



Human movement develops quite differently from that of other superior vertebrates, since it responds far more to will, or voluntary control, than to instinct ... [A] rat's movements, no matter how slight, are hereditary and are characteristic to his species. On the other hand, human movement is largely acquired, and characteristically has an unlimited developmental potential, connected with the development of the will (voluntary control). (18:167)

The coordination of all the muscles comes through work in human beings. The animals acquire their particular movements by heredity. Squirrels run up trees quickly, tortoises move slowly, some animals jump, etc.—all these movements are hereditary. Man, in contrast, must construct all the coordination of all his movements. (17:166–7)

While skills of other animals may be like innate faculties, human skills must be acquired.

Moreover, such skill development is “connected with the development of the will” (18:167) in two crucial respects. First, one *becomes* physically dexterous through acts of will. Part of the reason to credit excellence in physical skills to individuals is that individuals acquire such excellence through deliberate work at cultivating the requisite capacities for movement. Humans acquire their most important muscular capacities through purposeful work that cultivates intelligent habits of coordination. Unlike mere physical strength, muscular refinement into abilities to excellently carry out specific purposes in the world is acquired through activities governed by norms of precision and perfection (see 17:158–69).

Second, physical dexterity *manifests* itself through voluntary actions. To be dexterous is to have one's muscles under one's *control*. Even when largely unconscious—as for an expert violinist playing a well-rehearsed piece or a tennis pro returning a serve—muscular capacities are “one's own” when they enable carrying out tasks (playing the concerto or returning the serve) in which one is volitionally invested: “Muscles are the organs of the nervous system. They are called voluntary because they are closely connected to psychic life” (17:166). This “muscular memory” (15:307), constitutive of cognitive engagement with the world, is acquired, honed, and manifested through interested intellectual activity. It is an epistemic *virtue*.

#### 4. Intellectual virtues and physical disabilities

In this section, I take up the issue of human “disability.” Even the word disability is contentious and multifaceted, and this book can hardly begin to offer a comprehensive theory of disability.<sup>6</sup> Moreover, so many different things are lumped together under the term “disability” that it's unclear whether disabilities as such can or should be dealt with as a bundle; by almost any standard, there are “disabilities” that relate to sensory acuity rather than physical dexterity, and others that do not directly relate to either. Nonetheless, disabilities of various kinds pose significant problems for virtue theories based on normative notions of human excellence in general and theories of intellectual virtue in particular. Any list of virtues will include virtues that are more



difficult for some people to achieve than others, and many such lists idealize and “normalize” conceptions of human nature or human flourishing that exclude some disabled persons.<sup>7</sup> For virtue epistemology, variations in humans’ physical or biological capacities seemingly can drive a particularly strong wedge between virtues conducive to the acquisition of knowledge and those for which one can legitimately hold people responsible; and virtue epistemologies predicated on “normal”—i.e., non-disabled—human capacities may be inappropriate for or lose sight of the ways that disabled people can and should intellectually flourish. Montessori’s virtue epistemology, with its emphasis on humans’ striving for perfection, might seem especially open to such objections. Moreover, by making physical dexterity a central intellectual virtue, Montessori seems to imply that those with significant physical disabilities are intellectually disabled, collapsing distinctions common in folk discussions of disability and risking further stigmatizing those with physical disabilities.

Before going further, I must note the danger of tackling the issue of disability in a short section and as a person not typically labelled as disabled. “Nothing about us without us” has rightly become a rallying cry for disability activists, advocates, and theorists<sup>8</sup>; and thinking and writing about dexterity and disability has made me acutely aware of epistemic disadvantages faced by anyone trying to describe the lived experiences of those with different physical capacities. I use examples like typing, playing violin, writing, and tennis to illustrate dexterity because I am familiar enough with them to use them with confidence. When it comes to the dexterity involved in shooting a crossbow with one’s mouth and neck<sup>9</sup> or controlling facial gestures to communicate emotion<sup>10</sup> or learning to operate a wheelchair, I must base my discussion on testimony of disabled persons, and many first person accounts of disability—like many first person accounts of non-disabled life—do not emphasize day-to-day operations of physical dexterity that are an essential part of life. Nonetheless, I cannot let my non-disabled status excuse me from discussing a genuinely important and woefully under-discussed issue, not only for Montessori, but for virtue epistemology—and philosophy—more generally.

