what everyone else is doing, but rather to stay at the forefront of innovation and invest resources in risky new projects. To enable such risk-taking, MPI directors are provided with the necessary resources until they retire, which makes them independent from short-term grants. This long-term funding reflects an unusual amount of trust in the directors, compared with the widespread system of distrust that invites playing it safe. Third, because new ideas do not respect the borders of established disciplines, a premium is placed on interdisciplinary research. To facilitate it, the directors are free to select the research staff, agenda, and composition of the group.

These three principles—the focus on eminent researchers rather than established fields, guaranteed funding to encourage risk-taking, and an interdisciplinary approach—are the pillars of the MPIs' success. They enable innovation, but do not specify the details of running a research group. Given the amount of trust directors enjoy, they can take the time and effort to develop a healthy working culture or not, and use their freedom in different ways. Therefore, what follows should not be generalized to how other directors or institutes have set up their research groups. I will explain how I did it: How I set up the research group and how the group maintained its open culture over the years with a fluctuating set of members.

HOW TO START A RESEARCH GROUP

When offered the MPI directorship, I was teaching at the University of Chicago. The offer allowed me to create an initial group of about 20 members at the level of associate and assistant professors, postdocs and predocs, and IT and support staff. The topic I chose was decision-making under uncertainty, a largely uncharted territory given that most psychological, statistical, and economic theories try to reduce all uncertainty to calculable risk. The research program took up Herbert A. Simon's widely neglected question: How do people make decisions when the future is uncertain and the assumptions necessary for expected utility maximization or Bayesian models do not hold? Moreover, it extended this descriptive question to a new, prescriptive one that had not been asked before: How *should* decisions be made under uncertainty? This led to many further exciting questions, such as: In which situations can smart heuristics lead to more accurate decisions than complex strategies? How can the findings be implemented to help doctors, judges, and other experts make better decisions under uncertainty? And, finally, how can heuristics be implemented to create better AI?

Principle 1: Common topic, multiple disciplines

There are two ways to do science. One is *discipline-oriented research*, where researchers identify with a discipline or subdiscipline and work on various topics within its conventions. I have seen this in quite a few psychology departments, and in other social science departments as well, where subdepartments rarely collaborate with others, let alone interact with other disciplines, even if these are relevant. The other is *problem-oriented research*, where researchers identify with a problem and work on it with colleagues, theories, and methods from various disciplines. Problem-oriented research is more common in the natural sciences, where large numbers of people with diverse backgrounds work together. Whereas discipline-oriented research is a closed system, in problem-oriented research, other disciplines are welcomed as a toolbox containing further useful tools to make progress. Here, the challenge is greater but so is the satisfaction.

As noted before, most interesting topics do not respect the fences that have been set up to demark the territory of a discipline and keep strangers out. Decision making under uncertainty is no exception. Progress requires cooperation between researchers from various disciplines. The initial ABC Research Group consisted of researchers from cognitive and evolutionary psychology, behavioral economics, empirical sociology, mathematics, engineering, and computer science. Over the years, we also hired anthropologists, animal biologists, neuroscientists, machine learning researchers, historians of science, philosophers, and medical researchers. Heterogeneity enables studying a topic from multiple perspectives and exploring what is known in fields that rarely seek contact with others.

Hiring researchers from different disciplines, however, is not enough. I have visited research centers that had the qualifier "interdisciplinary" in their name but not in their spirit. The psychologists huddled together, pursued their own topics, and published in psychology journals, while the economists stuck with other members of their tribe and published in economics journals. I worried that this state of separation could also happen to our group. The first countermeasure was to establish a common topic. The second was to establish the rule that each researcher must collaborate (and publish) with at least one person from another field. Otherwise, there is not much point in employing researchers from different fields.

Yet there remains a potential problem. Engaging in interdisciplinary research means taking a risk regarding one's career, given the disappointing state of estrangement and ignorance between many fields. If a young economist publishes in premier psychological journals, that may not count much when applying for a position in an economics department. Similarly, a psychologist who succeeds in publishing in a premier medical journal may be treated as an outsider by other psychologists. I warned all new researchers of the risk they were taking when joining the group. But I was proven wrong. I cannot recall a single case where someone did not find a good position because of departmental tunnel vision.

