Becoming Us and Them:
Social learning and intergroup bias

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Abstract

In recent years, research has demonstrated that the basic features of prejudice and discrimination emerge early in children's development. These discoveries call into question the role of social learning in intergroup bias. Specifically, through what means do we learn to distinguish "us" from "them"? Here we explore this question, focusing on three key issues: how children respond to biased information they receive from others, how children selectively seek out certain types of biased information, and how children communicate biased information to others. We close by discussing the implications of this research for interventions to reduce stereotyping, prejudice and discrimination.

Becoming us and them: Social learning and intergroup bias

Intergroup bias remains a powerful and destructive force in the contemporary world. Even in ostensibly open societies, stigmatized groups face discrimination in employment, housing, and the law (e.g., U.S. Census Bureau, 2011; Goldin, 2014). The many forms of prejudice and discrimination leave their mark on individuals' minds and bodies via chronic stress and even outright violence (Pascoe, & Smart Richman, 2009; Townsend, Major, Gangi, & Mendes, 2011). At a global level, intergroup conflict fuels wars within and between countries and prevents cooperation on pressing environmental concerns (Biliuc, McGarty, Thomas, Lala, Berndsen, & Misajon, 2015). Recent political trends across the globe suggest that these problems are not abating and may, in fact, be on the rise (e.g., Hainsworth, 2016). Given the serious costs of intergroup bias, it is imperative that we understand its nature and origins.

Research reveals that the psychological origins of intergroup bias appear early in development. Before the age of five, children show consistent preferences for members of their own gender (Shutts, Banaji, & Spelke, 2010; Shutts, Roben, & Spelke, 2013), race (Baron & Banaji, 2006) and language group (Kinzler, Dupoux, & Spelke, 2007). These preferences are inextricably linked with discriminatory behaviour. Young children are typically more likely to help and share with members of their own social groups (Buttelmann & Boehm, 2014; Killen & Verkuyten, 2017; Over, 2018) and to avoid and even betray members of other groups (Misch, Over, & Carpenter, 2015; Oostenbroek & Over, 2016). Negative stereotypes surrounding specific social groups are learned by the early school years and constrain children's estimates of their own potential (Bian, Leslie, & Cimpian, 2017; Liben, Bigler, & Krogh, 2001).

In this paper, we revise and extend social learning accounts of intergroup biases, discussing the ways in which social learning contributes to the origins of these social problems. Previous accounts differ in the weight they place on social learning, with some theorists suggesting that it can account for a wide range of phenomena in this area (Allport, 1954; Devine, 1989) and others arguing for a more restricted role, suggesting that it provides 'fine tuning' for early emerging

processes of categorisation and reasoning (Aboud, 1988; Dunham, Baron, & Banaji, 2008). Delineating the ways in which learning does and does not contribute to intergroup bias is essential for identifying when and how interventions can reduce the prevalence of these social problems (Paluck & Green, 2009).

Traditional social learning accounts of intergroup bias and their critics

Social learning accounts of intergroup bias have deep roots in social psychology, dating back at least as far as Allport (1954). The idea that social learning was important gained increasing support with the work of Bandura (1977) who showed that children learn social behaviours such as aggression from observing other people. It has been argued, by extension, that prejudice, stereotyping, and discrimination could also be learned from observing others (Smith & Mackie, 2007). Early socialisation accounts were very influential in developmental psychology, particularly in applied domains, but they also proved controversial. Criticism of these accounts haven taken a number of different forms.

Maturational accounts suggest that intergroup bias is primarily the product of immature reasoning abilities rather than social learning. One of the most influential maturational theories has been offered by Aboud (1988; Aboud & Doyle, 1996) who argued that intergroup bias is a product of young children's difficulties with multiple categorisation and their tendency to engage in egocentric and rigid thinking (Aboud, 1988). These immature reasoning abilities, she argues, explain the apparent peak in explicit prejudice in middle childhood. However, maturational accounts alone cannot explain the prevalence of prejudice and discrimination among adults. Nor can they explain the stability and persistence of implicit biases across development (Dunham et al., 2008).

