10

The Psychology of Collaborating Situated Agents

Insights from the Podcasts

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This chapter summarizes the insights that emerged from the interviews[1] conducted prior to the Forum. The first section summarizes the responses to our general question: What properties and traits do agents have to create and sustain collaboration? Thereafter, examples of collaboration brought forth in the interviews are described.

> [D]eployment to Somalia opened my eyes to the need that collaboration is critical when you are in that…deployed setting. You cannot succeed in life without collaboration. And I knew that to a small extent, working in a hospital as a doctor....But when you're on the world stage in a foreign country trying to make a difference in peacekeeping and providing health care and stability in the country, there are a lot of different entities involved to make that mission successful. And it made me focus…more on a mission…approach to life than a short term [approach]: I got to get this patient better. There is a higher structure out there that I should be mindful of, and that higher structure has a different mission than the immediate need of taking care of this particular patient. (R. Poropatich, 11:35)

What properties and traits do agents have to create and sustain collaboration? Examples put forward during the interviews include a common understanding (C. Hedegaard), commonality of purpose (M. Levi, A Nuyken, A. Sparrow), ideology, consideration, love, and affection (N. Chaudhary, D. Narayan, R. Malpica Padilla). Collaboration builds on the variability in skills present in a collective (L. Sciulli), and in turn, can amplify these capabilities (S. Puri). To act, collaborating agents must look for ways to maximize individual and mutual utility (H. Keller, R. Axelrod), which can come in several forms, such as

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[1] Podcasts are available at https://esforum.de/forums/ESF32_Collaboration.html ?opm=1_3. Here, key positions are attributed to individual interviewees; block quotes are cited using the timestamp from the podcasts (minute:second).

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experience, growth, and personal or organizational affirmation through monetary rewards and promotions (S. Puri). Membership in a collaborating collective depends on and defines the identity of its members. Communities shape identity through cultural practices and, in this way, shape the types of collaboration in which agents engage (H. Keller). Similarly, nation-states, religions, and organizations (e.g., companies) shape the adherence of their members to goals by building a shared identity (H. Keller, E. Slingerland). Conversely, identity can emerge from the "community of fate," which is defined by the collaborative process (M. Levi).

From the 27 interviews that were conducted, the following psychological factors were seen to shape collaboration in crucial ways:

- common understanding and belief systems
- shared goals and intentions
- commonality of purpose and ideology
- identity, community
- curiosity, enjoyment, and trust
- communication

Common Understanding and Belief Systems

Collaboration requires a shared understanding of common goals by collectives of agents, their roles, and the protocols that govern their interactions to balance self-interest and ethical commitment (M. Levi). Common understanding is also fundamental to conflict resolution. This common understanding can be based on power and love (D. Narayan), the aesthetical quality of performance (I. Schmiel), trust in leadership, a sense of duty, and a commitment to the collective mission for military leaders (R. Poropatich) as well as nonviolence and inclusion (N. Agrawal-Hardin). Agents that collaborate must thus be able to entertain abstract beliefs about the world, its ontology, and their relation to the reality behind it:

> [P]eople who are building [neolithic] sites…like Göbekli Tepe, are cooperating on a much larger scale than is typical for hunter-gatherers…They're coming together, they probably don't know each other well…coming from different regions…So you're giving people a new fictional identity that's linked, as you say, to some kind of ontological claim about the world. So you have this idea that there's a Crocodile God, and the Crocodile God wants X, Y, and Z, and we, who all tattoo ourselves with the mark of the crocodile and worship the Crocodile God, are brothers in a significant way. We can trust one another. We know we can meet someone far away from the ritual site but greet them in a way that shows that we are worshippers of the Crocodile God and therefore we know we can cooperate right away. Religion gives you this tool that allows you to scale up cooperation on a level that you just can't, we think, you can't get by without it. (E. Slingerland, 29:06)

Shantamritananda Puri and Rafael Malpica Padilla elaborated on the shaping effect of religious belief systems, or spirituality, emphasizing the role of values and ontologies that religion teaches, such as "love" (also mentioned by D. Narayan), "oneness," and "selflessness" through which collaboration can be realized. Indeed, the Latin root of religion, *Religare*, means to reconnect. The common feature of every religious system is to reconnect individuals with their god and each other, regardless of how the deity is defined:

> Well, in my experience, when we engage the other in a religious or political order, we are going back to the common denominator that will allow for greater engagement. And that is our shared humanity.…Both of us have needs and aspirations to have dreams for a better society. Those transcend political or religious systems and go to a basic need. The mother in an African community wants to provide her child with better health care, food, and housing. I find that same mother in the south of Chicago. So, my job or role in this position is how can I become a broker and midwife so that those two stories meet together and create that shared space and improve people's lives. (R. Malpica Padilla, 16:44)

Religion can be seen as a driver of collaboration through the construction of common narratives and belief systems, especially in the so-called prosocial religions (E. Slingerland). Religious cognition is built on and creates supernatural beings and powers. In this way, agency is projected onto the physical world, creating amoral gods that define the logic of reality. Subsequently, the gods evolve in tandem with societies to reinforce prosocial norms to instill and maintain collaboration:

