Toward a representative and rigorous science of the mind:

Notes from a young psychologist on the Mind & Spirit Project

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Abstract: The Mind & Spirit Project uses methods from anthropology and psychology to explore how understandings of 'mind' shape the 'spiritual' or 'supernatural' experiences of people in different cultural contexts. Here I reflect on why this project has been so stimulating for me as an early-career psychologist. I argue that our methods address two pressing issues in modern psychology—the overreliance on convenience samples and the reproducibility crisis—thus providing a model of how to work toward a more representative and rigorous science of the mind. I then highlight one aspect of this research that should be of interest to many psychologists and anthropologists: its implications for the study of 'theory of mind.' My goal is to inspire psychologists and others to engage this project with a generous spirit and a critical eye.

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The Mind & Spirit Project is a comparative, interdisciplinary project based at Stanford University, funded by the Templeton Foundation, and led by T. M. Luhrmann.[1] The project draws on the expertise of anthropologists, psychologists, historians, and philosophers to explore whether different understandings of 'mind,' broadly construed, might shape the ways that people attend to and interpret experiences they deem 'spiritual' or 'supernatural.' The project has taken place in the US, Ghana, Thailand, China, and Vanuatu, with some additional work in Ecuadorian Amazonia; in each country, we have worked with charismatic evangelical Christians as well as other religious communities of local importance, in both urban and rural settings. The articles in this special issue are our first pass at making sense of what we have learned so far through participant observation, semi-structured interviews, and surveys with local undergraduates and adults in the general population. They lay the foundation for further quantitative work, including psychological experiments with adults and children (currently in progress).

There are many reasons that this project has been so stimulating for me as a psychologist at the beginning of my career. I share a few of them here, with the goal of inspiring psychologists and others to engage this project with the generous spirit and critical eye that we bring to work in our primary disciplines.

In the first sections of the paper, I address two major points of interest in psychology today: (1) The challenge of moving beyond convenience samples to diversify our participant pools; and (2) The challenge of conducting research that is replicable and scientifically rigorous (the 'reproducibility crisis'). I argue that the Mind & Spirit Project models an approach that can contribute to addressing both of these pressing issues. In the third and final section, I highlight one aspect of this research that should be of interest to many of my

[1] This paragraph is based on a description drafted by T. M. Luhrmann and the Mind & Spirit team.

colleagues in cognitive, developmental, and other areas of psychology: The possibility of a more complete understanding of 'theory of mind.'

The challenge of moving beyond convenience samples

Thanks to the sustained efforts of a few pioneers in cultural and social psychology and their collaborators in other fields, more and more psychologists have become convinced that we need to expand psychology into a more global, representative science. As these pioneers have argued, culture is at the core of human thought and behavior, shaping us and being shaped by us with each word we utter and every action we take (e.g., Adams & Markus 2004; Cole & Scribner 1974; Fiske et al. 1998; Rogoff 2003; Shweder 1995). The creation, transmission, and evolution of different ways of thinking, feeling, and interacting are fascinating psychological phenomena in their own right, and should pique the interest of anyone who cares about intuitive theories, communication, morality, or the self (which is to say, many psychologists).

Moreover, as more examples of variability in even 'basic' psychological processes accumulate, they threaten the assumption—latent in much of our thinking and writing—that work with a single population is sufficient for building a science of 'the human mind.' In their now-classic paper, J. Henrich, S. J. Heine, and A. Norenzayan (2010) made compelling arguments for how our over-reliance on Western, educated, industrialized, rich, and democratic ('WEIRD') participants constrains the generalizability and scope of psychological science. Many of us heard their clarion call.

However, although we may enjoy reading about others' cross-cultural work and include statements about the possibility of cultural differences in our own discussion sections, in practice most of us still gravitate toward so-called 'convenience samples.' In my own case,

this means working with majority White or Asian American, middle- to upper-class US citizens, including families visiting nearby children's museums, or the (mostly young) adults who have opted in to my studies on the web-based platform Amazon Mechanical Turk. I am far from alone in working primarily within these constraints (see Nielsen et al. 2017 for a comprehensive exploration of this phenomenon in developmental psychology in particular).

My view coming into this project was that cross-cultural research was important and fascinating—but virtually impossible. I am now more optimistic. Consequently, I see more urgency than ever in recruiting more 'basic' researchers in psychology and adjacent fields to join the effort to build a more global and representative science of the mind. In the following sections, I share insights from the Mind & Spirit Project on the challenges of diversifying our participant pools and ways to address these challenges.