Evolutionary accounts have sought to explain the prevalence of intergroup bias among both children and adults. According to these accounts, humans have an evolved tendency to seek out ingroup members as potential co-operators (Fishbein, 1996; Lewis & Bates, 2010; Tomasello, 2016). In support of a role for innate architecture, twin studies have shown that monozygotic twins show

greater concordance in terms of ingroup favouritism than do dyzgotic twins (Lewis & Bates, 2010). Further evidence used to support these claims comes from research with infants showing that they seem to prefer members of their own groups before they have had extensive opportunities to learn about their historical and cultural significance (Bar-Haim et al., 2006; Conway & Schaller, 2007; Kinzler, et al. 2007; Mahajan & Wynn, 2012).

Finally, researchers within the social identity tradition typically focus on the importance of social categorisation as an explanation for intergroup bias rather than social learning (Tajfel, 1970; Turner, 1999). According to this perspective, intergroup bias emerges as a natural result of categorising self and other in group terms. In support of this claim, empirical research using the minimal group paradigm has shown that learning about a particular group is not necessary for intergroup biases to emerge. Ingroup preference and discriminatory behaviour can be quickly induced in both children and adults from an arbitrary and apparently meaningless distinction, for example dividing individuals into two groups on the basis of a coin flip (Dunham, Baron, & Carey, 2011; Tajfel, 1970; Turner, 1999).

Revisiting social learning accounts

Research demonstrating the existence of early emerging biases and the powerful effects of categorisation has led some researchers to question whether social learning plays a significant role in the development of intergroup bias. However, these findings are not incompatible with a substantial, additional role for learning (Bigler & Leaper, 2015; Bigler & Liben, 2007; Gelman et al., 2004; Kashima, 2008; Rhodes, Leslie, and Tworek, 2012). Children grow up in rich social environments. Intergroup bias is situated within a broad legal, political and economic context. It would be surprising if the cultures children inhabit did not substantially shape the ways in which intergroup biases manifest in the individual. Social learning accounts offer us the opportunity to understand these cultural influences on children's intergroup psychology.

Several sources of empirical evidence support the notion that social learning plays an important role in the origins of intergroup bias above and beyond the effects of categorisation and early emerging biases. First, culture level differences determine which groups are positively and negatively evaluated. For example, whereas divisions based on religion may be more salient in some cultural contexts, divisions based on race and social class are more common in others (Segall, Birnbaum, Deeb, & Diesendruck, 2015). Related to this, the nature of any given individual's biases varies across the particular groups in question. An individual may have an equally negative attitude towards African American men and Syrian refugees, but the content of their stereotypes about those groups is likely to differ (e.g., Operario & Fiske, 2001). Second, correlational research suggests that there is cross-generational similarity in the intergroup attitudes of parents and their children. A recent meta-analysis of over 45,000 parent-child dyads suggests a moderate and positive relationship between the attitudes of parents and those of their children (Degner & Dalege, 2013). Although causal inference remains a challenge with correlational data, social learning is a plausible explanation for this association. Third, we know from research in other domains that children are prolific social learners (Fridland & Moore, 2014; Over & Carpenter, 2012; 2013). Indeed, in the domain of tool use, children are so keen to learn from other people that they do so even at the expense of performing a task efficiently (Nagell, Olguin, & Tomasello, 1993; Horner & Whiten, 2005; Lyons, Young, & Keil, 2007). Taken together, this evidence requires us to consider whether the role of social learning in the development of intergroup bias may have been underestimated (Oostenbroek & Over, 2016).

The key question for the field is not so much *whether* social learning influences the development of intergroup bias but rather *how* it influences the development of intergroup bias and how it interacts with other cognitive constraints (Bigler & Leaper, 2015; Bigler & Liben, 2007; Gelman et al., 2004; Over, Eggleston, Bell, & Dunham, 2017; Over & Cook, 2018; Rhodes, et al., 2012). Experimental research directly investigating this question is relatively rare. However, important sources of evidence do exist. In the remainder of this paper, we discuss experimental research that speaks to this question.