Finally, there is another obstacle. The principle of taking high risks implies that a number of projects will fail; otherwise they would not be so risky. That creates a problem for young researchers who need publications on their CVs to succeed in academia. My advice was to work on two projects, a high-risk project that enables true innovation and a low-risk one

consisting of excellent but standard research, which provides a safety net if the high-risk project does not pan out.

Principle 2: Create an open culture

My greatest fear was that, as a director, I would end up intellectually isolated at the top of a hierarchy. Nobody would dare to criticize my ideas openly. To make sure that did not happen, I asked three of my best American graduate students at the University of Chicago and two of my former German postdocs—all of whom I knew would not hesitate to debate my thoughts if they spotted a flaw—whether they would be willing to take a risk and embark with me into the unknown. They all agreed. These young researchers set the example of an open culture for the rest of the group, a culture of intense, critical, but respectful and fact-oriented discussion.

Yet that was not what other researchers were used to. Some newcomers were frightened by the passionate discussions, mistaking them for aggressiveness, until they realized that the critique was directed at ideas, not persons. And that a culture open to dissent is actually a "bodyguard" that protects everyone from running into harsh criticism outside the safe environment of the group. To further this protection, we installed the rule that members preparing a talk for a conference or a job opening first had the opportunity to give their talk to the group (We also had regular weekly talks that all group members were required to give in turn.) Coming to everyone's practice talk is a time-consuming service but also an opportunity for the listeners to learn how to improve their own talks. The combination of an open culture, a common topic, and interdisciplinarity creates the space for a sparkling intellectual atmosphere.

Principle 3: Spatial proximity

An open culture can work only if everyone feels accepted and trusts the others. Trust is facilitated by an environment that makes it natural for people to meet. The key features are:

- *Everyone on the same floor*. In my experience, a group that is spread over different floors interacts half as much than when located on the same floor. If the members work in different buildings, the loss is even greater.
- *Open doors*. These set a sign that visitors are welcome and opens up the space.
- *Tea and coffee at 4 pm every day*. That may appear to be wasted time, but is not. When researchers chat over personal things, that helps create trust, and when they discuss research, that helps increase the flow of information. It also provides a relaxed situation in which people can educate others on the basics of their own discipline. To make this work, the director should not demand participation, but simply set a model by showing up regularly. There was also an element of suspense attached to the tea and coffee hour, as everyone was eager to find out whether cake would be served that day—the *cake rule* is described below.

Principle 4: Temporal proximity

One problem I had encountered in other research groups was that the first people who joined the group tended to look down on or even patronize those who came later as if these were their younger siblings. To avoid such a "birth order problem," I made sure that all members of the initial group started on the same day. That created a level playing field from the beginning. The downside of this rule is that the administration can be overwhelmed for a short time by the simultaneous appearance of so many new people. But arriving at the same time and figuring out together how things work in an unfamiliar environment fosters bonding.

HOW TO MAINTAIN THE CULTURE

Once an open culture is established, a new challenge emerges: How can one maintain the culture in the ever-changing composition of a research group? Postdocs and graduate students typically leave after 3 or 4 years, while researchers may stay longer, for 5 to 10 years. In addition, research groups tend to grow if successful. In the ABC Research Group, more than 150 predocs, postdocs, researchers, senior researchers, and guests participated over the years. For me, the struggle was finding a balance between giving direction and not directing too much. With too little direction, the group loses sight of the common topic; with too much direction, I would become oblivious to new ideas the group developed. I had no experience with running such a large group, but did have experience in running a band before I entered academia. So, I decided to run the group as a jam session, not as a conductor that directs from a podium.

Set collective goals

A collective goal requires the collaboration of many researchers; it cannot be achieved by a single person. In the case of our group, the first goal was to write a book together that laid out the research program and the first results. We wrote *Simple Heuristics That Make Us Smart* (Gigerenzer et al., 1999) in the first 3 years of the group's existence. The unique feature of *Simple Heuristics* was its intense collaborative nature, written by an enthusiastic, highly motivated, and efficient group of 18 researchers. Everyone knew everyone's else research. Each chapter had between two and five authors, but most authors had their hands (and writing) in many other chapters. In numerous meetings and retreats and over games of ping-pong, we collectively went through each sentence of the book.