Discussing disability alongside dexterity as an intellectual virtue narrows this section’s focus. I do need neither an overall account of disability nor distinctions between “disabilities” that pose challenges for intellectual life ~~from~~ mere “differences” that pose challenges.<sup>11</sup> The key issue for this chapter is how to deal with physiologically based differences that preclude certain forms of physical dexterity, given that dexterity is an intellectual virtue in a responsibilist sense. Some ways I reconcile dexterity-as-virtue with human physical disabilities apply to other impairments and other virtues, but I focus here on this one set of cases.<sup>12</sup>

Before discussing how physical disabilities in this sense relate to physical dexterity, it is worth re-emphasizing a point mentioned in Chapter 1. Montessori’s transition from medicine to pedagogy (and thereby to philosophy) came about when, as a surgical assistant for the Santo Spirito Hospital, she visited asylums in Rome and saw deplorable conditions for children with mental disabilities and disorders. This realization led her to advocate for disabled people, and particularly disabled children, most prominently in an important speech to the National Medical Congress in Turin in 1898. Her advocacy for disabled children led her to serve as co-director of an “Orthophrenic



School” in Rome to work with children with disabilities and mental disorders, and eventually to her engagement with the pedagogical work of Itard and Séguin and her desire to pursue graduate education in philosophy in order to better understand the principles of human cognition and development. The basic structure of her pedagogy and the whole trajectory of her life work were initiated by close interaction with those labelled as “deficient.”<sup>13</sup>

Moreover, while she approached these children as a scientist seeking the best ways to facilitate their development, her whole pedagogy was based on the principle that the teacher—and researcher—needs to “follow the child” (22:166). That is, the goal is to create conditions wherein children—whether disabled or not—can engage in activities they find interesting that cultivate capacities for further expressions of agency (intellectual and otherwise). For very young (and severely disabled) children, this does not involve explicitly *asking* them to *articulate* their points of view, but it involves close sympathetic observation that aims to discern real interests of those with whom she works. Such sympathetic observation anticipates, for the case of children, something like the “nothing about us without us” principle of contemporary disability studies, a point Montessori herself often emphasizes. In that sense, she exemplifies how humanity can benefit from attending to interests, desires, capacities, and needs of those with disabilities.<sup>14</sup>

One reason children with disabilities were so pivotal for Montessori’s pedagogy is that ordinary life presents learning opportunities for non-disabled children that are denied to or insufficient for children with disabilities. This was particularly extreme in nineteenth- and early-twentieth-century Rome, where “abnormal” children had virtually no sensory stimulation and no capacity for self-directed activity. Even today, disabled children are often given substandard learning environments, whereas the built world provides non-disabled people opportunities for intellectual activity and engagement at every turn. In a world designed for people with “normal” bodies, disabled children often require more intentional and graduated materials to facilitate development of intellectual virtues that others develop, albeit imperfectly, without such intentional pedagogy.

One of Montessori’s key educational discoveries was that when materials designed to help disabled people were made available to non-disabled children at the right stages of development, they facilitated rapid and refined motor and intellectual development. Partly because we dismiss or ignore the work of young children, many people think of various features of physical dexterity as innate. Capacities that disabled people cultivate laboriously and painstakingly can seem to come to non-disabled individuals merely “by nature.” *Every* human excellence, however, is developed, honed, and refined through interested activity. Disabled people—and those who pay attention to their experiences—often have privileged epistemic access to a central claim of Montessori’s virtue epistemology, that *all* virtue—including even the most basic physical dexterity—must be acquired through active work.

This emphasis on virtue as the product of active, *embodied* work highlights a crucial *similarity* among all human beings: human embodiment is always *both* enabling and disabling. Imagined as a Cartesian ego freed from all bodily limitations, we might ~~imagine~~ human beings as capable of un-mediated insight into the world. But real



cognitive engagement always depends upon our bodies, and “*everyone* is constrained by the way their bodies work” (Barnes 2016:157). Locke highlighted that humans lack microscopic eyes; we also lack infinitely dexterous fingers or tongues, and we cannot run at the speed of sound. Intellectual excellence does not require attaining some abstract limit of perfect sensory acuity or physical dexterity or intellectual love, humility, or courage. Human excellence is always situated. As Garret Merriam suggests:

Instead of wondering “how does this individual compare to a species-norm in terms of the capacities necessary for flourishing?” we must ask instead “*given the individual circumstances of this person’s life, are they living well, or living poorly? ...* This vision of *eudemonia* still adheres to the Aristotelian notion that “anything that lives can live well or live poorly” while also avoiding the species essentialism that plagues Aristotle’s literal theory. (Merriam 2010:135–6)

Because all human ability is embodied, all intellectual virtue involves cultivating abilities in a context of widespread dis-ability.