Why is it so hard? The undervalued advantages of cultural fluency

There is an obvious reason that I, like other psychologists, continue to gravitate toward convenience samples—they are convenient! Not just in the sense that these participants are relatively easy for me to recruit, but in other, deeper senses: We speak the same language; we can read each other's gestures and facial expressions; I have strong intuitions about what experimental manipulations will 'work' for them; I am sensitive to what questions might seem too strange, academic, or personal; I have strong prior beliefs guiding my hypotheses and analyses; and so on. In a word, psychologists, like most other people, are *fluent* in our own cultures.

What we do not often acknowledge is that this is a good thing: Cultural fluency offers many advantages that substantially improve the quality of our research.

Consider the following example: If I ask someone, 'How often in the past month have you felt melancholy?' and that person thinks the word 'melancholy' means happy, or he does not know the word, his answer will not reflect his experience of melancholy *per se*. If I think of melancholy as undesirable, but he thinks of melancholy as a valuable experience to be savored in moderation, I might ask inappropriate follow-up questions (e.g., 'What do you do to stop feeling melancholy?'). I might look him in the eye and nod when he responds, with the goal of facilitating a friendly, natural exchange. But if he interprets the eye contact as impolite, or if nodding up and down usually signifies 'no' in his everyday life, I might inadvertently—and perhaps unknowingly—steer the conversation in a different direction, or cause it to stall entirely.

Such instances of miscommunication happen often enough between speakers of the same language in the same cultural context, but they are likely more frequent and severe with linguistic or cultural barriers in the way. At low levels of cultural fluency, it becomes easy for a researcher to misinterpret participants' answers, both when they say what we expect them to say (*He's just like my usual participants*) and when they do not (*He's so different)*. At higher levels of cultural fluency, it is easier to notice the subtleties (*He said 'yeah' instead of 'yes'—maybe he's not sure*), infer social-emotional dynamics (*He's avoiding eye contact—is he feeling uncomfortable?*), correct misunderstandings (*What he's saying doesn't follow—did he misunderstand my question?*), and question one's own assumptions (*That's not what I thought he'd say—what am I missing?*). As researchers, we do not often acknowledge that moving outside of our comfort zones means giving up these advantages.

How are we to proceed in contexts where we lack this fluency? One option is to hope (or pretend) that certain experimental methods are so straightforward that they should work the same way anywhere, provided we check our translations and run a few pilot

participants—and some methods do prove themselves to be appropriate in a variety of cultural contexts. We can also hope (or pretend) that a brief visit to the place we plan to work will be enough to alert us to any important differences that could affect our results—and spending even a few weeks in the field often does yield thought-provoking, cautionary, and otherwise powerful experiences that shape the course of a research project.

But our methods do not always translate so well. To give just a few examples: Standard incentives like money, food, and toys have different values in different settings. The presence—or absence—of onlookers may shape participants' behaviors in different ways across contexts. People in different communities have variable levels of experience talking to strangers, reasoning about fictional characters in hypothetical scenarios, and reflecting and reporting on their thought processes—not to mention filling out pen-and-paper surveys or using computers. (See Greenfield 1997; Heine et al. 2002; and Cohen 2007; for extended reflections on the challenges of cross-cultural research.) To make matters worse, many of these differences are difficult to discern if you are not looking for them. And—perhaps most dangerously—differences in how participants experience the study can easily be confused with more dramatic cultural differences (e.g., *These participants are incapable of solving this problem*).

In other words, brief visits aimed at confirming that an established experimental protocol translates well enough to a new cultural context just do not meet the increasingly high standards of rigor we demand with respect to other aspects of psychological research. Doing good work in any context requires a high degree of cultural fluency; hopes and fantasies are no substitute.

Of course, many psychologists are fluent in more than one language or culture, and many excellent studies have emerged from researchers working in the non-'WEIRD'

communities where they grew up, or where they have spent many years living and working. This is absolutely critical to the pursuit of a more representative and accurate psychological science. But the task of expanding psychology into a global science should not fall solely on the shoulders of people who have the linguistic and cultural fluency to do this kind of work. This runs the risks of tokenizing these researchers, marginalizing cross-cultural research, and adding undue burden to underrepresented minorities who may already face additional barriers to professional success. It also denies the possibility that an outsider who acquires cultural fluency as an adult might have a unique perspective that would otherwise be missed.

At the same time, requiring every psychologist to acquire cultural fluency before diversifying his or her participant pool is such a high bar as to stop this important project in its tracks. Doctoral students in anthropology complete at least a year of fieldwork for their dissertations (*after* developing competency in any necessary languages); most psychology departments are simply not set up to support this kind of investment. But this project has shown me another way forward, the principles of which I describe in the following section.

Can we have our cake and eat it too? Principles of interdisciplinary collaboration, mixed methods, and friendship

As I see it, there are three principles underlying the approach we have taken in the Mind & Spirit Project that would go a long way toward building a more representative science of the mind without sacrificing cultural fluency: interdisciplinary collaboration, mixed methods, and friendship. Although I am not the first to discover these principles, I describe them here because they offer practical suggestions for how to build the kind of science to which many modern psychologists aspire.