What features of bias could be socially learned?

To begin discussing the role of social learning in more depth, it is necessary to map out the types of information that children might attend to when observing others and reproduce in their own interactions (Carpenter & Call, 2002; Oostenbroek & Over, 2016). First, children may learn that a particular social division exists and carries social meaning (Tirell, 2012). For example, a child may learn that skin colour marks meaningful divisions between social groups in many Western cultures whereas eye colour typically does not (Bigler & Liben, 2007). Second, children may learn to associate particular traits, activities, roles and occupations with particular social groups (Devine, 1989; Over & Cook, 2018). To the extent that children rigidly apply these generalisations about particular social groups throughout development, they will have learned cultural stereotypes (e.g., Lurye, Zosuls, & Ruble, 2009). Third, children may learn a particular attitude towards a social group from observing or listening to others. To the extent that they learn a negative attitude towards another social group, they would have learned to be prejudiced. Finally, children may learn a norm or social rule about the appropriate way to treat a social group. To the extent that they learn to treat some social groups more favourably than others, they would have learned to discriminate. Of course in the real world, stereotypic beliefs, prejudiced attitudes and discriminatory behavior are closely intertwined. Nevertheless, these distinctions provide valuable constructs for understanding the possible mechanisms underlying intergroup bias (Dovidio et al., 1996).

Early social learning accounts of intergroup bias have sometimes been criticized, perhaps unfairly, for assuming that social learning takes the form of simple mimicry in which children automatically reproduce the attitudes and behaviours of their parents (Aboud & Doyle, 1996). In reality, the relationship between what children observe and what they learn, however, is considerably more complex. It is clear from research in the domain of tool use that social learning need not simply be a case of mimicking or passively absorbing information from others (Meltzoff, 1995; Over & Carpenter, 2012). Social learning can also involve active interpretation of social situations and making inferences from limited data (Carpenter, 2006; Gergely, Bekkering, & Király, 2001; Meltzoff, 1995; Over &

Carpenter, 2012). Applying this observation to intergroup psychology, we can reason that a child may observe discriminatory behaviour and infer that a particular attitude is appropriate towards that group. Alternatively, a child may learn an attitude from another person and then extrapolate what behaviours are justified by that attitude (Oostenbroek & Over 2016; Tirrell, 2012).

Conceptualising the social learning process

How might we best conceptualise the social learning process? Traditional social learning accounts have tended to focus on how adults, most typically parents, communicate information about social groups to their children (Bandura, 1977; Degner & Dalege, 2013). This is an important aspect of social learning but it is not the only one. In order to consider the role of social learning in more depth, we broaden the focus by posing three questions. First, and most closely related to the majority of previous research, how do children respond to and internalize information about social groups that is presented to them by others? In order to address this question, we analyse social psychological research on how prejudice is expressed in language and behavior and developmental research on how children respond to these biases. Second, what types of information do children seek out about social groups? In order to address this question, we discuss recent work on children's model preferences and information selection biases. Third, how do children transmit intergroup biases to others? In order to address this question, we discuss an emerging body of research on children's own communication of prejudice and discrimination (see Figure).

Question 1: How do children respond to and internalize information about social groups that is presented to them by others?

The first step towards understanding the cultural transmission process is to understand the ways in which individuals communicate their stereotypes, attitudes and support for discriminatory social norms and behaviour to children. Below we outline social psychological research on how intergroup biases express themselves in communication, and developmental research on how these different ways of expressing intergroup biases influence children's attitudes and behavior. For ease of exposition, we structure this discussion of

the existing literature into four subsections centred around the acquisition of group distinctions, stereotypes, prejudice and discrimination.

