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ON IQ AND OTHER SCIENCEY DESCRIPTIONS OF MINDS

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1. Ouch! My c-fibers are firing!

This article is about how science influences the ontology of folk psychology, and in particular how science influences the metaphysical commitments that are implicit in what Daniel Dennett (1998: 81) calls folk psychological "craft": our actual practices of attributing mental phenomena to one another. Philosophers have had lots to say about how the sciences of the mind appropriate folk psychological concepts. I'm concerned with the flipside of that relationship: how folk psychology appropriates scientific concepts.

That scientific psychology does inform folk psychology is oft-noted (Wilkes 1991; Anderson 2015; Pettit & Young 2017; Dewhurst 2021; Westfall 2024), and some cases have been treated in depth in science studies and the history and philosophy of neuroscience (Rodriguez 2006; O'Connor & Joffe 2013; Vidal & Ortega 2017; Francken & Slors 2014, 2018) and psychiatry (Foucault 1965; Hacking 1995a; Richards 2000; Murphy 2017). Nevertheless, philosophers have by and large been more interested in prognosticating science's future effects on folk craft than in detailing the history of the relationship. One infamous prognostication is the Churchlands' half-jesting, half-serious insistence that folk psychology will come to adopt the terminology of neuroscience. A 2007 *New Yorker* profile confirmed longstanding rumors that Patricia and Paul Churchland were "already preparing themselves for this future" by infusing their everyday conversations with expressions like "my serotonin levels have hit bottom, my brain is awash in glucocorticoids, my blood vessels are full of adrenaline, and if it weren't for my endogenous opiates I'd have driven the car into a tree on the way home" (MacFarquhar 2007).

Here are two ways of expressing optimism, representing (I) traditional folk psychology and (II) the Churchlands' preferred neurovernacular, respectively.

I. I feel like this will go well!
II. My rostral anterior cingulate cortex is awash in dopamine! (Schacter & Addis 2007)

Some philosophers think that expressions like II are more descriptively accurate than expressions like I (PM Churchland 1979; PS Churchland 1986; Rosenberg 2018), or at any rate that as neuroscience matures people will (perhaps regrettably) have no choice but to replace expressions like I with expressions like II in their quotidian thought and talk about minds (Murphy 2017). (Vestigial folksy terms like "awash" will presumably be swapped out for more precise technical terms in due course.) As Paul Churchland (1979: 99) puts it, folks must "learn to comprehend and report [their] internal states and activities within a different and more adequate framework"—namely, the framework of (especially cognitive and computational) neuroscience. In recent years, many prominent neuroscientists and philosophers have committed themselves to the quest to articulate the parameters of this more adequate "cognitive ontology" (Price & Friston 2005; Anderson 2015; Poldrack & Yarkoni 2016; Francken, Slors, & Craver 2022; Khalidi 2023).

Others are skeptical that II is a helpful (or inevitable) way of communicating about the mind. Even for most cognitive scientific purposes, it's far from clear that II is a more precise way to invoke the phenomenon of interest than I (Fodor 1999; Hatfield 2000; Figdor 2018). Regardless, it's hard to see how the neurovernacular improves on the traditional expression for any practical folk psychological purpose (Dewhurst 2021; Hutto 2022). "I think this will go well" is pithier than "my rostral anterior cingulate cortex is awash in dopamine", and it doesn't require your interlocutors to have read the latest issue of *Nature Neuroscience*. Similar considerations can be mustered against many other lay appropriations of scientific jargon, ranging across levels of psychological explanation from the reductive—"ouch! my c-fibers are firing!"—to the decision-theoretic—"those exit poll results made me adjust my priors!"[1]

The debate I've just canvassed concerns the best way to talk about minds, but it's also supposed to have some bearing on the metaphysics of mind. It's supposed to tell us something about which mental phenomena exist. I think the latter camp has this much right: II is a normatively suboptimal way of speaking about minds, for most human purposes. However, I'm dubious that this normative claim can carry the metaphysical weight that most of its proponents assign it. I'm dubious that the best way to talk about minds is equivalent to the one true way to talk about minds.

This reluctance to draw metaphysical conclusions from normative premises puts me at odds with most philosophers of mind.[2] Even the staunchest defenders of folk psychology tend to agree with the Churchlands that if somebody isn't speaking about minds in the best possible way (given their purposes), then they must not be invoking real mental phenomena at all. For example, the principal figures embroiled in the folk psychology debates of the 1980s and 1990s—from eliminative materialists like the Churchlands, to psychofunctionalists like Jerry Fodor (1987), to interpretivists like Donald Davidson (2001) and Dennett (1987)—all shared the assumption that *some* (set of) normative ideal(s) is responsible for delimiting which mental phenomena exist (and which don't). These figures disagreed vehemently about how to characterize the normative ideals in question. The Churchlands and Fodor agreed that mental reality should be judged relative to the most fruitful taxonomy put forward by the best science of the mind, but

1. Some scientific precision is often lost in lay appropriations—in Bayesian decision theory, priors aren't the sort of thing that can be adjusted. But that's not in and of itself damning: the loss of precision isn't always a bad thing, depending on the purpose(s) being served by the folk psychological ascription in question.
2. Mental fictionalists (Demeter, Parent, & Toon 2022) are an exception, as they argue that the best concepts of mind have fictional referents. Whereas fictionalists argue that the best descriptions of minds are (strictly speaking) false, however, I'll argue that normatively inferior descriptions of minds are often true.

they disagreed about whether that best science was neuroscience or (an explanatorily autonomous) psychology. They thus famously disagreed about whether traditional folk psychological posits like beliefs and desires are real mental phenomena, while agreeing that the final answer to that question will be determined by whether beliefs and desires play a role in the cognitive architecture unveiled by our best science. Meanwhile, Davidson and (in a less-clear-cut way) Dennett denied that science is the arbiter of mental reality. But they put a different arbiter in science's place, arguing that mental reality should be judged relative to the ideal folk psychological taxonomy that renders people maximally intelligible via radical interpretation (Davidson 2001: 215) or maximally predictable from the intentional stance (Dennett 1987: 15).[3]

Given their distinct normative ideals, the eliminativists, psychofunctionalists, and interpretivists disagreed further about whether it would be best to describe mental phenomena in terms of underlying neural activity, or psychofunctional roles, or behavioral dispositions that maximize interpretability. Nevertheless, they all assumed that the best way of talking about minds, whatever it is, delimits the one true ontology of mind.[4] It was simply an unstated axiom of these otherwise foundational debates that if somebody is talking about the mind in some other, inferior way, then they're just wrong about which mental phenomena exist.[5]

This assumption remains orthodox in 21st century philosophy of mind. I think it's false. Much to many philosophers' chagrin, the true can and does come apart from the good, the beautiful, and even the useful. The very best descriptions of the world aren't the only true descriptions of the world. Jargon-ridden statements like II might be accurate descriptions of people's minds even while being normatively less-than-ideal ways of describing those people's minds for either cognitive scientific or folk psychological purposes.