Interdisciplinary collaboration: *Psychologists working toward a global, representative science of the mind should collaborate with researchers with anthropological expertise*.

This principle addresses many of the concerns about cultural fluency raised in the previous section. In our haste to recognize and overcome the limitations of convenience samples, it is important for psychologists to remember that there are entire fields of study that have spent generations developing ways of acquiring fluency in a new culture. Psychologists might have critiques of these approaches, or new perspectives to add—but there is no need to reinvent the wheel. We do not have to set up new field sites from scratch, hoping or pretending that we can achieve sufficient cultural fluency with the limited visits that most psychologists' careers allow for. We need not squander time and resources on the inevitable missteps of newcomers who do not quite know the rules of the place and have limited social networks. Instead, we can take advantage of the division of labor that academic departments engender, drawing on the expertise and resources of our colleagues in anthropology while offering our own complementary knowledge and skills.

Of course, it takes effort to communicate well across disciplines and to work out compromises that do not feel compromising. But these tensions are, in a sense, the point: Moments of confusion are informative, and the theories that emerge on the other side of internal debates are generally stronger than the ones each debater began with.

For example, at one point our team was discussing whether people in different field sites considered the mind to be 'modular.' The conversation became unusually difficult, and it took five or ten minutes of confusion to understand why we were talking past each other: We were using the term 'modular' in very different senses. Some of us were thinking of 'modular' furniture, a metaphor used by the religious studies scholar M. Heim to describe

how a seemingly endless list of mental states could emerge from the recombination of reusable components (see Aulino, this issue, on the 'kaleidoscopic' mind for an elaboration of this idea). Others associated the term 'modularity' with J. Fodor's (1983) discussion of distinct, encapsulated cognitive systems that are likely to be innate and instantiated in distinct brain regions—a rather different view of the 'mind.' Recognizing that we were using the term differently helped us understand each other and articulate our own positions more clearly. Beyond this, the misunderstanding illuminated new aspects of people's beliefs about the mind that we had yet to discuss.

The holistic views emerging from our collaboration are more nuanced and frankly more accurate than the conclusions that any one of us would come to on his or her own. In my case, it is a tremendous relief to know that the anthropologists on our team will not let me get away with doing anything that is egregiously off base from their perspectives of anthropological expertise. I hope that I can lend them the same sense of confidence and nuance as we grapple with the results of the more quantitative, 'psychological' aspects of our project.

Mixed methods: *Research teams working toward a global, representative science of the mind should take a multi-pronged approach to their research questions, drawing on multiple methods*.

Different aspects of psychological phenomena manifest differently under different circumstances. Limiting oneself to one or two tried-and-true methods certainly has its advantages, but these are outweighed by the benefits of convergent evidence—a basic tenet of psychological research that is of particular importance in a cross-cultural project.

In our case, we used pen-and-paper surveys with large samples of anonymous participants to gauge the distribution of various spiritual experiences across the general population in each field sites—but long-form interviews with smaller samples of well-known interlocutors have revealed things that such surveys never could, and psychological experiments are allowing us to test our hypotheses instead of relying only on correlational data. Each of these methods provides a check on the validity of the others, making it all the more compelling when results from these different approaches converge. In the end, it is less anxiety-arousing and more satisfying to have data from multiple methods, each with its own flaws, which complement and complicate each other, rather than a single method that would have had to be—but never could have been—perfect.

This mixed methods approach has also served to reframe some of the challenges of interdisciplinary collaboration as assets that contribute to our collective understanding: We each have our own sense of the flaws and advantages of each method, which methods meet the standards of our own subfields, and which aspects of the project we personally trust the most. This allows us to fulfill our obligations to each other of challenging assumptions, catching misinterpretations, and holding the team to high standards of rigor and nuance.

Friendship: *Research teams working toward a global, representative science of the mind should cultivate personal relationships among team members.*

Interdisciplinary collaboration using mixed methods is time-consuming and exhausting. It can also be invigorating and inspiring. I suspect that the time and effort are inevitable, while the invigoration and inspiration only emerge under special circumstances—namely, friendship.

In our case, friendships were formed through twice-weekly meetings in person, and over frequent 'salon'-style dinners at the home of our fearless leader, T. M. Luhrmann. When fieldworkers were scattered around the world we held a weekly videochat, with some of us waking up at dawn and others struggling to stay awake past midnight. We hosted workshops with leaders in the fields of anthropology, psychology, religious studies, and philosophy, and went on a weeklong retreat to the Esalen Institute (where we met up with another team with similar interests, led by J. Kripal). These experiences cemented our professional relationships into deep intellectual collaborations and meaningful personal connections.