Group distinctions. In any given society, some social distinctions are marked as significant whereas others are not. Researchers have investigated the types of environmental input that might lead children to interpret some dimensions of variability as more important than others and to treat them in categorical terms. Bigler and Liben (2006) have pointed out that children often observe de facto segregation between groups, for example, in the neighbourhoods in which they live or in the structure of their peers' relations. As a result, they might infer that a particular distinction, like skin colour, is socially important. In some societies, social distinctions between groups will be more clearly marked than others. For example, they may be highlighted by clothing choice and other forms of body adornment.

Individuals may also communicate the relative significance of social divisions more subtly through their behaviour and language. For example, parents within Western societies regularly draw attention to gender distinctions. Even in infancy, toys and clothing are regularly gender specific (Bigler & Leaper, 2015). With growing linguistic competence, children become more vulnerable to verbal means of marking social divisions. This could involve directly contrasting one group with another but it could involve something as simple as using labels to refer to particular groups (Bigler & Liben, 2006; Tirrell, 2012). Gelman et al. (2004), for example, investigated how mothers talk to their children while discussing a picture book and found that parents often mark the gender of the characters by labelling drawings of children as little boys and little girls. The extent to which adults mark a particular social category appears to be influenced by the extent to which they believe that category is important. Segall et al. (2015) investigated the language Jewish Israeli parents' used to talk to their 5-year-old children about religious groups. They found that parents who were the most opposed to negotiations with Palestinians were also the most likely to mark ethnic categories in conversation with their children. The degree to which a child encodes these category-based differences is likely to have a significant effect on

their own intergroup biases. As other developmental research has shown, once children categorise themselves as belonging to a particular group, preferences and discriminatory behaviours follow (Bigler & Liben, 2007; Dunham et al., 2011).

Stereotypes. Children within Western cultures are exposed to a considerable amount of stereotypical information from the broader cultural context. Research within linguistics and communication has shown that stereotypes are often present in various forms of media designed specifically for children. One example of this is stereotype consistent representations of gender roles in children's books. Crabb and Bielawski (1994) investigated presentations of gender in Caldecott Award children's books, typically read by children up to the age of 14, published between 1937 and 1989 in America. Females were shown more often using household artefacts and males were shown with non-domestic artefacts. Interestingly, there was no change in this trend over time, suggesting that at least during the latter part of the twentieth century, advances made by women in American culture and the workforce were not necessarily reflected in the information communicated to children. More recently, Hamilton, Anderson, Broaddus, and Young (2006) analysed 200 best-selling children's books in America and found that females were more often presented in nurturing roles than were males and were more often seen inside the home rather than outside. Depictions of occupations were also gender stereotyped, with more females appearing to have no occupation outside the home. A comparison of this sample of books to samples of books from the 1980s and 1990s suggested that there had been no reduction in stereotypical content over time. Other research has shown that this type of environmental input influences children's endorsement of stereotypes. Flerx, Fidler, and Rogers (1976) reported that when 4- and 5-year-old children were exposed to gender egalitarian storybooks, it reduced their gender stereotyping. Generalising from data as these, Schau and Scott (1984) suggest that, throughout development, exposure to gender bias in children's books leads to less flexibility in views of gender roles compared to exposure to more egalitarian material.

Adults may also communicate stereotypes to children through their conversation. A body of developmental research has investigated the role of generic language in children's intergroup bias. Generic language involves talking about typical qualities of a given group. For example, generic statements might describe apparent truths such as 'girls like dolls' or 'Americans are friendly' (Gelman et al., 2004). Research has shown that hearing generic language about a social group encourages children to hold essentialised beliefs about that group whereby they come to think that all individuals from a group possess a basic and unchangeable quality or 'essence' (Gelman, et al. 2004). In a particularly elegant demonstration of this, Rhodes et al. (2012) introduced 4-year-old children to a novel group called Zarpies through a picture book. The individuals in this book were either described with generic language (e.g., 'Zarpies are scared of ladybugs') or nongeneric language (e.g., 'This Zarpie is afraid of ladybugs'). Children who heard the generic descriptions came to hold essentialised beliefs about the 'Zarpie' group, thinking that members of that group shared a deep underlying nature. Because Rhodes and colleagues used novel groups to which children were not themselves assigned, they could conclude that generic language alone was sufficient to generate these essentialised beliefs in children.