I won't attempt to prove that normative ideals play no role in delimiting which mental phenomena exist in a single article. I'll instead advance two more specific theses that chip away at the assumption. First, I'm going to propose that a comprehensive ontology of mind includes some mental phenomena that are neither (a) explanatorily fecund posits in any cognitive scientific practice that aims to unveil the functional architecture of cognitive systems nor (b) ideal (nor even progressively closer to ideal) posits in any given folk psychological practice. In other words, I'm going to argue that there are real mental phenomena that fit neither (a) the Churchlands and Fodor's scientifically oriented normative ideal nor (b) Davidson and Dennett's folk psychologically oriented normative ideal. Second, I'm going to suggest that, descriptively speaking, one major function of some areas of scientific psychology has been (and will be) to introduce just such normatively suboptimal mental phenomena into folk psychological ontologies. In other words, I'm going to argue that scientific psychology has served (and will likely continue to serve) to give ordinary people new things to talk about when they talk about each others' minds—and often, thereby, to lead them to stop talking about some of the old things

3. For a breakdown of Davidson and Dennett's respective views on this normative constraint on the metaphysics of mind, see Curry (2020).

4. Other philosophers offer mixed accounts (Place 1956; Kriegel 2011). (Somebody might be an eliminativist about pain, yet a psychofunctionalist about belief, yet an interpretivist about love.) However, even they tend to think there's one true (because normatively ideal) ontology of mind—it's just a mixed ontology. One underappreciated exception to this rule is David Ludwig (2015), who advocates for a pluralist theory of mind according to which different mental ontologies are fit for different scientific purposes. (A similar proposal has been put forward by Eric Hochstein (2016); see also McCaffrey & Wright 2022; Corns 2023.) Ludwig thus rightly denies the supremacy of a single overarching ideal ontology, but even he doesn't go as far as I'd like, since he doesn't argue for countenancing mental phenomena that aren't especially well-fit for any purpose.

5. Debate on this score has mostly concerned whether the edges of the one true ontology of mind are fuzzy: whether there are sometimes cases in which it's indeterminate whether somebody has a particular belief, for example. Fuzzy edge cases, when they are countenanced, are generally agreed to be cases in which the relevant normative ideals (combined with the facts on the ground) deliver no clear verdict about what exists (Dennett 1998: 118; Schwitzgebel 2002: 262).

they used to talk about—even when talking about the new things isn't clearly preferable to talking about the old things.

In ğ2, I'll briefly introduce a (more-or-less-Dennettian) framework for thinking about folk psychology and its ontology. In ğ3, I'll motivate my twin theses by way of an examination of the development and public dissemination of IQ research in the 20th century. In short, I'll argue that when folks describe each other in terms of IQ, they're often accurately describing a real feature of each others' minds, even if (a) IQ is not a fruitful posit in our best theories of cognitive architecture and (b) there are better ways of talking about intelligence for lay purposes. Finally, in ğ4, I'll consider a complication: my framework implies that scientific psychology is itself a variant—or, to be precise, a family of variants—of folk psychology.

2. Diverse folk crafts detect diverse real patterns

My framework is built on two foundational suppositions. The first supposition is that folk psychology is "pluralistic" (Andrews, Spaulding, & Westra 2021): people engage in lots of different practices that involve cognitively modeling mental phenomena and attributing them to one another, and these practices employ lots of different methods in pursuit of lots of different goals (few of which are well-described as theoretical goals). The second supposition is that, although folk psychology is ill-described as a theory, it nevertheless involves positing the existence of mental phenomena, many of which do indeed exist in the form of "real patterns" (Dennett 1991). I won't attempt to argue for these suppositions (or for the sometimes idiosyncratic ways in which I spell them out), though I will provide references that point the reader to relevant arguments. My focus in this section will be on articulating how these suppositions (and their interactions) support a plausible framework for thinking about folk psychology and its ontology.

2.1 Diverse folk crafts

At a first gloss, folk psychology comprises common human practices of making sense of people (and other animals) via the attribution of mental phenomena. Under the broad umbrella of "folk psychology," Dennett (1998: 81) distinguishes between "folk craft"—how people actually go about attributing mental phenomena to one another—and "folk theory"—what people theorize that they're doing when they attribute mental phenomena to one another. In fact, folk theory is just one variant of folk craft, since it inevitably involves directly attributing mental states to oneself (or others) in the attempt to articulate a theory concerning the attribution of mental states.

According to the pluralistic approach I favor, folk craft has a wide diversity of goals, including but not limited to understanding, contextualizing, evaluating, regulating, predicting, explaining, or explaining away behavior, as well as communicating and strengthening (or occasionally weakening) social bonds (Andrews 2012; Zawidzki 2013; McGeer 2015; Spaulding 2018; Westra 2021; Westra & Nagel 2021; Lavelle 2022). Folk craft also targets a diversity of phenomena, including but not limited to thoughts, experiences, attitudes, purposes, interests, personality traits, capacities, perspectives, moods, plans, habits, and proclivities. The plain fact is that we talk about a lot of different kinds of things when we talk about people's minds, for a lot of different purposes.