Our friendships allowed us to let our guards down. As our social bonds strengthened, we became increasingly able to maintain equanimity (or as Aulino's interlocutors in Thailand might say, *jai yen*—a 'cool heart'). By now, our baseline assumptions are that we are on the same team, we have each other's best interests in mind, and things will work out in the end. Friendship with my team members has made it easier to hear their critiques without taking them personally, and to ask them to elaborate when I do not understand, or debate with me when I disagree. Likewise, it has allowed me to challenge my teammates' interpretations and point out inconsistencies in their arguments, without putting anyone on the defensive. Our closeness makes it easier to be equanimous and charitable in our conversations, and the equanimity and charitability of our conversations bring us closer—a virtuous cycle.

These friendships have also alleviated the pressure to pursue every idea and complete every follow-up study before the official end of our project, because we hope that this is just the beginning of our work together. Our social connections fortify our intellectual collaborations, at the timescale of a single conversation and, we hope, across the length of our careers.

Takeaways

Cultural fluency is critical to high-quality psychological research with any population. I suspect that psychologists generally underestimate the advantages of understanding our participants' cultural contexts—but we nonetheless benefit from them enormously.

I believe that there are firm limits on the completeness and accuracy of a science built overwhelmingly on work with one or two populations; the pioneers whose work I described at the beginning of this section are right to call for a diversification of our participant pools, among other changes to our field. I have also come to think that psychologists cannot afford to make compromises in cultural fluency in the name of working toward a more global, representative science. The Mind & Spirit Project offers one example of how we could have our cake and eat it too, by following the principles of interdisciplinary collaboration, mixed methods, and friendship across disciplines.

The challenge of conducting research that is replicable and scientifically rigorous

In the circles that I frequent, psychologists discuss a second crisis that often feels even more urgent than our overreliance on convenience samples: The fact that many—perhaps half—of the findings published in psychology journals have proved impossible to replicate (Open Science Collaboration 2015).

In a field like modern experimental psychology, the goal of most research is to gather evidence for or against a hypothesis and thereby push our collective understanding closer to something like the true state of the world. The possibility that so many of our 'findings' might not be *true* calls into question how much progress psychology has actually made in understanding the mind and how best to proceed as a field.

In recent years there have been many suggestions for how to improve our science, including identifying and avoiding questionable research practices; teaching principles of

reproducibility, repeatability, and replicability to psychology students; making our data openly available for external reanalysis, and reuse; and adopting better statistical practices (e.g., Simmons, Nelson, and Simonsohn 2011; Frank and Saxe 2012; John, Loewenstein, and Prelec 2012; Simonsohn 2013; Brandt et al. 2014; Cumming 2014; Munafò et al. 2017; O. Klein et al. 2018; Wagenmakers et al. 2018). It is an exciting (albeit disorienting) time to be an early-career psychologist, because so many people in the field care deeply about these issues and there seems to be genuine interest in self-improvement.

I will add to this conversation a few observations from the Mind & Spirit Project that lead to additional ideas for improving psychological science. On good days, at least, I have the feeling that this general approach models one style of research that will lead to theories and results that are closer to truth.

Multi-site research as a built-in check on repeatability

My first observation is somewhat obvious: Conducting a study in multiple field sites is like conducting multiple internal replications of that study, thereby improving its repeatability, i.e., the probability that another researcher could conduct the same study at a future date (regardless of its outcome).

Preparing to run a study in multiple locations forces researchers to make materials easy to re-create, standardize experimental protocols, and be explicit about techniques that might typically be passed on by word-of-mouth (e.g., strategies for recruiting and 'warming up' participants). This provides a built-in check, early in the research process, on which aspects of a study are easy for a new team to implement from scratch and which might need to be specified in greater detail. Several prominent research groups in psychology have capitalized on this general insight, advocating for studies to be conducted in multiple labs in

parallel to assess replicability, estimate effect size, and gauge generalizability (Frank et al. 2017; Klein et al. 2014).

Cross-cultural research provides an example of how the immediate incentives of a researcher—to enable teams located in different field sites to do the same things in parallel—can be aligned with the higher-level goal of enabling researchers who are totally external to the project to repeat the study in the future. Increased repeatability is a happy side effect of doing cross-cultural research well, and something that researchers who conduct studies in multiple field sites should be encouraged to document, discuss, and advise on.

Some researchers are primarily interested in how results might differ across field sites, while others are more interested in whether a finding is 'replicable,' i.e., whether the results are the same across sites and time points. Both variability and continuity, within and across cultural contexts, are important to detect, and both require studies to be repeated multiple times as exactly as possible. My hope is that this observation might inspire more labs to consider expanding their studies to include multiple sites—perhaps even some that are beyond our typical convenience samples (with the provisos outlined in the previous section).