> [The gods] don't just want stuff. They don't just want their sacrificial goods. They want us to be good to one another. They want us to be generous. They want us to not lie. They want us to not violate social norms. That's an innovation. (E. Slingerland, 24:50)

A further innovation that Edward Slingerland observes is the expansion of surveillance. The region of interest for a small-scale society god is limited to a village; the prosocial god is all-seeing and knowing, including the motivations and thoughts of all people. This innovation is an example of cultural convergent evolution, which occurred worldwide and correlated with the emergence and establishment of large-scale societies. A similar ontological framing occurs in shared scientific paradigms. Slingerland discussed the transition from a world filled with magic to one where magic is suppressed, allowing for the development of science, which is counterintuitive compared to naive intuitive thinking (e.g., praying to gods for rain). This cognitive achievement, which happened gradually in northern Europe, represents a shift to a shared scientific understanding of the world. As a result, conditions emerged for large-scale collaboration. One example of this is the realization of high-energy physics experiments at CERN, which involved thousands of scientists, engineers, and support staff (S. de Jong). Surprisingly, Sijbrand de Jong claims that this can be done without trust but realized in the form of a cage fight combined with a fear

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of failure. Also here the shared worldview or ontology contributes to the coherence in the collective activities beyond interpersonal traits and reciprocity (see Chapters 2 and 11, this volume). This is comparable to the role of religion (E. Slingerland, R. Malpica Padilla), although apparently lacking its prosociality. Similarly, the ideological commitments of grassroots movements can provide for coherence in collective activities (N. Agrawal-Hardin).

Amir Taaki spoke about the ideologies driving technology and cryptocurrency, highlighting the philosophies and narratives underpinning various cryptocurrency projects and their ideal to create a trustless financial system. He discussed how Bitcoin is associated with an economic rationalist ideology and the concept of universal sound money, which is the idea that everyone would use Bitcoin as a form of currency. This ideology emphasizes the importance of a decentralized, secure, and universally accessible form of money. Technological disruptions, such as cryptocurrency, can create their own belief systems. Taaki notes that some cryptocurrencies, such as Ethereum, started with a political philosophy oriented around liberalism, combined with greed and nihilism. As Ethereum's decentralized finance (DeFi) trend grew, it began to develop its own distinct character, and the narrative moved toward positioning itself against the traditional economic establishment, with discussions focusing on democratic organization and strategies around decentralized autonomous organizations, or DAOs. This difference in ideologies creates a turf war, especially when Ethereum began encroaching on being a store of value, a traditionally associated role with Bitcoin. This competition reflects the differing ideologies and narratives that drive the development and adoption of these cryptocurrencies, shaping collaboration among the many participants in a cryptocurrency (for discussion on the role of narratives and virtualization, see Chapters 1 and 5, this volume). Technology is not just a tool for power; it is also a means of organizing and bringing people together to enable them to coordinate and form a community of faith (in the perspective of M. Levi) while counteracting central control and surveillance systems. Taaki suggests that there is a vision at the heart of cryptocurrency technology that seeks to remove dominance hierarchies and enable people to regain a sense of autonomy and sovereignty. This contrasts with the more traditional financial systems described by A. Nuyken and E. Wiecko. Yet, these ideologies and visions are not static; they evolve with the development of technology and the communities that form around them in a feedback loop where they influence the direction of technological development, the features of cryptocurrencies, and how they are used within society. This feedback can lead to unwanted moral implications. While people identify with cryptocurrency and its philosophy as protecting and advancing autonomy, there are also exploitative aspects to consider: Bitcoin miners are potentially enslaved by the system, creating an inconsistency between the narrative around cryptocurrency and the realities of its implementation (see Chapter 4, this volume).

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The role of belief systems in collaboration can significantly influence how individuals and groups work together. Belief systems encompass the values, ideologies, and cultural norms that shape the worldviews and behaviors of individuals, and they can either facilitate or hinder adaptability and change within collaborative efforts. Rigid belief systems may resist new ideas, whereas more flexible systems may embrace innovation and evolution to pursue collaborative goals (E. Slingerland). Belief systems fulfill several functions:

- They establish guiding principles that inform the goals and methods of collaboration and serve as a lodestar for an organization's collaborative efforts (L. Kramer, N. Agrawal-Hardin).
- They can determine what is considered important, ethical, and worth pursuing within a collaborative effort (E. Slingerland).
- They motivate individuals to collaborate (D. Narayan), particularly if a collaborative effort is viewed as a way to advance or align with values (E. Slingerland).
- They engender trust and cohesion within the group and impart a sense of shared identity and purpose to agents (M. Levi, E. Slingerland).
- They provide frameworks for resolving conflicts that may arise during collaboration, as they provide common ground for understanding needed to reconcile different perspectives (R. Malpica Padilla).

Heidi Keller, however, cautioned against the naive adoption of a single universal belief system to shape collaboration globally due to cultural differences in how collaboration is understood and practiced. She pointed out the ethical issues that arise when Western, middle-class psychology is used as the norm and imposed on cultural systems worldwide because of its assumed inherent values. The resulting implications may not apply to or be respectful of other cultures, such as child-rearing practices and developmental frameworks. Recognizing and respecting cultural differences is essential for effective collaboration across diverse groups.

