

**Intergroup Biases and Social Preferences**  
**in Children and Adults**

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## Abstract

From early on in development, belonging to social groups is a crucial aspect of human life with wide-ranging effects, including on people's social preferences and prosocial behaviour. What is less well understood, however, is how group processes are affected by the contexts in which they occur. The overarching aim of my doctoral research was to examine important aspects of group membership – intergroup bias, its effects on prosocial behaviour, and leader selection – in context. In the first studies (Chapter 2), I found that ingroup favouritism often trumped concerns for procedural fairness in 6- to 8-year-olds' sharing preferences, especially for younger children and especially when the social context suggested that their sharing choice would not affect their reputation. In the following studies (Chapter 3 and Chapter 4), I investigated changes in intergroup bias and social preferences over the first year and a half of the Covid-19 pandemic in the United Kingdom. During this time, I collected four separate samples (total N = 800). Results of empirical work from Chapter 3 suggest that intergroup bias in group identification and in prosocial behaviour was strongest early on in the pandemic, when perceived threat from the pandemic was also highest, and then declined. In Chapter 4, I found that, contrasting experimental research and research measuring singular threats, the complex context of threat from the Covid-19 pandemic did not lead to systematic increases in preferences for dominant group leaders. Overall, my research shows that social context can affect intergroup biases and social preferences in important ways, but that findings from experimental research and from research from specific social contexts may not always consistently generalize to real-world or different social contexts.

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## Author's Declaration

I, Juliana Luise Olivier, declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

**Chapter 2:** The empirical work presented in Chapter 2 of this thesis is a collaborative work and has been accepted for publication at a peer-reviewed journal:

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All authors contributed to the design of this study. Juliana L. Olivier designed and created the stimuli, and collected and analysed the data under the supervision of Harriet Over and Cade McCall. Bethany Fisher provided reliability coding. Juliana L. Olivier drafted the manuscript and Harriet Over made a number of revisions. All authors approved the final manuscript before submitting it for publication.

**Chapter 3:** The empirical work presented in Chapter 3 of this thesis is a collaborative project of Juliana L. Olivier, Florence Enock, and Harriet Over. All collaborators contributed to the design of the study. Juliana L. Olivier collected, coded, and analysed the data, and drafted the manuscript. Harriet Over and Florence Enock made a number of revisions.

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## Primary Supervisor Statement

I am listed as a co-author on the empirical paper which makes up Chapter 2 of this thesis.

The work is primarily that of Ms. Juliana Olivier. Juliana compiled the relevant stimuli, completed all of the data collection and coded and analysed the data. Juliana wrote the first draft of this paper.

A handwritten signature in black ink, appearing to read 'Harriet Over', with a stylized flourish at the end.

Harriet Over

## Secondary Supervisor Statement

I am listed as a co-author on the empirical paper which makes up Chapter 2 of this thesis.

The work is primarily that of Ms. Juliana Olivier. Juliana compiled the relevant stimuli, completed all of the data collection and coded and analysed the data. Juliana wrote the first draft of this paper.

A handwritten signature in black ink that reads "Cade McCall". The signature is written in a cursive style with a large, prominent 'C' and 'M'.

Cade McCall

## Chapter 1: General Introduction

Belonging to social groups is a crucial aspect of human life. From early on in development, group membership has wide-ranging effects on people's affect, cognition, and behaviour (Fiske, 2002; Hewstone, Rubin, & Willis, 2002; Mackie, Smith, & Ray, 2008; Moradi, Najlerahim, Macrae, & Humphreys, 2020). It affects people's identity as well as their relationships with other people within their groups (i.e., ingroup members) and in other groups (i.e., outgroup members) (Allport, 1954; Tajfel, Billig, Bundy, & Flament, 1971). Given the importance of these topics, a large body of research has sought to illuminate both intragroup and intergroup antecedents and consequences of group membership. Yet, many unanswered questions remain. One important question is how group processes are affected by the contexts in which they occur. The overarching aim of my doctoral research was to examine important aspects of group membership – intergroup bias, its effects on prosocial behaviour, and leader selection – in context. How these aspects of social life are affected by context is an important question to address because, in real life, social preferences and group processes do not occur in a social vacuum but always within a social context. Examining contextual effects, therefore, increases the external validity of research findings and can contribute to identifying boundary conditions for the generalisation of findings from often highly controlled experimental studies to other contexts. Given the extensive body of research that my doctoral studies draw on, this introduction will not be an exhaustive account of the research themes it introduces. It will focus on those aspects of the existing literature which are directly relevant to the hypotheses being tested in my doctoral studies.

I will first introduce the social identity approach. Specifically, I will introduce social identity theory, self-categorisation theory, and the common ingroup identity model. I focus on these theoretical accounts because they became particularly important in the social context in which much of my doctoral research took place, namely the Covid-19 pandemic. These theories gave rise to much hope that, in contrast to existing research that finds that threat tends to lead to increases in intergroup bias, the ongoing pandemic could instead lead to more positive intergroup relations (Dovidio, Ikizer, Kunst, & Levy, 2020; van Bavel et al., 2020). Examining whether this was the case in the context of the Covid-19 pandemic was the aim of one of my doctoral studies (Chapter 3).

Next, I will turn to a potential consequence of group association, namely intergroup bias, and its effects on prosocial behaviour in childhood and in adulthood. Here, I will also

introduce two ways of studying intergroup bias: real-world groups and ‘minimal groups’. Both have unique advantages and disadvantages, and both approaches were used in my doctoral studies. I will then provide an overview of seminal findings on the effects of intergroup bias on prosocial behaviour. I focus on the relationship between intergroup bias and prosocial behaviour because I investigated this relationship in children (Chapter 2) and in adults (Chapter 3) in my doctoral studies.

Lastly, the introduction turns to intragroup processes of leadership and followership. Here, I introduce recent influential theoretical accounts of leadership and followership. Importantly, research suggests that followers’ leader preferences may be contingent on the context, and threats in particular have been found to influence leader preferences (Laustsen & Petersen, 2015, 2017). Contextual effects of pandemic-related threat on preferences for dominant leaders are the topic of my final doctoral study (Chapter 4).

## **Social Identity**

### **The Social Identity Approach**

The social identity approach, which encompasses social identity theory and self-categorisation theory, has been highly influential in research on group processes and intergroup relations (Hornsey, 2008). First developed by Tajfel and Turner (e.g., 1971), social identity theory broadly addresses cognitive, motivational, and social-contextual aspects of group processes but mostly focusses on intergroup relations. While closely related, self-categorisation theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) sought to elaborate on the cognitive processes underlying social identity, addressing both intergroup and intragroup processes. Social identity theory and self-categorisation theory share many of their core assumptions and research methods (Hornsey, 2008) and will be introduced together here.

A core tenet of the social identity approach is that a person’s identity is comprised of not only personal identity, in which one defines the self as an individual, but also social identity, in which the self is defined as a member of salient social groups (Turner & Reynolds, 2012). When personal identity is salient, one may think of oneself with a focus on idiosyncrasies – what makes one unique and sets one apart from relevant others, particularly other ingroup members (Turner, Oakes, Haslam, & McGarty, 1994). In contrast, when social identity is salient, one may focus on the importance of salient group memberships to one’s identity and

define the self based on its perceived similarities with the salient ingroup, in contrast to the outgroup (Turner et al., 1994). For example, in the moment, one may primarily identify (and think of oneself) as transgender, a man, German, European, or as an employee of one's company. Thinking of oneself predominantly as a member of a group in the moment – that is, shifting from personal to social identity – is called self-categorisation. What follows from self-categorisation, according to self-categorisation theory, is depersonalization (Turner et al., 1994). Individuals are thought to view themselves as, and to become, more similar to what they view as a 'typical' group member, a prototype, by acting in accordance with perceived group norms (Hogg, Terry, & White, 1995; Terry & Hogg, 1996). Especially for individuals who identify strongly with a particular group, making social identity salient can even influence their emotional experiences (Mackie et al., 2008; Smith, Seger, & Mackie, 2007). For instance, self-categorisation can enhance individuals' experience of outgroup-directed emotions that are congruent with the salient groups' intergroup relations, such as experiencing more anger towards Muslims when one's identity as an American rather than as a student is salient and experiencing more anger towards the police when one's identity as a student rather than as an American is salient (Ray, Mackie, Rydell, & Smith, 2008).

Importantly, any individual is simultaneously a member of multiple social groups. Predicting which group membership becomes primarily salient in a given context is an important theoretical contribution of the social identity approach to understanding group processes. Which group membership is salient at a given time is postulated to be a function of category accessibility and fit (Oakes, 1987; Oakes, Turner, & Haslam, 1991; Turner et al., 1987). Accessibility here refers to how readily a category can be activated (Turner et al., 1987). Social categories that are frequently activated are chronically more readily accessible than less commonly activated categories. Further, categories that are temporarily made accessible (e.g., through priming) as well as categories that an individual is currently motivated to use are more accessible in the moment (Stollberg, Fritsche, & Bäcker, 2015; Turner et al., 1994). A social category is further thought to be more likely to become salient if it is perceived to 'fit' the situation. This is hypothesised to be the case when a category meets the criteria for comparative fit and normative fit (Turner et al., 1987). According to the meta-contrast principle of comparative fit, a particular category is more likely to be activated if in the moment, perceived intergroup differences are greater than perceived intragroup differences (Turner et al., 1987, 1994). For example, gender may become salient if during a discussion, the differences between women's contributions and men's contributions are more pronounced than the differences

within women's contributions and within men's contributions (Hogg & Turner, 1987). Normative fit is achieved when observations in the moment (e.g., the discussion contributions of present women and men) are congruent with stored category content (e.g., gender-stereotypically associated values, norms, or behaviours) (Turner et al., 1987). What is more, social categories only become socially meaningful in relation to a different group (Haslam, Turner, Oakes, McGarty, & Hayes, 1992; Hornsey, 2008; Turner et al., 1994). That is, the ingroup only has meaning for the self in comparison to an outgroup. Taken together, category salience is not fixed but rather highly flexible and context-dependent. The social identity approach is therefore well suited to making predictions for changes in social identity based on changes in the context.

For the purpose of my doctoral studies, two features of research in the social identity tradition are particularly important: First, the social identity approach emphasizes the context-variability of self-categorisation, and thus, of salient social identity. Second, social identity research has demonstrated that even in the absence of an intergroup history and a rich social context, self-categorisation in a group can give rise to intergroup processes such as intergroup bias (Dunham, 2018; Dunham, Baron, & Carey, 2011; Hornsey, 2008). I return to the second point later in the introduction where I introduce 'minimal groups', which are commonly employed to study the effects of mere group membership. For now, I will turn to particularly relevant aspects of context dependence.

### **Social Identity in Context**

According to the social identity approach, social identity (rather than personal identity) is likely to emerge in intergroup (rather than interpersonal) contexts (Turner et al., 1987). The conceptualization of self-categorisation as inherently comparative further implies that the reference group influences self-categorisation. Research based on the social identity approach has demonstrated this context-variability of social identity (for a review, see Turner et al., 1994). For example, in seminal studies, Haslam and colleagues showed that the content of stereotypes about different national groups varied depending on the group of comparison and that it changed over time (Haslam & Turner, 1992; Haslam et al., 1992). In one study, associations with 'Americans' changed over the course of the Gulf War and depending on which other nationality Americans were compared to (Haslam et al., 1992). What is more, who is considered to be an ingroup and an outgroup member varies flexibly with salient social



identity and with a perceiver's goals in the current context. For example, in contexts of resource scarcity, individuals have been found to categorise fewer ambiguous faces as ingroup members, thereby limiting who receives access to the group's scarce resources (Krosch & Amodio, 2014). Relatedly, experimentally inducing fear has also been found to lead individuals who feel vulnerable to harm to categorise fewer threatening faces as ingroup members for both real-world and novel groups (Miller, Maner, & Becker, 2010). Competitive contexts have also been found to increase social identity salience and intergroup bias (Moradi et al., 2020; Turner et al., 1994), at times even leading to hostility (Sherif, Harvey, Hood, Sherif, & White, 1988).