Interdisciplinary collaboration as a boost to theoretical rigor

The reproducibility crisis has made clear that it is also important for psychologists to hold ourselves to higher standards of theoretical rigor. Questions we might ask ourselves include: *Does our study manipulate and measure what it is intended to? Is the hypothesis linking our experiment to our research question reasonable? What are the assumptions underlying our analysis plan, and how can we test whether they are upheld? How much could*

we learn from a result in the predicted direction—and what about a result in the opposite direction, or a 'null' result?

These are the kinds of questions that come naturally to colleagues in other fields who are trying to understand and evaluate psychological approaches. To give just one example: For one of the psychological experiments for the Mind & Spirit Project, I had originally planned to ask participants about what various entities 'can or cannot do' (e.g., 'Can a beetle feel happy?'), following my previous work in the US (Weisman, Dweck, and Markman 2017a). But N. A. Peterson, a wise research assistant new to psychological methods, drew on her knowledge of Christian teachings in modern Ghana to suggest that this linguistic framing might discourage participants from saying 'no' to any of our questions, because saying that a beetle *cannot* feel sad could be interpreted as denying that, with God, anything is possible (i.e., anything *can* happen). Another way to phrase Peterson's concern would be to say that if we were to phrase our questions in this way, participants might not end up answering the question we intend to ask them; our study would not measure what we think it measures. When we brought this issue to the larger group, several others agreed that this could be a problem in their field sites, and we decided to rephrase our questions accordingly (asking, e.g., 'Do beetles feel happy?').

This is another happy accident of the practical realities of a project like the Mind & Spirit Project, related to the principles of interdisciplinary collaboration and friendship described in the previous section: Collaborating with colleagues outside of psychology with complementary expertise forces conversations that reveal and challenge the assumptions built into our experimental methods, suggest modifications and improvements, and generate new research ideas with the potential to clarify, falsify, or otherwise extend our understanding. We

would do well to make space for more of these discussions, both within psychology and (perhaps especially) in conversation with colleagues in other fields.

Including qualitative methods in the modern psychology toolkit

Another question we might ask ourselves in order to assess the rigor of our research is, *If we asked the same research question in a different way, would we reach the same conclusion?* As I noted earlier, psychologists value converging evidence, and collecting multiple kinds of data about a single research question is something that I have found especially valuable in the Mind & Spirit Project. Here I highlight one advantage of this mixed methods approach that has received relatively little attention in the context of the reproducibility crisis: The potential for qualitative methods to improve the replicability and rigor of our science.

In a 2018 talk at the Stanford Graduate School of Business, A. Gelman, a prominent critic of psychological methods and staunch advocate for improved statistical practices, asked the audience to consider how many people we really need to talk to before we have a sense of the answer to our research questions. Two or three, for a general sense of a phenomenon? A few more to confirm our hunches? Gelman used this example to illustrate that our statistical methods do not align well with our intuitive feel for how we know what we know. He also mentioned the possibility that bridging quantitative and qualitative methods could improve the quality of our research and the validity of our results. (See Gelman 2018, for a blog post documenting a conversation between us about this issue.)

Gelman's observation reminded me of a complaint I have made—half-jokingly—to my teammates from anthropology: When they are in the field almost all of their lives count toward their research progress as ethnographic observation, while I 'throw away' the data

from the dozens of people I talk to in the course of designing and piloting an experiment. Of course, distinguishing between the free-flowing interactions I have with participants during piloting and the rigorously controlled process of data collection is critical to the logic of the statistical analyses I employ. But in juxtaposing this approach with the framework for knowledge-building implicit in qualitative research, I have come to see how much data I fail to record in my own work, how much I end up glossing over (and likely forgetting) by the time I write up a scientific paper—and how much more a reader could learn from my efforts if I made my 'informal' observations explicit and available.

Like many psychologists, I base my interpretations of quantitative results, in part, on my sense of what a study felt like. Many of us include anecdotes or video clips in our conference presentations to give context for the plots and numbers that constitute our primary findings. But we rarely write up the details of piloting; the earlier studies that 'failed'; the design choices that increased participants' attention; the spontaneous comments that participants made before, during, or after the study; or the general social-emotional qualities of the exchange between researcher and participant. There are some notable exceptions to this trend, but most high-impact psychological research from the past several decades omits these kinds of observations.

At a minimum, then, I would argue that psychologists should embrace the fact that our quantitative methods also yield valuable qualitative data, and describe our studies, findings, and conclusions more thoroughly from a mixed-methods perspective. Many psychologists may not feel as comfortable with qualitative data as we do with quantitative data; it is hard to set standards for evaluating qualitative observations objectively and gauging its generalizability. But readers will continue to be free to question or reject any aspect of our

results, including our qualitative observations. (They might actually have an easier time doing so if we make them more explicit.)