> The ethical question [concerns] all the big stakeholders (e.g., UNICEF, the World Health Organization, all the NGOs, foundations) which take the Western, middle-class, 5% portion of the world population, and use their psychology as the norm—without proving it—and intervene in cultural systems all over the world. Count the number of…countries they have reached and want to impose our Western framework: the play and the nurturing framework. An enormous amount of money gets thrown out the window because this framework is not applicable; this also signals a deep disrespect toward other cultures and other human beings. (H. Keller, 55:58)

Annie Sparrow provided an example of this collision between cultural traditions and expectations and its associated callousness:

> You can also imagine how Westerners, like *Save the Children*, for example, would come in and do a cultural sensitivity exercise. You would get everyone in

> the village together, have lunch together, and say this is what we're going to do, this is why we need to do it. We want to help in planning, whether it's a polio campaign, or measles campaign. Then, we need all your signatures to get reimbursed for the lunch. It's like, seriously? It's so insulting in a way that I cannot believe that you would you do these things. It's so counterintuitive to what we would really call cultural competence, especially in such a population that is so generous and hospitable and is suffering such tragedies. (Annie Sparrow, 32:30)

Collaborating agents should also be able to project themselves into the future or mental time travel (see Chapters 5, 11, and 17, this volume). They exist in the "shadow of the future," where all collaborating agents assume their relationship will continue (R. Axelrod). As a result, the future cannot be discounted in their attitudes and decision making. It may be worth sacrificing current individual returns to lay a foundation for trust in terms of future collective utility. Yet, the shadow of the future extends beyond the prediction of future rewards, the emphasis on incentives by economists (see Chapters 11 and 15, this volume). Consider, for example, successful merger and acquisition operations where "a lot of effort and time [has been] put into really taking this project through the ranks down to people who work on everyday tasks in different regions and to explain to them what we will be doing, what's the target, what do we want to achieve, and how these organizations will work in the future" (E. Wiecko, 46:24). Belief systems of collaborating agents elaborate and contextualize information and influence choice and action, as beliefs themselves are shaped by collaboration.

Throughout the interviews, the importance of a common understanding was highlighted as being foundational for successful collaboration and conflict resolution. Margaret Levi links this to the concept of a community of fate (i.e., a group of individuals who perceive themselves as having a shared or intertwined destiny or future, often due to common circumstances or challenges that bind them together). In her example, longshore workers were willing to close ports to stand behind a cause that mattered to the world at large; their stance demonstrated solidarity with an issue as well as with workers far outside their immediate community. A community of fate, however, can be both positive and negative, as discussed in Chapters 2, 3, and 12 (this volume). Regardless of intent, a community of fate requires baseline agreement of fundamental principles, including a sense of collective responsibility, ethical commitments, and cooperation around shared objectives. A community of fate is rooted in shared experiences as well as a commonly held belief system and involves witnessing and agreeing with the fate of others. Not only is knowledge shared; it is collectively acknowledged and accepted. This process is vital in environments rich in diversity and differing viewpoints.

In the political realm, the shared perception of issues is the starting point for collaboration (i.e., convergence or alignment of belief systems). Drawing on the case of climate change, Connie Hedegaard notes that the International Panel on Climate Change (IPCC) has played a significant role in providing

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a structured presentation of science and has contributed to a profound, joint understanding of the problem. Even countries with vested interests in fossil fuels, she notes, no longer question the existence of the problem. Thus there has been a shift in focus from "is it an issue" to "how should it be addressed." She stressed the importance of understanding the interests of counterparts in collaboration, which, when absent, can hinder progress. This can be contrasted with other movements' more confrontational and activist approach (N. Agrawal-Hardin).

In another example, Alexander Nuyken addressed the importance of aligning disparate goals, ambitions, and intentions to form a coherent, larger objective in the context of finance. For collaboration to be effective, he suggests that the overarching goals and the subgoals that support them must align and be consistent to prevent counterproductive outcomes. This alignment is critical to avoid contradictions that can undermine collective efforts. Nuyken touches on the idea of aligning common goals or purposes to drive collaboration effectively and suggests that recognizing multiple facets of a goal and combining different ambitions, goals, and intentions into one larger construct is essential.

These examples illustrate the crucial role that a common belief system—whether it concerns the problem at hand, the fundamental principles, future, or shared goals—plays in fostering effective collaboration.

Community and Identity

Throughout the interviews, community and identity were advanced both as necessary conditions for collaboration and as a factor that shapes the sense of self and agency within a collaborative environment. To illustrate, Nandita Chaudary described the dynamics within a small-scale unit of the Indian multigenerational family in which the task of raising children is a collaborative endeavor. The common purpose implicit in this task unites the family; the sharing of knowledge is expected which, in turn, enhances group coherence. Starting from the family unit, community practices build on this dynamic to provide a framework for the shaping of individual identity. In another example, Heidi Keller described collaboration in the context of a Cameroonian village, where the individual is situated as a part of a social unit and broader community. She argues that in non-Western environments, the intrinsic sense of community shapes life and experience; collaboration is experienced as a continuous part of the fabric of life. For further discussion, see Chapters 7 and 8 (this volume).