The claim that intellectual virtue is relative to “individual circumstances of this person’s life” (Merriam 2010:135) can sound a lot like the widespread ableist notion that “disabled people are only ever going to be doing their best with a bad deal” (Barnes 2016:169). Given its emphasis on intellectual *character*, however, Montessori’s approach to intellectual virtue affirms the situatedness of human excellence without seeing disabled people’s virtue as a second-best consolation. To be intellectually excellent is to constantly progress toward increasingly perfect cognitive engagement with reality. A human who lacks microscopic eyes but cultivates the visual acuity needed to see fine-grained features of microorganisms through a microscope has intellectual character not only because of fine sensory acuity but because of effortful intellectual work toward cultivating that acuity. Another who hones manual dexterity to pour chemicals from beakers at just the right rate for doing a carefully controlled experiment not only has excellent physical dexterity but also the intellectual character required to develop that dexterity. And someone who lacks the capacity to move hands or legs but cultivates a fine-tuned dexterity of the mouth and tongue, sufficient for manipulating a machine to control movement in the world, has intellectual virtue not only because of physical dexterity in the tongue but also because of effortful intellectual work toward cultivating that dexterity.

This emphasis on cultivated physical excellence also shows how the notion that “*everyone* is constrained by the way their bodies work” (Barnes 2016:157) is only half true. The way one’s body works at present constrains one’s present abilities, both epistemic and otherwise. I cannot understand the face of El Capitan the way that Alex Honnold, free-solo climbing it and thereby attending to every feature along his route in a particularly intense way, could understand it. In college when I tried to study the properties of laser-cooled rubidium, part of the reason I could not get my experiments to work was that my hand was just not consistently and sufficiently steady enough. Alongside the experience of lost capacities, a consistent experience of those who become disabled as adults is a lack of abilities that they will need—and can come to develop—to manage their new bodies. In that sense, we are—present tense—



constrained by the ways our bodies work now. Moreover, there are limits to what one's body can do, even in principle. I might have been able to cultivate the steadiness of hand needed to do my laser-cooling experiments, and those who become disabled as adults generally learn new skills they need to navigate the world with their new bodies. Given my age (and weight, and a host of other factors), it is unlikely that I would be able to hone the climbing skills of Alex Honnold, and some physical abilities—Barnes gives the example of “males and pregnancy” (Barnes 2016:157)—are demonstrably precluded by my biology (given current technology).

Nonetheless, human beings are *not* constrained forever by how their bodies happen to be at a given time. As noted in Chapter 4, humans are often capable of more than *seems* possible. As Neil Marcus, a playwright with generalized dystonia, put it, “the person I never thought I was, or could be, I am” (Marcus 1992). Whether disabled or not, pushing the limits of human capacity is part of what human life involves. When he free-solo climbed El Capitan, Alex Honnold did something that many people—including himself, at times—thought was simply impossible. Pianists and violists (and others) regularly move their arms, hands, and fingers in ways and at speeds that would seem, to someone looking at “natural” human physiology, to be impossible. When my cousin was born with Down Syndrome in the 1960s, his parents were told that he would never walk or talk; people with Down Syndrome today (including my cousin) work steady jobs, play sports, make creative art, and investigate questions of interest to them. This is not to say that if those with C1–C2 spinal cord injuries work hard enough, they can climb El Capitan or play violin with their fingers; innate features of our bodies do limit what capacities are developmentally possible. My point here, however, is to emphasize that *everyone's* bodies are always only partly “natural”; what physical capacities one actually has at any given time are developed, honed, and expressed through interested intellectual activity.

Montessori's emphasis on character provides a new way to think about narratives of disability that focus on so-called “super-crips”—disabled people like Stephen Hawking (1942–2018) or competitors in Paralympic Games—as well as “the narrative of disability that we're most familiar with” wherein “the positive aspects of disability have to do with ‘overcoming’ disability” (Barnes 2016:91). As Elizabeth Barnes notes, “many disabled people reject this narrative of disability,” claiming “to value their experience of disability itself and strongly reject[ing] narratives of ‘overcoming’ disability” (Barnes 2016:91–2). In some cases, these counter-narratives emphasize apparently passive features of living with disability, such as “sudden surges of random joy” (Eyre 2012, cited in Barnes 2016:92), but others emphasize active engagements with the world made possible through disability. Neil Marcus's *Storm Reading* exemplifies someone who explicitly both appeals to character-driven activity—to “leap and soar and twist and turn constantly in public” (Marcus 1992)—and also, more profoundly, illustrates how to make a disabled body and its experiences into, as Montessori put it, “a fulcrum which sustains his own ... creation” (9:159).