Self-categorisation theory conceptualizes group memberships as hierarchically structured, based on their levels of inclusivity. For example, a German national identity is more exclusive than that of a native German speaker, which in turn is more exclusive than a European identity, or that as a human. Although such fine distinctions of relative inclusivity of social groups are possible (Hornsey & Hogg, 2000), self-categorisation theory broadly focuses on three levels of inclusivity: a superordinate level (i.e., humanity) compared to non-humans, an intermediate level (i.e., social identity), in which social identity is construed in comparison to other (human) social groups, and a subordinate level (i.e., personal identity) in which interpersonal comparisons define the self (Hornsey, 2008; Hornsey & Hogg, 2000; Turner, 1975). Self-categorisation theory predicts that as the context of comparison is extended to additional and diverse others, self-categorisation also becomes more inclusive (Turner et al., 1994). For example, if in a given context, another nation becomes a salient group of comparison, self-categorisation may shift from an interpersonal comparison level ('me' compared to 'you') to an intergroup comparison at the intermediate level (e.g., 'us' Britons compared to 'them', the French). Such a shift in categorisation inclusiveness leads individuals who were formerly grouped among the 'others' (e.g., other Britons) to become part of the social self ('us' Britons). Former outgroup members can therefore become ingroup members if the context supports such a shift in inclusivity. The common ingroup identity model has aimed to operationalize this prediction as a tool for bias interventions.

### **The Common Ingroup Identity Model**

Based on the social identity approach, Gaertner, Dovidio, and colleagues formulated the common ingroup identity model, which targets prejudice and stereotypes for intervention by altering the inclusivity of self-categorisation through recategorisation (Dovidio, Gaertner,

Anastasio, Bachman, & Rust, 1993; Gaertner & Dovidio, 2000). Recategorising the self at a higher level of inclusivity means that fewer people will then be seen as outgroup members and thus potentially be the target of intergroup bias. By altering the perception of salient group boundaries, positivity towards ingroup members can then be extended to former outgroup members (Dovidio, Gaertner, & Saguy, 2007).

At the superordinate level (i.e., humanity), all humans are included in the salient ingroup. Such superordinate recategorisation may allow groups to avoid the common negative consequences of salient intergroup distinctions, such as intergroup bias, while preserving the positive effects of group membership, such as solidarity and support (Dovidio et al., 2020; Greenaway & Cruwys, 2019). According to the common ingroup identity model, recategorisation can be achieved through the introduction or emergence of perceived commonalities across groups (e.g., shared tasks or a shared fate) or through increasing the salience of an existing common ingroup identity (Dovidio et al., 1993). Based on the tenets of the social identity approach, the common ingroup identity model further posits that social category salience can, for instance, be altered by modifying an individuals' goals, motivations, or expectations (Dovidio et al., 2007; Gaertner & Dovidio, 2000). Research suggests that recategorisation can successfully reduce intergroup bias (Crisp, Turner, & Hewstone, 2010; Dovidio et al., 1993, 1997; Nier et al., 2001; for a brief review, see Dovidio et al., 2007). For example, Stone and Crisp (2007) found that identification with a subordinate category (i.e., British) was positively related to intergroup bias towards another subgroup (i.e., French), whereas superordinate group identification (i.e., European) was negatively related to bias, but only when this superordinate social identity was made salient through a vignette. This decrease in intergroup bias following recategorisation into a salient superordinate category was found to follow from a reduced psychological distance between the self and the outgroup (Stone & Crisp, 2007). However, one limitation of relevance to real-world interventions is that a superordinate identity that is inclusive of all subgroups may not be stable in the long term, as this may hinder individuals' need to perceive their social self (their group) as distinct from others (Brewer, 1991; Dovidio et al., 2007).

### **Interim Summary**

Social identity theory and self-categorisation theory have highlighted the importance of group memberships for the self, as well as the context-variability of self-categorisation. Which group

membership is primarily salient can have important consequences for intragroup and intergroup processes, as former outgroup members can be perceived as ingroup members at higher, more inclusive levels of self-categorisation. Research based on the common ingroup identity model has demonstrated that recategorisation interventions that make more inclusive social identities salient can, at times, at least temporarily reduce bias towards individuals who would have otherwise been perceived as outgroup members. The ontogeny, nature, and some important consequences of intergroup bias will be introduced next.

### **Intergroup Bias**

Associating oneself with one's ingroup tends to lead to more positive feelings about ingroup members and to increased willingness to support them, even at a cost to the self (Dunham, 2018). Group membership can thereby lead to positive outcomes for ingroup members, increasing coordination and cooperation to the benefit of group members (Allport, 1954; Balliet, Wu, & De Dreu, 2014). A multitude of cognitive effects of group membership have further been observed (Macrae & Bodenhausen, 2000; for a recent review, see Moradi et al., 2020). We tend to differentiate perceived ingroup members better than perceived outgroup members, which can at times lead us to view outgroups as more homogenous than ingroups (Park & Judd, 1990; Park & Rothbart, 1982; for reviews, see Boldry, Gaertner, & Quinn, 2007; Ostrom & Sedikides, 1992). We further have better memory for positive events and behaviours from our ingroup (Dunham et al., 2011).

While these findings point to positive effects of group membership, particularly directed towards ingroup members, there is another side to the coin: Favouritism for the ingroup implies intergroup bias (Balliet et al., 2014). Intergroup bias gives rise to pervasive phenomena like stereotyping, prejudice, and discrimination, which are commonly considered to conflict with widely endorsed values of fairness and morality (e.g., Allport, 1954; Killen, Elenbaas, & Rizzo, 2018; Over & McCall, 2018; Raabe & Beelmann, 2011). In employment, for instance, women are often paid less and hold positions of lower status compared with men, even after controlling for occupation and job qualifications (Al Ramiah, Hewstone, Dovidio, & Penner, 2010; Goldman, Gutek, Stein, & Lewis, 2006). Experimental research in the United States of America (USA) has further found that when White and Black applicants with equal, moderate qualifications (i.e., neither highly qualified nor unqualified) compete for the same job, White applicants are recommended for the job more than twice as often as Black applicants

(Dovidio & Gaertner, 2000). In Germany and the USA, women wearing a Muslim headdress are similarly discriminated against in job application processes (Ghumman & Ryan, 2013; Unkelbach, Schneider, Gode, & Senft, 2010). Intergroup bias can thus have grave consequences. That being the case, the development of intergroup processes in general, and of intergroup bias in particular, have received considerable academic attention (Dunham, 2018; Killen, Elenbaas, Rizzo, & Rutland, 2017; Killen & Verkuyten, 2017; Over, Eggleston, Bell, & Dunham, 2018; Rutland & Killen, 2015; Rutland, Killen, & Abrams, 2010). I will first introduce how intergroup bias is often studied, using minimal and real-world groups, before turning to what this research has shown.

### **Studying Intergroup Bias**

Novel groups have long been used to study the emergence and effects of intergroup bias (e.g., Tajfel et al., 1971). As they are artificially created, participants have no prior knowledge of or experiences with these groups, which do not carry social meaning outside of the research setting in which they are introduced. For example, novel groups are sometimes based on similar task performance or shared preferences, such as participants' preferences for one of two pictures, or are arbitrarily assigned, as is typically the case with novel groups based on colours (e.g., random allocation to either the 'Yellow' or 'Green' group) (Bigler, Jones, & Lobliner, 1997; Nesdale & Flessner, 2001; Patterson & Bigler, 2006). Minimal groups are novel groups, but they adhere to additional constraints: The dimension of group distinction must be value neutral and socially irrelevant (e.g., by not implying common interests or abilities), groups cannot be of unequal status or compete with each other, and participants do not interact differentially with in- and outgroup members (e.g., by never meeting other group members). In minimal group research, these factors are constrained because they may affect group identification, often increasing it beyond the effects of mere social categorisation (Dunham et al., 2011; Spielman, 2000). By limiting the influence of additional influencing factors, this line of research can illuminate the (self-) categorisation-based mechanisms underlying complex phenomena like racism and gender discrimination and can help identify factors that contribute to their development (Dunham, 2018). Beyond its theoretical importance, such research can also contribute to the design of targeted bias interventions (Bigler & Liben, 2007).

While these features make intergroup research with novel groups very informative of general effects of group membership, it also means that caution should be exercised when

extrapolating from minimal group studies to real-world groups. The social and historical context in which real-world groups are embedded can lead to different outcomes for different groups in the same situation or task. This can be exemplified by a study from Olson and colleagues, who presented predominantly White children of high socio-economic status in North America with information about past unequal distributions of resources among members of different social groups (Olson, Dweck, Spelke, & Banaji, 2011). Participants were then given the opportunity to distribute an unequal number of resources (cookies) between new members of the two groups they had learned about, giving each potential recipient “what he deserves”. When children had learned about resource inequalities between Whites and Asians, younger (age 3.5-7.5) and older (age 7.5-11.5) children tended to perpetuate the observed inequality by giving more resources to the recipient belonging to the already advantaged group. In contrast, after learning about the same inequalities between Whites and Blacks, older children tended to rectify the inequality by giving more cookies to the member of the disadvantaged group, while younger children repeated the pattern they had seen. Using novel groups in the same study design shed light on these findings. Here, both younger and older children perpetuated the inequality, suggesting that perpetuation may be the default choice for young children, while something particular about inequalities between Blacks and Whites, such as widespread public awareness and debate, likely drove older children to rectify the inequality in this particular case. Taken together, this research using both minimal groups and real-world groups shows that group membership can interact with group-specific evaluations of deservingness and need and may lead members of different groups to experience different outcomes in the same situations.

Disentangling the effects of ‘mere membership’ from those of membership in a specific group at a specific time is also of theoretical importance because it constrains models of intergroup bias (for a recent review, see Dunham, 2018). Specifically, any group process that arises even in a minimal group setting cannot be caused by factors not present in the minimal group paradigm, such as conflict or established status differences (Dunham, 2018). Further, any phenomenon arising in a minimal group context cannot be specific to a certain real-world social group (e.g., to Asian immigrants in the United Kingdom) (Dunham, 2018). As will be shown, many forms of intergroup bias can follow from mere minimal group membership. This finding has, for instance, been informative of the causal role that social learning may play in the development of intergroup bias. Minimal group research has shown that, congruent with self-categorisation theory, many group processes (e.g., intergroup bias) can follow from mere

membership alone and do not require having learnt about or having experience with the group in question. Notably, however, at least for high-status groups, group identification and intergroup bias are often stronger for real-world groups than minimal groups for both children (Dunham et al., 2011) and adults (Dunham, 2011; for a review, see Mullen, Brown, & Smith, 1992). Minimal group research may therefore underestimate intergroup biases for real-world groups, which may, for instance, make interventions that are effective in minimal group settings ineffective for real-world groups (Dovidio, Validzic, & Gaertner, 1998). To sum up, real-world groups and novel groups both have their limitations but also offer unique advantages for studying social identity and intergroup bias.

## **The Developmental Origins of Intergroup Bias**

### ***The Development of Intergroup Bias in Real-World Groups***

Examining intergroup processes in infancy and childhood can elucidate the developmental origins of intergroup bias. Broadly, research on the development of intergroup bias in children encompasses investigations into children's differential thinking, attitude, and behaviour towards others based on their group membership (e.g., Dunham, 2017). As such, intergroup bias is a multifaceted phenomenon with interacting cognitive (e.g., stereotypes), affective (e.g., prejudiced evaluations) and behavioural (e.g., discrimination) components, all of which have been operationalised in research that suggests children, like adults, tend to favour their ingroup from a young age (Raabe & Beelmann, 2011). For example, by age 3, children show preferences for members of their language (Kinzler, Dupoux, & Spelke, 2007) and gender (Horwitz, Shutts, & Olson, 2014; LaFreniere, Strayer, & Gauthier, 1984; Shutts, Banaji, & Spelke, 2010; Shutts, Roben, & Spelke, 2013) ingroups, and White majority children explicitly express racial ingroup favouritism by age 4 (see Aboud, 1988 for a review).

While intergroup bias was long believed to emerge early, increase until around age 7, and then decline thereafter, a growing body of research paints a more complex picture (e.g., Baron & Banaji, 2009; Baron, 2015; Dunham, Baron, & Banaji, 2007, 2008; Dunham, Chen, & Banaji, 2013; Dunham, Newheiser, Hoosain, Merrill, & Olson, 2014; Newheiser & Olson, 2012; R. Turner, Hewstone, & Voci, 2007). A recent meta-analysis of studies on the development of ethnic, racial, and national prejudice from early childhood to late adolescence attempted to integrate much of this research by constructing and analysing age comparisons based on 121 cross-sectional research studies (Raabe & Beelmann, 2011). While the results do,

overall, support previous reports of a developmental arch, they also suggest that this picture is largely based on the most commonly researched prejudiced relationship, namely the development of prejudice among higher-status children towards lower-status outgroups, and that environmental factors moderate prejudice development in childhood. Furthermore, it adds to the growing body of research that indicates an increasing divergence of explicit and implicit prejudice from middle childhood onward (Baron, 2015; Baron & Banaji, 2006; Dunham et al., 2008, 2013; Rutland, Cameron, Milne, & McGeorge, 2005).