Identity can also be formed through the fundamental human drive to understand oneself through the relationship with another (R. Malpica Padilla, S. Puri). From a philosophical perspective, Rafael Malpica Padilla described a situation where one needs another person to gain an understanding of oneself. This reverses the process from making the other an object of action to engaging with the other to achieve self-consciousness. The dynamic relationship between "I" and "thou" is based on the idea that both individuals need each other in basic humanity. Through engagement with the other, individuals form a community that seeks the common good for both parties involved. The lives of individuals, societies, or communities can be seen as texts that meet and create a new shared reality in their intertextuality. Margaret Levi situated identity within the context of collective action and social movements through a community of fate. Here, identity is tied to the collective recognition of shared interests and the pursuit of common goals, transcending individual differences and fostering collaboration well beyond face-to-face interactions. Her example of trade unions illustrated how engagement and action benefitted other people who were geographically distant from the trade unions and not in the position to reciprocate. In this way, as discussed above, a community of fate functions similarly to religion.

Across all interviews, the notion of community was emphasized as being central to collaboration; community often forms the basis for identity, collective action, shared goals, and a sense of belonging. In addition to bottom-up generation, as in a community of fate, a community can be shaped by cultural processes such as dress, rituals (S. Puri), dance, or celebratory events (S. Fitzpatrick). Yet, contemporary societal changes may disrupt collaboration processes; for further discussion, see Chapters 16 and 18 (this volume). For instance, the current rise of identity politics reflects a change in community dynamics and may create obstacles to collaboration (M. McKee). Others mentioned the effect of cultural diversity to provide resilience in collaboration (see Chapters 13 and 14, this volume) through, for example, culturally dependent differences in views on risk and adherence to collective objectives (S. de Jong). Yet this specific assessment, in turn, can be detrmental and biased (A. Sparrow, H. Keller).

In discussing the carryover between religious beliefs and national identity, Edward Slingerland pointed out that the nation-state borrows effective elements from religion (e.g., synchronized rituals and symbols) to foster a sense of national identity. He notes that modern nation-states did not initially consider themselves separate from a religious worldview. For instance, the United States was founded on the idea that it was destined for greatness through divine will, a belief that still holds among many today. Religion and politics employ similar tools, and their intertwining is a common practice worldwide, although Europe and Canada are outliers, according to Slingerland. This practice challenges the neat division between secular nationalism and religious belief, and suggests a complex relationship where both are deeply interwoven and rely on similar mechanisms to create a sense of identity and community as a foundation for collaboration. Rob Van der Laarse elaborated further on the nation-state's role in collaboration from the historical perspective of wartime occupation. He explained that the relationship between the state and its citizens in Europe evolved into one of collaboration during both World Wars. At this time, "collaboration" carried a negative connotation, as it became associated with activities in the service or support of occupying powers, which was seen as a form of treason of the nation-state. This contrasts with the moral value of such actions during the sixteenth to eighteenth centuries, when working with a new authority after an occupation was considered normal. However, with the invention of the nation-state in the late eighteenth and nineteenth centuries, this behavior came to be viewed negatively. He notes that even during the Second World War, the Dutch government in exile instructed bureaucrats to collaborate with the German Occupiers and that this was considered official policy. Nonetheless, after the war, those who had worked with the Germans were accused of collaborating with the enemy. Here, one has to distinguish between economic and administrative collaboration; the latter, he argues, was necessary to prevent chaos and maintain essential services, such as keeping the trains running. However, the moral implications of such collaboration become complex when those trains are used for purposes like transporting Jews to concentration camps. In summary, Van der Laarse's view is that the nation-state plays a crucial role in defining the context and parameters of collaboration, which can be both a necessary and a contentious aspect of the relationship between a government and its citizens, particularly in times of occupation.

Returning to the concept of community and its relationship to identity, community plays a significant role in shaping an individual's sense of self and cultural identity (H. Keller). In the context of a Cameroonian village, Keller noted that collaboration constitutes a major dimension of social life and shapes one's experience of being part of a social unit (see also Chapter 8, this volume). For instance, infants are constantly watched after and physically carried by multiple caregivers, whereas in the Western world, infants are trained to become independent as soon as possible. Further, communal living arrangements are the norm in traditional rural villages, in contrast to individual, biologically defined family structures of the West (H. Keller, N. Chaudhary). A typical household in northwestern Cameroon has a fluid organization composed of multiple generations, with people constantly coming and going. This fluidity allows children as young as two years of age to decide which household they wish to sleep or eat in and reflects a different sense of community and identity from Western settings. Keller points out that in non-Western environments, the intrinsic sense of community is greater than in Western settings. She holds that collaboration in non-Western societies is an intrinsic, continuous part of the fabric of life. In contrast, in the Western world, collaboration must be structured to unite individual egos in the same space.

Empathy, Sympathy, and Reciprocity

Several interviews discussed the relevancy of psychological traits, such as altruism, empathy, sympathy, and reciprocity, in collaboration (see also Chapter 2, this volume).