On my view, we keep track of these diverse targets and their interrelations in our own minds by modeling psychological profiles (Giere 1996; Maibom 2003; Godfrey-Smith 2005; Newen 2014; Spaulding 2018; Moore 2021; Curry 2022).[6] Folk craft measures people (ourselves and others) up against these models to see whether people can be said to possess a particular state of mind, to normatively evaluate, explain, or

6. This model-theoretic approach to folk psychology has gained popularity over the last decade, both because it dovetails with empirical work (Conway et al. 2020; Kryven et al. 2021) and because it synthesizes the virtues associated with theory theories, simulation theories, and narrativity theories.

predict people's actions on that basis, or to goad people into changing how they think, feel, act or react (such that they come to better fit the model the attributor thinks they ought to fit). Folk psychological models themselves come in several varieties fit for these various purposes. We wield general-purpose models of generic people with particular mental attributes—e.g., a model of *how any strategically minded person is prone to think, feel, act and react*—and make judgements about actual people—e.g., about their strategic prowess (or lack thereof) itself, about whether we can expect them to win the chess match, or about whether we should coach them to become more strategically minded—by comparing them to our models. When it behooves us to make more fine-grained distinctions between (types of) minds, we also construct and wield archetype-specific models of personality types—*the typical proclivities of a no-nonsense military officer in the field*—as well as person-specific models of individuals whom we know personally (or by reputation)—*Colonel Mustard, with the idiosyncratic belief, in the billiard room*.

In sum, folk psychology consists in diverse folk crafts of modeling people (and categories of people), and thereby understanding, evaluating, regulating, bonding with, covering for, and predicting them, via the attribution of thoughts, experiences, attitudes, purposes, interests, traits, capacities, perspectives, moods, plans, habits, proclivities, and other mental phenomena. As this complexity suggests, folk psychology isn't (just) naïve psychology; rather, folks develop more flexible, sophisticated, and culturally inflected models over the course of their lives. As Victoria McGeer (2015: 270) writes, "folk psychological competence is always a work in progress."

It's not fashionable, within the literature cited in this section, to speak of the "ontology" of folk psychology. Indeed, many philosophers who endorse a pluralistic approach to folk psychology also lean towards mental fictionalism (Demeter, Parent, & Toon 2022): the view that the phenomena apparently posited in folk psychological discourse should be considered mere useful fictions, bits of make-believe not to be taken ontologically seriously (unless (or until) they've been vindicated by cognitive science). I think this fictionalist leaning is a mistake. I think many of the targets of folk craft have earned their keep in a realist ontology of mind, for the simple reason that people often really are the ways they're depicted as being by other folks (and themselves); people really do live, think, experience, and act in many of the ways they're depicted as living, thinking, experiencing, and acting by other folks (and themselves).

2.2 *Diverse real patterns*

As Dennett puts it, folk craft often models real patterns: patterns that exist in people's thoughts, feelings, capacities, tendencies, and behaviors independently of how those people are modeled. Other philosophers have suggested that, to earn their keep in the ontology of mind, such patterns must prove to be usefully posited as kinds within a scientific research program (Ludwig 2015; Hochstein 2016, 2017; Khalidi 2023; Betzler 2024). This stricter criterion still leaves the door open for a wide range of phenomena, since scientific psychology features many different paradigms, which fasten onto many different patterns of thoughts, feelings, capacities, tendencies, and behaviors. Not all of those patterns are well-described in mechanistic (or even more generally causally productive) terms. For example, traits like IQ and openness to experience are real mental kinds that have been fruitfully studied by rigorous scientific research programs, even though (by my reckoning) the evidence is clear that neither of them are fruitfully posited as discrete subcomponents that play productive causal roles in cognitive systems. IQ and openness are useful posits in the psychometric traditions of differential psychology and personality psychology, respectively, but they're not explanatorily fecund posits in cognitive psychology or neuroscience (Van der Maas, Kan & Borsboom 2014; Con-

way & Kovacs 2018; Serpico 2018; Curry 2021a).[7] So, even by the lights of the stricter criterion, we have very good reason to adopt an ontology of mind that incorporates a wide range of scientifically respectable phenomena beyond those that function as cogs in cognitive systems.[8]

Similar considerations motivate my still more expansive ontology, according to which we should countenance the real patterns accurately modeled in folk craft (as well as those modeled in scientific psychology) as real mental phenomena. The reality of intelligence isn't held hostage by whether cognitive scientists find it to be a useful posit for explaining how minds work. It also wasn't held hostage by whether differential psychologists ever developed IQ tests to measure it. To be frank, we didn't need scientific instruments to tell us that some people are smarter than others. For thousands of years, scientifically uninformed folk craft already enabled human beings to track the relevant real patterns well enough to reliably make that judgment.[9]

2.3 Diverse folk crafts shape diverse real patterns

Thus far I have supposed that folk psychological craft consists in a diverse array of practices at any given time and place in human history, and that many of these practices target real patterns. I have also hinted that folk craft is historically and culturally variable. To complete my framework for thinking about folk psychology and its ontology, I need to say something about how these elements come together.

Diverse folk crafts don't just detect diverse real patterns. They also help shape them. We often attribute mental states to each other in the midst of social practices in which we're (explicitly or implicitly) trying to change which patterns people live out, often so that people conform better with particular folk psychological models. For instance, McGeer (2021) has stressed how we shape our own minds to conform with our own folk psychological models of how particular sorts of people (who we are aspiring to be like) ought to think, feel, and act. If Kyra aspires to be a great military strategist—and her general-purpose model associates the strategic mind with the tendency to have a no-nonsense attitude on the battlefield—she may feel compelled not only to study the art of arranging troops, but also to avoid frivolities in order to cultivate a stern demeanor.

Such "mindshaping" (Zawidzki 2013) practices necessitate the continual revision of folk psychological models (to capture the new, mindshaped mental reality), and revised models inevitably lead to new mindshaping practices, including new forms of self-regulation. Imagine that Kyra and the other strategists of her generation find that purposively perfecting their game faces requires developing a sort of stoic attitude towards life in general, including tight control over their own

7. This claim is admittedly controversial—the staunchest advocates of IQ still hold out hope that it will prove to be a fruitful posit in cognitive psychology and neuroscience (Jensen 2006; Haier 2017)—but I am convinced by the arguments of the authors cited in the main text, and will assume for the sake of this article that traits like intelligence and openness are not (also) causally productive cogs in cognitive systems (though they may be interesting explananda of the mutualistic functioning of such cogs).

