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Barriers to inclusion: Incorporating the social model in the study of children's understanding of disability

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ABSTRACT

How can we improve children's attitudes toward and their treatment of disabled peers? One way is by targeting the model that non-disabled children hold about disability, which in Western cultures tends to be that the challenges disabled people face arise from intrinsic factors, or characteristics inherent to the individual (i.e., the medical model of disability). In this paper, we describe a model of disability that highlights external factors contributing to the challenges disabled people face (i.e., the social model). Drawing on research showing that children's attitudes toward other stigmatized groups can be improved as they learn about structural explanations for group disparities, we suggest that exposing children to the social model of disability may have similarly beneficial effects on the ways they think about and treat disabled peers. We highlight some challenges that this approach may encounter—challenges that, we argue, cognitive developmentalists are well-positioned to address.

The 21st century has seen marked increases in the rates of educational inclusion for disabled children (Enrich, 2021; Lynch, 2000) and in research efforts to understand and improve non-disabled children's attitudes towards their disabled peers (e.g., Armstrong et al., 2017; Freer, 2023; Lindsay & Edwards, 2013; MacMillan et al., 2014; McManus et al., 2021). And yet, many disabled children continue to be educated in separate settings, isolated from their non-disabled peers for most or all of their school day (Enrich, 2021; Westling, 2019). For example, in fall 2019, almost half (47%) of autistic students in the U.S. were educated in separate classrooms for the majority of the school day or in separate schools altogether (National Center for Education Statistics NCES, 2023). Disabled school-age children also have fewer and lower-quality friendships than their non-disabled peers (Buyse et al., 2002; Edwards et al., 2019; Webster & Carter, 2007). One reason that segregation and exclusion of disabled people continues to be common is because of the attitudes non-disabled people have towards disabled people and their beliefs about the nature of disability itself (Nario-Redmond, 2019; Nario-Redmond et al., 2019).

Even young children show negative attitudes and prejudice toward disabled people ("ableism") (see Nowicki & Sandieson, 2002). In seminal work conducted over 50 years ago, Richardson and colleagues found that children as young as six years old consistently liked non-disabled over disabled peers (Richardson, 1970; for a summary, see Richardson, 1983). Although this work involved forced-choice methods (i.e., choosing whether they would most like to be friends with a disabled or non-disabled peer), the same pattern is evident in more recent work in which children are prompted to evaluate non-disabled and disabled peers separately (Huckstadt & Shutts, 2014; Sargent & Jaswal, 2022). It is also evident in open-ended observational studies, including pretend play scenarios. In one recent study, for example, Federici and colleagues (2017) presented 6- to 10-year-old children with the opportunity to

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wear (and play with) two hand puppets, one in a wheelchair and one not in a wheelchair. Children were asked to play with the puppets for five minutes, and researchers observed whether children chose to play with one, both, or neither of the puppets. They found that only one child in their sample of 55 chose to wear the puppet with a physical disability without prompting from the experimenter; the rest wore the puppet without a disability, or avoided wearing the puppets altogether. Importantly, these lab-based studies are consistent with meta-analytic and qualitative evidence that non-disabled children display more favorable attitudes to non-disabled than disabled peers (Nowicki & Sandieson, 2002) and that children with disabilities are more likely than children without disabilities to be bullied and excluded by their peers (Bourke & Burgman, 2010; Lindsay & McPherson, 2012; Pinquart, 2017).

Exposure is not enough to improve children's attitudes towards disabled peers. While some studies have found a positive effect of inclusive educational settings on preschool children's attitudes (e.g., Buysse et al., 2002; Diamond et al., 1997), other studies reveal that children in inclusive and non-inclusive preschool settings hold similarly negative attitudes towards disabled peers (see Diamond & Huang, 2005 for review). For example, when Huckstadt and Shutts (2014) asked preschoolers to indicate how much they would want to be friends with a peer who was in a wheelchair and a peer who was not in a wheelchair, they overwhelmingly preferred to befriend the apparently non-disabled peer, regardless of whether they were in an inclusive preschool program or not. Observational studies have also found that non-disabled children in inclusive preschool classrooms prefer their non-disabled peers as playmates over disabled peers (Diamond et al., 1993), even when they say they have no preference for non-disabled or disabled peers (Hestenes & Carroll, 2000). Adults may view inclusive programs as successful, but they may still have the negative and unintended consequences of leading children to view disabled peers as different from themselves (Schnorr, 1990; Sierksma & Shutts, 2020).

In this paper, we argue that cognitive developmentalists are ideally positioned to conduct research that could help to reduce children's negative attitudes and beliefs about disability. We begin by describing two theoretical frameworks of disability that shape and organize attitudes about the causes and consequences of disability and about what it means to be disabled: the medical model (which seems to be the default for Western children and adults) and the social model. We describe research that demonstrates attitudinal benefits of exposing adults to the social model. Finally, drawing on literature in developmental science that seeks to address and improve children's attitudes about the unequal treatment of other stigmatized groups, we argue that exposing children to the social model has the potential to improve their attitudes about disability and their disabled peers.