Altruism

In Indian philosophy, Shantamritananda Puri explained that the concept of nonduality leads to the idea that one should value everyone's life as one's own. This perspective fosters a monistic form of love from which compassion arises. Compassion, in turn, leads to selflessness, and from selflessness, other qualities emerge, such as humility and patience, all of which facilitate collaboration. This chain of values suggests that sympathy and altruism are interconnected; they arise from a deep understanding of oneness and compassion taught and reinforced through spiritual practices. Nandita Chaudhary remarked on the cultural aspects of altruism and reciprocity, particularly in family dynamics, noting that reciprocal benefits of altruistic behavior are a foundation for collaboration. Edward Slingerland highlighted the intrinsic drivers of collaboration; that is, those which are genetically predefined and thus picked up during evolution, such as kin selection and reciprocal altruism. Humans are naturally motivated to cooperate with kin and those with whom they have reciprocal relationships. This behavior is driven by evolutionary mechanisms that are common across the animal world. Slingerland stated that religion can scale this intrinsic motivation by expanding the scope of kin through the use of kin-based language and painful initiation rituals; both create bonds and tap into empathy and sympathy for others within the group. Theo Mulder also expressed this view, highlighting the behavioral side of altruism and empathy as necessary ingredients for collaboration.

Empathy and Sympathy: Critical Values

The importance of genuine concern for one another, rooted in empathy, was emphasized by Ron Poropatich. During the selection process for teams or admissions to an academic program, he suggests that it is important to gain insight into an individual's capacity for empathy by looking at their value system and what makes them most proud. A candidate speaking only about self-centered achievements may lack empathy and sensitivity toward others, which could deter collaborative work. In terms of underlying values and human passions in collaboration, Deepa Narayan views love and trust as foundational elements. Martin McKee spoke about the importance of listening and humility, which can be linked to empathy. He suggests that the ability to listen and the humility to recognize that one is not above the law (or any other set of norms) are crucial for effective collaboration. Robert Axelrod also indirectly referenced empathy when he warned against the dangers of vengeance, a psychological feature that can lead to destructive behavior. Understanding and empathizing with the feelings of others can help mitigate the desire for vengeance and promote more constructive interactions. For further discussion, see Chapter 11 (this volume).

Although sympathy was not explicitly mentioned in the interviews, the concept is closely related to empathy and was discussed in terms of "genuine

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concern" and the understanding others' perspectives. Heidi Keller suggests that developing an interest in other individuals and their lives can lead to better collaboration, as it fosters a sense of connection and understanding that goes beyond one's own perspective. Deepa Narayan explored the meaning of "being a man" and how this affects collaboration. From her work in impoverished settings with women's groups, she has found that collaboration is fostered when people are able to understand and be sympathetic to different perspectives, including gender roles and expectations.

Reciprocity

Larry Kramer distinguished two types of reciprocity: specific and diffuse. In his opinion, most collaboration in philanthropy is specific: foundations and parties collaborate only if it aligns with their own strategies. He advocates for more diffuse collaboration, where foundations help each other without immediate benefit to themselves, trusting that it will lead to long-term mutual benefits. This builds a collaborative "muscle" and overcomes the barrier of not needing each other unless there is a direct alignment of interests. Ilona Schmiel mentioned that a breakdown in collaboration can occur when agents lose mutual understanding. She suggests that maintaining communication and seeking consensus are essential for a successful collaboration. This process can be seen as a form of reciprocal engagement in which each party contributes to and benefits from the collaboration. For Deepa Narayan, love is relational and involves reciprocity, which must be consistent. She emphasized that trust is the foundation of love; without it, relationships can devolve into abuse and isolation. When power and love imbue each other, there are ways to enforce or ensure collaboration beyond relying on litigation and formal rules.

Nature–Nurture

A continual theme that emerged throughout the interviews centered on how evolutionary biology and cultural practices influence collaboration and the development of human societies. Evolutionary traits can be seen as intrinsic drivers of collaboration, which suggests that natural selection has honed traits conducive to cooperative behavior and its underlying processes. Edward Slingerland supports this idea concerning kin selection and reciprocal altruism, which instill a natural propensity to work with kin and reciprocal partners. Cultural evolution has played a role in amplifying these innate tendencies, thus allowing human collaboration's complexity to expand beyond the basic framework provided by natural selection (D. Narayan). With respect to the impact of the nature–nurture debate on our understanding of collaboration, Heidi Keller highlighted the significant impact of cultural practices on the development of the self and social behaviors. In Western societies, individualism is emphasized whereas in traditional communities (e.g., Cameroonian, Mayan, and

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Indian), cultural practices prioritize belonging to the larger group (H. Keller, D. Narayan, N. Chaudhary, R. Malpica Padilla). These practices are not arbitrary but create potential modes of collaboration based on rational adaptations to the respective environments (for a discussion on niche construction, see Chapter 12, this volume). In a discussion on cognitive development, Keller noted that cultural context significantly influences whether a society fosters analytical intelligence that pushes knowledge boundaries or a more holistic approach that concentrates on present circumstances.