8. Some philosophers would argue that this distinction—between the psychological kinds that play a productive causal role in cognitive systems and those that don't—is overly simplistic, since it overlooks both the blurriness of the distinction between varieties of causal structure and the ways in which natural kinds at various levels of explanation (including the one at issue) ubiquitously crosscut one another (Khalidi 2013; Potochnik & Sanches de Oliveira 2020; Havstad 2021). I'm ambivalent. I find many of these arguments convincing. But I also find myself unable to relinquish the idea that there's some principled distinction to be drawn between the psychological kinds (like working memory capacity and mental representation) that figure in explanations proffered by cognitive psychologists/neuroscientists and the psychological kinds (like IQ and openness to experience) that have no role to play in those explanations of cognitive functioning, even if they are fine constructs for the purposes of other subfields of psychology.

9. My simple—some might say obstinate—defense of the reality of (some of) the targets of folk craft bears strong affinities with what Daniel Hutto (2022) has recently called the "brickhouse defense of folk psychology", as well as with Joe Dewhurst's (2017, 2022) defense of a "folk psychological ontology" (as distinguished from a "neurocognitive ontology").

emotional reactions. This stoicism sets Kyra and her cohort apart from the earlier generation of strategists, who tended to be quick-tempered (having developed their no-nonsense attitudes less purposively). Folks who now take Kyra to be an archetypical strategist thus revise their models, excising the tendency towards anger from their conception of the strategic mind, and instead associating strategic prowess closely with the capacity for emotional control. Under the influence of these revised models, the next generation of aspiring strategists focus their efforts on tempering their passions (rather than avoiding frivolities). These mindshaping practices and consequent revisions to models iterate indefinitely via looping effects (Hacking 1995b). Over time, both the models employed in folk craft and the real patterns that people live out (such that they do or don't fit particular models) can shift dramatically—often unpredictably, but usually in ways that reflect the values of the society in which folk crafts are practiced (Andrews 2015).

3. Scientific psychology for folk craft: the case of IQ

The main upshot of ğ2 is that, by modeling minds as featuring particular mental phenomena (conceptualized in particular ways), diverse folk crafts can have a kind of top-down effect on the ontology of mind, generating new patterns of cognitive functioning, which in turn produce new cognitive, phenomenal, and behavioral patterns for folk psychological models to detect. I'm now going to explore how scientific psychology plays a role in this process.

My view is that rigorous, methodologically sound science can shed light on real patterns—incorporating those patterns into a scientific ontology of mind, and leading to their uptake into the taxonomies inherent in folk craft—even when countenancing those patterns is ultimately both next-to-worthless for branches of cognitive science that aim to explain how minds work and less-than-ideal given the aims of folk craft. My argument will turn on the claim that this is precisely what happened in the case of the development and dissemination of IQ tests over the course of the 20th century.

3.1 A potted cultural history of IQ

In the early years of the 20th century, the Englishman Charles Spearman and the Frenchman Alfred Binet independently noticed positive correlations between how well students do in different school subjects. The two men reacted to their simultaneous discovery in very different fashions.

Spearman (1904) took the correlations to support his conception of intelligence as a kind of mental energy powering all rational thought: students with a lot of mental energy would do well in school, no matter what they were studying, and students with less mental energy would do poorly in school, no matter what they were studying. Spearman invented the statistical technique of factor analysis in order to distill the many correlations between students' performance across many tasks into a single factor, and thereby, he thought, to measure intelligence. He labeled this single factor *g*. He also sometimes used "*g*" to stand in for "general intelligence": the theoretically posited mental energy that he took to be measured by the *g*-factor.[10]

Meanwhile, in the wake of France making primary school education compulsory for all children between the ages of six and thirteen, Binet was involved in political debates about what to do with kids who struggled to successfully complete their schoolwork (Brysbaert & Nicolas 2024). One pertinent question was how to identify the children who needed extra help. Together with his disciple Théodore Simon, Binet invented the IQ test for this purpose, without ever considering it to be a good measure of intelligence (Binet & Simon 1905, 1908). Instead, Binet thought, IQ tests are merely a handy means of abstracting away from a bunch of disparate mental abilities in order to come up with a single score that can be used to determine which kids are generally bad at school.

In 1908, the American H. H. Goddard translated the Binet-Simon

10. To avoid ambiguity in what follows, I'll use "*g*" to refer to the mental phenomenon measured by the *g*-factor (without assuming Spearman's particular theory about the nature of that phenomenon). And I'll use "the *g*-factor" to refer to the measure.

Intelligence Scale into English, and brought it to the United States for expressly eugenic, racist, and xenophobic purposes.[11] Goddard advocated for Spearman's interpretation of the correlations over Binet's, declaring in a lecture at Princeton that "the chief determiner of human conduct is a unitary mental process which we call intelligence", and going on to argue that intelligence is almost entirely genetically hardwired (Goddard 1920). In 1916, the Stanford psychologist Lewis Terman published his popular adaptation of the Binet-Simon Intelligence Scale. In 1917, the president of the American Psychological Association, Robert Yerkes, led a team that adapted Terman's IQ test into the Army Alpha and Beta exams that were used to determine which new recruits became officers when the United States entered the First World War. In 1926, the College Board further adapted the Army Alpha exam into the SAT (Scholastic Aptitude Test) for use in college admissions. In short order, IQ tests in various guises came to serve a wide variety of functions in the socioeconomic structure of the United States and other post-industrial countries (Carson 2007). By the time Mensa was established as a global society for geniuses in 1946, its unequivocal equation of IQ with intelligence (and soon afterwards of 98th percentile scorers with geniuses) was widely accepted by the general public, not merely as a reasonable hypothesis, but as received scientific wisdom.[12] And Mensa itself worked to further cement this consensus; the club "functioned as a kind of lobbying group for intelligence measurement and IQ valuation, and played a pioneering role in promoting intelligence testing for adults" (Schregel 2020: 17).[13]

As it evolved, IQ test construction came increasingly to mirror Spearman's vision rather than Binet's. Binet and Simon had famously declared that "one might almost say, 'it matters very little what the tests are so long as they are numerous' " (1916: 329). Later IQ test constructors disagreed. Instead of continuing to test as many disparate mental abilities as possible, IQ tests were winnowed over the course of the 20th century to test for an ever more specific handful of abilities. In particular, the IQ tests, subtests, and test items that remain in circulation are those that correlate most strongly with each other (Block & Dworkin 1974). As Terman himself readily disclosed, during the iterative process of test construction "tests that had low correlation with the total were dropped even though they were satisfactory in other respects" (Terman & Merrill 1960: 33). In other words, psychologists consciously altered IQ tests to focus more precisely—and accordingly more narrowly—on a particular, highly positively intercorrelated constellation of capacities.