Beyond this, I think we would benefit enormously from incorporating more rigorous qualitative techniques into our research, following in the footsteps of our forbearers (e.g., James, Piaget) and drawing on recent advances in qualitative methodologies to identify important areas of research, form our hypotheses, design ecologically valid studies, and guide our interpretations of our results. In my work on the Mind & Spirit Project I have had the chance to sit in on hours-long interviews; to attend church services, engagement parties, and initiation ceremonies; to observe how many people are awake at 3:00am vs. 7:00am on a Wednesday morning; and to talk to some of the same people multiple times over the course of several days or weeks. These experiences pale in comparison to the depth and richness of an anthropologist's knowledge of his or her primary field site. Still, as a psychologist, I almost never get to know my participants so well or think about their lives in such detail. It has been tremendously thought-provoking and inspiring—in many cases providing converging evidence for what we are observing in our quantitative studies, as well as shedding new light on what these results really *mean*.

As Gelman pointed out, psychologists already collect and interpret qualitative data in private; as we push toward openness and honesty in our methods, data, and analyses, let's also include more of the qualitative observations that help us formulate our studies and interpret our findings. We might even incorporate more of the modern qualitative methods developed by anthropologists and others to improve how we go about deciding what to study, how to study it, and what we make of our results. In these ways, including qualitative methods in the modern psychology toolkit could help us navigate toward theories and conclusions that meet our increasingly high standards of replicability, rigor, and truth.

Takeaways

I have argued that the methodological approach of the Mind & Spirit Project has happy consequences for the replicability of our research and its proximity to truth. In my view, popular 'open science' practices—e.g., preregistering studies; distinguishing exploratory from confirmatory analyses; sharing data, materials, and analysis scripts—should continue to be top priorities, and our team has done its best to adopt these practices. But the project has also revealed other ways to improve our science that have received less attention in recent discussions. Multi-site, interdisciplinary, mixed-methods projects offer built-in checks on reproducibility and rigor, and qualitative methods could help us grapple with our relationship to truth by guiding us toward interesting research questions, ecologically valid experimental manipulations, reasonable hypotheses, and interpretations that are closer to reality.

The possibility of a more complete understanding of 'theory of mind'

In the first two sections of this paper, I focused on methodological aspects of the Mind & Spirit Project. I now turn to the content of our research, focusing on a topic that should be of interest to many of my colleagues in psychology: the expansion of the study of theory of mind.

The idea that, in our everyday social lives, people draw on 'intuitive theories' of how mental states like beliefs and desires combine to influence actions is one of the most successful concepts in modern psychology. 'Theory of mind' has captured the interest of hundreds of researchers in psychology—not to mention cognitive neuroscience, computational cognitive science, and anthropology (see Wellman 2017, for a historical overview; and Luhrmann et al. 2011, for an anthropological perspective).

Much of this research has centered around a task designed to assess children's ability to represent 'false beliefs' (Wimmer & Perner 1983): One person (call her Sally) places an object in a drawer and then leaves the room. While Sally is away, another person (Ann) moves the object to a cabinet. The question for the participant is, where will Sally look for the object when she returns: the drawer where she left it, or the cabinet where it really is? The idea behind this study is that if a participant has an accurate theory of how Sally's mind works he or she will infer that Sally *believes*, falsely, that the object is still in the drawer where she left it and will look for it there. When a participant instead indicates that he or she expects Sally to look for the object in the cabinet, many researchers interpret this as a failure to represent Sally's false belief—evidence of an immature theory of mind. The case of false belief has been of particular interest because success in the task seems to require what psychologists call a 'fully representational theory of mind,' that is, the idea that a person's mind contains *representations* of reality (not a direct replica of reality).

The 'false belief' paradigm has been incredibly generative—so generative that it has come to symbolize the field of 'theory of mind.' Recently there have been renewed efforts to expand the study of theory of mind beyond false belief—e.g., to encompass a wider range of mental states (e.g., Kushnir, Gopnik, Chernyak, Seiver, & Wellman 2015; Wu & Schulz 2018) and to include non-human minds (Brink et al. 2017; Lane et al. 2018; ojalehto et al. 2017). The Mind & Spirit Project has begun to reveal additional ways in which understandings of the mind might vary across cultural contexts, which in turn suggest more ways to expand our understanding of theory of mind. Here I draw attention to a few points of particular interest and preview how we are following up on these observations from the field.

I consider this an invitation for psychologists, anthropologists, and others interested in theory of mind to be on the lookout for updates from our team. These are areas ripe for further research, and we hope others will be inspired to build on these initial insights.

Where do thoughts and feelings come from?

One question at the core of the Mind & Spirit Project is: Is it possible that some thoughts and feelings are not generated by the self, but are placed in the mind by other people or beings? The extent to which the mind is perceived to be sealed off from the world vs. permeable to outside influences is one aspect of what we have called 'porosity' (following Taylor 2007; see Luhrmann et al. 2011).