Both nature and nurture critically shape the propensity for and effectiveness of human collaboration. Natural selection has provided a biological foundation for collaborative behavior, and cultural practices have adapted and refined these behaviors to suit specific environmental and social contexts, boosting the reach of human collaboration. The nature–nurture duality underscores the importance of recognizing the interplay between biological priors, traits, learned behaviors, context, and culture in fostering successful collaboration across diverse cultures.

Examples and Use Cases

In addition to the examples presented in Chapter 6 (this volume), the podcast interviews revealed notable instances of collaboration from domains associated with the participants' expertise: health care, resource management, religion, science, and philanthropy.

Health Care

Many participants view collaboration in health and medicine as a critical component for achieving common goals and addressing public health challenges (M. McKee, A. Sparrow, A. Nuyken, R. Poropatich). In his discussion of the Medtech domain, Alexander Nuyken emphasized the need to empower patients. Annie Sparrow stressed the essential nature of collaboration in public health and medicine, as it allows specialized expertise to be pooled from various sources to tackle complex issues. During the pandemic, she noted, there was an unprecedented level of collaboration across different sectors (e.g., scientific research, medical practice, finance, business, sports, education), which enabled things to get done by working together toward a common good. Furthermore, one cannot work effectively in public health without collaboration; especially when lives are at stake, it is crucial to establish connections and working together. Martin McKee described his work as rapporteur for a Pan-European Commission on Health and Sustainable Development. This independent, interdisciplinary group of experts is convened by the WHO Regional Office for Europe to rethink policy priorities in the light of pandemics. Comprised of various stakeholders involved in public health (e.g., medical experts, politicians, representatives of central banks), it aims to improve the quality of evidence used in European policy and health. Achieving equitable, sustainable healthcare systems requires broad cross-sectoral collaboration with an emphasis on stakeholder capitalism or the introduction of economic incentives.

> [This] is not going to be something that we will accomplish by bridging the gaps between research, policy, and health.…You're talking about reforming the capital markets, in particular private equity and accountability. (McKee, 57:41)

From his long medical career in the military, Ron Poropatich spoke of teamwork and the importance of leadership:

> [I]n the operating room [there is] this team concept of who's doing what, how. And it's like an orchestra…a conductor conducting the orchestra, the surgeon in the operating room, with all the other team members: the circulating nurse, the scrub nurse, all the other people in the room that makes that operation a success. It's how that lead surgeon responds. Is he or she going to throw instruments and yell at people because things aren't going well? Because as they're looking at the patient in front of them, that patient's not doing well, and they start yelling at anesthesia, saying the patient's moving, you know, you got to sedate them more. I can't do this because I have very fine surgical things...there's all these little things that go on. And no matter what area of involvement,…the orchestra or the O.R., you have to be alert and awake and pick up on those cues somehow. I don't know how else to explain it other than through experience.…Put yourself in those experiences so you learn from these examples. (R. Poropatich, 20:42)

Resource Management

The traditional model of collaboration and common pool resources is grounded in the management of common resources (e.g., water, forests, land use) brought to the fore by the seminal work of Elinor Ostrom (see Chapters 16 and 17, this volume). This perspective was explicitly discussed by Naina Agrawal-Hardin, Margaret Levi, and Deepa Narayan. In her work on water management, Narayan points out that rules alone do not suffice to resolve conflicts between those with and without access to water. Instead, goodwill, social connections, social capital, and trust are necessary to prevent perpetual conflict and foster collaboration. She discussed the importance of modifying underlying values, such as gender imbalance and the need for support and investment from men, to exact successful interventions in communities facing severe drought and water scarcity. In the four villages in Timor where she worked, she observed that efforts to manage water resources were most effective when men actively supported women, who are traditionally responsible for fetching water. Despite employing similar processes and actions across different communities (e.g., creating men's and women's groups, holding talks with village leaders, engaging facilitators), the success of the interventions hinged on the attitudes of men in recognizing the water problem as a priority and their willingness to invest resources as well as to collaborate with women. Conversely, in places where

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men were not supportive due to an underlying cultural or psychological factor (e.g., animosity or lethargy), all efforts failed. This illustrates that collaboration in resource management involved more than technical aspects: cultural and social dynamics needed to align and all stakeholders needed to be willing to work together toward a common goal.

> If the only relationship is through water, trust is very difficult to maintain when water becomes scarce. As resources get scarce, the fight gets harsher, and collaboration becomes a distant dream. Whoever is the strongest, whoever has the most money, whoever is going to use the most muscle and power wins. Then you have a winner and loser framework. Collaboration is a horizontal framework or needs to be for it to last. (D. Narayan, 21:11)

Religion

Religious institutions can play significant roles in fostering collaboration. Through the provision of social services, they respond to people's needs in various ways and shape the behavior of communities. Edward Slingerland described common features across the main religions of the world, in particular, prosocial religions. Religions like Christianity, Buddhism, and Islam have successfully spread to new regions and fostered collaboration through adherence to prosocial morality. He also discussed the concept of a moralistic God and the cultural innovations that have allowed certain religions to scale collaboration effectively, comparing pagan and Greco-Roman religious traditions with the Judeo-Christian school.