1. Models of disability

Disability models can have important implications for the ways that disabled individuals make sense of their own experiences (Dirth & Branscombe, 2019) and for the ways that non-disabled individuals view and interact with their disabled peers (Dirth & Branscombe, 2017). The most dominant model of disability, particularly within Western medicine and scholarship, is the medical model. As its name implies, the medical model identifies individual impairments, including medical conditions and diagnoses, as the source of disability. Not all medical conditions are disabilities under the medical model. Instead, disability arises from impairments that substantially limit an individual's ability to engage in activities and life situations such as learning and applying knowledge, mobility, self-care, managing interpersonal relationships, and employment (Centers for Disease Control and Prevention CDC, 2020; World Health Organization WHO, 2001). Medical conditions that are not themselves disabilities (e.g., diabetes, cancer) may

Table 1
Solutions/interventions offered by the medical and social models of disability.

Potential Areas of Activity Limitation and Participation Restriction	Medical Model Approach	Social Model Approach
Learning and applying knowledge	Self-contained classrooms to provide special education support	Provide accommodations and support within general education classrooms
Communication	Speech therapy to learn to speak	Providing alternative communication devices
Mobility	Providing amputees with prosthetic limbs and rehabilitation to regain the ability to walk	Installing curb cuts and elevators to make the physical environment accessible to wheelchair users
Self-care	"Social stories" modeling self-care tasks	Replacing sensory-aversive soaps or shampoos with unscented or hypoallergenic alternatives
Domestic life (e.g., acquiring a place to live, carrying out household tasks)	Institutional living environments (e.g., group homes) that include only disabled people and do not have opportunities for broader community involvement	Establishing inclusive and accessible living spaces, including individualized supports for independent living in a community of disabled and non-disabled people (example: Our Stomping Ground)
Interpersonal interactions and relationships	Providing social skills training (e.g., dating coaching) for individuals with social-communicative disabilities	Conducting trainings to reduce prejudice and stigmatizing attitudes among non-disabled individuals
Major life areas (e.g., employment)	Training potential applicants on interview skills (e.g., making eye contact with the interviewer, giving expected responses to standard interview questions)	Adapting interview format to be more transparent (e.g., providing printed copies of the interview schedule and explicit instructions about interview format)
Community, social and civic life (e.g., engaging in religious or spiritual activities)	Providing dedicated and separate spaces for disabled people within places of worship (e.g., a "Special Needs" division of children's ministry)	Ensuring that places of worship and worship services are both accessible and inclusive (e.g., through ramps and seating that is accessible for people with physical disabilities; making sermons and learning materials accessible to people with intellectual and developmental disabilities)

Note. Examples in the leftmost column are taken from the International Classification of Functioning, Disability and Health (ICF)'s categories of activities and participation.

sometimes result in an impairment (e.g., loss of vision, nerve damage) which subsequently limits an individual's activities, thus resulting in a disability. But those conditions on their own are not necessarily disabilities under the medical model.

In line with its medical and individualized emphasis, solutions offered by the medical model tend to include treatments that are focused on the rehabilitation and amelioration of perceived deficits that arise from an individual's disability. [Table 1](#) outlines a few examples of how the medical model may offer solutions for disabilities that impact various areas of activity and participation (along with contrasting solutions offered by the social model, described in more detail below). For example, someone whose leg has been amputated may receive a prosthetic leg and rehabilitation to enable them to walk. Although physical, "visible" disabilities are often emphasized in conversations about the medical model of disability, the medical model also has implications for "invisible" disabilities, such as social and cognitive disabilities. For instance, autistic young adults have lower rates of employment than non-autistic young adults ([Roux et al., 2015](#)). One potential approach to improve this situation, consistent with the medical model, is to provide autistic young adults training in interview skills like making eye contact with the interviewer and giving expected responses to standard interview questions (e.g., [Roberts et al., 2021](#); [Strickland et al., 2013](#)).

In contrast to the medical model, the social model of disability locates disability *outside* of the individual, as primarily driven by inequitable systems, policies, and attitudes that disadvantage people. The social model originated through the disability rights movement in the 1970s and 80s and was influenced by the civil rights perspective of disability advocates during this time ([Finkelstein, 1980](#); [Heumann & Joiner, 2020](#); [Oliver, 1996](#); [Union of the Physically Impaired Against Segregation UPIAS, 1976](#)). This model draws a distinction between "impairment," an individual state of physical, motor, or sensory limitations, and "disability," the result of social situations and environments that create difficulties for people with impairments. Thus, according to the social model, disability is not an inherent deficit, but a form of social oppression that arises in societies that are not designed with impairments in mind ([Union of the Physically Impaired Against Segregation UPIAS, 1976](#)). As [Montgomery \(2012\)](#) put it, "disability, on this understanding, is not *in-ability* but *dis-enablement*" (p. 75). In the frame of the social model, dis-enabling forces include physical barriers (such as doors that are not wide enough to accommodate wheelchairs, thereby limiting the access of people with physical mobility disabilities), inequitable policies and practices (such as interviewing procedures or academic evaluations that require responses in a short amount of time, thereby disadvantaging people with slower processing speeds), and prejudiced social attitudes ([Finkelstein, 1980](#); [Gernsbacher, 2015](#); [Nario-Redmond, 2019](#)).