As Richard Nisbett (2021: 198) puts it: "IQ tests do a good job of measuring people's ability to solve problems that someone else poses for them, which generally have little intrinsic interest, which are often

11. Goddard was far from the last figure to employ IQ tests in pursuit of these ends. For studies of the entanglement of psychometrics with eugenics, racism, and xenophobia, see Gould (1996); Carson (2007).

12. As Susanne Schregel (2020) explains, the early history of Mensa—"the only society whose members are selected by a scientific technique" (Serebriakoff 1959)—was rife with controversy. But the bulk of public discourse about Mensa concerned questions like 'are these geniuses actually going to help solve world problems, or are they just going to play parlor games and solve brainteasers together?', not the question of whether intelligence could be equated with IQ.

13. I don't intend to insinuate that there wasn't pushback. Throughout the century there were skeptics who fought against many of the (theoretical and practical) uses to which IQ tests were being put. Most notably, Walter Lippmann debated Terman in the early 1920s (the complete exchange is reprinted in Block & Dworkin 1976: Part I); Richard Lewontin and others debated Arthur Jensen in the 1960s and 70s (Block & Dworkin 1976: Part II); and many public intellectuals, including Noam Chomsky (1972) and Stephen J. Gould (1996), debated Richard Herrnstein, first after Herrnstein published "IQ" in the *Atlantic* in 1971, and then again after Herrnstein published *The Bell Curve* with Charles Murray in 1994. Meanwhile, Howard Gardner (1983) and Robert Sternberg (1985) introduced their influential non-*g*-centric theories of intelligence(s). (See Curry (2021b) for a philosophical treatment of Sternberg and Gardner's theories.) Despite some significant local victories, however, the skeptics ended up doing little to slow the roll of IQ testing as individuals like Terman, Jensen, Herrnstein, and Murray, as well as organizations like the American Psychological Association, US Army, College Board, and Mensa, facilitated its institutionalization across society.

quite abstract, and for which there is a single right answer" and (I would add) a single available route to finding that answer. Test items (and whole subtests) that don't fit this description have been culled from IQ tests over the decades because they turn out not to correlate highly with the test items that do fit the description. IQ testmakers have described this winnowing as a process of making IQ tests purer measures of general intelligence (conceived of in a more-or-less Spearmanian way), principally by rendering them "culture free" or "culture fair" (Cattell & Cattell 1973). And they've claimed success in this endeavor, since IQ subtests and test items now correlate even more strongly with each other than ever before: supposed proof that they're more precisely measuring *g*—general intelligence—as opposed to specific culturally bound abilities.[14]

This is a bad inference. Throwing out test items that are not highly correlated with the rest of the test has inevitably made the intercorrelations among the remaining test items higher on average. As a result of this rigorous scientific process, streamlined IQ tests such as Raven's Progressive Matrices are homing in on a particular set of abilities to solve abstract puzzles with single right answers in scholastic (or quasi-scholastic) settings. They are homing in on *a* real pattern: the one Spearman labeled *g*. That pattern undoubtedly exists; psychometricians have discovered truths about the relationships between the relevant mental abilities. So, the concept of IQ does refer to a real mental phenomenon (which, in line with my second thesis, scientific psychology has introduced into folk psychological taxonomies via the winnowing and popularization of psychometric tests). However, as per my first thesis, the reality of *g* doesn't guarantee that talking about IQ is the best way to talk about (general) intelligence. After all, Spearman's label is a bit of a misnomer: the real pattern detected by IQ tests is an interesting constellation of analytical abilities which is perfectly worth of study, but it is not nearly as general as the abstract capacity for schoolwork that Binet set out to measure, much less the all-purpose mental energy that Spearman set out to measure. The *g*-factor is modestly correlated with measures of creativity, perspective, and judgment, and uncorrelated with measures of prudence, social intelligence, and self-regulation (Kretzschmar et al. 2022). And as Keith Stanovich (2009) has documented, it is only modestly correlated with most measures of rationality.

Moreover, there is good evidence that high IQs are cultivated to different degrees in different cultures (Okagaki & Sternberg 1993; Sternberg et al. 2001). Declaring IQ tests culture fair is rather like declaring free throw shooting contests culture fair. It's true that just about anybody can shoot a basketball, but it turns out that people from the United States or Lithuania tend to have much more practice shooting basketballs than people from Peru or Norway. It would thus be absurd to take a free throw shooting contest to be a "culture fair" way of determining whether Lithuanians are better athletes than Norwegians, much less of whether the Lithuanian basketball player Domantas Sabonis is a better athlete than the Norwegian footballer Erling Haaland.

Proponents of IQ testing will object that this analogy misses the mark. They might mention, first, that IQ is highly heritable. But it's implausible that heritability would make for a point of disanalogy: athletic abilities are approximately as heritable as IQ (Ahmetov et al 2016). A better objection would focus on what "culture fair" is supposed to mean. It could mean that cultural factors don't bias people's chances of winning. If so, neither free throw shooting contests nor IQ tests are culture fair. Alternatively, though, it could mean that the test solely judges capacities that are universally valuable. If free throw shooting were an important skill to cultivate for every human in every culture, then free

14. I am glossing over a great deal of technical detail here. (Psychometricians are, to their credit, masters of nuance.) Most intelligence researchers agree that the *g*-factor has two major subcomponents: "fluid *g*" and "crystallized *g*". Tests of fluid *g* (which many take to capture the essence of *g*) are supposed to focus on pure analytical reasoning abilities, whereas tests of crystallized *g* are supposed to focus on reasoning that relies on previously earned knowledge. The "culture fair" tests discussed in the main text tend to focus exclusively on fluid *g*. While this distinction is crucial for understanding the ins-and-outs of contemporary IQ research, I don't think it makes a difference to the arguments of this article.

throw contests could reasonably be deemed culture fair (despite the fact that Lithuanians tend to have a significant leg up on the competition). And most proponents of IQ testing do think that the *g*-factor tracks a constellation of skills that is important to cultivate in every culture. After all, IQ is strongly correlated with prominent measures of success in life, including educational attainment, lifetime income, and job complexity. Towards the end of an influential review of this data, Linda Gottfredson remarks that "to the extent that one is concerned about inequality in life chances, one must be concerned about differences in *g*" (1997: 120–121).