Prejudice. Other research has investigated how individuals might communicate prejudiced attitudes to children. Traditional social learning accounts tended to focus on the effect of hearing explicitly negative statements about stigmatised social groups (Dalhouse & Frideres, 1996). The explicit expression of prejudice is presumably common within certain subgroups and cultural contexts making this an important topic of investigation (Hainsworth, 2016). However, in lab-based studies, parents rarely express explicitly prejudiced attitudes in conversation with their children (Gelman et al., 2004). Furthermore, at least within the West, the explicit expression of prejudice is often actively discouraged. Nevertheless, prejudiced attitudes can still be communicated to children. Extensive social psychological research has demonstrated that prejudice can 'leak' into subtle aspects of language and behaviour (McLoughlin & Over, 2017; Werkman, Wigboldus & Semin, 1999).

Recent research has suggested that observing subtle manifestations of prejudice can influence children's intergroup attitudes. One route by which this can occur is through observing the nonverbal behavior of individuals engaged in intergroup interactions (Weisbuch, Pauker, & Ambady, 2009). Whereas interactions with ingroup members are typically marked by positive non-verbal signals such as smiling, eye contact and physical proximity, interactions with outgroup members may be marked by fewer signs of positivity (Weisbuch et al., 2009; Word, Zanna, & Cooper, 1974). Developmental research has shown that observing biased non-verbal behavior can influence children's attitudes towards members of certain social groups. Castelli, Dea and Nesdale (2008) presented 3- to 6-year-old white children with videos in which a black person interacted with a white person. The nonverbal behaviour of the white person was manipulated such that they either displayed easiness (high eye contact and physical closeness) or uneasiness (distance and avoidance of eye contact). These nonverbal cues influenced children's attitudes towards the black individual, and towards other, unconnected, black individuals, such that they were judged less positively following exposure to nonverbal signs of uneasiness. These findings have recently been extended by Skinner, Meltzoff and Olson (2016) who demonstrated that observing negative non-verbal behaviour towards a stranger is sufficient in and of itself to lead children to hold a negative attitude towards that person and towards that person's friends. More applied research on vicarious contact lends further support to the claim that observing intergroup interactions influences children's own intergroup attitudes. For example, Cameron, Rutland, Brown and Douch (2006) found that reading stories depicting intergroup friendships to 5- to 11-year-old English children led them to have more positive attitudes towards refugees.

Discrimination. Social learning may also influence children's willingness to engage in discriminatory behaviour. The processes by which discriminatory behaviour is learned may be at least partially separable from the processes by which negative intergroup attitudes are learned. In principle, children could learn a discriminatory norm without having a negative attitude towards a particular group (Killen & Verkuyten, 2017). The role of social learning in the

acquisition of discriminatory behaviour has been investigated within the context of resource distribution. Olson, Dweck, Spelke and Banaji (2011) presented 3- to 11-year-old (predominantly white) children with stories in which one social group received more resources than another. The influence of these stories on children's own resource distribution was then measured by giving them the opportunity to distribute additional resources to new members of these same groups. When distributing between an Asian person and a White person, children followed the example in the story and unfairly favoured the White person. Interestingly, when distributing between a Black person and a White person older children rectified the unfair distribution from the story, distributing more resources to the Black person. This flexibility in response is argued by the authors to be the result of socialisation practices emphasising the importance of rectifying discrimination experienced by Black people within the USA.

Question 2: What type of information do children seek out about social groups?