Focussing on changes in prejudice (rather than absolute levels of prejudice), the meta-analysis suggests that bias towards lower-status and equal-status outgroups increases between early and middle childhood (i.e., between the ages of around 2-4 and 5-7 years old; Raabe & Beelmann, 2011). This trend was robust across different measures of prejudice, but contact opportunities with the lower-status outgroup emerged as an important moderator of change between these ages, with more contact opportunities leading to weaker increases in prejudice. In contrast, studies examining prejudice towards higher-status groups did not find significant increases in intergroup bias between these ages, suggesting that a group's relative position in a status hierarchy plays an important role in the development of prejudice (Raabe & Beelmann, 2011; see also Newheiser & Olson, 2012). Between middle and late childhood (i.e., between the ages of 5-7 and 8-10 years old, respectively) and within late childhood, explicit prejudice towards lower-status outgroups was found to then decrease again, suggesting an explicit prejudice peak around age 7 (Raabe & Beelmann, 2011). However, these explicit prejudice levels remained unchanged in the absence of contact opportunities, indicating that the overall decrease observed here depended on at least some opportunity for contact with the outgroup. Furthermore, prejudice towards higher-status outgroups increased strongly between middle and late childhood, independently of contact opportunities, and levels of nationality-based prejudice were stable (Raabe & Beelmann, 2011).

Importantly, studies employing implicit measures rather than explicit ones did not find a decrease in prejudice between middle and late childhood (Raabe & Beelmann, 2011). To assess explicit intergroup bias researchers typically rely on self-report measures, which can be informative of forms of intergroup bias that one can become consciously aware of (e.g., asking children how they feel about members of another group). In contrast, implicit measures attempt to assess unconscious influences of intergroup bias on cognition, affect, and behaviour. To illustrate the difference in behavioural measures, one may be able to report about one's friendships with individuals of the same and of other races (Aboud, Mendelson, & Purdy, 2003)

but may at the same time be unaware of more subtle behaviours, such as whether one tends to stand further away from outgroup than ingroup members or smile at them less frequently (Dovidio, Kawakami, & Gaertner, 2002). Implicit measures therefore capture important forms of intergroup bias, which have recently been found to develop differently from explicit bias, with implicit bias robustly emerging by the age of 6 and remaining stable into adulthood (Baron & Banaji, 2006; Dunham, Baron, & Banaji, 2006; Dunham et al., 2008, 2013; Rutland et al., 2005). This suggests that the decline in explicit prejudice may reflect greater adherence to social norms of equality at this age rather than a general decline in intergroup bias, with implicit bias persisting because its influence is more difficult to monitor and control (Dovidio et al., 2002; Dunham, 2017; Monteiro, De Franca, & Rodrigues, 2009; Rutland et al., 2005).

To sum up, the existing body of research identifies common developmental trends of intergroup bias throughout childhood, including a developmental arch of explicit prejudice towards equal-status and lower-status outgroups that peaks around age 7 and subsequently declines, and an increase in implicit bias from childhood into adulthood. However, this research also indicates that, rather than being universal, these trends are influenced by societal and historical factors such as status hierarchies, intergroup contact opportunities, and social norms in important ways (Baron, 2015; Baron & Banaji, 2009; Dunham et al., 2007, 2013, 2014; Newheiser & Olson, 2012; Rutland & Killen, 2015). To study the effects of group membership in isolation of these influencing factors, researchers have therefore often elected to introduce novel groups in experimental settings.

### ***Consequences of Mere Membership in Development***

Perhaps surprisingly, research suggests that by the age of 5, even membership in a minimal group can have a diverse range of effects on children's intergroup evaluations and cognition (for a review, see Dunham, 2018). For example, children typically prefer (unfamiliar) children from their own minimal group to outgroup children even in the absence of additional information (e.g., Dunham et al., 2011). Moreover, hearing negative information about their own minimal group (i.e., that ingroup members behaved poorly while outgroup members were merely the recipients of this bad behaviour) has been found to only eliminate ingroup favouritism, leading to equal ingroup and outgroup liking, rather than leading children to dislike their ingroup (Baron & Dunham, 2015). Once they favour their ingroup, young children further tend to attribute more positive behaviours to ingroup and more negative behaviours to outgroup members, as well as demonstrating an ingroup favouring memory bias for positive



information (Baron & Dunham, 2015; Dunham et al., 2011) and interpreting ambiguous information less negatively for ingroup than outgroup members (Dunham & Emory, 2014). This research shows that although other factors like social learning contribute to intergroup biases between real groups (Devine, 1989; Dunham et al., 2011; Killen & Verkuyten, 2017; Over & McCall, 2018), social categorisation can rapidly lead to cognitive biases which alter subsequent information processing in favour of one's ingroup. In other words, once established, ingroup favouritism starts to function as a self-fulfilling prophecy, effectively causing children to generate evidence for their existing intergroup attitude (Dunham et al., 2011; Dunham & Emory, 2014; Over et al., 2018).

Studies using novel groups have also explored behavioural forms of intergroup bias, demonstrating that children can treat others differently based on such group membership alone. Jordan, McAuliffe, and Warneken (2014) for instance found that 6-year-olds were more willing to pay a price in order to punish an outgroup child than an ingroup child for the same selfish behaviour. The study also found that children were more willing to pay a price to punish another child whose selfish behaviour had been to an ingroup child's disadvantage, compared to when it disadvantaged an outgroup child (Jordan et al., 2014). Misch, Over, and Carpenter (2016) further found that 4- and 5-year-olds were more willing to turn down rewards in order to keep a secret for their novel ingroup, compared to an outgroup secret, thereby demonstrating preferential costly loyalty.

Many studies have further found that children preferentially share desirable resources with their ingroup members, even only minimally associated ones (Dunham et al., 2011). One such study has elucidated the ontogeny of intergroup biases. Although ingroup favouritism leads to intergroup bias, this bias could be driven by particularly positive treatment of the ingroup (i.e., 'ingroup love') or by hostility towards the outgroup (i.e., 'outgroup hate'), compared to the treatment of individuals who are not saliently perceived as outgroup members (e.g., a neutral control group) (Brewer, 1999; Buttelmann & Böhm, 2014). Alternatively, ingroup love and outgroup hate could be inextricably linked. One empirical investigation using novel colour groups tested these alternative hypotheses in children aged 6 to 8 years old by asking them to allocate desirable resources (e.g., ice cream) and undesirable resources (e.g., a broken can) between an ingroup recipient, an outgroup recipient, or a neutral box, in which case the item was discarded (Buttelmann & Böhm, 2014). The study found that 6-year-olds already allocated desirable items to ingroup members significantly more often than to outgroup members, and this ingroup favouritism increased further by age 8. In contrast, only 8-year-olds

allocated the undesirable items to outgroup members significantly more often than they gave them to ingroup recipients or relinquished them to a box. Ingroup love therefore was already present at age 6 and increased further by age 8, whereas outgroup derogation did not emerge until 8 years of age (Buttelmann & Böhm, 2014). This study suggests that ingroup favouritism and outgroup derogation emerge independently, and it highlights the contribution that developmental research can make to advancing our understanding of the nature of intergroup bias.

### **Intergroup Bias in Adults**

Intergroup bias remains ubiquitous in adulthood (Allport, 1954; Amodio, 2014; Balliet et al., 2014; Cutler, Nitschke, Lamm, & Lockwood, 2021; Fiske, 2002; Hewstone et al., 2002). As in childhood (Baron & Dunham, 2015), research on intergroup cognition in adults finds that self-categorisation biases information processing, both for real-world groups (Rule, Ambady, Adams, & Macrae, 2007; Sporer, 2001) and minimal groups (Gramzow, Gaertner, & Sedikides, 2001). For example, individuals have been found to show enhanced memory for ingroup-associated stimuli (Rule et al., 2007; Sporer, 2001). Individuals further tend to attribute more negative uniquely human emotions to outgroup members than to ingroup members, and to attribute more positive uniquely human emotions to ingroup members than to outgroup members (Enock, Tipper, & Over, 2020). Similarly, desirable human traits are attributed more to ingroup than to outgroup members whereas undesirable human traits are attributed more to outgroup than to ingroup members (Enock, Flavell, Tipper, & Over, 2021).

Intergroup biases in adulthood have also been demonstrated on response time tasks measuring implicit biases. For instance, in a recent study, White adults showed superior (i.e., faster and more accurate) categorisation of threatening objects and inferior processing of innocuous objects after being primed with Black compared with White faces, even when the primes depicted children (Todd, Thiem, & Neel, 2016). Facilitation effects can emerge rapidly, even for newly learnt associations between a stimulus and an ingroup (Moradi, Sui, Hewstone, & Humphreys, 2017). Studies have further found that untrained participants are more likely to “shoot” an unarmed target stimulus (by button-press) in a computer-based task when the target is Black rather than White (Correll, Park, Judd, & Wittenbrink, 2002; Johnson, Cesario, & Pleskac, 2018), or wearing a turban or a hijab rather than no headdress (Unkelbach, Forgas, & Denson, 2008). A recent review suggests that such group-based biases in cognition and affect

may be supported by enhanced attentional salience for stimuli associated with salient ingroups, compared with outgroup-associated stimuli (Moradi et al., 2020).

Pertinent to my doctoral studies (Chapter 2 and Chapter 3), and consequential for real-world intergroup relations, intergroup biases also affect social preferences and behaviour, pervading intergroup cooperation in general (Balliet et al., 2014) and prosociality in particular (Flippen, Hornstein, Siegal, & Weitzman, 1996; Vaughan, Tajfel, & Williams, 1981; Yazdi, Heyman, & Barner, 2020). These findings will be examined in the introduction section on prosocial behaviour. For now, I will turn to contextual influences on intergroup biases.

### **Intergroup Bias in Context**

Although intergroup bias has been widely investigated in both novel experimental groups and real-world groups, many questions remain. One important question is how intergroup cognition, prejudice, and discrimination are modulated by contextual factors. Research shows that situational contexts (e.g., intergroup cooperation versus competition), broader social contexts (e.g., intergroup status differences) and individual differences derived from contexts (e.g., opportunities for intergroup contact) can all affect intergroup bias (for a recent review of contextual effects on affective and cognitive intergroup biases, see Moradi et al., 2020). For instance, research with both children (Raabe & Beelmann, 2011) and adults (for a review, see Pettigrew & Tropp, 2008) has demonstrated that increased intergroup contact can curtail explicit prejudice, but also low-level attentional biases (Yankouskaya, Humphreys, & Rotshtein, 2014).

Of particular importance for my doctoral studies (Chapter 3) is the question of how contextual effects, such as experiencing a complex crisis like a global pandemic, affect intergroup biases. Intergroup biases are often enhanced in contexts of competition, conflict, and threat (Chang, Krosch, & Cikara, 2016; Hewstone et al., 2002; Moradi et al., 2020; Sherif et al., 1988). Kahn and Davies (2017), for instance, found that subliminally priming participants with a threatening context (i.e., an unsafe neighbourhood) led participants to respond more stereotypically to target stimuli in a computer-based ‘shoot/don’t shoot task’, compared with a safe neighbourhood prime. The finding of increased intergroup bias in response to threat is also supported by a meta-analysis, in which a range of threats were all found to be related to negative outgroup attitudes (Riek, Mania, & Gaertner, 2006). Specifically, conflict over scarce material resources or power, which threatens the ingroup’s

well-being (i.e., realistic threat), as well as threats to a group's values (i.e., symbolic threat), anxiety about intergroup interactions, and stereotype-based negative expectations of the outgroup were all moderately strongly related to negative outgroup attitudes. Threats to the ingroup's esteem were also significantly related to negative outgroup attitudes, although this effect was weaker (Riek et al., 2006). Taken together, these findings demonstrate that diverse threats can all be significantly related to intergroup bias, which raises the question of how compounded, complex threat may affect intergroup relations.