For Montessori, stories of overcoming disabilities and of so-called “super-crips” are worth telling, but not because there is something exceptionally bad about disability. Such stories are worth telling because character is always about the pursuit of higher levels of perfection through cultivating and perfecting capacities one has



and developing new capacities. Hawking and Yo-Yo Ma and Neil Marcus and Richard Feynman are all worth celebrating, attending to, and emulating. We will not all be super-crips, or super-stars. But we all need to intellectually engage with the world in ways that develop, hone, improve, and express our capacities, and we can—and should—all strive to be like those who have “added a point to the circle of perfection which fascinated him and drove him to action” (~~AbeMind~~1:191).

Another important feature of Montessori’s epistemology helps her make an even stronger point. As we will see in more detail in discussing courage in Chapter 10, Montessori’s epistemology emphasizes intellectual diversity and specifically highlights the *physical* dimensions of such diversity.

Movement, or physical activity, can be extremely complicated. A man’s muscles are so numerous that it is impossible for him to use them all. It can even be said that a man always has at his disposal a reservoir of unused organs. A ballerina will make use of muscles which will not be employed at all by a skilled surgeon or mechanic, and vice versa. And the use which one makes of his muscles has an influence upon the development of his personality. (Secret 1966:97)

Insofar as physical dexterity involves development and specification of muscular skill through activity, having the intellectual virtue of dexterity does not require that one be dexterous in *every* possible way. One who hones some capacities necessarily leaves others undeveloped. Yo-Yo Ma cannot climb El Capitan; Alex Honnold cannot play Bach’s Cello Suites. Many contemporary depictions of disabled people focus on what they *cannot* do and ignore the excellences—including physical excellences—they do cultivate.

Another common element in these [depictions of disability] is the emphasis on “what Johnny can’t do.” A child, usually a boy, is shown sitting at the edge of a playground. The narrator talks about the games the child can’t play, and how he has to watch other children running and jumping. He can only dream, the narrator tells us sadly. Never mind that the kid might be adept at playing Nintendo, or making rude noises with his mouth. In the real world of children, these skills are valued at least as much as running and jumping. The truth is, all children play at different levels of skill; most can’t run as fast as they would like, or jump as high, or play as well. Children in wheelchairs do play with other kids on the playground—I did. A child in a motorized wheelchair can be mobile, active—and popular, if willing to give rides now and then. But instead of acknowledging any of this, the telethon encourages viewers to project their own worst fears onto people with muscular dystrophy: “Just imagine what it would be like if your child couldn’t play baseball.” (Hershey 1993)

No one develops *every* sort of dexterity they might. Many disabled people do not develop forms of physical dexterity that are widespread and taken for granted by those without disabilities. Many cannot walk or skip; some cannot hold a pencil or type. But disabled individuals are capable of other forms of dexterity. Some of these, like



playing Nintendo, are shared with the non-disabled. Others, such as deftly operating a wheelchair, might in theory be learned by those without disability, but are typically arenas where “disabled” people excel anything their non-disabled peers can do. And some forms of physical dexterity—perhaps including certain sorts of “making rude noises with his mouth” and certainly including the sorts of leaps and soars that Neil Marcus performs—are unavailable to people without the relevant disabilities. Given the vast and indeterminate range of ways humans cultivate dexterity, a disability that removes some subset of these ways from one’s innate potentials does not preclude developing other forms of the intellectual virtue of physical dexterity.

Montessori makes a similar point with respect to differences in sensory capacity. Strikingly, one of her paradigms of sensory acuity is Helen Keller:

Helen Keller is a marvelous example of ... the possibility of the liberation of the imprisoned spirit of man by the education of the senses ... If one only of the senses sufficed to make of Helen Keller a woman of exceptional culture and writer, who better than she proves the potency of that method of education which builds on the senses. (Montessori 1914:vii–viii)

One might think that Keller shows how *unimportant* the senses are because she accomplishes so much despite lacking both vision and hearing. But Montessori’s point is that Keller’s accomplishments all depend upon extreme—and carefully cultivated—acuity in her sense of touch. By showing how much can be accomplished with a refined sense of touch, Keller shows the *importance* of sensory acuity for intellectual excellence. In a similar way, once we shed prejudices that focus only on physical *incapacities* of disabled people and instead attend to how their lives and pursuits of excellence depend upon honing refined physical capacities, we will see even more clearly how physical dexterity is an intellectual virtue.

At present, unfortunately, the distinctive forms of physical dexterity cultivated by disabled persons are often seen merely as deficient version of “normal” movements. By this standard, the control over ~~the muscles in his~~ mouth and face that allows Christopher Reeve ~~and~~ Christina Crosby ~~and~~ countless others to control their wheelchairs is just a poor substitute for the control over my legs that I use to walk. But that is false. Those capable of deftly maneuvering a wheelchair using “pressure on a mouthpiece like a retainer” (Crosby 2016:82) have distinctive physical skill, one as distinctive as my ability to type is distinct from my grandmother’s ability with a pen. My typing skill is not a poor substitute skill, but a different one, and it allows me to engage with the world in different ways.