Rafael Malpica Padilla emphasized that the roots of religion reflect a core human value of connecting to, and thus instilling, an ethos of collaboration:

> [T]he problem with the religious encounter is when that encounter is mediated by dogmatism—by a need to clearly state not only what "I" believe, but in the end, to make you believe in my own system. However, if we go to a very basic definition of religion using the Latin root, *Religare*, which means to reconnect, the basis or common denominator for every religious system is how that reconnection happens (a) between an individual and God (however, defined) and (b) between individuals themselves. So, if we understand religion as that ability for us to reconnect with one another based on some shared principles, we have a better chance to avoid the pitfall of dogmatism, which leads to the imposition of my subjectivity as normative for everyone. (R. Malpica Padilla, 19:15)

As an example, Malpica Padilla advanced the role of the church during dictatorships in Latin America, noting that while the church may not have had much influence on the political scene, it was involved in building community resilience and supporting marginalized societies. He emphasized the importance of the church as part of processes for liberation and transformation, which requires displacement at the margins. Building on this, he described a transformative process where engagement with marginalized communities leads to a fundamental change in both the marginalized and those who come

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to their aid. He suggests that true transformation requires displacement; that is, those in positions of power or privilege must move toward the margins, where they encounter and work with oppressed groups. This movement is not about doing something for others from a position of power but rather about doing things with and among the oppressed, leading to mutual transformation through collaboration. Displacement at the margins is about being present and active in the spaces where marginalized people are, and it is through this engagement that both the lives of the marginalized and those who join them are transformed. Examples that he highlighted ranged from the confrontation between the German missionary Helmut Frenz and the Chilean dictator Pinochet to the process of liberation from dictatorships in South America and Africa.

Science

The large-scale physics experimentation use case illustrates a unique model of industrial-scale scientific projects, which, putatively, should reflect collaboration. However, the model advanced to describe the underlying dynamics is one of a "cage fight"— a minority view expressed by one participant (S. de Jong) Susan Fitzpatrick observed that "there is absolutely nothing in science that is not collaborative" despite the dominant stereotype of the "lone wolf genius." Science is a collaboration spread out over time where any individual is always building on previous work or implicit collaboration.

> You have to have your idea, this has to be your thing, and this has to be your original contribution, which I think is true. People do generate original scholarship, but it's not without the context of all the other work that's going and is around you. (S. Fitzpatrick, 8:42)

Unfortunately, she stressed, the pressure of branding and marketing has caused this to fall to the wayside.

Sten Grillner described the process of awarding the Nobel Prize: Established in 1901, it initially faced skepticism from the Swedish Academy of Science, the Karolinska Institute, and the King of Sweden. Over time, these bodies developed a unique and enduring selection structure, which includes a global call for nominations and a meticulous review process where nominees are vetted through written accounts and in-depth analyses by experts, focusing on specific discoveries rather than lifetime achievements. This process, built on historical records, ensures a collegial yet rigorous deliberation within the committee to honor outstanding scientific contributions. The success and prestige of the Nobel Prize are attributed to this well-conceived process, the historical context available for review, and the selection of panel members who deeply respect science, ensuring that the award highlights exceptional scientific breakthroughs to the public and scientific community. This illustrates how traditions, both those in the present as well as previous generations, established collaboration. It must be noted, however, that the common goal in this case is given and not co-constructed by the experts involved in the selection process.

Theo Mulder discussed the process of creating consortia within the scientific community with an emphasis on the institutes of the Dutch Royal Academy. He underlined the importance of a bottom-up, content-driven approach to ensure successful cooperation among scientists, especially across disciplinary boundaries. This involves slowly building the supporting framework around content bearers, such as professors and senior researchers, and involving a larger group of junior scientists from the start, who he considers the driving force behind the realization of successful scientific experiments and consortia. Mulder reflected on the necessity for consortia to demonstrate visible advantages within a short time frame to ensure their future, such as the ability to answer questions that cannot be addressed by any one discipline. Further, he advanced the idea that we should not ignore the normal social dynamics between humans in scientific collaboration; tensions between people who work together are natural and require an atmosphere that supports resolution as part of the group's social dynamic. Citing the Netherlands Institute for Neurosciences as a successful case, he described how the institute faced turmoil and mistrust after a merger and yet transformed into a success story through a reorganization that led to a more social community, injecting funds, hiring new directors, and recreating the institute.

Military

In the U.S. military, concrete methods are used to select people based on their ability to collaborate. Luke Sciulli described a scenario from a 21-day initial selection process where the objective was for a group of recruits (a team) to move a telephone pole 15 miles through the woods. Transporting the pole from point A to point B successfully requires effective collaboration among the team members. This, in turn, was contingent on a key process: the team needed to consider and use the various strengths and skills of team members to build its strategy. This experience revealed how individuals adapt to a situation and their aptitude to work together. Sciulli also described how every deployment involves working with the local population, be it in Africa, Eastern Europe, or Afghanistan; when one engages with the host nation's citizenry and military, a range of challenges must be met due to different work ethics, plans, and perceptions.