Studies on intergroup bias under threat often manipulate or measure a single, specific (perceived) threat (e.g., resource scarcity, symbolic threat, or mortality threat), and in laboratory research, competition is often operationalized in zero-sum games (for a review, see Rios, Sosa, & Osborn, 2018). However, in real-world contexts, threat is often complex (e.g., natural disasters also bring resource scarcity) (Fritsche, Jonas, & Kessler, 2011), and not all threats pose a zero-sum intergroup dilemma. For example, the ongoing Covid-19 pandemic poses a disease threat, but it has also caused much economic insecurity, and pandemic-related restrictions may threaten a group's established way of life. Although some aspects of the pandemic, such as scarce medical resource distribution, pose zero-sum problems, many aspects do not. For instance, equitable vaccine distribution may ultimately protect perceived ingroups as well as outgroups by slowing the emergence of new virus variants. Complex, societal threats may further simultaneously be perceived as both a threat on an individual level, as well as on a group level, and perceived threat at each level may lead to increases in bias (Fritsche et al., 2011). However, how such complex, real-world threat contexts affect intergroup biases is not yet well understood. As findings from laboratory research do not always predict real-world biases (see, e.g., Moradi et al., 2020), investigations in real-world groups and contexts are warranted.

### **Interim Summary**

Research suggests that intergroup bias develops early in childhood and remains prevalent in adulthood, both on explicit and implicit measures and for real-world and novel groups. Minimal group studies demonstrate that such biases can emerge rapidly, even in the absence of information about or experience with the group. Intergroup biases are not immalleable, however; rather, they are modulated by contexts in important ways. Intergroup competition,

conflict, and other perceived threats tend to increase bias. The effects of complex threats on real-world intergroup relations are, however, not yet well understood.

One area in which intergroup relations, including intergroup bias, may be particularly consequential is in the distribution of resources between groups. The relationship between intergroup bias and prosocial behaviour, with a focus on resource allocation, is discussed next.

### **The Relationship Between Intergroup Bias and Prosocial Behaviour**

Humans often undertake actions that are intended to benefit others, even at a cost to themselves. Such prosocial behaviour constitutes an important facet of cooperation and is already commonly observed early in development (Slocombe & Seed, 2019). For example, 14-month-old infants already aid others by handing them objects that they are trying but struggling to reach (Warneken & Tomasello, 2007; see also Hepach, Kante, & Tomasello, 2017). In early childhood, children further already comfort others in emotional distress and share material goods with them (Dunfield & Kuhlmeier, 2013).

Prosocial behaviour is commonly investigated using resource allocation tasks in which participants decide how to divide resources between potential recipients. These tasks offer an easily quantifiable outcome measure (i.e., who received what) and can capture the outcome of decision-making processes that weigh different concerns, such as concerns for fairness and for self-interest or group-interest. Resource allocation studies are therefore central to research on prosocial behaviour, fairness, and intergroup bias (McGuire, Manstead, & Rutland, 2017).

### **Prosocial Behaviour and Fairness in Development**

Questions of what is fair, or just, are central to our understanding of morality (Killen et al., 2017; Rutland & Killen, 2015; Tomasello & Vaish, 2013). Research on children's developing understanding of fairness can illuminate which factors they take into consideration when they evaluate situations and events and when they make decisions. Beyond adding to our understanding of the developmental pathway from infancy to adulthood, this research has further been argued to be informative of how humans think about fairness prior to extensive formal education, including sophisticated theories of justice, thereby potentially revealing a 'basic' human understanding of fairness (Shaw & Olson, 2012).

Children are concerned with fairness from a young age (Killen et al., 2017). For example, research shows that by the age of 5, children reject social exclusion based on group membership alone as wrong and justify their position with moral reasoning, referencing concepts like equality and fairness (Killen et al., 2017; Killen & Stangor, 2001; Theimer, Killen, & Stangor, 2001). For example, they consider it to be unfair to not allow a child to join a play group only because their gender is stereotypically incongruent with the activity, such as excluding girls from playing with trucks and boys from playing with dolls (Theimer et al., 2001). The ability to explain judgments and decisions with references to fairness may emerge around age 5 and was long considered to be the hallmark of emerging moral concerns (LoBue, Nishida, Chiong, Deloache, & Haidt, 2011). However, recent research suggests that young children, and possibly even infants, may have an intuitive understanding of fairness in resource distribution before they can explicitly express this understanding (e.g., Dunn & Munn, 1987; Sloane, Baillargeon, & Premack, 2012). Resource allocation tasks are therefore well-suited to capturing young children's developing concerns for fairness (Fehr, Bernhard, & Rockenbach, 2008; Killen & Verkuyten, 2017; McGuire et al., 2017; Shaw & Olson, 2012).

How to distribute resources fairly is an important question in everyday life, and one that children are already familiar with. Children frequently have to navigate questions of how to share toys with siblings, friends, and unfamiliar children, and this has been suggested to be a formative field for thinking about fairness (LoBue et al., 2011). In resource distribution research, awarding every potential recipient the same number of resources is called an equal distribution – that is, inequality here simply refers to any asymmetrical distribution outcome (e.g., Fehr et al., 2008; LoBue et al., 2011). Research suggests that by 15 months of age, infants are already sensitive to such unequal resource distributions and expect others to share equally (Schmidt & Sommerville, 2011). Furthermore, by 16 months of age, infants themselves prefer fair distributors of resources and expect others to prefer them as well (Geraci & Surian, 2011).

Most investigations of fairness in resource allocation have focussed on distributive justice – that is, they have probed how individuals evaluate, respond to, and make decisions about resource allocation *outcomes* (Dunham, Durkin, & Tyler, 2018). Procedural justice in resource allocation, which is concerned with fair allocation *processes*, has received less attention. Following a review of developmental research on distributive justice, I will introduce procedural justice before turning to adult research. Throughout, the focus will be on prosocial behaviour in intergroup contexts, as this topic is central to my doctoral studies (Chapters 2 & 3).

## **Intergroup Resource Allocation in Development**

Although children show concerns for fairness from a young age (e.g., Dunham et al., 2018; Shaw & Olson, 2014), these concerns can compete with ingroup favouritism, and sometimes even with stereotype-based assumptions about need and deservingness, in resource allocation decisions (Elenbaas, Rizzo, Cooley, & Killen, 2016; Olson et al., 2011). Research shows that children often favour their ingroup when dividing or sharing resources (Dunham, 2018; Dunham et al., 2011). Specifically, children tend to allot more desirable resources to members of their own group, more undesirable resources to the outgroup, and to be more willing to accept a cost to benefit ingroup compared to outgroup members (Buttelmann & Böhm, 2014; Dunham, 2018; Over, 2018).

In third-person experiments, children are asked to distribute resources between two or more other potential recipients. Findings from such experiments can be informative of how children weigh concerns for fairness and ingroup favouritism in the absence of personal interest. Third-party research with real-world groups shows that children tend to prioritise ingroup members in their sharing, especially when resources are scarce. Such ingroup favouritism has not only been found for familiar ingroup members (e.g., Olson & Spelke, 2008), but also generalises to unfamiliar ingroup members, such as unfamiliar members of the same racial or gender group (Dunham et al., 2011; Renno & Shutts, 2015). Research further shows that children also differentiate between members of novel ingroups and outgroups in third party resource allocations (e.g., Buttelmann & Böhm, 2014; Spielman, 2000; Vaughan et al., 1981; Yazdi et al., 2020). In a particularly informative study, Dunham and colleagues (2011) investigated the effects of both minimal and gender group membership on children's resource allocations and found that 5-year-olds tended to give somewhat more resources to minimal ingroup members, compared to minimal outgroup members. Notably, across measures, the authors found the effect sizes in minimal group conditions to be about half the size of those observed for gender comparisons, with the strongest minimal group effect emerging on a measure of implicit attitude. While this direct comparison suggests that established, familiar groups lead to stronger intergroup bias in resource allocations than minimal groups, the finding that novel and arbitrarily assigned groups can produce effects half as strong as those caused by gender also speaks to the power of minimal groups to influence attitudes and behaviour.

First-person intergroup resource allocations are indicative of how children weigh self-interest, considerations for their group, and concerns about fairness. Here, participants are asked to allocate resources between themselves and another potential recipient. In first person distributions, sharing is costly – that is, participants receive fewer resources themselves when they share with others. Research suggests that when sharing is costly, young children tend to prioritise their ingroup, and that they are more willing to share with ingroup than outgroup members at a cost. Fehr, Bernhard, and Rockenbach (2008), for instance, found that 3- to 8-year-olds were significantly more likely to give up a resource in order to share fairly with an anonymous (unfamiliar) recipient when the latter was described as a child attending the same rather than a different educational institution. In an earlier study investigating group-based sharing behaviour, Zinser, Rich, and Bailey (1981) found White children attending preschool, first grade, and third grade, respectively, to be willing to share their resources significantly more often with a silhouette depicting a White than a Black child. The same trend was further observed for fifth-graders, but the difference was weaker for this older group of participants, which may be indicative of developmental changes in children's explicit expression of intergroup bias as well as their developing understanding of fairness.

Recent research on first-person resource distribution among minimal group members demonstrates that young children not only often favour their ingroup, but at times also act spitefully towards outgroup members and are willing to incur a cost in order to prevent outgroup members from receiving resources (Benozio & Diesendruck, 2015; Buttelmann & Böhm, 2014). For instance, Sparks, Schinkel, and Moore (2017) found evidence of this in a first-person forced-choice sharing task in which children chose between different options for allocating resources. The study found that 4- to 6-year-olds chose less generous allocations for minimal outgroup children, instead keeping more for themselves when possible, compared to their more generous sharing with ingroup members (Sparks et al., 2017). Minimal group membership thus led children to be less generous towards outgroup children in their costly sharing. Notably, this effect was robust even on trials in which a generous distribution would have benefitted not only the passive recipient but also the participant, allowing them to receive more resources as well. This suggests that children were willing to accept a personal cost in order to prevent outgroup members from accumulating resources, thereby supporting other research that indicates children are prepared to harm others even based on trivial group membership alone (e.g., Buttelmann & Böhm, 2014). In other words, at least in lab-based



settings, children can be motivated to discriminate against others, even at a cost to themselves, only because they are temporarily members of different arbitrary groups.

To sum up, intergroup bias in resource distribution outcomes for real-world groups and minimal groups emerges early and is common throughout development. However, bias can not only manifest in unfair allocation outcomes, but also in unfair allocation processes. It is this potential interaction between procedural justice and intergroup bias that I turn to next.

### **Procedural Justice in Childhood and Its Relation to Intergroup Bias**

Adults have been shown to accept unequal outcomes when they were determined by an impartial procedure, such as a coin toss (e.g., Becker & Miller, 2009; Bolton, Brandts, & Ockenfels, 2005; Frey & Stutzer, 2005; Lind & Tyler, 1988; Tyler, 2000). The concept of procedural justice was originally developed by researchers concerned with people's attitudes towards outcomes in the legal system (for a review, see Brockner & Wiesenfeld, 1996). This research indicates that adults generally value fair procedures (Tyler, 2003) and that unfavourable outcomes that result from fair procedures elicit less negative responses than unfavourable outcomes brought about by procedures that are perceived as unjust (Brockner & Wiesenfeld, 1996). Early work on procedural justice in development has similarly focused on legal and political socialization, investigating how children and adolescents come to accept and abide by political processes and legal norms. In congruence with adult research, children's and adolescents' attitudes towards outcomes of legal procedures were found to depend not only on the outcome but also on the perceived fairness of the procedure used to determine it (Fagan & Tyler, 2005; Hicks & Lawrence, 1993). Importantly, procedural fairness can be undermined by intergroup biases, as exemplified by racial biases in legal procedures (Blair, Judd, & Chaplean, 2004; Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006). This raises questions about how intergroup biases interact with concerns for procedural justice in resource allocations.

Research has only very recently begun to explore children's understanding of and attitudes towards procedural justice in resource allocations (Shaw & Olson, 2014). Young children frequently experience conflict related to resource sharing (for example, sharing toys with siblings) (e.g., Hay, Caplan, Castle, & Stimson, 1991) and may resolve these amongst peers with the help of procedures (Grocke, Rossano, & Tomasello, 2015). Grocke, Rossano, and Tomasello (2015) introduced triads of 5-year-olds to a fair wheel of fortune that they could

use to distribute stickers amongst themselves. Critically, in the test phase, the fair wheel was replaced with an unfair wheel for half of the groups. The experimenter then left the room and let children decide how to go about distributing an unequal number of stickers. Analyses of the sessions and subsequent interviews showed that even personally disadvantaged children were mostly willing to accept unequal sticker distributions when they were determined using a fair procedure. In contrast, groups that were given an unfair procedure to use were much more likely to reject the outcome and to abandon the unfair procedure in favour of one that provides all participants with an equal opportunity to receive more stickers. This shows that, like adults, children as young as 5 years of age are more willing to accept unequal resource allocation outcomes that result from using a fair procedure, and that children consider the fairness of a procedure when deciding how to allocate resources.