IQ also strongly correlates with more specific culturally valued outcomes: MIT reinstated their SAT/ACT requirement after the COVID-19 pandemic because data about applicants' scores "*significantly* improved" their admissions office's "ability to accurately predict student academic success at MIT" in particular (Schmill 2022). Here's the rub: it's not an accident that the *g*-factor reliably predicts success, at MIT or on the job market in post-industrial nations. IQ tests, subtests, and test items have historically been winnowed based on their correlations with measures of success in life, in addition to their correlations with each other. As Ned Block and Gerald Dworkin report, "the history of IQ testing right up to the present is littered with the corpses of tests which were dropped because they failed to correlate sufficiently with measures of success (e.g. the Cattell-Wisler tests and the Davis-Eels games)" (1974: 374). IQ tests have thus been refined, not to home in on any old constellation of intellectual abilities, but to home in on a particular constellation of analytical abilities that reliably predicts success at prestigious universities and white-collar jobs.

For another thing, most evidence of the positive correlations between IQ and success was collected after IQ tests had been seamlessly incorporated into the hierarchical structure of society. (Gottfredson cites research from the 1970s, 1980s, and 1990s.) Want to take challenging classes in middle school? You'd better get marked "gifted and talented" thanks to your performance on Raven's Progressive Matrices in elementary school. Want to get into MIT? You'd better have a top-notch SAT score. Want to land a white-collar job in Japan? You'd better ace the IQ test required by most application processes. In short, there are very strong incentives to get good at taking IQ tests in post-industrial societies, where the institutions that largely dictate individuals' success select for the narrow variety of analytic intelligence measured by IQ tests, and indeed often explicitly select for high IQ scores themselves. The same ambitious folks who are driven by the desire to "succeed in life" in these societies—or to maximize their children's chances of making a so-called "good living"—are therefore also very likely to strive to cultivate the specific set of skills required to perform as well as possible on IQ tests.

3.2 *IQ tests as tools for mindshaping*

Indeed, famously, people living in such societies have gotten significantly better at taking IQ tests. The 20th century witnessed IQ gains from each generation to the next, including small gains in scores on subtests of vocabulary, arithmetic, and general knowledge, and massive gains in scores on subtests of analogical reasoning, logic, hypothetical reasoning, and pattern matching (Flynn 2009).

These generational IQ gains have been dubbed the "Flynn effect," and the eponymous James Flynn has given a convincing cultural explanation of their etiology. IQ scores across a population changed far too significantly from one generation to the next—including within families—for those changes to be controlled by genetic evolution. Instead, the trends were plausibly "dictated by altered social priorities that affect the cognitive problems habitually confronted and deemed worth solving … these priorities and habits of mind have changed radically as societies begin to industrialize" (Flynn 2016: 121). Building on Flynn's explanation, theorists of cultural evolution have recently stressed how cultural forces (like the advent of the information economy and the ubiquitous role of computers in modern life) have selected for the analytical problem-solving abilities that make up the real pattern measured by the *g*-factor (Uchiyama, Spicer & Muthukrishna

2021: 77–81).

I think this is fundamentally correct: intelligence has culturally evolved. But I also think these theorists have missed out on a key part of the story, insofar as they have ignored the fact that folk psychological *models* of intelligence have culturally evolved too. IQ tests didn't merely passively reflect the manners in which people became smarter over the course of the 20th century. By influencing how folks thought about intelligence, IQ tests actively spurred people to become smarter in those particular manners.

The history of IQ test construction suggests that 20th century cultural forces—including the psychometric tradition itself—introduced new looping effects, shaping intelligence largely by shaping folk conceptions of intelligence (and thus which varieties of intelligence folks sought to cultivate in themselves and others). The winnowing of IQ tests, combined with their institutional uptake across society, led to greater understanding—and greater valuing—of an increasingly narrow conception of intelligence among laypeople. As Stanovich writes, "after 100 years of testing, it is a simple historical fact that the closest associate of the term 'intelligence' is 'the IQ test part of intelligence' " (2015: 17). The information economy does indeed emphasize *g*-loaded skills (that is, skills that correlate highly with the *g*-factor). Crucially, though, in so doing it also leads folk craft to fixate on the real pattern captured by the *g*-factor. It thus leads to people cultivating IQ-style intelligence, and letting other varieties stagnate, since IQ is what's valued.

At the extremes, people from all walks of life—from Mensa members to kids vying for a spot in their neighborhood charter school—have been led to conceptualize intelligence solely in terms of IQ, and to excise other conceptions of intelligence from their folk craft. This folk psychological hyperfixation leads to further cultivation of *g*, and to the neglect of other varieties of intelligence, since IQ has become the only variety of intelligence that folks consider worthy of the label.

3.3 Scientific psychology as R&D for folk craft

I am now in a position to defend my twin theses. My first thesis, recall, is that a comprehensive ontology of mind includes some mental phenomena that are neither (a) explanatorily fecund posits in any cognitive scientific practice that aims to unveil the functional architecture of cognitive systems nor (b) ideal (nor even progressively closer to ideal) posits in any given folk psychological practice; my second thesis is that, descriptively speaking, one major function of some areas of scientific psychology has been (and will be) to introduce just such normatively suboptimal mental phenomena into folk psychological ontologies. For example, IQ tracks a real mental phenomenon—*g* is a real pattern targeted by IQ-testing-influenced folk craft—even if it is a normatively suboptimal posit for both cognitive scientific and lay purposes.[15]

As mentioned in ğ2, *g* has proven not to be an explanatorily fecund posit in cognitive science or neuroscience. The scientific study of *g* has nevertheless proceeded unabated. That's partly because *g* is a perfectly valid construct within the confines of differential psychology, despite the fact that it has no place in serious theories of the underlying causal structures of the human mind. But it's also partly because which research questions are asked, and which real patterns are targeted, is dictated largely by folk psychological concerns. To be blunt, a great deal of intelligence research has been driven by the desire to have an easy way of ranking people's minds, for all sorts of folk psychological purposes (some of them innocuous, some noble, some nefarious). And the conception of intelligence qua IQ has captured folk craft, even