And this brings us to a second important implication of Montessori’s point about diversity in physical abilities. For Montessori, human diversity—partly acquired, and partly innate—is worthy of celebration and cultivation. She highlights that “every man has his own creative spirit that makes him a work of art ... an inner work must be performed which is not the simple reproduction of an already pre-existing type, but the active creation of a new type ... This fashioning of the human personality is a secret work of ‘incarnation’” (Secret 1966:31–2). Part of how we make ourselves into the *intellectual* agents that we are is through the cultivation of specific *muscular*



capacities. Ballerinas, surgeons, and mechanics see the world in different ways because they cultivate their muscular capacities in different ways; different sorts of physical dexterity give rise to different sorts of intellectual agency. These differences are partly rooted in innate differences in interest and bodily capacity, even in those not considered “disabled,”<sup>15</sup> but they are ultimately all cultivated differences based on different ways we have actively engaged with the world. Such differences, including between the physical excellences of those who are “disabled” and those who are not, have epistemic consequences; those who move in the world in different ways see the world in different ways. Once we recognize how “nonnormative bodyminds”—to use Christina Crosby’s way of describing her disabled self (Crosby 2016)—provide different sorts of epistemic access to the world, we can appreciate that those with “minority bodies”—to use Barnes’s term (Barnes 2016)—can contribute to humanity’s overall potential to disclose new perspectives on reality: “Disability can offer unique, valuable experiences ... Disability can also be ... an ‘epistemic resource’ and a ‘narrative resource’: it can expand the scope of what we can know and what we can experience, in ways that disabled people often find valuable” (Barnes 2016:96). I would add that these epistemic insights can and should be valued by those who are not disabled. Montessori understood the importance of sensory acuity and physical dexterity largely through taking seriously experiences of disabled children. Improved human understanding depends upon sharing new perspectives gleaned from the experiences, understandings, and insights of those with diverse ways of being physically dexterous in the world.

Before moving on to concessions and pedagogical recommendations, one further feature of Montessori’s overall philosophy is crucial for understanding the relationship between disability and the intellectual virtue of physical dexterity. For Montessori, humans’ capacities to modify muscular capacities through active engagement with the world contribute to intellectual progress most profoundly when we modify our muscles to use new *cultural* resources. The most obvious example of such muscular appropriation of cultural resources takes place in learning a language. Because the human tongue can be trained to move in such refined ways, we are capable of learning to speak the language of our culture, and learning to speak that language facilitates a host of other sorts of learning. Similarly, manual dexterity allows for learning to use new tools, from sewing needles and spears to microscopes and cellos and computer keyboards. The intellectual excellence of playing the cello not only depends upon there being cellos and sheet music but also on a culture that fosters appreciation of music and the cognitive development that makes it possible for playing the cello to be a way of more deeply understanding one’s world. All of this is to say that what constitutes “excellence” in physical dexterity depends in large part upon the cultural resources—and particularly the technology—one uses one’s body to interact with.

Montessori consistently designed her materials not only to interest children but also to provide them with access to the culture and technology of her time. Puzzle pieces and metal insets all had small knobs, precisely the diameter of a typical pencil, to strengthen the pincer grip in just the way students would need when writing later. Students trace sandpaper letters in the alphabet of their culture to learn the motor memory needed for writing. As typewriters were coming into use, Montessori even





suggested that letters be arranged on a shelf in the order of a qwerty keyboard in order to facilitate the use of typewriters.<sup>16</sup> Young children practice and master washing dishes and sweeping floors and sewing and knitting and climbing stairs and riding bicycles, all using technology developed for life in their culture.

Nonetheless, Montessori recognized that the culture of her day failed to provide a technological world designed for children. Adults have been “constructing an environment that is further and further removed from nature and more and more unsuited to a child” (10:12; cf. 22:171–6, 187–95). She tells a parable of children’s life in a world designed specifically for adults:

Suppose that we should find ourselves among a race of giants, with legs immensely long and bodies enormously large in comparison with ours, and also with powers of rapid movement infinitely greater than ours, people extraordinarily agile and intelligent compared with ourselves. We should want to go into their houses; the steps would be each as high as our knees, and yet we should have to try to mount them . . . ; we should want to sit down, but the seats would be almost as high as our shoulders; clambering painfully upon them, we should at last succeed in perching upon them. We should want to brush our clothes, but all the clothes-brushes would be so huge that we could not lay hold of them nor sustain their weight . . . We should perhaps be glad to take a bath in one of the washstand basins; but the weight of these would make it impossible for us to lift them. If we knew that these giants had been expecting us, we should be obliged to say: they have made no preparations for receiving us, or for making our lives among them agreeable. The baby finds all that he himself needs in the form of playthings made for dolls; rich, varied and attractive surroundings have not been created for him, but dolls have houses, sitting-rooms, kitchens and wardrobes; for them all that the adult possesses is reproduced in miniature. Among all these things, however, the child cannot live; he can only amuse himself. The world has been given to him in jest, because no one has yet recognized him as a living man. He discovers that society has prepared a mockery for his reception. (9:13–14)