Relatedly, Shaw and Olson (2014) investigated 6- and 8-year-olds' choices of resource distribution procedures in third-party contexts. Participants heard about two children who were to receive rewards for completing a chore. Both children received two prizes each, leaving one prize (a colourful eraser) left over. Participants were then asked to select a procedure to use for determining who receives the extra reward, choosing between three different spinner wheels: a fair spinner wheel that gave both children equal chances of winning, a spinner that was advantageous for one child but still gave the other child a chance of winning, and a fully advantageous wheel that pre-determined which of the two children would win. Almost all children in both age groups chose the fair spinner, and none of the participants chose the fully advantageous spinner. In a follow-up study (Shaw & Olson, 2014), participants either had to choose between discarding the extra resource and allocating it using a fair procedure (fair wheel condition), or between discarding the resource and allocating it using the fully advantageous wheel (i.e., accepting a pre-determined unequal outcome; unequal wheel condition). Distributive justice research with children of the same age has previously shown that children prefer throwing a resource away over directly giving it to one of two equally deserving children, thus demonstrating inequality aversion (Shaw & Olson, 2012). Contrastingly, in the fair wheel condition, where children were offered a fair procedure to make the allocation decision, both 6- and 8-year-olds preferred to give the reward to one of the children using the fair procedure over discarding the resource (Shaw & Olson, 2014). When an impartial procedure was offered, 6-year-olds further discarded the resource at similar levels as 8-year-olds, which suggests that younger children were not generally more reluctant to discard the resource than older children.

Shaw and Olson's (2014) finding that younger children do not generally appear to be more reluctant to discard a resource than older children aids in the interpretation of findings from the unequal wheel condition. In contrast to the fair wheel condition, an age effect was observed in the unequal wheel condition: While 6-year-olds chose at chance level between using the fully advantageous spinner and discarding the resource, 8-year-olds preferred wasting the resource to maintain equality. If younger children are generally as willing to discard a resource as older children, then younger children's greater willingness to distribute a resource using a partial procedure suggests that younger children may be less averse to partiality in procedure choices than older children. Nevertheless, comparing choices across conditions shows that both the younger and the older children were more likely to discard the prize when the alternative was using an unfair procedure than when they could use a fair one. Taken together, the findings from these studies suggest that by the age of 6, children can understand the value of using procedures to make decisions. However, 6-year-olds may not yet be able to fully evaluate the fairness of a procedure and weigh procedural and distributive justice concerns, making them more likely to use a partial procedure, compared to older children. By 8 years of age, children choose to accept unequal outcomes to avoid wasting a resource if – and, unlike 6-year-olds, only if – the outcome can be determined by a fair procedure. Eight-year-olds therefore reliably prioritise procedural over distributive justice in resource allocations.

Recently, Dunham, Durkin, and Tyler (2018) investigated how children weigh concerns for distributive and procedural justice in first- and third-person allocations by asking them to decide what to do with a resource in a forced-choice task. Children aged 4 to 8 years old completed two choice conditions. In one condition, participants chose between flipping a coin (impartial procedure, unequal outcome) and directly giving a resource away (partial procedure, unequal outcome). In the other choice condition, participants chose between flipping a coin and throwing the resource away (impartial procedure, equal outcome). All participants had to make one of these procedure choices in a third-party condition and the other in a first-party condition. In third-party allocations, and consistent with Shaw and Olson's (2014) findings, both younger (ages 4 to 6) and older (ages 7 to 9) children were more likely to flip the coin than to give the resource directly to one recipient. Furthermore, comparing across choice conditions, both younger and older children were more likely to flip the coin when the alternative was to directly give the resource to one recipient than when the alternative was to throw the resource away. This suggests that both younger and older children valued procedural

justice and preferentially used impartial procedures to maintain fairness when an equal distribution outcome was not possible.

Interestingly, when choosing between the coin flip (fair procedure, unequal outcome) and discarding the resource (fair procedure, equal outcome but wasting a resource), Dunham et al. (2018) found that younger children preferred the coin flip over discarding the resource whereas older children appeared indifferent between these options. In this study, older children therefore chose at chance level between using a fair allocation procedure and discarding a resource, whereas in Shaw and Olson's (2014) study, children of the same age preferred to distribute the resource. This discrepancy raises questions about its possible causes. Differences between studies preclude firm conclusions, and differences emerging from the results of only two studies should be interpreted cautiously. That said, it is possible that children understood the randomness of the coin flip procedure less well than that of the fair spinner wheel. Although Dunham et al. (2018) employed a training procedure in which children practiced using the coin to allocate the resource and were asked whether they could predict the outcome of the coin flip, feedback was not provided for their responses, and outcomes on the few training trials were unlikely to have been exactly equal. The impartiality of the spinner wheel with two equally-sized colour sections (one for each colour group recipient) may have been more visually apparent than that of the two-sided coin. If this was the case, older children may have been more willing to create distributional unfairness with the visibly impartial spinner wheel, compared to the coin. In contrast, comparing across studies, younger children preferred to distribute the resource using both the impartial wheel (Shaw & Olson, 2014) and the coin (Dunham et al., 2018) over discarding the resource. This is consistent with younger children's willingness to use procedures in a wider range of contexts, even when it is not apparent that the procedure promotes fairness, for instance because it is not impartial (Dunham et al., 2018; Shaw & Olson, 2014). Older children may thus be more averse to using (potentially) partial procedures in third-party resource allocations than younger children.

Turning to first-party allocations, results from Dunham et al.'s (2018) study suggest that younger children's allocation choices were more strongly influenced by self-interest than older children's choices. Younger children chose at chance level between flipping a coin and giving the resource to themselves, whereas older children strongly preferred flipping a coin to directly taking the resource for themselves. What is more, comparing across choice conditions, younger children were more likely to flip a coin when the alternative was throwing the resource away than when the alternative was to keep the resource for themselves. In contrast, older

children were more likely to flip a coin when the alternative was to keep the resource for themselves than when the alternative was throwing the resource away. Overall, the findings from children's first-person allocation choices suggest that both younger and older children understand the value of impartial procedures in making allocation decisions, but that younger children prioritize impartiality over self-interest less reliably than older children.

To sum up, both children and adults are concerned with procedural justice, which may even be prioritized over distributive justice when these concerns conflict. By 8 years of age, children have further been shown to understand that partiality can influence other people's judgments and decision-making in a way that threatens fairness (Mills, Al-Jabari, & Archacki, 2012; Mills & Grant, 2009; Mills & Keil, 2008). This is indicative of children's understanding that some ways to decide an outcome are fairer than others, with personal connections not being considered a legitimate factor (see also Shaw & Olson, 2012). However, how procedural justice in resource allocation interacts with intergroup bias in development is not yet known.

### **Intergroup Resource Allocation in Adults**

As Tajfel's seminal studies have shown, adults often preferentially allocate resources to ingroup members, compared to outgroup members, even for novel groups (e.g., Tajfel et al., 1971). For instance, recently, Yazdi and colleagues (2020) allocated adults to minimal colour groups and informed participants that the two groups are competing, although researchers emphasized that this was not a zero-sum game. Participants were tested individually but were led to believe that they were playing a first-person resource allocation game with others in real time. Participants were found to share significantly more tokens with ingroup members than with outgroup members at a cost, giving approximately half of their tokens to ingroup members but only a third of their tokens to outgroup members. While ingroup favouritism may have been strengthened by explicit competition here, adults have also been found to favour their ingroup in non-competitive settings. For example, following arbitrary allocation to novel groups, Spielman (2000) found that adults gave more coins to minimal ingroup than outgroup members in a third-party sharing task. Importantly, this was the case not only in a competitive prime condition but also in the absence of a competitive prime. Ingroup favouritism in resource allocation therefore appears to persist from childhood into adulthood.

These findings are supported by a meta-analysis of research on costly intergroup cooperation in a range of tasks, including resource allocation tasks, among relatively

anonymous adults conducted by Balliet and colleagues (2014). Overall, the meta-analysis found that participants tended to cooperate more with ingroup than outgroup members, a small to medium-sized effect. Even on tasks in which participants were not interdependent, such as in one-off resource allocation tasks with no prospect of future cooperation, a small but significant effect of group membership on cooperation emerged, which may follow from self-categorisation alone. However, this effect was substantially stronger on tasks in which participants are interdependent, suggesting that reciprocity motives may often be at play in real-world intergroup relations with the potential for repeated ingroup interactions (Balliet et al., 2014).

Research investigating the motivations underpinning intergroup bias in adults' costly cooperation further suggests that such biases are primarily motivated by ingroup love rather than outgroup hate (Balliet et al., 2014). This is, for instance, indicated by studies that offer participants the option to either support their ingroup through costly contributions to a shared resource pool without harming the outgroup, or to make costly ingroup-pool contributions that simultaneously lead to decreases in outgroup members' resources (Halevy, Bornstein, & Sagiv, 2008; Halevy, Weisel, & Bornstein, 2012). Here, adults were found to strongly prefer supporting their ingroup without harming the outgroup (Halevy et al., 2008; Halevy, Weisel, et al., 2012). At least in lab-based resource allocation tasks, promoting the ingroup thus appears to be the primary motivation for intergroup bias. While ingroup favouritism does not necessarily imply outgroup derogation (Brewer, 2007), it is worth noting that in many situations (e.g., when dividing scarce resources), ingroup favouritism nevertheless often leads to a disadvantage for outgroup members (Dovidio et al., 1993). It is therefore important to advance our intergroup biases in resource allocations.

Taken together, research shows that adults often display bias on intergroup resource allocation tasks. These biases can further emerge even in the absence of competition and interdependence among distributors and recipients. Notwithstanding, contextual factors can modulate intergroup biases in resource allocations.

### **Intergroup Prosocial Behaviour in Context**

Intergroup prosocial behaviour shows considerable variability with context. Two considerations are particularly relevant for my doctoral studies: How does intergroup

prosociality vary with perceived competition or threat, and how may it be affected by reputational concerns?

Intergroup biases in cooperation and prosocial behaviour tend to increase in the face of competition (e.g., over scarce resources) and threat (e.g., Spielman, 2000). Threat has, for instance, been shown to increase intergroup bias in instrumental helping (Flippen et al., 1996). Competitive resource allocation games can further elicit considerable willingness to harm the outgroup, even at a personal cost, for the sake of benefiting the ingroup when it is not possible to help the ingroup without harming the outgroup (Halevy et al., 2012). Notably, much research on contextual effects on intergroup biases in resource allocation relies on lab-based experimental games, usually with one-off or few interactions. More naturalistic investigations could aid our understanding of how intergroup biases in resource allocation change in response to perceived real-world threats.

Another important question arises from observations that prosociality can vary with the social contexts in which it occurs. Allocating resources in private, rather than in public, often leads to more selfish allocations in first-party contexts (Romano, Balliet, & Wu, 2017), arguably because individuals aim to present themselves as relatively fair (Shaw, 2013; Shaw & Olson, 2014). What is less well understood, however, is how reputational concerns interact with intergroup biases in intergroup resource allocation. Knowing whether the mere presence of an observer, such as an experimenter, affects prosociality is important both for designing and interpreting research, and for understanding contextual effects on intergroup bias in everyday, real-world settings.

### **Interim Summary**

Intergroup biases are present in cooperation and resource allocation from childhood through adulthood. While they often appear to be primarily driven by ingroup love rather than outgroup hate, the result is often an ingroup favouring allocation outcome. Whether procedure choices for resource allocation would be similarly biased remains to be seen, but by middle childhood, children already appear to understand the potential of fair procedures for maintaining impartiality, even when equal outcomes are not possible. Contextual effects of competition and threat, as well as of opportunities for reputation management, on prosociality between groups remain underexplored.

Within groups, an individuals' prosocial behaviour may affect whether they are likely to gain influence over group decisions and be selected as a leader (Cheng & Tracy, 2014; Cheng, Tracy, & Henrich, 2010; Halevy, Chou, Cohen, & Livingston, 2012; Hardy & van Vugt, 2006; Maner, 2017; Maner & Mead, 2010; von Rueden, Gurven, & Kaplan, 2008; Willer, 2009). Intragroup processes of leader selection will be examined next.