Many of the people whom we interviewed for this project expressed the importance of considering whether certain sensations, perceptions, desires, preferences, and intentions might come from a source beyond the self. (See Ng, this issue, and Brahinsky, this issue, on bodily sensations; Aulino, this issue, on perceptions, desires, and intentions.) In special circumstances—for instance, when charismatic Christians in the US or Ghana were slain in the spirit (Brahinsky, this issue; Dzokoto, this issue), or when traditionalist priests in Ghana were possessed by a god (Dulin, this issue; Dzokoto, this issue)—people reported that their entire mind, soul, spirit, or body was overtaken by an external force, such that for a limited time most or all of their experiences and actions had their origins in another agency. In some cases, thoughts and feelings that came from beyond the self were a cause of concern, while in others they were a cause for celebration, a source of information, or a call to action.

Many of the pieces in this special issue discuss how people reason about the source of their own mental states. For example, Brahinsky (this issue) describes how 'ontological anxiety' motivated charismatic Christians in the US to methodically test their sensory

experiences of God. Ng (this issue) describes how, in a rural Chinese setting, both Christians and spirit mediums considered their bodies to be permeable to other agents, and used bodily and emotional experiences to gain information from these agents. Dzokoto (this issue) recounts many examples of Ghanaian Christians and traditionalist priests seeking protection from external spiritual influences through their prayer and other religious practices. These are vivid examples of people taking seriously the possibility that some thoughts and feelings may come from an agent or force other than the person who experiences them—an aspect of theory of mind that has received very little attention from psychologists to date.

To follow up on these insights, we are conducting an experiment to investigate what kinds of thoughts and feelings are most likely to be perceived as coming from beyond the self. Following ongoing work by T. M. Luhrmann and C. Morewedge, we read participants short stories in which a character has a vivid thought or feeling, and prompt participants to explain where this thought or feeling comes from. We are interested in which stories invite the most speculation about possible origins beyond the self, whether the spontaneity of these thoughts or feelings makes a difference in people's attributions of their source (Luhrmann 2012; Morewedge et al. 2014), and the ways in which people of different ages or in different cultural contexts might vary in this aspect of theory of mind.

What can thoughts, feelings, and language do in the world?

Another idea at the core of the Mind & Spirit Project is the possibility that thoughts, feelings, and other mental states might have causal potency, either on their own or through the power of spoken language. This blurring of the boundary between 'mind' and 'world' is another aspect of what it might mean to have a 'porous' mind.

In several of the communities where our fieldwork took place, people expressed concern about the possibility that someone's thoughts, feelings, or intentions could have effects in the world, even in the absence of that person's direct actions. For example, Ng (this issue) writes about rural Chinese Christians' concern about demonic contagion, in which one person's spiritual corruption could affect others through his or her expression of anger, preparation of food, or mere physical proximity. In Ghana many interlocutors endorsed the idea that, as Dzokoto (this issue) puts it, 'Some bad minds are able to directly affect the physical world without physical mediation'; such people are often called 'witches' (see Dzokoto, this issue; Dulin, this issue). In several cases, interlocutors stressed the power of spoken language to act as a bridge between private thoughts, feelings, intentions, wishes, and prayers, on the one hand, and the shared physical world on the other (see Brahinsky, this issue; Dulin, this issue).

To follow up on these observations, we are conducting an experiment to investigate how people reason about the possibility that thoughts and feelings could have effects on the world, perhaps by way of spiritual or supernatural forces. Following work by C. Legare and others (e.g., Legare, Evans, Rosengren, & Harris 2012), we read participants stories in which a character has a strong feeling of either anger or caring toward another character and a salient positive or negative outcome ensues (e.g., the second character falls ill). In a series of questions, we probe whether participants think the first character's emotion might have played a causal role in the outcome. Inspired by reports from many field sites about the importance of spoken language in mediating the connection between mind and world, we include stories in which a character utters a wish or curse out loud, as well as stories in which the character simply experiences the intense emotion (see also Lane et al. 2018). We are interested in which stories invite the most speculation about a causal connection between emotions and worldly consequences; whether spoken language affects causal inferences; and

the ways in which people of different ages or in different cultural contexts might vary in this aspect of theory of mind.

What is the 'mind,' and how does it relate to the body, soul, or spirit?

The question of what counts as a 'mind' for the purposes of our project has been difficult and fascinating. We know that people in different social worlds appear to imagine their minds differently (e.g., Lillard 1998; Luhrmann 2011)—but how are we to identify the object that these different interpretations describe?