Situating disability outside the individual means that solutions to the challenges disabled people face focus more on removing the environmental, institutional, and attitudinal barriers that disadvantage them rather than changing a disabled individual to fit existing structures and attitudes. Importantly, the social model also emphasizes that disabled people ought to be included in all parts of the community alongside non-disabled people, drawing attention to the patterns of disability-based segregation that tend to accompany medical model approaches (e.g., institutionalized housing vs. community-based integration, see [Table 1](#)) ([Finkelstein, 1980](#); [Union of the Physically Impaired Against Segregation UPIAS, 1976](#)).

The relevance of the social model for physical disabilities (e.g., installing curb cuts and elevators to make physical spaces more accessible for people with physical mobility disabilities) may be more apparent than its relevance for other kinds of disabilities. But as [Table 1](#) demonstrates, the social model has relevance for all kinds of disabilities. For example, accommodations for non-physical disabilities may include providing more time for exams (or removing the time limits altogether; [Gernsbacher, 2015](#)) and developing inclusive interviewing practices (e.g., providing printed copies of the interview schedule and explicit instructions about interview format; [Maras et al., 2021](#)). Importantly, while these sorts of changes to physical structures and social practices are often intended to benefit disabled people, they are likely to be beneficial for non-disabled people as well ([Gernsbacher, 2015](#); [Maras et al., 2021](#); [Scott et al., 2003](#); [Waisman et al., 2023](#)).

The social and medical models of disability are sometimes seen as incompatible, but they need not be. For example, some disability scholars have argued that disability models need to address individual challenges and impairments; a disability model that is purely focused on social influences, they point out, is detached from the lived experiences of disabled individuals and therefore impractical ([Shakespeare & Watson, 2001](#)). As noted earlier, the social model distinguishes between "impairments" as individual states and "disability" as a result of oppression; it acknowledges that even if all disability-based oppression and barriers were eliminated, individual impairments in need of medical treatment would remain (e.g., chronic health conditions, seizure disorder). Thus, the social model should be considered a complement to (not a replacement for) more individualized approaches to understanding disability ([Oliver, 2013](#)). Indeed, the same individual can have attitudes and beliefs that are consistent with both the medical and social models ([Kapp et al., 2013](#)). For example, [Bogart and colleagues \(2022\)](#) measured the degree to which college students agreed with statements such as "Lack of accessibility and discrimination by employers are the main reasons why disabled people are unemployed" (reflecting the social model) and "Doctors and medical professionals know what is best for people with disabilities" (reflecting the medical model). In this sample, medical and social model beliefs shared only a small negative correlation: While people who agreed strongly with the medical model were less likely to agree strongly with the social model, these beliefs were not perfectly inverse of one another, demonstrating that people can hold beliefs in line with the medical and social models simultaneously.

We turn now to considering why the social model of disability should be given more attention in developmental research. As just noted, however, we recognize that the individualized approach that is central to the medical model can, under some conditions, be helpful in thinking about disability, and that people can hold beliefs in line with the social and medical models simultaneously.

2. Benefits of the social model

Research with adults suggests that holding beliefs consistent with the social model or even being exposed to the social model can positively influence both disabled and non-disabled adults' disability-relevant attitudes and behaviors. For example, the degree to

which disabled adults hold and express beliefs consistent with the social model of disability is related to the way they view the treatment of disabled people in society. [Dirth and Branscombe \(2019\)](#) asked disabled adults to rate their agreement with social model themes, such as “Many of the difficulties of our disability are located outside the individual, within the environment” and “Society needs to accept more responsibility to correct the ways in which they have treated people with disabilities unfairly” (p. 801). Disabled adults who agreed more strongly with these items were also more likely to see ableist discrimination as widespread and frequent, more likely to imagine an equitable future for disabled people, and less likely to view disabled people as fundamentally different from non-disabled people. These tendencies also mediated an effect of social model endorsement on perceived illegitimacy of ableist discrimination, such that disabled adults who more strongly agreed with the social model were also more likely to correctly identify ambiguous situations as instances of discrimination.

One particularly striking example of how the model of disability one holds appears to influence ableist beliefs comes from recent research conducted with autism researchers. [Botha and Cage \(2022\)](#) asked 195 autism researchers to describe autism, autistic people, and their own research. The authors coded responses for whether they reflected primarily the medical model, the social model, or “neutral embodiment.” For example, responses that defined autism in terms of individual impairment or disease (e.g., “Impairments in social communication with stereotyped and repetitive behaviors beginning early in development”) were coded as medical model; responses that focused on social barriers (e.g., “Growing up autistic... attracts stigma and stress to the individual and also their family. This is because of prejudice, intolerance and lack of reasonable accommodations”) were coded as social model; and responses that described autism as a value-neutral difference (e.g., “Autism is part of a constellation of ways of being”) were coded as neutral embodiment. Researchers whose responses primarily reflected the medical model were more likely to include dehumanizing, objectifying, or stigmatizing descriptions of autistic people in their responses (e.g., “shut down from the outside world; rigid; emotional”) than were researchers whose responses reflected the social model or neutral embodiment. The authors suggest that the model one holds can either perpetuate or challenge prejudice against autistic people and can have implications for the type of research that one conducts (e.g., research to cure/eradicate autism vs. research to inform accommodations that can support autistic people’s wellbeing).