## **Leadership and Followership**

### **Group Hierarchies and Influence Asymmetries**

Social asymmetries such as status differences not only shape relationships between groups, but also relationships within groups in important ways (van Kleef & Cheng, 2020). Indeed, social asymmetries within groups are ubiquitous among humans and other social species (Anderson, Hildreth, & Howland, 2015; Cheng & Tracy, 2020; van Vugt, Hogan, & Kaiser, 2008; von Rueden, 2014). Research has variably investigated aspects of differences in social rank under the terms status, prestige, power, and dominance (Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013; Henrich & Gil-White, 2001). Definitions for these terms have further varied across research disciplines and researchers (Henrich & Gil-White, 2001; see Cheng et al., 2013, for an overview of terminology across fields). Broadly, status, prestige, power, and dominance can be conceptualised as antecedents of higher social rank and influence (Torelli, Leslie, To, & Kim, 2020). That is, individuals who are higher in status, prestige, power, and/or dominance can achieve higher social rank, defined as the degree of influence possessed over group decisions, collective action, and resource allocation (Anderson et al., 2015; Cheng et al., 2013; van Vugt & Smith, 2019). Given their influence on others, those who attain a high social rank tend to be better able to achieve their goals than individuals of lower status (van Vugt, 2006). It is therefore not surprising that high status is associated with positive outcomes, such as enhanced perquisites, social attention, support, and deference, as well as enhanced health, longevity, and reproductive success (Anderson et al., 2015; Anderson & Kilduff, 2009a; Cheng, 2020; Hasty & Maner, 2020; Henrich & Gil-White, 2001; Maner & Mead, 2010; van Vugt, 2006; von Rueden, Gurven, & Kaplan, 2011).

Importantly, such increased influence is strongly associated with leadership, which is characterized by behaviours that have evolved or are intended to differentially influence group decisions and behaviour (Cheng & Tracy, 2020; van Vugt, 2006; van Vugt & Smith, 2019).



Leaders, then, can be defined as “individuals who impose a disproportional influence on the collective behaviours of group members” through their actions (Smith, Ortiz, Buhbe, & van Vugt, 2020, p. 1). In some theoretical accounts, the increased influence afforded by higher social rank not only aids (see, e.g., Smith & van Vugt, 2020; van Vugt & Smith, 2019) but enables leadership, thus making high status a necessary, albeit sometimes insufficient, condition for leadership (e.g., Cheng & Tracy, 2020). Theories and empirical examinations of rank attainment can therefore be usefully extended to address questions of leader emergence (Smith & van Vugt, 2020; van Vugt & Smith, 2019). Given leaders’ heightened influence on group decisions and actions, who emerges as a leader is important for group outcomes (Maner & Mead, 2010).

### **Leader Selection**

Leadership is ubiquitous across human societies and social species (van Vugt, 2006; van Vugt et al., 2008). Research has examined who is likely to emerge as a group leader (Lord, de Vader, & Alliger, 1986; van Vugt, 2006). Many of these examinations have focused on traits and attributes that leaders commonly possess (e.g., Cheng et al., 2010; Lord, Brown, Harvey, & Hall, 2001; Lord et al., 1986), on the traits that may make an individual effective as a leader (e.g., Judge, Bono, Ilies, & Gerhardt, 2002; Nyukorong & Quisenberry, 2016), or on the strategies that aspiring leaders may use to try to attain their desired position (e.g., Cheng et al., 2013; Maner, 2017; Maner & Case, 2016). Other research has more strongly focussed on what followers look for in a leader (Junker & van Dick, 2014). For example, implicit leadership theories hypothesize that followers have implicit conceptualizations of what a leader should be like and evaluate others based on these schemas (Junker & van Dick, 2014). Research shows that leader evaluations are related to leader preferences (Laustsen & Petersen, 2017). Such implicit evaluations therefore matter for who emerges as a leader, as many important leader selections, such as elections, are decided by followers’ leader preferences. Taken together, however, the wealth of research on leadership emergence and leader selection has produced contradicting evidence (see Cheng et al., 2013).

Research suggests that one possible path to disproportionate influence is providing value to group members (e.g., Anderson et al., 2015). Commitment to the group, as well as supporting group members and contributing to the achievement of group goals, tends to increase individuals’ status (Anderson et al., 2015; Anderson & Kilduff, 2009a). For example,

acting prosocially towards group members and contributing to public funds has been found to increase individuals' influence on other group members (Flynn, Reagans, Amanatullah, & Ames, 2006; Willer, 2009). Perceived expertise and sharing relevant skills and knowledge with group members may also increase individuals' social standing and influence (e.g., Henrich & Gil-White, 2001; Littlepage, Schmidt, Whisler, & Frost, 1995). Being perceived as capable of conferring such benefits on group members leads to prestige, which is conceptualized as voluntarily deferred high social rank derived from respect and admiration for valued knowledge, skills, and achievements (Cheng & Tracy, 2020; Cheng et al., 2013; Henrich & Gil-White, 2001). Given the influence of prestigious individuals on group members, prestige is associated with leadership. Importantly, accounts based on the value leaders provide to a group often claim that prestige, social status, and leadership positions can *only* be achieved through voluntary deference from other group members (Anderson & Kilduff, 2009a; Cheng et al., 2013).

Contrasting this account, some research finds that high rank must not always be freely conferred (McClanahan, Maner, & Cheng, 2021). Specifically, when employed successfully, a dominance strategy may lead to high social rank achieved through fear, intimidation, or coercion (Cheng & Tracy, 2020; Cheng et al., 2013; McClanahan et al., 2021). Dominant individuals thus achieve influence through inflicting, or appearing to be capable of inflicting, costs on group members, for example by controlling access to scarce resources (Cheng et al., 2010; Maner & Mead, 2010). The evidence for dominance as a successful strategy for the attainment of leadership is, however, mixed. For example, a meta-analysis of over eight decades of leadership research found that dominance as a stable personality trait predicted becoming a group leader more consistently than any other individual difference measure (Lord et al., 1986). Developmental research has further found that not only preschoolers' prosocial behaviour, but also their dominant and aggressive behaviour, as rated by their teachers, is associated with both children's control over resources in peer interactions and parents' perceptions of children's social competence (Hawley, 2002). However, other reviews have not found a link between dominance and leadership (van Vugt, 2006), and some empirical studies have found that dominance only increases influence indirectly, by increasing perceptions of competence (Anderson & Kilduff, 2009b; Chen, Jing, & Lee, 2014).

To sum up, research on social status and leadership emergence has led to conflicting accounts and findings, particularly relating to the importance of dominance. Rather recently, the conflicting accounts of competence-based and fear-based rank attainment have been

reconciled in a dual model of the attainment of high social rank and influence (Cheng & Tracy, 2014; Cheng et al., 2013; Henrich & Gil-White, 2001).

### **Dual Models of Social Rank, Influence, and Leadership**

Derived from evolutionary psychology, the dual model of rank attainment posits that both dominance and prestige can lead to high social rank and leadership (Cheng & Tracy, 2014; Cheng et al., 2013; Henrich & Gil-White, 2001; van Vugt & Smith, 2019). The dominance-prestige model has been very influential in research of social influence asymmetries and is largely compatible with other leadership theories which have been supported empirically (e.g., implicit leadership theory, contingency models of leadership/followership) (Lord et al., 1986; Spisak, Homan, Grabo, & van Vugt, 2012). Beyond the often descriptive nature of other models, the dominance-prestige model aims to explain high rank and leader emergence, based on evolutionary logic, and makes additional predictions (Cheng et al., 2013).

In the view of the dual model of rank attainment, dominance and prestige are conceptualized as distinct, independent cognitive and behavioural strategies that can be used to achieve group influence (Cheng et al., 2013). Research suggests that both strategies can lead to positions of influence. For example, Cheng and colleagues (2013) introduced previously unacquainted individuals to each other. Participants first completed a task in private, which required them to rank items in the order of their usefulness in the case of a crash landing on the moon (similar tests are commonly used in influence research, e.g., Littlepage et al., 1995). Participants were then tasked with coming to a shared group answer, which they decided upon through discussing their private answers. Then, participants privately completed peer ratings of their group members on measures of perceived influence, agency, dominance, prestige, and liking. Additionally, independent outside observers rated group members on similar measures of perceived influence, agency, dominance, prestige, and how well they were liked by their group members based on video recordings of the group interactions. The researchers further assessed the degree of similarity between participants' private responses and their group's shared response as a proxy for social influence on group decisions. The study found that dominance and prestige each positively – and independently – predicted social influence, as measured by peer ratings, outside observer ratings, and influence on group decisions. In another study, Cheng et al. (2013) tracked participants' eye movements while they watched video recordings of groups working together on a joint task. The study found that explicit ratings of

perceived dominance and perceived prestige each independently predicted participants' visual attention to individual group members, which is taken to indicate high social rank and leadership (Anderson, John, Keltner, & Kring, 2001; Cheng et al., 2013). Taken together, these findings indicate that dominance and prestige strategies can both lead to increased influence, and that they do so independently of one another.

Although dominance and prestige are conceptualised as strategies for enhanced influence that anyone could employ, success may vary based on a range of factors, including the fit between the respective strategy and a leaders' traits and attributes as well as the context in which the strategy is used (Cheng et al., 2010). For example, a prestige strategy is more likely to be effective if the aspiring leader possesses helpful attributes, such as being generous, conscientious, and skilled or knowledgeable in domains valued by group members (Cheng et al., 2010). On the other hand, individuals may be more successful in pursuing a dominance strategy if they are perceived to be intimidating, willing to engage in aggressive behaviour, and capable of asserting themselves and prevailing in a contest (Cheng et al., 2010). Consistent with this hypothesis, dominance and prestige have each been found to be associated with a distinct affective, cognitive, motivational, and behavioural profile, and those who tend to pursue these strategies across contexts show distinct trait profiles (Cheng et al., 2010). Specifically, individuals who typically pursue a dominance strategy (i.e., dominant individuals) are often aggressive and score high on measures of Machiavellianism and narcissism (Cheng et al., 2010). In contrast, pursuing a prestige strategy across contexts is associated with intelligence, agreeableness and conscientiousness (Cheng et al., 2010). Dominance and prestige in rank attainment are therefore associated with distinct profiles in individuals, which relate to distinct profiles of leadership and followership.

The dual model of social rank and influence has been extended to leadership (e.g., Cheng & Tracy, 2020; van Vugt & Smith, 2019). Prestige and dominance strategies can each be employed to pursue positions of leadership (van Vugt & Smith, 2019), and dominant and prestigious leaders elicit different responses from followers. Specifically, dominant individuals tend to elicit fear and avoidance and are not particularly well liked, whereas prestigious leaders tend to be well liked and followers tend to seek their proximity, defer to them, and learn from them (Cheng et al., 2013, 2010; Henrich & Gil-White, 2001). As for rank attainment more generally, although leaders can employ dominance and prestige strategies to achieve leadership positions, how successful they are at doing so depends on many factors. These include their success in convincing followers of their ability to control resources (i.e., to dominate) (Chen et

al., 2014; Cheng et al., 2010) or of their value to the group (i.e., their prestige) (Anderson & Kilduff, 2009a; Cheng et al., 2010), but also contextual factors, to which I will return. In many contexts, followership enables or, in the case of formal elections, even determines leadership. Who followers prefer as their leader may therefore be predictive of leader selection outcomes. Examining followers' leader preferences is therefore informative of many real-world leader selection processes.

Followers' preferences can take into consideration potential costs and benefits of different leader types, such as their perceived ability to take action and ensure group cohesion but also to exploit their followers. Overall, social asymmetries of leadership and followership are widely thought to be beneficial for both leaders and followers (Cheng & Tracy, 2014; Halevy, Chou, & Galinsky, 2011; Price & van Vugt, 2014), and leaders can support their group to achieve its goals (Maner & Mead, 2010). However, leaders are often endowed with control over group resources and are thus able to exploit their followers and prioritize personal goals, such as maintaining their privileged position, over group goals (Maner & Mead, 2010; van Vugt, 2006). Given leaders' disproportionate influence on followers (e.g., by enforcing group members' contributions to group action) and on group outcomes (e.g., through decisions about intergroup cooperation or conflict), who rises to a leadership position is very important for all group members. Across many theoretical accounts of leadership, how followers weigh potential costs and benefits and who is therefore preferred as a leader is considered to be context-dependent.