So far, we have discussed how intergroup bias may be transmitted from parents, teachers and other models to children. In each of the examples discussed above, the direction of influence is from the broader cultural context to children. This form of cultural transmission is clearly important. However, it is not the whole story. Social learning accounts are sometimes criticised for assuming that children are merely 'blank slates' onto which the effects of learning slowly accumulate (Aboud, 1988). However, social learning accounts need not be committed to this assumption of passivity. In order to understand the social learning process, we also need to understand how children themselves engage in and influence learning situations (Degner & Dalege, 2013). One important aspect of this relates to which information children choose to learn. Research on children's learning about the physical world has shown that they make choices about whom to learn from based on their previous reliability, apparent prestige, age, and the nature of their personal relationship with them (Chudek, Heller, Birch, & Henrich, 2012; Harris, 2007). This selectivity in social learning is typically referred to as 'model choice'.

The topic of model choice has not been widely investigated within the domain of intergroup bias. However, one relevant set of studies has been conducted by Over and colleagues. Over et al. (2017) investigated whether children prefer to learn from models who are biased in favour of their own group. Over and colleagues allocated 5- and 6-year-old children to one of two groups and then presented them with a choice between which of two stories they wanted to hear. Whereas one of the authors was described as favouring their own group and disfavouring the other group, the other was described as favouring the other group and disfavouring children's own group. In two studies, children showed a strong tendency to choose to hear the story that favoured their own group. Furthermore, hearing the ingroup favouring story led to an increase in children's intergroup bias, suggesting that children were choosing the raw material from which to furnish their own intergroup attitudes. In this sense, children's own choices set into motion a feedback loop. A further study demonstrated that children prefer ingroup favouring information even to balanced, unbiased information (Over et al., 2017). This bias in information seeking can be viewed as a simple form of niche construction in which children create situations where they are more likely to be exposed to some types of information than others (Flynn, Laland, Kendal, & Kendal, 2013). It is important to consider how this bias might operate across development. As children grow older, they have increasing scope for choosing the information they consume and, once they engage in extensive activities online, this scope for choice expands (and becomes yet more difficult to supervise) (Kahan et al., 2012).

Question 3: How do children transmit intergroup biases to others?

In order to understand the cultural transmission process, it is necessary to appreciate that children are not only the recipients of cultural transmission, but agents of cultural transmission with the potential to communicate prejudice and discrimination to others (Over et al., 2017). Children may exert a systematic influence over the attitudes and behaviour of their peers and perhaps even over those of their parents (Bigler & Liben, 2007; Degner & Dalege, 2013; Harris 1998; Paluck, 2016). There is relatively little experimental research on how children communicate intergroup bias to others, perhaps because research has

tended to focus primarily on children as recipients of social information. However, it is possible to piece together some important evidence relating to how children communicate to others about social groups.

Stereotypes. Research suggests that children sometimes explicitly communicate stereotypes to the individuals around them. For example, they may directly enforce stereotype consistent behaviour on their peers. We know from research in other domains that, from at least the age of 3, children regularly enforce adherence to conventional norms on others (Rakoczy, Warneken & Tomasello, 2008). This tendency extends to policing activities that are typical of the group (Killen & Rutland, 2011). Taking the example of gender, Fagot (1977) investigated 3- and 4-year old children's reactions to gender counter-stereotypical behaviour among their peers. She found that children criticised boys for engaging in stereotypically feminine behaviours

Children may also inadvertently communicate stereotypes to their peers through other aspects of their behaviour. One way in which this can occur is simply by repeatedly acting in line with cultural stereotypes, thus providing models of culturally typical behaviour. This can again be illustrated through adherence to gender stereotypes. Banerjee and Lintern (2000) demonstrated that 4- to 6-year-old boys conform to gender norms and do so more often when they are being observed by their peers than when they are in private. By engaging in reputation management in this way, they provide models of normative behaviour to those around them. Moreover, the fact that they are more likely to exhibit normative behaviour in the presence of others suggests that they may behave in stereotype consistent manner, thus providing stereotypical models of behaviour to others, even when they do not necessarily endorse those stereotypes themselves.