Montessori was among the first to advocate for the creation of a world within which children could work with serious materials—not mere toys—designed for *their* physical bodies. She manufactured small (and light) chairs and tables, coat-racks, washing basins, brushes and combs and knives and screwdrivers. Children’s bodies are different from adult bodies, and to cultivate the physical dexterity *they* need in order to be capable intellectual agents, they need technology designed for their bodies. Because most of our lives take place interacting with what Montessori calls “supernature” (e.g., 10:88, 93)—the built world humans have made for ourselves—children are disadvantaged in a world made by and for adults. In contrast, Montessori exhorts us “to construct the supernature necessary for the life of children and young people” (10:63). She “offer[s] a very simple suggestion: give the child an environment in which everything is constructed in proportion to himself, and let him live therein. Then there will develop within the child that ‘active life’ which has caused so many to marvel” (9:15).



Intellectual virtue co-develops with supernature. We are what we are because we create an environment that enhances us, and our physical dexterity is valuable because and in the context of that environment. Prehistoric hunter-gatherers would not recognize the refined movements of fingers involved in typing or violin playing as virtuous because the relevant technologies with which these forms of dexterity interface did not exist and many of the intellectual uses to which we put them would not have been relevant or significant to them. We often fail to recognize the refined motor capacities of disabled individuals as virtues because they involve interfacing with technology that is outside of our experience. Moreover, prejudices against people with disabilities often make us discount their virtues, treating them as mere competence. To be able to type quickly on a standard keyboard is not typically seen as a “compensation” for an inability to write and redraft quickly with a pen, and writing is not typically seen as “compensation” for bad memory. But Stephen Hawking’s amazing ability to type and speak using muscles in his cheek—an ability shared by others who do not make headlines for their accomplishments—is seen as compensation for a disabled body. Hawking used advanced technology to speak and write. I also use advanced technology to write—typically, a computer with a keyboard designed for hands of my size that can exercise a specific sort of motor control—and to speak—phones and microphones, not to mention a language adapted for the range of possible motor control in my tongue and range of auditory discrimination in my ear.

Montessori’s acute awareness that the built world is not built for children helped provoke widespread social change. Child-sized furniture and tools became common, and children are happier, more capable, and better agents—intellectual and otherwise—because the world is better designed for them. The recognition that physical dexterity is always dexterity-in-a-techno-cultural-context also has important implications for those with disabilities. Like children, disabled people have often been ignored in designing the supernature in which we all live. The Americans with Disabilities Act in the United States, and comparable legislation in other parts of the world, has begun to redress some of the most blatant ways that those with disabilities have been occluded in humans’ construction of a world suited to what we might call “majority bodies.” Technologies developed for those with various disabilities provide contexts within which many individuals can hone new physical skills. But we have a long way to go. The recognition that physical dexterity is an intellectual virtue is also a call to create a world wherein those who cannot cultivate the same sorts of dexterity as others are able to cultivate forms of physical dexterity that allow them to cognitively engage with the world in increasingly rich ways. A world within which some are unable to cultivate intellectual virtues of physical dexterity is an unjust world, and we need both better pedagogy and better cultural resources (technologies, for example) to remedy those injustices.

Recognizing that dexterity is excellent always only relative to culture and technology provides an important nuance to a common distinction between “disability” and “impairment.” On some accounts, impairments are “traits of the individual that he or she cannot readily alter” that are “labelled or perceived as a ... dysfunction,” while “disabilities” are “some personal or social limitation associated with that impairment” (Wasserman et al. 2016:4). Many disability activists rightly point out



that much hardship due to disability is caused by social stigma and discrimination, and distinguishing between disability and impairment helps articulate ways that “disability” as such is socially constructed. Like others who critique aspects of this distinction (e.g., Shakespeare 2006), Montessori would point out that what makes a physical (or mental) condition an ability rather than a limitation is *always* how it facilitates or limits one’s adaptation *to one’s environment*, and the environment within which humans live is socially constructed. Human adaptation is a complex affair that involves, on the one hand, making our bodies capable of excelling in a world that we have made to facilitate certain ways that we can make our bodies excel, and, on the other hand, remaking that world as we pursue higher and higher forms of achievement. Almost the entirety of the excellences in bodily capacity—from speaking to lifting one’s arm to typing to running or moving a wheelchair—are excellent only in a given technological–social context. Many of these forms of physical dexterity—such as typing and the labile manipulations some quadriplegics use to move wheelchairs—would not even be possible outside of that context. Impairment and disability bleed into one another as the bodies we need depend upon the built world we need those bodies in (and for).