### **Leader Selection in Context**

Leadership emergence, and leader selection, vary by context. Leadership is particularly likely to emerge quickly when the need for coordinated group action is enhanced, for example in the face of natural disasters as well as intragroup (e.g., insurrections) and intergroup (e.g., conflict, war) threats (van Vugt, 2006). Who is likely to emerge as a leader is also influenced by the context in which leader selection takes place (de Waal-Andrews & van Vugt, 2020; Gleibs & Haslam, 2016; van Vugt & Grabo, 2015; White, Kenrick, & Neuberg, 2013). For example, voting intentions have been found to vary with risk-tolerance, which fluctuates between weekdays (Sanders & Jenkins, 2016). Many theoretical accounts of leader selection also emphasize its context variability. For instance, leadership theories focussing on attributions and evaluations of leader characteristics from an information-processing perspective, such as

implicit leadership theory and connectionist models of leadership prototypes, posit that which leader qualities are desired by followers varies with contextual factors, such as the challenges the group faces (Lord et al., 2001). These accounts are further consistent with social learning accounts of context variability, as individuals may learn associations between particular contexts (e.g., threat) and leader characteristics (e.g., dominance, masculinity).

The dominance-prestige model focusses on broad strategies for gaining influence that can be employed across contexts (Cheng et al., 2013). Nevertheless, how likely dominance is to lead to a position of leadership may vary by context (Spisak, Dekker, Krüger, & van Vugt, 2012; Spisak, Homan, et al., 2012). Research testing the dominance-prestige model shows that at least in some contexts, such as in newly formed collaborative task groups, both dominance and prestige can be successful strategies for gaining and maintaining increased influence among group members (Cheng et al., 2013; McClanahan et al., 2021). Notwithstanding, non-dominant leaders are often preferred (Petersen & Laustsen, 2020), while dominant leaders are rather involuntarily deferred to out of fear (Cheng et al., 2013, 2010; McClanahan et al., 2021). Yet, in some contexts, for example when there is a salient threat of conflict, followers may come to prefer dominant leaders (Spisak, Dekker, et al., 2012; Spisak, Homan, et al., 2012; van Vugt, 2006). Notably, however, research has typically investigated how singular threats at a brief moment in time affect leader preferences. More complex threats and long-term effects of perceived threat on leader preferences are not yet well understood.

### **Interim Summary**

Taken together, research on social asymmetries in general, and on leadership in particular, has led to a multitude of theoretical models and inspired many empirical investigations. While theoretical models differ in their focus (e.g., follower expectations versus leadership attainment strategies), empirical studies show that individuals who rise to positions of leadership often possess certain attributes, traits, and behavioural tendencies (e.g., they are perceived as agentic). Distinct leader profiles – namely, a prestigious and a dominant profile – can further be differentiated based on these characteristics. Leadership research has further shown that followers' preferences for different leader types vary by context. However, complex, real-world threats and their long-term consequences have yet to be investigated.

### **Summary of the Present Research Aims**

The overarching aim of the present research was to investigate intergroup biases and social preferences in different contexts.

I first examined intergroup bias and its influence on resource allocation preferences in children. Specifically, in the first set of studies (Chapter 2), I examined whether children prioritise advantaging their ingroup over fairness in the resource allocation procedures that they choose (Studies 1 and 2), and whether their choices differ by context (Study 2). Procedural justice is an important facet of fairness in adult society, but how (or when) it develops in children has only very recently garnered research attention. I believe that it is important to better our understanding of procedural justice in children because procedural justice can be an important tool for conflict avoidance and resolution. Fair procedures can ensure fairness and satisfaction with decisions even among those disadvantaged by their outcome, and even when fair distribution outcomes are not possible. Additionally, I investigated whether children's procedure choices vary depending on the social context (Study 2). Reputational concerns have been shown to sometimes affect children's resource distribution choices, but this was the first study to examine reputational effects on children's procedure choices in an intergroup context. This is an important step towards gaining a better understanding of how children weigh these different factors. Additionally, it affords us a better understanding of whether, and if so, how, the presence of an experimenter during testing may affect children's choices.

Notably, for use in experimental procedures with children, procedural justice is preferably operationalised through physical objects which randomize outcomes. Interacting with these objects themselves allows children to experience their randomness, which is important for the paradigm to be convincing, and it is engaging, which contributes greatly to their continued attention to the task. Additionally, examining reputational concerns with children requires face-to-face interaction in order to allow for the emergence of possible social desirability effects. The Covid-19 pandemic prevented me from continuing to investigate these questions further, as my data collection sites closed for extended periods of time and face-to-face research was prohibited. Although this caused a major shift in my research programme, it also allowed me to investigate changes in intergroup biases and social preferences under extraordinary circumstances.

In my first study following the start of the pandemic (Chapter 3), I examined changes in intergroup biases and prosocial behaviour in adults in the context of the Covid-19 pandemic.

While research suggests that perceived threat tends to increase intergroup bias, the Covid-19 pandemic widely prompted calls for solidarity and cooperation across nations. Experiencing a shared sense of fate, as may be the case in a global pandemic, may further lead to shifts in group identification as well as in prosocial behaviour towards different groups. The Covid-19 pandemic therefore offered the unique opportunity to explore such possible changes. I chose to address this question over an extended period of time, collecting samples over the first year and a half of the pandemic, in order to maximize the likelihood of capturing changes and gain a better understanding of longer-term developments in intergroup bias in a rapidly changing real-world context.

My last study (Chapter 4) was also conducted in the context of the Covid-19 pandemic. Here, I explored changes in leader preferences in adults over the first year and a half of the pandemic. I also measured changes in perceived threat from the pandemic and examined whether these relate to leader preferences. Research suggests that leader preferences may shift in response to threat, such that dominant leaders are more strongly preferred in the face of some threats. To date, however, this question has mostly been examined in laboratory studies in which perceived threat is experimentally induced. These studies further find that not all types of threat equally increase preferences for dominant leaders. Given the complex nature of threats arising from the ongoing global pandemic, which include threats to health, life, and livelihood, but also competition over scarce resources, it is not yet known whether – and if so, how – the pandemic will affect preferences for dominant leaders. Addressing this question not only tests the external validity of lab-based experimental studies on the relationship between perceived threat and dominant leader preferences, but it can also be informative of what followers expect from their leaders in this complex crisis. I again examined this research question over an extended period of time, collecting data for this study alongside data for Chapter 3. I measured dominant leader preferences on a rating scale as well as in a forced-choice task in which participants were presented with pairs of face stimuli which varied in facial dominance and selected the face they preferred as a leader in the current context. I analysed changes in these leader preferences over time, as well as how they relate to perceived threat.



## **Chapter 2:**

### **Procedural (In)Justice and Intergroup Bias in Children**

This chapter is based on published research: Olivier, J. L., McCall, C., Dunham, Y., & Over, H. (2022). Procedural (in)justice in children: Children choose procedures that favour their ingroup. *Journal of Experimental Child Psychology*, 215, 105313. Advance online publication.

#### **Abstract**

Research has shown that both ingroup bias and concern for procedural justice emerge early in development; however, these concerns can conflict. We investigated whether 6- to 8-year-old children are more influenced by procedural justice versus ingroup favouritism in a resource allocation task. In our first study, children played a novel spinner game in which they chose among fair, ingroup favouring, and outgroup favouring procedures to decide whether a resource would go to an unfamiliar ingroup or outgroup recipient. We found that 6- to 8-year-olds overall chose ingroup favouring procedures. However, this tendency decreased with age; whereas younger children were more likely to select procedures that were advantageous to their ingroup, older children (7- and 8-year-olds) mostly chose fair procedures. Our second study investigated the motivations underpinning children's choices by testing whether children's fair procedure choices were in part driven by a desire to appear fair. Here we varied whether children made procedure choices in public, allowing them to manage their reputation, versus in private, where reputational concerns should not guide their choices. We found that from 6 to 8 years of age children chose ingroup favouring procedures and that this tendency was slightly stronger when choosing in private. Taken together, our research suggests that ingroup favouritism often trumps procedural justice in resource allocation tasks, especially for younger children and especially when reputation is not in play.

#### **Introduction**

Successful cooperation within a group relies on individuals being able to agree on how to distribute resources (Grocke et al., 2015). A fair distribution of resources can be achieved in one of two fundamental ways (Dunham et al., 2018; Grocke et al., 2015). In distributive justice, the focus is on outcome - individuals are directly allocated the resources they deserve. In

procedural justice, the focus is on process. A procedure is typically thought to be fair if each individual has an equal chance of receiving resources (i.e., the procedure is *impartial*), even if using the procedure produces unequal outcomes (Grocke et al., 2015; Shaw & Olson, 2014). Using *fair* procedures is thought to demonstrate equal respect and can therefore contribute to conflict avoidance and higher satisfaction with unfavourable allocation outcomes by those affected (Engelmann & Tomasello, 2019; Grocke et al., 2015; Tyler, 2000). Procedural justice is an integral component of contemporary Western society. Principles of procedural fairness are codified in national constitutions and international conventions, and people's judgments about procedural fairness influence their satisfaction and compliance with legal authorities, court proceedings, and police interactions, as well as their evaluations of leaders and political candidates (e.g., Rasinski & Tyler, 1988; Sunshine & Tyler, 2003; Thibaut & Walker, 1975; Tyler, 2003; Tyler, Rasinski, & Spodick, 1985).

However, in adult society, concerns for procedural justice are often undermined by intergroup bias. For example, many Republicans believe that established election procedures were not applied fairly in the 2020 US presidential election, while Democrats typically affirm that the election process was fair (Pennycook & Rand, 2021). Importantly, having voted for a losing candidate has been found to relate to lower levels of trust in the political system and the government, as well as lower satisfaction with democracy and perceived legitimacy of the elected leader (Craig, Martinez, Gainous, & Kane, 2006). The fair application of criminal justice procedures is also often undermined by intergroup biases including systemic racism (e.g., Blair et al., 2004; Eberhardt et al., 2006). The influence of intergroup bias on procedural justice can thus have grave social consequences. To date, the majority of developmental research has focused on children's emerging sense of distributive justice but increasingly research attention is turning to the development of procedural justice as well (Dunham et al., 2018). Following a brief review of important findings from this work, we explore how children weigh concerns for procedural justice and ingroup favouritism.

### **Distributive Justice in Development**

Developmental research has shown that, all else being equal, children have a strong preference for equal distribution outcomes. For example, young children tend to allocate the same number of resources to all potential third-party recipients (e.g., Chernyak & Sobel, 2016; Kenward & Dahl, 2011; Olson & Spelke, 2008). Indeed, by age 6, children will discard a resource in order

to ensure an equal outcome between two third parties (Shaw & Olson, 2012; but see Paulus, 2015). Even infants expect equal others to receive the same amount of resources and prefer distributors who share fairly (Geraci & Surian, 2011; Schmidt & Sommerville, 2011; Sloane et al., 2012), and 3-year-olds respond negatively to observing unequal allocations (LoBue et al., 2011).

At least by the age of 5, ingroup favouritism competes with a desire for fair outcomes (Killen et al., 2017, 2018; Killen & Stangor, 2001; Theimer et al., 2001). Children are often more generous toward members of their own social groups, especially when sharing is costly or resources are scarce (Dunham, 2018; Dunham et al., 2011; Fehr et al., 2008; Olson & Spelke, 2008; Yazdi et al., 2020). Eighteen-month-old infants already expect distributors to give more to ingroup than outgroup members when resources cannot be shared equally (Bian, Sloane, & Baillargeon, 2018). By two-and-a-half years of age, children have been found to offer a toy to a native speaker much more frequently than to a foreign speaker (Kinzler, Dupoux, & Spelke, 2012). Race- and gender-based sharing preferences emerge a bit later (Kinzler & Spelke, 2011) but have been documented as early as age 3 (e.g., Dunham et al., 2011; Renno & Shutts, 2015; Shutts, 2015; Zinser et al., 1981). Fehr and colleagues (2008) further found that between ages 3 and 8 children were increasingly willing to give up a resource in order to share fairly with a child from their kindergarten or school, while this willingness decreased slightly for outgroup peers. It thus seems that older children make increasingly prosocial choices for ingroup members but not for outgroup members, leading to strong intergroup bias in sharing at age 7 or 8.