Prejudice. Children may also communicate intergroup attitudes to their peers. One way in which this can happen is through explicit choices relating to what information other individuals hear or read. Over and colleagues (Over et al., 2017) investigated whether 5- to 6-year-old children seek to communicate biased information about social groups to others. They allocated five- and six-

year-old children to one of two minimal groups and then asked them which story they would like another child to hear – one that was biased in favour of the participants' own group or one that was biased in favour of the other group. The majority of participants preferred the other child to hear information that was biased in favour of their own group. This study suggests that children sometimes make explicit choices to communicate biased information to others. One possible mechanism for this is a desire to manage the reputation of their social group, which is present from at least the age of five in children from Western cultural backgrounds (Engelmann, Herrmann, & Tomasello, 2017).

Intergroup biases may also be communicated more subtly, and perhaps even inadvertently, through language. One interesting topic within this general domain is the use of dehumanizing language (Haslam & Loughnan, 2014; Leyens et al., 2000). Related to this, McLoughlin and Over (2017) investigated how 5- and 6-year-old children spontaneously describe the actions of ingroup members and outgroup members. They found that children refer to mental states, such as what individuals believe, think and feel, less often when talking about members of an outgroup. This effect held across two different types of group division – those based on gender and nationality. It remains for future research to determine whether hearing language of this sort influences children's attitudes and behaviour (McLoughlin & Over, 2018).

Discrimination. Very little research has directly investigated how children might communicate discrimination or support for discrimination to other people. However, to the extent that children engage in discriminatory behaviour themselves, they provide models for their peers of how to treat members of different social groups. We know from previous research that, within lab-based settings, children typically distribute more resources to members of their own group (Dunham et al., 2011; Over, 2018), offer more help to members of their own group (Sierskma, Thijs, & Verkuyten, 2014) and show loyalty to members of their own group (Misch, Over, & Carpenter, 2015). In addition to modelling discriminatory behaviour, children may also provide models of passivity in the face of other people's discriminatory behaviour, failing to intervene to encourage

more egalitarian relations (Ploetner, Over, Carpenter, & Tomasello, 2015). The observation that children influence those around them has important applied implications because it suggests that the effects of intervening to modify the behaviour of certain individuals within a social network may spread to other individuals within that network (Paluck & Green, 2009; Paluck, Shepherd, & Aronow, 2016). This is an issue to which we return below.

Implications for interventions

For many researchers, the academic study of intergroup bias is intimately connected with the desire for research-led interventions to reduce prejudice and discrimination. Different theoretical perspectives on the development of intergroup bias suggest different routes to intervention. Social problems as complex as prejudice and discrimination require a concerted effort from different approaches and, of course, different academic disciplines. Psychological interventions that stem from a social learning perspective have typically sought to contribute to this mission by emphasising the importance of modifying the cultural input available to children, for example supporting egalitarian or counterstereotypic models (Schau & Scott, 1984). The research we have highlighted in this review suggests some important considerations for future interventions. First, research in this field demonstrates the importance of modifying subtle expressions of stereotypes, prejudice and discrimination in children's media as well as their more explicit expressions. It also suggests, however, that modifying the available cultural input is not enough to ameliorate these social problems. If children are uninterested in egalitarian material or models, their potential to modify attitudes and behaviour will remain unfulfilled (Over et al. 2017). Thus interventions also need to consider how children can be encouraged to read and engage with egalitarian material and how the materials themselves can be constructed to be more appealing. Beyond these observations, social learning accounts make one further contribution to the interdisciplinary mission to reduce intergroup bias. Understanding how egalitarian attitudes and behaviour can spread through children's social networks can help broaden the scope of interventions, making them both more powerful and more cost effective. For example, Paluck and colleagues used social

network analyses, and particularly understanding of which models are the most influential, to encourage the spread of interventions among high school students (Paluck et al., 2016). This exciting new approach suggests that bias reduction may flourish on its own once the seeds are sown.