In some cases, interlocutors addressed this question directly. For example, Ng (this issue) quotes a Christian in urban China who seemed to draw on both Chinese theology and Western psychology when he described the triadic nature of the self: 'Body, mind-heart, and spirit. The spirit influences the mind-heart. The mind-heart then influences your body.' Linguistic analysis has also helped to reveal local taxonomies. Dzokoto's analysis of the lexicon available to Fante-speakers in Ghana reveals the centrality of planning and moral valence to what Ghanaian interlocutors called the 'mind,' and highlights the further possibility that many abilities that Americans would label 'mental states' (e.g., memory, wisdom, knowledge, self-control, emotions) may be understood by Ghanaians to be located more in the physical self (the body) than in the mind *per se* (Dzokoto, this issue; see also Dzokoto 2010). Meanwhile, Aulino (this issue) reports that in the Thai communities where she worked people conceptualized the apparent unity of 'mind' or conscious experience as personally compelling but not the only way to perceive and understand the world.

Many of the pieces in this special issue highlight the particular importance of the *body* in making sense of the 'mind.' For example, Brahinsky (this issue), observes that bodily experiences became important evidence of God and other spiritual beings for US

evangelicals; because people in this community imagined a wall between body and mind, and between the human world and the spiritual realm, such sensations provided a way to break down this wall and prove to themselves that their spiritual experiences were real. Ng (this issue) describes that bodily sensations were also important in the spiritual lives of Christians in rural China, but finds that in this community, where body and mind were perceived to be more integrated (less distinct), such sensations were on relatively equal footing with other 'mental' and spiritual experiences, and were not needed as proof of God's reality.

The question of how people conceptualize the mind, body, and other aspects of the person has been the focus of most of my own studies over the last several years (Weisman et al. 2017a, 2017b, 2018). My collaborators and I have attempted to chart out an intuitive ontology of mental life by asking US children and adults questions like 'Can a beetle feel happy?' or 'Can a robot think?' and tracking which capacities (including bodily sensations, perceptions, emotions, thoughts, memories, etc.) tend to hang together in people's reasoning.

Building on this work—and, again, drawing inspiration from our fieldwork—the Mind & Spirit team is conducting similar studies in each of the field sites involved in this project. Participants in these studies evaluate a wide range of 'mental' capacities as well as a few spiritual abilities (e.g., prayer) for one of a variety of target entities, including natural objects, technologies, non-human animals, humans, and spiritual or supernatural beings. They are also asked whether that being has a mind, whether it has a soul, and whether it would bleed if it touched something sharp (one important aspect of bodily life). We are interested in which capacities participants perceive to go together—e.g., when a participant says that a being is capable of feeling happy, what else does he or she say it is capable of?—as well as which abilities participants tend to attribute to which kinds of beings (e.g., are flowers perceived to have any mental life? Is God perceived to have physiological sensations?). Of great interest

are the ways in which people of different ages or in different cultural contexts might vary in this aspect of theory of mind.

Takeaways

I highlighted three questions arising from the qualitative results of the Mind & Spirit Project that have informed our quantitative studies: Where do thoughts and feelings come from? What can thoughts, feelings, and language do in the world? What is the 'mind,' and how does it relate to the body, soul, and spirit? I previewed some of our ongoing work on these topics, but this is just the beginning of how psychologists and others could address these questions. Linking these questions back to more traditional studies of theory of mind could be an especially fruitful approach. For example: How are notions of karmic conditioning and the contingency of mental states (Aulino, this issue) incorporated into people's everyday reasoning about the relationships among perceptions, beliefs, and actions? In worlds where emotions and beliefs might have their source in an external supernatural agent (e.g., a witch, God), how do people link mental states to moral responsibility, if at all?

My hope is that the observations included in this special issue, as well as the general approach of drawing inspiration from ethnography and open-ended conversations—will inspire further research by psychologists and others who are interested in expanding 'theory of mind' into a more complete account of how people understand thoughts and feelings, minds and bodies, and other aspects of experience.

Conclusions

In this essay, I shared some of the reasons that the Mind & Spirit Project has been so intellectually stimulating for me as an early-career psychologist. I highlighted lessons from the project about how we might expand psychology into a more global, representative science

of the mind while holding ourselves to higher standards of replicability and rigor. I then turned to ways in which this project could expand our understanding of how people conceptualize the mind, inviting readers to look out for the results of our ongoing studies and to take inspiration from our fieldwork to forge their own extensions of 'theory of mind.'

This project—which aims to bridge gaps between cultural contexts, intellectual traditions, and methodologies, embracing the ways that they complement and complicate each other—has been an incredibly satisfying intellectual experience for our research team. I hope that our colleagues in anthropology, psychology, and other fields will engage this work with a critical eye and an open mind, because I believe that this is the way of the future: Research teams like the Mind & Spirit Project are my best bet for how we can expand and improve our scientific understanding of the mind.

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