Ron Poropatich expanded on the military's collaboration culture by describing his deployment to Somalia in 1993. He emphasized that a clear focus on the mission requires personnel to integrate and work together, regardless of their specific roles. This holds for both combat missions and combat support missions: both require a clear understanding of the mission's importance to national security and societal needs.

The lessons that Sciulli and Poropatich extract from these experiences are multiple. Sciulli highlighted the need for adaptability and creative problem-solving during a collaborative task. Poropatich emphasized the importance of trust within the military hierarchy and the shared focus on accomplishing the mission. In discussing the relationship between different ranks, Poropatich stressed that everyone is working toward the same goal and that this understanding fosters a collaborative environment where individuals can learn from each other and their leaders. He also mentioned the significance of observing and emulating good leaders. Being in the presence of effective leaders, he notes, allows team members to assimilate positive traits and skills, such as listening and knowing when to allow the team to discuss among themselves. This emulation and assimilation process is crucial for building a strong, collaborative team.

Philanthropic Funding

As the President of the William and Flora Hewlett Foundation, Larry Kramer discussed the challenges and successes of working with funders on collaborative projects. He highlighted the complexity involved in providing large-scale funding for climate change initiatives. Nevertheless, despite the difficulties, collaboration is present in every program they undertake, and a lengthy process was followed to learn how to collaborate effectively.

In her capacity as the President of the James S. McDonnell Foundation, Susan Fitzpatrick shared several examples of collaboration: their program in cognitive neuroscience (a joint effort with the Pew Charitable Trusts), the multi-year collaboration with the MacArthur Foundation, and the Brain Tumor Funders' Collaborative, where six funders worked collaboratively to promote brain tumor research. The latter project was realized because the funders involved felt that greater collaboration was needed among brain tumor researchers. She also mentioned the Collective Memory Project, a recent collaborative effort focused on understanding how individuals share cultural knowledge.

Fitzpatrick and Kramer shared several lessons gleaned through attempts to collaborate with other funders. Doing this is not easy or straightforward. Collaboration requires time to build trust and mutual respect as well as a willingness to recognize other ways of knowing. Kramer emphasized that there is no one-size-fits-all strategy. Fitzpatrick stressed that collaboration does not work when one funder tries to get others to contribute financially to a project defined by the funder. It is more effective to determine who has similar interests and explore the possibility of working together from the onset. This enables distributed decision making and ensures that a project is a shared endeavor rather than the sole purview of a single funder. To do this, Kramer proposes an initial focus on building relationships with other funders through small-scale initiatives before developing major programs. In this way, trust can be established and respective strengths maximized.

Fitzpatrick highlighted the importance of patience and developing a shared language and understanding over time, which she finds crucial in funding collaborative programs for long periods of time. Kramer acknowledged the challenge of ensuring that the provision of funds does not become the main factor when relationships with grantees are shaped. It is important to foster relationships where grantees feel they can be honest and not merely seek to please the funder for future funding.

Arts and Creativity

As a composer, Jônatas Manzolli spoke of his experience on the role of rules within a creative collective. He emphasized the importance of interpretation and collaboration in the rule-making process and the realization of these rules. In his view, rules should not be seen as rigid commands but as frameworks within which individuals can exercise creativity and interpretation (see also Chapter 9, this volume). This suggests that everyone involved in collaborative work, regardless of their position, is engaged in a creative process and contributing to the outcome. Any participant who feels stifled or uncreative should be seen as a signal of a problem within the broader system. Manzolli expressed concern that prioritizing individualistic or egotistical perspectives over the collective good can lead to compromises in creative expression and, at a larger scale, to societal issues, as seen when people disregard the benefits of vaccination for the community. He introduced the concept of the "aesthetics of compression," which relates to the experience of isolation and repetitive patterns, as he experienced during the pandemic. In such circumstances, values become a crucial point of reference; if existing values are inadequate, new ones must be created. To combat the stress of isolation during the pandemic, Manzolli composed musical letters to friends and colleagues, which sparked collaborative exchanges and grew into broader creative experiences. This process culminated in a project that combined dance and poetry, which they then transformed into an expression they consider "music" through algorithmic composition, even without traditional musical notes (for further discussion, see Chapter 9, this volume).

Ilona Schmiel, Intendant of the Tonhalle-Gesellschaft Zürich, shared her insights in the context of the artistic world. Summarizing her vast experience in leading this world-renowned orchestra and concert hall, she emphasized the importance of bringing together the best ideas and empowering people to achieve common objectives. She highlighted the need for quality in artistic collaboration, the complexities of the selection process for outstanding orchestra members, and management's supporting role in meeting common objectives (e.g., assuring buy-in from industrial sponsors). Schmiel elaborated on the collaboration between a conductor and an orchestra, emphasizing the unique and impactful moments that can occur during a live concert. She asserts that even someone who attends a concert for the first time will recognize the "magic moments" between a conductor and the orchestra, as this is audible and often felt (e.g., musical chills; Chapter 9, this volume). Such moments, however, can only be conveyed in a live setting, she contends, and cannot be mediated by technology.

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