There is some research showing that learning about the social model can increase adults’ support for policies designed to improve the lives of disabled people. In an experiment by [Dirth and Branscombe \(2017\)](#), non-disabled adult participants read a research report that attributed poor life outcomes for physically disabled people to their physiological symptoms (e.g., “the devastating consequences of disability are critically linked to factors inherent in one’s orthopedic condition;” the medical model condition) or to prejudiced attitudes and environmental barriers (e.g., “the devastating consequences of disability are critically linked to factors inherent in one’s everyday environments;” social model condition). Later, participants in the social model condition were more likely than those in the medical model condition to show support for funding legislative issues concerning disabled people (e.g., civil rights, education, housing, and transportation). Additionally, this effect was mediated by an increased awareness of structural discrimination among participants in the social model condition. Thus, even in the course of a relatively short experiment, learning about some structural explanations for disability-based inequality can improve adults’ disability-related attitudes.

Similarly, college students who are exposed to the social model through their coursework are more likely to agree with the social model and to hold positive attitudes towards disabled people than students who have not been exposed to the social model ([Bogart et al., 2022](#)). Over the course of a semester, students in a course about psychology and disability, taught from a social model perspective by a professor with a disability, showed increased agreement with social model beliefs (e.g., “All buildings should be accessible to people with disabilities”) and decreased agreement with medical model beliefs (e.g., “Doctors and other medical professionals know what is best for people with disabilities;” [Darling & Heckert, 2010](#), p. 136). Students in a “contact-only” class (social psychology) that was also taught by a professor with a disability also showed increases in social model beliefs and decreases in medical model beliefs, but to a lesser extent than students in the course about psychology and disability. Finally, beliefs about disability held by students in a control class (cognitive psychology) taught by a professor without a disability did not change. Importantly, students’ disability model beliefs also predicted their prejudice against disabled people: Students with increased social model beliefs and decreased medical model beliefs held more positive attitudes towards disabled people (e.g., viewed disabled people as warm and competent). These studies provide evidence that adults’ disability model beliefs can be intervened upon, and that changing these beliefs has implications for adults’ ableist attitudes as well.

There is not yet much research explicitly addressing children’s models of disability. The little there is suggests that like adults, children growing up in Western cultures may assume, by default, that the reason why a person is disabled is because of characteristics inherent to them, in line with the medical model (e.g., [Federici et al., 2017](#); [Meloni et al., 2015](#); [Morña & Carnerero, 2022](#)). That is, they may not readily consider how the environment can create disabling conditions. For example, in the study mentioned earlier involving 6- to 10-year-old Italian children who were invited to play with a puppet who was seated in a wheelchair ([Federici et al., 2017](#)), about half of the sample spontaneously made comments about the puppet’s disability. Most of these comments were consistent with the medical model (e.g., having a non-disabled puppet say to the disabled puppet, “The physician [said] that you must take these pills that make you feel better”). Only three of the children who made spontaneous disability-related comments referred to disability as arising from factors outside of the disabled puppet’s control, and two of these children expressed a combination of medical and social model beliefs.

In another study, [Meloni et al. \(2015\)](#) asked Italian 6- to 11-year-olds and their parents a combination of open- and closed-ended questions about why disabled people can face difficulties in life. For example, when shown a picture of a disabled individual, children rated their agreement with statements such as “he’s sick” (reflecting medical model beliefs) and “nobody will give him a job” (reflecting social model beliefs). In response to the open-ended prompts, both children and adults gave comments consistent with the medical model, though social model explanations increased with age. In the forced-choice questions, children were more likely to agree with medical explanations (e.g., “he’s sick”) than were parents.

The bias to focus on inherent characteristics of an individual as responsible for the difficulties they face as a result of their disability seems consistent with other biases in children (and adults) where explanations focused on the individual seem to be prioritized over those that take into account aspects of the situation. For example, [Curtis and Schildhaus \(1980\)](#) found that preschool-aged children were more likely to give personality explanations for others' behavior than for their own behavior (e.g., "John spilled his milk because he is careless" vs. "because the milk was too close to his plate"). At the same time, and as we will elaborate below, there is increasing evidence that even preschoolers can be taught to recognize structural inequalities when it comes to domains such as race, gender, and socioeconomic status, which can increase their likelihood of challenging bias and inequality (e.g., [Hawkins, 2014](#); [Rizzo & Killen, 2020](#)).