15. Note that while I think IQ is a normatively suboptimal posit, my argument hinges on the weaker claim that its reality doesn't depend on whether it is a normatively optimal posit. So, even the most bullish proponents of IQ—who disagree with me about IQ being a normatively suboptimal posit—can accept my conclusions so long as they agree that it *would* track a real mental phenomenon even *if* it were useless to do so. On the flipside, my argument entails that even thinkers who are more skeptical of IQ than I am—who denounce the use of the concept for any and all purposes, rather than merely deeming it suboptimal—should admit that the concept tracks a real pattern of cognitive abilities.

though it would be better, per many of the goals of folk craft, if many of the relevant folk psychological practices focused on other conceptions of intelligence (such as those that center rationality, creativity, perspective, or prudence) instead.[16]

Nevertheless, IQ tests do measure a real pattern. Mensa members have a characteristic in common—besides their club membership and the fact that they are in the 98th percentile of test takers—which sets them apart from other people. We should adopt an expansive ontology of mind which countenances that characteristic, even while insisting that it is rarely (if ever) the most worthwhile characteristic to pay attention to. After all, scientific psychology hasn't only furnished the models at the heart of folk craft with *g* as a pattern of potential interest; it has conspired with folk craft, over generations, to shape people's minds such that they more often really do live out the patterns consonant with having a high IQ (relative to previous generations).

Intelligence research is in some ways an idiosyncratic branch of psychology, but it is not the only branch that's well understood in terms of my second thesis. Many psychological research programs introduce patterns into the models of folk craft in roughly this manner. Consider this partial list of subfields and examples of their proprietary posits: educational psychology (grit); health psychology (Type A personality); psychoanalysis (anal-retentive personality, Freudian slips); clinical psychology (ADHD and other DSM diagnoses); personality psychology (the Big Five traits); social psychology (cognitive dissonance); judgment and decision-making (confirmation bias); Bayesian decision theory (priors). The parentheticals on this list vary widely in terms of (a) how theoretically fruitful they are as cognitive scientific constructs and (b) how practically helpful they are as elements of folk psychological models. Nevertheless, they are all concepts that originated in scientific psychology but have since been adopted, in various ways, by folk craft. And I'm fairly confident that they all track real patterns, as invoked in folk craft—some people really do have type-A personalities!—even though I'm not at all sure that they all track patterns that are particularly worth modeling (much less the patterns *most* worth modeling). In some cases, psychologists have self-consciously introduced these patterns into folk craft (e.g., by publishing personality quizzes in "pop psychology" venues, by discussing their research on cognitive biases with science journalists, or by promoting the concept of grit in elementary schools). In other cases popularization is more incidental to how psychologists conceive of their own research agendas.

Regardless, my claim is that much of psychology is (implicitly or explicitly) geared towards unveiling—or redescribing, or measuring relationships between—patterns, not because those patterns are necessarily going to be explanatorily helpful from a cognitive scientific point of view, but because of their potential impact on the models employed in folk craft. Or, in slogan form: scientific psychology serves as R&D for folk craft, trying out new ways of conceiving of human minds and their characteristics, which may or may not enter the widely used folk psychological lexicon. The popularization of scientific styles of thinking about minds plausibly also plays a role in pushing other, less sciencey concepts out of folk psychological models. As John Greenwood remarks, "one does not hear much about 'acedia' these days (a spiritual disgust with the world that John Cassian listed, in 415 AD, as the eighth deadly sin), although this was a popular explanatory concept in medieval times" (1992: 355).

It would nevertheless be a mistake to presume that scientific R&D is pushing folk psychology ever closer to an objective normative ideal—

16. It might be objected that IQ earns its ontological keep because it is an ideal posit in some practices—namely, scientific (and bureaucratic) practices that aim to sort people by analytic intelligence (for the purpose of correlating analytical intelligence with some other construct, or tracking kids into different school programs). I won't quibble over the utility of thinking in terms of IQ in those contexts here (though I will note that "ideal" is a high bar). Instead, I'll insist, again (see ğ2.2, ğ3.1, fn. 14), that IQ's reality does not depend on whether the objector is right about it being a normatively ideal posit in some practices. The relevant cluster of analytical abilities really exists whether or not anybody *ought* to be using IQ as a (scientific or folk psychological) concept, all things considered. Even if it was misguided for psychologists to start measuring IQ in the first place, the fact is that they have measured it, and have amply confirmed that it represents a real cluster of abilities.

the perfect way of thinking about people. Instead, scientific psychology provides a menu of options for folk craft. Which of those options are taken up in any given context depends on a plethora of factors, including the idiosyncratic values, interests, and resources of the folks operating in that context.[17] For one reason or another, scientists might not yet have provided folks with the conceptual resources required to exploit the most valuable real patterns for their purposes (Pohlhaus 2012; Toole 2021). Or folk craft might lose touch with some real patterns with which it has been quite valuable to be in touch (Diamond 1988; Cerbone 2021). Even if science succeeds in shifting folk craft towards more fine-grained descriptive accuracy, we may be giving up (or otherwise altering) some of the evaluative or regulative power inherent in our old folk craft, with its old (descriptively less accurate) models.

As Dominic Murphy writes, "if the new sciences of the mind reinterpret human beings very comprehensively, we will risk losing our grip on what matters to people because we will lack the vocabulary within which to state and justify it" (2017: 171). Listing off IQ scores is less interesting, and gives us a poorer understanding of the people we're trying to understand by attributing mental capacities to them, than comparing the quick wit of a comedian with the shrewdness of a tactician, or the ingenuity of a lyricist with the discernment of a critic. Catherine Cox (1926: Figure 1), a colleague of Terman's, infamously estimated the IQs of great men of history based on their biographies. Even if Cox's estimates weren't spurious, focusing on the fact that Grotius, Leibniz, and J.S. Mill would have all had IQ scores of at least 185, while Cervantes and Faraday each would have had an IQ score of around 105, obscures far more about their respective minds than it could illuminate. Similarly, talking about serotonin levels is sometimes less helpful—and in important respects less precise—than talking about the range of moods and emotions that depressed people experience.