The next collective goals were two follow-up books, *Ecological Rationality: Intelligence in the World* (Todd et al., 2012),

and *Simple Heuristics in a Social World* (Hertwig et al., 2013). Each was authored by two of us along with the entire research group. This emphasized the collaborative nature of these books but posed a challenge for librarians, as it generated a new genre of books. Previously, only edited books had individually authored chapters, but here there were no editors, and the entire ABC Research Group was named as collective coauthor of the book.

While trying to complete these two follow-up books, we ran into a problem. Many of the original team of authors had left to take up professorships around the world, so spatial proximity was no longer a possibility for everyone. These books had to be written without the advantage of everyone being on the same floor, open doors, and daily tea and coffee together. We tried to counteract this physical separation by inviting coauthors abroad to join us in retreats, such as at the beautiful Ringberg Castle in Bavaria, owned by the Max Planck Society, where we could discuss research face-to-face. Nevertheless, these books took much longer to complete than *Simple Heuristics*.

We also set goals about publishing articles, but in terms of quality rather than quantity. One marker of quality are the premier journals in a field. For instance, we aimed to publish one paper a year in the *Psychological Review*. Indeed, we published 20 papers in the journal over the first 20 years of the group's existence, which turned out to be more than any psychological department worldwide in terms of papers per capita. At the same time, we published in the top journals of medicine, management, philosophy, and other fields, as well as in prestigious interdisciplinary journals, such as *Science*.

Some university departments pay researchers a cash bonus for publishing in a top journal or pay a sum that increases with the impact factor of the journal. This economic view of research is a matter of taste; it replaces scientific curiosity with monetary calculation and encourages individualistic competition and a focus on metrics. In our research group, we introduced the *cake rule* that takes the opposite approach: If a paper is accepted or published, the first author brings cake for the entire group. That rule respects the fact that most ideas have been inspired by the entire group, over tea and coffee or in other discussions. It violates the theory of economic incentives because the author does not get the reinforcement but instead rewards everyone else. Nevertheless, the cake rule worked well and increased our publication record.

How to deal with growth

Successful research groups tend to increase magically, by attracting guest researchers and visitors. And unexpected events happen. In the case of our group, the London investment banker David Harding was taken by a book I had written, *Reckoning With Risk* (US title: *Calculated Risk*, 2002), and gave us a large private donation that enabled us to found the Harding Center for Risk Literacy, which focuses on risk communication in health and beyond. The second unexpected fact was that many of the researchers who had left for a professorship at a university or a job in a tech company kept coming back home to their "family" for days or weeks. As a result, the group grew to about 35 members plus a dozen student assistants and about 10 IT and support staff, not counting the guest researchers and homecoming members. The floor became overly crowded, which required new heuristics to deal with growth.

- *Maintain Spatial Proximity*. When we ran out of space, the architect proposed constructing a new building for the newcomers. I vetoed the proposal because that would have split the group. Instead, we extended our existing building horizontally, so that everyone could still be on the same floor.
- *Avoid Temporal Proximity*. The culture of a research group is handed on to newcomers by explicit rules but, equally important, by implicit learning, through imitation of how things are done. In that way, the open culture lives on even if none of the initial group is still present. This implicit learning process would end abruptly if all or most members were to leave at the same time and be replaced by new people. An entire working culture would be lost. A good rule is to never hire more people at one point in time than there are old members. Temporal proximity—starting all members of the group at the same point in time—is ideal for setting up a new group, but fatal later on. Only if the existing group was no longer operating well would it be a smart strategy.
- *Introduce a Tutorial System*. In a small group, members learn by doing, and more spontaneity is possible, such as announcing a spontaneous talk in order to present a new discovery or asking for advice on an issue. The larger the group, the more structural measures it requires to support the learning process. In our group, these measures included a schedule of talks where each member presented the current research at regular intervals, a 1-year course for newcomers that covered *Simple Heuristics* and other classics, a 4-day retreat for the entire group every year, and an annual Summer Institute for Bounded Rationality.
- *Side-by-side writing*. Most young researchers who entered our group had never learned how to write an article. One of the key heuristics we introduced to fill this void was that a more experienced researcher sat side-by-side with a younger one in front of the computer screen. They discussed the design of the article together, as well as the wording of every sentence. Useful questions include: What do we really want to say with this sentence? Do we need this sentence at all? Do we need all the words in it? Did we define the concepts, and are we using different words for the same concept? Side-by-side writing also benefits experienced researchers. It is simultaneous and interactive, and many new ideas can emerge from it. Creativity happens less often if one researcher writes a draft alone, sends it to a coauthor who then revises it alone, and so on. Side-by-side writing is a much more enjoyable and profitable process.
- *Exploit Cultural Diversity*. A benefit of growth is that it allows for more cultural diversity. It adds to the disciplinary diversity of a research group, but in a different way. Being in close contact with researchers from other countries facilitates