3. Incorporating the social model in developmental science

One goal of developmental science is to conduct research that has the potential to improve intergroup attitudes and behaviors from a young age. As just described, exposure to the social model can improve adults' attitudes toward disability (e.g., [Bogart et al., 2022](#)). To our knowledge, however, there has not yet been any analogous work asking whether exposure to the social model can improve children's attitudes toward disability. Nor has there been any work, to our knowledge, investigating how best to introduce the social model to children. In this section, we provide a developmentally-informed discussion of ways children might be taught about the social model, including considerations of factors that may inhibit or facilitate children's adoption of beliefs consistent with the social model.

3.1. Teaching children about external sources of inequality

Although Western children appear to be biased toward the medical model ([Federici et al., 2017](#); [Meloni et al., 2015](#); [Moriña & Carnerero, 2022](#)), research in other domains suggests that teaching children about the social model of disability may increase their ability to recognize and oppose structural inequalities. For example, [Hussak & Cimpian \(2015, 2018\)](#) introduced 4- to 8-year-old children to two novel groups, one of whom had more money, better grades, and/or more powerful jobs than the other group. When children were prompted to explain the status differences between the two groups (e.g., why one group had much more money), they tended to reference intrinsic properties of the group members themselves, such as their intelligence or how hard they worked ([Hussak & Cimpian, 2015](#)). The authors attributed this bias to an early-emerging "inherence heuristic" that makes it easier for children and adults to quickly recall inherent characteristics of a group, which in turn makes it more likely that individuals will believe inherent rather than extrinsic explanations for complex social phenomena (e.g., [Cimpian & Salomon, 2014](#)).¹ Furthermore, when children explained the disparities in intrinsic terms or when an experimenter provided children with intrinsic explanations (e.g., "The Blarks are really really smart, and are much better workers than the Orps are... Because of this, the Blarks have a lot more money than the Orps;" [Hussak & Cimpian, 2015](#), p. 743), children were more likely to see the disparities as fair, to believe that the high-status group deserved their advantage, and to believe that the disparities should be maintained. Crucially, however, [Hussak and Cimpian \(2015\)](#) found that teaching children about external, social sources of disparities, including the provision of more job opportunities or school supplies to one group than another, increased the likelihood that children viewed disparities as unfair and as in need of change.

An important area for future research will be investigating whether exposing children to extrinsic explanations for why disabled people experience some challenges has similar effects on children's attitudes toward maintaining vs. dismantling the structures that can cause those challenges. It is possible that effects involving disabled groups will be smaller than effects with novel groups because beliefs about disability have already begun to form by the preschool years ([Birtel et al., 2019](#); [Diamond & Huang, 2005](#); [Hong et al., 2014](#)). However, there are at least two reasons to believe that these kinds of extrinsic explanations could still influence children's attitudes about disability-based inequalities.

First, the type of disability in question and the age of study participants may moderate whether children already have pre-existing beliefs about the causes of specific inequalities relevant to disabled people. For example, most preschool children show some understanding of physical disabilities, but they struggle to understand disabilities that are not as visually apparent as physical disabilities, such as intellectual and developmental disabilities ([Diamond & Hestenes, 1996](#); [Diamond & Huang, 2005](#)). Second, there is some evidence that reflecting on extrinsic explanations even for neutral phenomena (such as why paper and books are rectangular) can reduce adults' reliance on the inherence heuristic, which in turn increases support for liberal positions on real-world social issues, such as LGBTQIA+ rights, immigration, and affirmative action ([Hussak & Cimpian, 2018](#)). If adults can be nudged to reconsider their beliefs on real-world groups and issues through reduced reliance on the inherence heuristic, perhaps children can too. Future experiments should test the effectiveness of teaching children about the social model of disability and how this influences their attitudes towards disabled peers and disabling structures. These experiments will benefit from special attention to developmental and individual difference factors that may influence children's receptivity to social model beliefs, some of which we outline below.

¹ As we will elaborate further below, this pattern of endorsing intrinsic rather than extrinsic explanations may also result in social essentialism, a pattern of beliefs that is associated with increased prejudice and dehumanization against minoritized groups ([Cimpian & Salomon, 2014](#); [Landry et al., 2021](#); [Peretz-Lange, 2021](#)).

3.2. Factors that may influence children's adoption of social model beliefs

3.2.1. Age

It is important to note that the kinds of scaffolding needed to encourage children to consider structural barriers in disability are likely to change with age. For example, 9- to 11-year-old children are more likely than 6- to 8-year-olds to spontaneously identify structural factors that contribute to the challenges disabled people face (though the relationship between children's spontaneous explanations of disability and their agreement with forced-choice examples of intrinsic and extrinsic explanations is still unclear) (Meloni et al., 2015). Peretz-Lange et al., (2021) also found that 9- and 10-year-old children were more likely than 5- and 6-year-old children to spontaneously offer structural explanations for why one novel group consistently won a game that was designed to advantage them and disadvantage another novel group. This study, as with the Hussak & Cimpian (2015, 2018) studies mentioned above, focused on novel groups, so it is not known the degree to which these results would directly apply to children's beliefs about disability. However, children's ability to engage in abstract thought increases from preadolescence through late adolescence (Marini & Case, 1994; Neys & Everaerts, 2008), and their reliance on the inherence heuristic decreases between ages 4 and 7 (and between childhood and adulthood; Cimpian & Salomon, 2014; Cimpian & Steinberg, 2014). Thus, it is likely that older children could consider the abstract, external sources of inequality that comprise the focus of the social model, and to inhibit their initial tendency towards the intrinsic explanations offered by the medical model.