Overall, Montessori’s insistence upon physical dexterity as an intellectual virtue can be reconciled with human disabilities. To intellectually excel, human beings must fine-tune their physical capabilities to interface with available cultural resources (particularly social and technological ones) in order to cognitively engage with the world. How our bodies move is not given by our innate biological potentials; it must be cultivated into various forms of physical dexterity. For those labelled as “disabled,” the range and kinds of dexterity available may differ from what is available to others. In some cases, existing social and technological resources may preclude cultivation of intellectually rich motor movements, but that is a social problem requiring solutions, not a philosophical problem requiring a different definition of intellectual virtue.

I end this section with two brief concessions, and a plea.

To start with my first concession, there is clear testimony from those with disabilities, and particularly from those who come to have disabilities later in life, that disability can be profoundly intellectually limiting. Cristina Crosby, who became paralyzed in a bicycle accident, remarks, near the end of her rich account of living with disability:

I can’t resolve the intractable difficulties of disabling incapacity, any more than I can suggest that everything will be (more or less) okay. Even the most accomplished cripple you can imagine is undone, and living some part of her life in another dimension, under a different dispensation than that of realist representation. (Crosby 2016:189)

Jimmy Anderson puts the point more succinctly—“it sucks being a quadriplegic”—and Anderson also illustrates the special role that Montessori ascribed to the hand: among the worst things about his condition, he claims, is “not being able to use your hands. I would be happy to never walk again if I could have my hands back—just to open the door, to crack my knuckles, to scratch my dog and make her leg kick. To give you the bird when you cut me off in traffic” (Anderson 2013). Disability brings real losses.



Many of these losses are properly epistemic. Anderson, in commenting on the value of his pre-injury body (and especially hands), adds as an example, “To be able to hold my wife,” and remarks, “I never realized how appropriate it is that we use the word feel for both emotion and sensation until I lost it. It sometimes feels like I am numb to the world around me” (Anderson 2013). Crosby, in much greater detail, notes how much is lost in terms of her ability to know her world (including especially her partner) after her injury, because so much of that knowledge is embodied. Take memory, for example, where she observes, “I can no longer feel the satisfaction of cycling forty miles, or hiking up a desert canyon, or kayaking in the ocean, or riding my gorgeous Triumph motorcycle. I don’t want to forget how those pleasures felt in my body, and I fear the erosion of embodied memory” (Crosby 2016:12). When Alex Honnold describes the face of El Capitan, he can do so only through moving his hands (and even shifting his body) in the way that he does when climbing the mountain. When Crosby remembers kayaking in the ocean, she wants—and indeed, needs—to reorient her bodily posture and gesture to express, even to herself, her memory. She can no longer do that, and she is losing her embodied memories. Human beings interface with the world through bodily movement. We learn about the world through bodily movements. We even process information in part through gesture and other bodily movements. Those who lack physical potentials that are common among other people, and particularly those who have *lost* potentials that they once had, have real impairments that hinder the capacity for certain sorts of intellectual growth. This is real epistemic loss.

Nonetheless, this epistemic loss is consistent with an overall virtue epistemology that recognizes both the value of physical dexterity for cognition and the real limits to that dexterity imposed by various disabilities. For one thing, none of us cultivate all of the potentials that we have, and no human being lacks *all* potential for physical dexterity. Elizabeth Barnes rightly distinguishes between “global bads and local bads,” pointing out that “disability ... can be good for you” even if “disability sometimes—perhaps always—[is] *locally* bad for you (that is, bad for you with respect to particular things at particular times)” (Barnes 2016:88). Epistemically, we might say that disabilities can be bad for a person with respect to some ways of cognitively engaging with some features of reality, without thereby saying that disability as such precludes intellectual virtue—or even the specific intellectual virtue of dexterity—as such. Particularly for those whose identities were shaped by bodies with different capacities than those available to them when they become disabled, and particularly when the loss of capacities is sudden and unforeseen, local bads can be very bad indeed. Our identities are shaped by how we have honed our bodies, and a loss of particular sorts of physical dexterity is a loss of an important part of our identity, of the *virtues* central to who one is. Particularly in a society that normalizes certain bodies, and especially when this normalization is reinforced by the cultural and technological resources that aid cognition for those bodies, it can seem like those with disabilities lack the “basic” or “ordinary” capacities needed for successful cognition of the world. But my account can affirm that physical dexterity is an intellectual virtue, that those with physical disabilities can have this intellectual virtue, and also that some forms of physical dexterity—along with their associated epistemic goods—are unavailable to those with certain disabilities.