the insight that one's own views about work, life, and science are not carved into stone, but a matter of one's cultural upbringing. Thus, they can be changed. Most important, experiencing the cultural contingency directly—in what others fear, what risks they take, and how they make (or avoid) decisions—helps develop a critical view about theories that assume a universal being, from *Homo economicus* to Western, educated, industrialized, rich, and democratic (WEIRD) societies, which comprise only about 12% of the world's population. Sharing space, cake, and an open culture enabled the group members to become good friends who helped each other in research and non-research activities and, even after leaving the group, maintained contact and collaboration across continents.

Growth provides benefits but also problems. I will never forget the day when I realized that I could no longer precisely describe what every predoc and postdoc in the group was working on. For me, that illuminating moment was one of extreme discomfort. The lesson is: let the group grow, but not by too much and not too fast.

Distribute responsibility

Collective research requires not only an intellectually open culture but also a group spirit, that is, an identification with a group's culture. Identification is facilitated when each member takes on a task that serves the entire group. That is why we distributed the tasks of running the group so that everyone was allocated one for which they alone were responsible, including the power to make related decisions. These tasks ranged from organizing and running the talks, retreats, the summer institute, and the tutorial system for newcomers to purchasing tea and coffee. Distributing tasks so that everyone has full responsibility in one area ensures that no one remains simply a passive member, and it enhances transparency. Everyone knows whom to congratulate or blame—all decisions are made within the group. Responsibility can thus be distributed in the form of a division of labor, but also by means of collective decisions, as in hiring.

To maintain the sparkling intellectual spirit in a research group, carefully selecting and hiring new members is important. In many institutions, the director makes the decision, based on a preselected set of candidates that someone else selected. That may lead to sensible choices, but the group is left out and does not share any responsibility. At the other extreme, letting every member vote and using the majority rule would install shared responsibility but introduce a quality problem because beginners may not be aware of what qualities more senior positions require. To avoid this drawback, we introduced a majority rule system with *equal votes for those who were at least at the same level in the academic hierarchy* as the advertised positions. That is, when hiring predocs, everyone in the group has a vote; when hiring postdocs, everyone except the predocs vote; and when hiring researchers, only the other researchers vote. At the same time, all can participate in the discussion before the votes are taken. In this way, everyone is included and held accountable, shares responsibility, and is motivated to engage actively in the hiring process. The downside is that I was outvoted from time to time, but that is the price for distributed responsibility.

To make the hiring process transparent not only to the group about also to the applicants, an unusual rule is to invite applicants to be present during all job talks. In our group, these typically lasted over 1 or 2 days, and we hired more than one person. The applicants were surprised to be invited to stay with us and listen to the other job talks. That openness makes the hiring process more transparent and provides a unique opportunity for applicants to learn from the other applicants—and for us to see how they interact with competitors.

For support staff, the procedure was similar. When we hired a new office assistant, the other assistants had the freedom to read all applications and select five to 10 candidates for an interview. To the applicants' surprise, they were exclusively interviewed by their potential future colleagues, who also gave them practical tests. It is only rational to rely on the office assistants' judgment; they know better than I or the other researchers who is competent, they want someone whose chemistry fits with theirs and the group, and they certainly do not want someone who would do less work than they do. Only after the number of final candidates had been reduced to two or three final candidates did I enter the picture and make the choice. That relieved the office staff from responsibility if something went wrong. Once, at the insistence of some researchers who were impressed by an applicant's academic record, I violated this procedure and hired their preferred candidate rather than the one preferred by the office staff. It turned out to be a poor decision.