Older children may also be less likely than younger children to approve of existing inequalities because of age-related declines in their "descriptive-to-prescriptive" tendencies (Roberts et al., 2017, 2018, 2019; Roberts & Horii, 2019). Around the ages of 4–6 years, children are able to identify behavioral regularities among group members, and they oftentimes infer that what group members *usually* do (i.e., a descriptive norm) is what group members *should* do (i.e., a prescriptive norm) (Roberts et al., 2017). That is, children use their observations of social regularities to infer how people *should* act, and they disapprove of individuals who do not conform to the majority behavior. In the context of disability-based exclusion, children who observe disabled peers being excluded may infer that these peers *should* be excluded, and they may be inclined to disapprove of individuals who reject this implicit norm by including disabled peers instead (see also Bigler & Liben, 2007). However, as children get older, they are less likely to disapprove of non-conformity (Roberts et al., 2019), suggesting that older children may be less influenced than younger children by descriptive norms, including being more supportive of equality and inclusion even in contexts where this is not the (descriptive) norm.

On the other hand, age-related developments in children's tendency to weigh multiple, sometimes conflicting priorities may actually make children *less* likely to include their disabled peers in situations where inclusion is perceived as inhibiting a group's goals (Killen & Stangor, 2001; Killen et al., 2018; Rutland & Killen, 2015; Rutland et al., 2010). According to the Social Reasoning Developmental (SRD) model, with age, children are increasingly able to coordinate simultaneous concerns for morality, group identity, and psychological knowledge when evaluating social inequalities (Rutland et al., 2010; Elenbaas et al., 2020). However, group identity plays an increasingly important role in older children and adolescents' evaluations of group-based exclusion. For example, in research with 6- to 13-year-olds, all children rejected gender- and race-based exclusion in situations where an experimenter simply said that some group members would be uncomfortable if the target individual were included (Killen & Stangor, 2001). In these straightforward situations, most children justified their disapproval on a moral basis. However, in contexts where two people wanted to join an activity, and one was said to be worse at the activity in a way that conformed with stereotypes (e.g., a girl and a boy wanted to join ballet, and the boy was worse at ballet than the girl), older children were more likely to say that exclusion was okay and to provide social-conventional reasons (i.e., social conventions, group functioning, and group identity) to justify their approval (Killen & Stangor, 2001).

Interestingly, research considering children's evaluations of disability-related exclusion reveals patterns that are consistent with the SRD model. For example, in a study with 6- to 12-year-old Swiss children, Gasser et al. (2014) found that most children reported exclusion on the basis of disability as morally wrong, an effect that increased with age. However, in the same sample, 9- and 12-year-olds were more likely than 6-year-olds to expect that disabled children would be excluded from situations where their specific disability type might limit their ability to participate. In other words, with age, children were increasingly likely to expect that intellectually disabled children would be excluded from academic situations (e.g., solving a problem at school) and that physically disabled peers would be excluded from athletic situations (e.g., a competition during a P.E. class). Thus, it will be important for researchers to consider the individual and contextual factors that contribute to age-related developments in children's beliefs about disability and discrimination.

3.2.2. Social essentialism

In addition to children's pre-existing beliefs about the nature of disability, another potential barrier to understanding and making use of the social model of disability may come from children's essentialist beliefs. Social essentialism is the tendency to view social categories as inherent, biologically-based, and predictive of group members' behavior (Rhodes & Mandalaywala, 2017). By three to five years of age, children hold essentialized views of various social categories such as gender (Gülgöz et al., 2019; Rhodes & Gelman, 2008), race (Rhodes & Gelman, 2009; Roberts & Gelman, 2015), and languages (Hirschfeld & Gelman, 1997). Additionally, school-aged children tend to essentialize some social categories (such as gender) more reliably than other social categories (such as race; Rhodes & Gelman, 2009). For example, some children believe that girls tend to play with tea sets because they are girls and that boys play with trucks because they are boys (Taylor et al., 2009). These findings suggest they view gender in and of itself as the causal mechanism predicting differences in girls' and boys' behaviors rather than considering the possibility that boys' and girls' behavior is influenced by sociocultural forces outside of the individual (e.g., stereotypes about appropriate activities for boys and girls).

While social essentialism tends to emerge early in development across cultures, the specific nature of children's essentialism is

culturally variable and shaped by adult influence. For instance, children are more likely to form essentialist beliefs about novel groups that are described with generic language (e.g., “Zarpies climb fences”) in comparison to non-generic language (e.g., “This Zarpie climbs fences”) (Rhodes et al., 2012). Additionally, cultural context shapes children’s essentialist beliefs: Even in two geographically close areas within the United States, children in a conservative community were more likely to express stable essentialist beliefs about gender than their counterparts in a liberal community, who showed decreasing essentialism across the ages of 5 to 17 years (Rhodes & Gelman, 2009).