Unlike Murphy, himself an eliminativist, I don't take it to be inevitable that we will abandon the presently meaningful aspects of our folk psychological practices as neuroscience marches on. Regardless, if we're interested in what people are talking about when they're talking about minds at some particular time and place, we want to know what real patterns they're actually latching onto. And those patterns are not necessarily identical to the patterns that would be latched onto by the members of some possible superior civilization featuring lossless folk psychological uptake of scientific consensuses.

Per my twin theses, *one* major function of *some* areas of scientific psychology is to make real patterns socially salient—whether or not those patterns figure in successful cognitive scientific explanations of how minds work. To be clear, I don't deny that another major function of some areas of scientific psychology is to study underlying psychofunctional or neural mechanisms that will in fact figure in successful cognitive scientific explanations. My argument in this article is incompatible with Fodor or the Churchlands being totally right about the ontology of mind (expansively construed to include the ontology inherent in folk craft),[18] but it is compatible with either psychofunctionalists or eliminative materialists being basically right about the ontology of cognition (narrowly construed to include only those posits that are explanatorily essential parts of a successful scientific theory of the mechanics of cognitive functioning).

Nevertheless, my theses do have ramifications for cognitive science narrowly construed. Insofar as particular mechanisms are of theoreti-

17. O'Connor and Joffe's (2013) review of how neuroscience interacts with understandings of personhood illustrates the complexity and contingency of this process.

18. There are two ways in which my view is a departure from the idealized Fodorian or Churchlandian (or, for that matter, Davidsonian or even Dennettian) picture. First, on my view the question of which folk psychological models are normatively ideal is indexed to particular varieties of folk craft informed by particular sets of values in particular contexts (Curry 2020, 2022). Second, on my view which folk psychological models are actually employed—and thus which models determine the folk psychological ontology that emerges in that context—almost always differ in complex ways even from that local ideal.

cal interest to cognitive psychologists or neuroscientists partly because they are the mechanisms that play a role in generating patterns of interest to folk craft—insofar, for instance, as researchers like Richard Haier (2017) seek an explanation of the neural mechanisms underlying IQ because they are the neural mechanisms underlying IQ—it will be a corollary of my theses that what is counted as a successful cognitive scientific explanation is contingent and historically variable. Even on the assumption that the mechanisms underlying intelligent behavior remain fundamentally unaltered through the ages, transient social forces influence which mechanisms—or which dynamic interactions between mechanisms (Van der Maas, Kan & Borsboom 2014)—are targeted as objects of cognitive scientific inquiry.

Moreover, it is implausible that all of the mechanisms involved in the generation of intelligent behavior do remain fundamentally unaltered as social practices evolve. Some (if not most) of the mechanisms underlying socially salient abilities are themselves shaped by social forces, constituting what Cecilia Heyes (2018) terms "cognitive gadgets" as opposed to genetically hardwired instincts. Insofar as folk craft favors normatively less-than-ideal posits like IQ, it exerts downward pressure on cognitive ontology narrowly construed, causing the inner workings of our minds to follow the (scientifically inflected) vicissitudes of our social concerns. Our IQ-revering society really has made us smarter than our great-grandparents in some respects. It has almost certainly made us dumber in others.

4. A concluding complication: scientific psychology is folk craft

So far, I've written as if there is a clear line to be drawn between scientific psychology and folk craft, the latter of which I glossed as the set of human social practices of ascribing mental phenomena to one another. It's now time to jettison that bit of expository pretense. Science isn't done by rabbits or martians or angels. Folks do science. As philosophers of science (especially feminist philosophers of science) have taken pains to remind us for decades now, science is itself a human social practice, which humans engage in using a wide variety of methods in pursuit of a wide variety of ends—including regulation and evaluation in addition to prediction and explanation (Harding 1986; Longino 1990). So, given the pluralistic understanding of folk psychology I've adopted, scientific psychology should be understood as nothing more and nothing less than a peculiar variant (or, to be precise, family of variants) of folk craft. It isn't just R&D for folk craft. It's an R&D wing of folk craft.[19]

When our folk psychological practices have certain sciencey goals and methods, abide by scientific standards of evidence (Santana 2018), and are institutionally situated in the social structure of science (Oreskes 2019), we appropriately call them "scientific psychology." But that doesn't make them any less folksy, any less a part of the broad human endeavor of trying to make sense of ourselves and others. Indeed, although scientific psychology is a relatively new part of folk craft—if we date it to Wilhelm Wundt (Spearman's doctoral supervisor) founding the first official psychology laboratory, it has only been around for a century and a half—I have argued that it can have (and often has had) wide-ranging ramifications for other parts of folk craft, many of which have distinctly non-scientific ends. In other words, scientific psychology is a special kind of folk psychology that, perhaps more than any other kind, actively works to shape the future of folk craft (Curry 2025).

The Churchlands are confident that science will shape folk craft for the better. Scientific psychology has had a short history—and cognitive/computational neuroscience an even shorter history—so the jury

19. If scientific psychology is indeed part of folk craft, then my twin theses may be sufficient for the defeat of the assumption, discussed in ğ1, that a normative ideal delimits the ontology of mind. My theses don't explicitly rule out the view (supported by Khalidi (2013, 2023) and others) that the real mental phenomena are all and only those that are (or will be) explanatorily fecund posits in ideal scientific practices (where those practices include, e.g., differential psychology as well as cognitive psychology). However, if scientific psychology is just a kind of folk psychology, then the theses do implicitly rule out this view, since they assert the existence of mental phenomena that are not ideal posits in any given folk psychological practice.

is still out. Indeed, if I'm right that folk craft needn't always bend towards justice, then the jury will ever be out. If we're "genealogically lucky," to borrow Amia Srinivasan's (2019) phrase, then the scientifically inflected future of folk craft might allow us deeper, subtler insights into each others' minds, and furnish us with better ways of living together in harmony. If we're genealogically unlucky, as the case study of IQ suggests we may well be, then the future might be Orwellian. I, for one, must admit that my rostral anterior cingulate cortex is not awash in dopamine.

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