A second concession acknowledges the limits of physical dexterity as an intellectual virtue in that a considerable amount of intellectual life can be “internalized,” such that it does not depend upon physical dexterity. Early in his life, Stephen Hawking—like Feynman—developed his theories using pencil and paper, and likely made extensive use of gesture in cognitive processing. These physical implementations of cognition were cut off as symptoms of his ALS became more pronounced, but Hawking’s intellectual productivity increased. We all internalize formerly externalized operations (doing math in the head instead of on paper), and vice versa (remembering appointments through interfacing with a phone rather than “pure” memory). Those with some disabilities highlight just how body-independent certain forms of cognitive processing can be. Human imagination and understanding are remarkable tools for cognitive engagement with the world. Both depend upon *some* physical dexterity, at least for their development and for connecting them with the world. Both are enhanced through greater physical dexterity. But just as one can pursue truth in a way that is relatively excellent even while lacking a perfectly virtuous degree of intellectual humility or acute vision, so too one can pursue truth in a way that is relatively excellent even while lacking much in the way of physical dexterity.

Finally, a plea. As I noted at the beginning of this section, it was Montessori’s work with disabled children, and her activism on behalf of such children, that cultivated her sensitivity to the abuses non-disabled children faced in a world built largely for the sake of adults. Her exhortation to “follow the child” (22:166) and her attention to the myriad ways that culture and environment need to change in order to make a world within which children can be the agents that they should be are echoed in the cries of contemporary disability activists for more just societies that allow *them* to express their agency. Montessori’s story of the world of the giants goes on, in a way that applies equally to children and disabled persons:

What should we do if we were to become the slaves of a people incapable of understanding our feelings, a gigantic people, very much stronger than ourselves? When we were quietly eating our soup, enjoying it at our leisure (and we know that enjoyment depends upon being at liberty), suppose a giant appeared and snatching the spoon from our hand, made us swallow it in such haste that we were almost choked. Our protest: “For mercy’s sake, slowly,” would be accompanied by an oppression of the heart ... If again, thinking of something pleasant, we should be slowly putting on an overcoat with all the sense of well-being and liberty we enjoy in our own houses, and some giant should suddenly throw it upon us, and having dressed us, should in the twinkling of an eye, carry us out to some distance from the door, we should feel our dignity so wounded, that all the expected pleasure of the walk would be lost. Our nutrition does not depend solely on the soup we have swallowed, nor our well-being upon the physical exercise of walking, but also upon the liberty with which we do these things. We should feel offended and rebellious, not at all out of hatred of these giants, but merely from our recognition of the innate tendency to free functions in all that pertains to life. It is something within us which man does not recognize, which God alone knows, a something which manifests itself imperceptibly to us to the end that we may complete it. It



is this love of freedom which nourishes and gives well-being to our life, even in its most minute acts. Of this it was said: "Man does not live by bread alone." How much greater this need must be in young children, in whom creation is still in action!

With strife and rebellion they have to defend their own little conquests of their environment. When they want to exercise their senses, such as that of touch, for instance, every one condemns them: "Do not touch!" If they attempt to take something from the kitchen, some scraps to make a little dish, they are driven away, and mercilessly sent back to their toys. How often one of those marvelous moments when their attention is fixed, and that process of organization which is to develop them begins in their souls, is roughly interrupted; moments when the spontaneous efforts of the young child are groping blindly in its surroundings after sustenance for its intelligence. Do we not all retain an impression of something having been forever stifled in our lives? (9:15–16; cf. 22:10)<sup>17</sup>

Children, and disabled persons, need care, but they do not simply need to be taken care of. Montessori reports that children in her classes would ask "help me to do it by myself" (22:175). She rightly saw that the sort of help children need is help that facilitates and fosters rather than replaces ~~intellectual (and other) agency~~. Moreover, she rightly saw that an essential part of fostering agency is cultivating the physical dexterity needed to learn, communicate, and engage with the world. And she rightly saw that this dexterity must be cultivated along with the transformation of the world into one in which every person—adult and child, non-disabled and disabled—can achieve intellectual virtue. Virtue epistemologists, and Montessorians, have a lot to learn from, and a lot to offer to, those with disabilities. There has already been excellent work among Montessorians aimed at engaging those with disabilities.<sup>18</sup> It's time for philosophers in general and virtue epistemologists in particular to take disability more seriously.