Children (Smith & Williams, 2004) and adults (Bogart et al., 2018; Haslam et al., 2000) also hold essentialized attitudes about some disabilities, seeing them as biologically-based, unified groups. For example, Maas et al. (1978) found that early elementary school children attributed disabilities that involved antisocial, socially withdrawn, and self-punitive behaviors to inherent causes (e.g., the individual was “born that way” or behaved that way because of disease) whereas older elementary school children were more likely to attribute the behaviors to socio-environmental causes (e.g., being mistreated by peers or failed by their school).

That children essentialize disability is important, because people who hold essentialized beliefs about a group tend to hold more negative attitudes about that group than people who acknowledge the structural, external reasons for their differences (for reviews, see Bigler & Liben, 2007; Peretz-Lange, 2021). In particular, when people make essentialist attributions about why some groups (such as disabled people, women, and racial and ethnic minorities) are lower in status than others, they are likely to believe that the low-status groups are inherently inferior and that their status is relatively fixed. This pattern of beliefs may contribute to increased prejudice and desire for social distance from the low-status groups in question. Indeed, adults hold more essentializing *and* stigmatizing attitudes towards people who have been disabled since birth (reflecting biological origins) than towards people who acquired a disability (e.g., due to an accident; Bogart et al., 2018). One possibility is that children’s essentialist beliefs about disability will affect their receptiveness to the social model’s emphasis on external explanations for disabled people’s disadvantaged position in society. It is also possible that teaching children about the social model of disability (e.g., by highlighting the external factors that contribute to the inequalities experienced by disabled people) will reduce their essentialist beliefs about disability.

3.2.3. Adult testimony

Providing children with information about structural explanations for the challenges faced by disabled people does not mean that they will take up that information or that it will change their attitudes or beliefs about disability. If children believe by default that disabled people face challenges because of individual impairments, then testimony that highlights society’s role in dis-enablement (Montgomery, 2012) may not be enough to shift children’s beliefs. Indeed, although children are often willing to accept testimony from trusted adults and in-group members (Corriveau & Harris, 2009; Elashi & Mills, 2014), testimony that conflicts with something one already believes can be difficult for children to believe (Harris et al., 2018). For example, Jaswal (2004) showed that 4-year-olds were more reluctant than 3-year-olds to accept that a dog-like animal was a cat, a finding that may reflect the greater experience that 4-year-olds compared to 3-year-olds have with the range of possible dogs and cats (see also Naigles et al., 1992).

One way to circumvent this challenge is to ensure that children are exposed from the very beginning to testimony that points out ways in which disabled people’s challenges can be caused by external factors—through books, media, and adult testimony. Teaching children about external sources of inequality from a young age has long been suggested as a way to decrease children’s intergroup prejudice towards low-status groups (for reviews, see Elenbaas et al., 2020; Peretz-Lange, 2021). School-aged children are aware of status disparities between people of different racial groups and genders (Bigler et al., 2008; Hawkins, 2014; Rizzo & Killen, 2020). Without information to the contrary, they are likely to attribute these disparities to inherent characteristics of the groups themselves, due in part to children’s reliance on the inheritance heuristic and tendencies to engage in essentialist thought (Bigler & Liben, 2007; Bigler & Wright, 2014; Cimpian & Salomon, 2014).

For instance, children as young as six years old are more likely to rate boys than girls as inherently brilliant (“really really smart”) and as well-suited for tasks involving high cognitive abilities, although the disparities between men and women’s representation in fields that emphasize brilliance are largely due to gender biases (Bian et al., 2017, 2018; Leslie et al., 2015). As others have argued, talking openly with young children about bias and discrimination (along with other external sources of inequality) and explicitly incorporating this content into media such as TV programs and books, is likely to improve their awareness of unequal structures. It also has the potential to interrupt their tendencies to infer essentialist explanations for such inequalities, thereby improving their attitudes towards members of marginalized groups (Bigler & Wright, 2014; Killen & Rutland, 2011).

3.2.4. Adults’ attitudes

Another potential barrier to children’s receptiveness to the social model is the dominant views of adults around them. Certainly, children are influenced by adults’ explicit remarks about social groups, even when such remarks are directed to someone else. For instance, 7- to 9-year-old children who overheard an adult disparage a novel outgroup were less willing to be friends with a member of that group and rated the group more negatively than children who did not hear negative information about that group (Conder & Lane, 2021). Parents’ beliefs are likely to be especially influential in shaping children’s beliefs, including their beliefs about disability. Indeed, children’s social attitudes often reflect those of their parents (Degner & Dalege, 2013). In the earlier described study by Meloni et al. (2015), how much parents agreed with the medical model option on forced-choice questions predicted children’s agreement with the medical model (and disagreement with the social model).