Conclusions

The picture that emerges from this review is one in which social learning shapes children's intergroup beliefs, attitudes and behaviours. Just as children learn about the physical world through other people (Carpenter & Call, 2002; Meltzoff, 1995) so too do they learn about the social world. In making this argument, we do not seek to minimise the contribution of other factors. Social learning clearly interacts with other cognitive processes. It is guided and constrained by innate patterns and the more general effects of categorising oneself as part of a group. Social learning is sometimes presented as an alternative to evolutionary or self-categorization accounts but we reject this dichotomy. Social learning can help explain how the boundaries and associations of specific categories are constructed within a given individual and how that construction is influenced by the environment. Social categories and the cognitive mechanisms that support them can, in turn, shape children's subsequent learning (Bigler & Liben, 2007; Gelman et al., 2004; Oostenbroek & Over, 2016; Rhodes, et al. 2012).

We have offered a social learning account of intergroup bias that, like traditional social learning accounts, emphasizes the cultural environment as an important contributing factor to intergroup bias. We have added to this tradition by incorporating recent advances in developmental and social psychology. For example, we have highlighted the effects of subtle expressions of intergroup biases as well as more explicit forms of communication (Weisbuch et al., 2009; Skinner et al, 2016). In addition, we have emphasised work demonstrating that social learning is not restricted to simple mimicry (Over et al., 2017). Finally, rather than postulating a passive role for the child in the cultural transmission process, we have emphasised that children are active agents who make choices about what information they consume and how they communicate with others (Bigler & Liben, 2007; Paluck et al., 2016).

Attitudes and behaviours towards different groups can be transmitted between and across generations through multiple different mechanisms. Our understanding of these mechanisms necessarily shapes the ways in which we try (or fail) to intervene to prevent or mitigate intergroup bias. Developmental psychology has a critical role to play in identifying effective psychological interventions for reducing prejudice and discrimination in the next generation.

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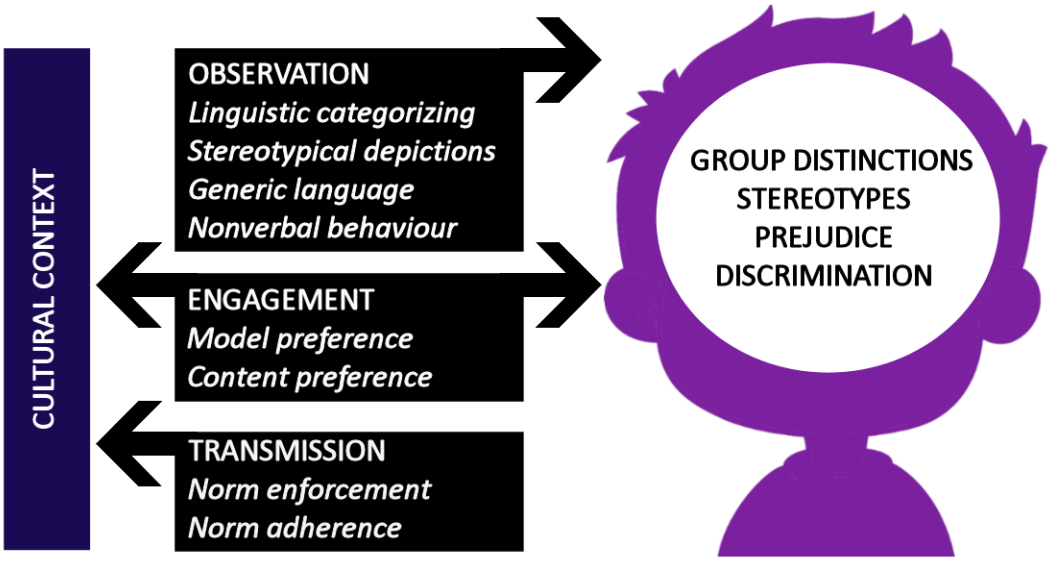

Figure. Examples of social learning processes and the negative consequences that can be the result.