Secure open culture

An open culture of intense but respectful and fact-oriented discussion is an asset that needs be secured. We introduced measures to protect this culture.

- *Be sure to include a contrarian*. Every research group can benefit from (at least) one contrarian, that is, a person who dares to question the group's and the director's wisdom, plays devil's advocate, insists on evidence, and questions what others take for granted. Such a person is sometimes frustrating but actually provides a great service by protecting the group from falling prey to groupthink. For that reason, when selecting new group members, we preferred those who found some fault or disagreement with our research findings in their application letter, rather than those who politely praised our research. Moreover, if external scholars had a strong disagreement with the group, we flew them in for a visit to discuss the issue in person.
- *Make bets*. Arguments and disagreements often lead to people going on and on and repeating what they have already said. An efficient heuristic is to stop this process early and offer the other side a bet. That forces both sides to state their

arguments or predictions precisely so that the bet can be resolved. Some are easy to decide, such as who wrote what, while others may require running a simulation. On some days, I had several bets going on. The prize was mostly cake for the entire group, which turned the disagreement into a social event and the person who lost the bet into a benefactor to the entire group.

HEURISTICS SHAPE RESEARCH CULTURE

The principles I have outlined in this essay can be thought of as heuristic rules that create and maintain the culture of a research group. They are called "heuristic" rather than "optimal" because there is no single way to create the best of all groups (Gigerenzer, 2006). Heuristics include higher-level principles, such as those of the Max Planck Institutes for hiring directors, as mentioned above, which can be rephrased as "Hire well, and let them to their job." "Hire well" establishes quality; "let them do their job" creates a climate of trust. I applied this policy to my entire staff as well, so that it was not an exclusive privilege for me. Other heuristics are meant for the micromanaging level, such as to resolve an argument by offering a bet. These can be further distinguished into heuristics that shape the research environment, such as spatial proximity, and heuristics for dealing with other people. Together, the repertoire of heuristics shapes the intellectual and social climate. This repertoire needs to be adapted to specific goals and environments—hence the term *adaptive toolbox*. The toolbox of an institution, a director, or a group influences whether the culture will become more or less open, more or less formal, and more or less inclusive.

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REFERENCES

Aad, G., Abbott, B., Abdallah, J., Abdallah, J., Aben, R., Abolins, M., AbouZeid, O. S., Abramowicz, H., Abreu, H., Abreu, R., Abulaiti, Y., Acharya, B. S., Adamczyk, L., Adams, D. L., Adelman, J., Adomeit, S., Adye, T., Affolder, A. A., Agatonovic-Jovin, T., … CMS Collaboration. (2015). Combined measurement of the Higgs boson mass in pp collisions at root s=7 and 8 TeV with the ATLAS and CMS experiments. *Physical Review Letters*, *114*, 191803. https://doi.org/10.1103/PhysRevLett.114.191803

Daston, L. (2017). The immortal archive: Nineteenth-century science imagines the future. In L. Daston (Ed.), *Science in the archives: Pasts, presents, futures* (pp. 159–182). University of Chicago Press.

Gigerenzer, G. (2002). *Calculated risks: How to know when numbers deceive you*. Simon & Schuster. (UK edition: *Reckoning with risk: Learning to live with uncertainty*. Penguin Books, 2002.).

Gigerenzer, G. (2006). Follow the leader. *Harvard Business Review*, *84*, 58–59.

Gigerenzer, G., Todd, P. M., & the ABC Research Group. (1999). *Simple heuristics that make us smart*. Oxford University Press.

Henriksen, D. (2013). *The rise of co-authorship in the social sciences (1980–2013)*. Aarhus University.

Hertwig, R., Hoffrage, U., & the ABC Research Group. (2013). *Simple heuristics in a social world*. Oxford University Press.

Todd, P. M., Gigerenzer, G., & the ABC Research Group. (2012). *Ecological rationality: Intelligence in the world*. Oxford University Press.

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