Children are also influenced by adults’ views, even when these views are not explicitly or intentionally communicated to them. Even the implicit use of groups as a basis for segregation (e.g., physically separating students into different classrooms according to social categories such as race or gender) can serve to make some social groups more salient, drawing children’s attention to those groups and leading them to attempt to identify important differences between the groups (Bigler & Liben, 2007). Accordingly, even if

adults do not make explicit statements about disabled children, separating disabled children from non-disabled children in educational settings could make disability a salient category for children and lead them to make inaccurate inferences about why disabled children differ from non-disabled children.

3.2.5. Type of disability

Children's beliefs about disability may vary by the type of disability in question; accordingly, children may be inclined to adopt social model beliefs in reference to some disability groups more readily than others. Bigler and Liben (2007) suggest that "perceptual discriminability" (i.e., the degree to which a group of people is perceptually distinct and identifiable) and explicit attributions from adults can both contribute to the likelihood that children will develop prejudice against some groups more than others. In the case of disability, non-physical disabilities such as intellectual and developmental disabilities are both less perceptually discriminable – i.e., may be less apparent to children (especially young children) – and are less likely to be discussed by adults than physical disabilities are (Innes & Diamond, 1999). Both of these factors could lead children to develop beliefs and attitudes about physical disabilities earlier (Diamond & Hestenes, 1996; Diamond & Huang, 2005) and to demonstrate more negative attitudes towards peers with physical than non-physical disabilities (Bigler & Liben, 2007). On the other hand, however, some studies have found that children hold more *positive* attitudes towards peers with physical than non-physical disabilities (Nowicki, 2006; Werner et al., 2015), perhaps in part because adults' explicit comments about these disabilities provide children with an explanation for disabled peers' characteristics or behaviors that children perceive to be unusual (Campbell et al., 2004; Sargent & Jaswal, 2022; Weiner, 1993).

Therefore, depending on their age and prior exposure to information about disability, children may be less receptive to social model explanations for physical disabilities (about which they may have prior medical model beliefs) than non-physical disabilities (about which they may be less likely to have prior beliefs). Future research should investigate whether children do indeed apply the medical and social models differently to different kinds of disabilities, and whether individual differences in these model beliefs influence children's receptivity to social model explanations for disabilities.

3.2.6. Disability identity

Among disabled children, disability identity is a factor that may *facilitate* the degree to which children agree with social model beliefs. With few exceptions, research on children's understanding of disability tends to focus on the perspectives of children without disabilities (but see Connors & Stalker, 2007). It seems plausible that disabled children as a group have different attitudes towards disability than do their nondisabled peers, in line with their direct lived experiences. Among disabled adults, the degree to which one identifies with the disability community (e.g., viewing disability as central to one's identity) also predicts greater likelihood to support other concepts that are in line with the social model of disability, such as disability rights, disability pride, and adopting civil rights approaches to social change (Nario-Redmond et al., 2012). Adapting disability identity scales used with adults (e.g., Nario-Redmond et al., 2012) to create a child-appropriate disability identity scale could provide a useful method to investigate children's disability identity both on its own and as a tool to measure within-group individual differences in disabled children's support for the social model and its related concepts (for an example of an analogous ethnic-racial identity scale developed for children, see Williams et al., 2021).

3.2.7. Cultural beliefs

It is worth noting that most of the limited research relevant to children's models of disability comes from Western cultures, where the medical model is dominant. Cross-cultural research will be an important way to identify the degree to which identified patterns (e.g., of default beliefs reflecting the medical model followed by increased social model agreement across age) are generalizable across cultures or are shaped by the dominant disability models of a child's immediate environment (for a review, see Babik & Gardner, 2021). Indeed, the social and medical models of disability are not the only frameworks used to understand and explain disability. For instance, people who adhere to the "moral" or "religious" model of disability may believe that people experience disabling conditions as a result of demon possession, punishment from moral failings, a curse, or sometimes as a gift from God (for review, see Nario-Redmond, 2019). The religious model remains an influential explanatory framework in many cultural communities and sub-communities, ranging from Native American tribes in the U.S. to some groups in Southeast Asia (Braddock & Parish, 2001; Groce & Zola, 1993). Accordingly, the moral or religious model may be an important one in some children's perceptions of disability and warrants closer investigation in future research on children's disability model beliefs.

4. Conclusion

Negative attitudes towards disabled children, especially among their non-disabled peers, present a significant barrier to their social inclusion and acceptance (Freer, 2023). Research on children's attitudes towards disability has the potential to inform important interventions and policies to improve disabled children's social status, but explicit attention to the external, social structures that impact disabled children's lives has been notably limited in the published literature on children's disability concepts thus far. The social model, an influential model in disability studies and advocacy (Finkelstein, 1980; Oliver, 2013), has the potential to create lasting change and impact in the study of children's attitudes and beliefs about disability. Developmental scientists informed by the social model will be prepared to raise new questions about children's social model beliefs (including their predictors and consequences) and consider how raising support for the social model may improve not only interpersonal attitudes, but also support for policies and systems change to benefit disabled children as a group.

CRediT authorship contribution statement

Robertson Zoe S.: Writing – review & editing, Writing – original draft, Conceptualization. **Jaswal Vikram K.:** Writing – review & editing, Conceptualization.

Declaration of Competing Interest

We have no conflict of interest to declare.

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