Even membership in novel and minimal groups has been found to bias children's sharing behaviour (e.g., Dunham et al., 2011; Sparks et al., 2017; Vaughan et al., 1981). This research has shown that, at times, children will even harm outgroup members by giving them resources they do not want (Benozio & Diesendruck, 2015), giving them undesirable resources (such as spiders) even though they could have relinquished them to a box (Buttelmann & Böhm, 2014), and by preventing them, at a cost, from accumulating resources (Sparks et al., 2017). Following a similar developmental trajectory to children's sensitivity to real world groups, ingroup favouritism in children's sharing in minimal group contexts seems to increase in middle childhood (Buttelmann & Böhm, 2014; Fehr et al., 2008).

## **Procedural Justice in Development**

Recent research has shown that, like adults, children not only care about outcomes, but also about how these outcomes are brought about. For example, children are more willing to accept distribution outcomes they dislike when they believe the allocation procedure was fair (Grocke et al., 2015), and they choose fair over unfair procedures for third-party allocations when both recipients are equally deserving (Dunham et al., 2018; Shaw & Olson, 2014). What is more, when concerns for distributive and for procedural justice conflict, children aged between 4 and 8 years old often prioritize procedural justice. Shaw and Olson (2014) found that 5- to 8-year-olds were willing to create unequal outcomes by allocating a single resource to one of two parties when the procedure for deciding who received it was fair. Dunham and colleagues (2018) similarly found that 4- to 6-year-olds preferred allocating a resource between third parties by coin flip, thus creating distributional inequality, over discarding the resource to maintain equality. These are important findings as they suggest that concerns for procedural justice may be stronger than concerns for distributive justice in this age range.

## **The Present Research**

Here, we investigate how children respond when opportunities for procedural justice and ingroup favouritism are placed in conflict with each other. This is an important question to address because children frequently face resource sharing decisions in their everyday lives. For example, deciding who gets to play with which toys or who first gets access to treasured parts of a playground can lead to conflict and frustration. Importantly, many interactions in childhood take place in intergroup contexts. Children not only form friendship groups from an early age, which often leads to favouritism (Engelmann, Zhang, Zeidler, Dunham, & Herrmann, 2021; Lu & Chang, 2016; Moore, 2009; Paulus & Moore, 2014), but friendship groups are often influenced by social category membership such as gender and race (Aboud et al., 2003; Nesdale, 2017). Children are therefore likely to experience intergroup conflict about resources.

Based on this overview of the literature, two distinct hypotheses emerge regarding children's approach to procedural justice. First, a hypothesis derived from work demonstrating children's preference for procedural justice in interpersonal contexts might predict that children will reliably choose fair procedures even in intergroup contexts. A desire to be (or at least

appear) impartial has recently been suggested to lie at the heart of people's willingness to share fairly, even at a cost (Shaw, 2013; Shaw & Olson, 2014). Cultural messages may further reinforce a preference for impartial procedures. While there are many reasons to distribute resources unequally (for example, based on merit or need), explicit endorsement of unequal procedures may be less common in Western culture (although affirmative action is one notable and important exception) (Schmidt, Svetlova, Johe, & Tomasello, 2016). A hypothesis derived from research providing evidence of partiality in children's distribution choices (e.g., Dunham et al., 2011; Fehr et al., 2008) and of children's strong preferences for their own groups (Dunham et al., 2011) would predict that children will instead choose procedures that are advantageous for their ingroup. Our first study pits these two hypotheses against each other by investigating whether children choose ingroup favouring procedures or fair ones and whether their preferences change with age.

In our second study, we start to address the question of why children choose the procedures that they do. Specifically, we investigate whether reputational concerns influence children's choices of particular procedures. A theory based on the importance of appearing impartial would predict that, when asked to choose between contrasting procedures in public, children will seek a reputation as fair by choosing impartial procedures (Shaw, 2013; Shaw et al., 2014; Shaw & Olson, 2014). Sharing in accordance with fairness norms when being observed allows children (and adults) to signal to others that they are desirable cooperation partners, a reputation that is thought to be helpful in building and maintaining cooperative relationships, and in avoiding scorn from others (Engelmann, Herrmann, & Tomasello, 2012; Engelmann, Over, Herrmann, & Tomasello, 2013; Engelmann & Rapp, 2018; Shaw et al., 2014). In private, reputational concerns should be less influential in the decision-making process and therefore being impartial may be less important (Shaw, 2013; Shaw et al., 2014). A substantial body of work supports this hypothesis, for example children are often more willing to take a cost in order to share fairly when their fair choices will be known to the experimenter (Shaw et al., 2014) or the affected recipient (McAuliffe, Blake, & Warneken, 2020), compared to when sharing in private.

An interesting alternative hypothesis is that children may seek a reputation as ingroup favouring when asked to choose between procedures in public. We know from previous research that children are loyal to their groups and that they value group loyalty in others (e.g., Misch, Over, & Carpenter, 2014). Indeed loyalty to the ingroup is viewed as a fundamental domain of moral intuition in some influential theoretical perspectives, such as Moral

Foundations Theory (Graham et al., 2013, 2018). At least from the age of 5, children believe that individuals who remain with their group are nicer, more trustworthy and more moral than individuals who change groups (Misch et al., 2014). Children also sometimes evaluate distributors who share their resources with ingroup members as nicer than those who share generously with outgroup members (Yazdi et al., 2020; but see DeJesus, Rhodes, & Kinzler, 2014). What is more, children expect ingroup members to behave more prosocially towards them and towards other members of their group (DeJesus et al., 2014; Dunham et al., 2011; Elenbaas & Killen, 2016b; Yazdi et al., 2020). It is thus possible that children will be more ingroup favouring in public than they are in private. A third hypothesis, consistent with theories postulating the importance of procedural justice in childhood (and adulthood), is that children's procedure choices will be largely driven by internal motivation rather than by reputational concerns. If this is the case, then children will act in a similar way in public and private. We distinguish between these competing hypotheses by asking children to choose between a range of procedures that vary from outgroup favouring to ingroup favouring in public and in private. We investigate these questions with children aged between 6 and 8 living in Britain. Previous research has shown that this is a crucial age for the development of adherence to fairness norms, but also of ingroup favouritism in resource sharing. Between the ages of 6 and 8, children have been found to increasingly share, even when it is costly, for the sake of fairness (Blake & McAuliffe, 2011; Shaw & Olson, 2012), but they may also increasingly favour ingroup members in their sharing (Fehr et al., 2008; Yazdi et al., 2020). In accordance with other research in the field, we use minimal groups, which do not convey information about shared values, competition, or status, which could influence children's choices (Dunham, 2018; Dunham et al., 2011).

The data for both studies are available at the Open Science Framework (OSF, [https://osf.io/2t9cu/?view\\_only=6be8a5d010b948d78142862637dcf7b8](https://osf.io/2t9cu/?view_only=6be8a5d010b948d78142862637dcf7b8)).

## **Study 1**

In our first study, we tested the hypothesis that ingroup bias would influence children's use of procedural justice. Specifically, we investigated whether children would choose ingroup favouring procedures to allocate a resource to one of two potential recipients, an ingroup and an outgroup child. To offer children procedure options ranging from fully ingroup favouring (i.e., certainty that one's own group will get the resource) via fair (equal chances for both

groups) to fully outgroup favouring (i.e., certainty that the outgroup will get the resource), we created spinners with different colour proportions (yellow and green). Using the minimal groups paradigm, children were then allocated to one of the colour groups (the Yellow or the Green group) represented on the spinners. As pre-registered on AsPredicted (<https://aspredicted.org/g2ar2.pdf>), we hypothesized that when asked to indicate which resource allocation procedures should be used, children would choose procedures which are advantageous to their own group (i.e., afford their ingroup a better chance of receiving the resource than their outgroup) more often than fair and outgroup advantageous procedures.

## **Method**

### ***Participants***

Seventy-two 6- to 8-year-olds were included in the study (age range: 6 years, 0 months to 8 years, 11 months). Eight additional children were tested but excluded from the final analyses because of technical error (1), experimenter error (1), or because they did not meet our pre-registered inclusion criteria: two due to distractions (parental interference), one due to missing data, and three failed comprehension checks. The final sample of 72 participants consisted of 25 6-year-olds, 23 7-year-olds, and 24 8-year-olds, with 12 males per age group<sup>1</sup>. Participants were recruited at a science museum in northern England, were fluent in English, and of the participants included in the analyses, most were described by their parents as being of White British background ( $n = 62$ ). Sample size was decided in advance based on related previous research on children's procedure choices (see Experiment 1, Shaw & Olson, 2014) and was pre-registered.<sup>2</sup>

### ***Materials***

Throughout the experiment, we used colour wheels with arrows (spinners) showing different proportions of two colours. For spinner practice, children used a fair blue and red spinner (equal

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<sup>1</sup> Due to experimenter error, the final sample did not include exactly 24 children per age group, as pre-registered on AsPredicted.

<sup>2</sup> We performed sensitivity analyses in G\*Power 3.1.9.4 (Faul, Erdfelder, Lang, & Buchner, 2007) for our pre-registered analyses (power = .80,  $\alpha = .05$ , two-tailed). These indicated that we were powered to reliably detect a minimum effect size of Cohen's  $d = 0.67$  in our independent samples  $t$ -test comparing Yellow and Green group participants' mean spinner choice scores, and of Cohen's  $d = 0.33$  in our one-sample  $t$ -test comparing participants' mean spinner choice scores, collapsed across colour and age groups, to a fair spinner choice score of 4.

colour proportions). For the test of partiality understanding, we used two pairs of red and blue spinners, one with two colour sections (one red and one blue) and one with four (two red and two blue).

For the main measure, we used eight sets of spinners, one set per trial (see OSF [https://osf.io/2t9cu/?view\\_only=6be8a5d010b948d78142862637dcf7b8](https://osf.io/2t9cu/?view_only=6be8a5d010b948d78142862637dcf7b8)). We did this to ensure that children could not directly remember and reproduce their choices across trials. Each set consisted of seven spinners ranging from all yellow to all green in equal increments, arranged in order. The middle spinner was therefore always fair. Across the eight spinner sets, four different spinner designs were used: two sets with four colour sections of equal sizes, two sets with four colour sections of unequal sizes, two sets with six colour sections of equal sizes, and two sets with six colour sections of unequal sizes (see Figure 1 for an example).

### *Design*

The main measure was children's spinner choice, assessed using a forced-choice task with seven options, which we compared for children in the Green and Yellow group (between subjects) (pre-registered) and between age groups (exploratory). To explore children's explicit reasoning for their spinner choices, we also asked them why they chose that spinner following every choice trial.

### *Procedure*

Testing took place in a screened-off area in museums, and only the participant and the experimenter (E) were present during testing. Participants were seated at a table next to E in front of a display (an example of a spinner choice trial display is depicted in Figure 1).

**Training/Familiarization Phase.** First, children practiced using a spinner to allocate resources. E placed a bowl of stickers in front of the child and said "We have some stickers that we want to give to other children today, and we would like your help with deciding who gets them. We can use this spinner [placing a fair red and blue training spinner in front of the participant] to decide which child gets a sticker. If the spinner lands on red, then Sasha gets a sticker [placing a red envelope saying 'Sasha' in front of the participant]. If the spinner lands on blue, then Charlie gets a sticker [placing a blue envelope saying 'Charlie' in front of the participant]. Let's spin the spinner and see who gets a sticker." E then waited for the participant to spin the spinner. Once the arrow stopped moving, E asked "So who gets the sticker, Sasha



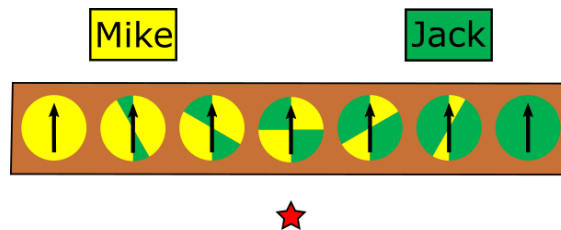
or Charlie?” and then provided feedback: “Yes, it landed on red/blue, that means Sasha/Charlie gets the sticker” or “No it landed on blue/red, that means Sasha/Charlie gets the sticker.” The participant was then instructed to place the sticker in the recipient’s envelope. E repeated this procedure (“Here’s another sticker. Let’s spin the spinner again and see who gets it.”) at least three more times, until each recipient had received at least one sticker, and then put away the fair spinner.

Following spinner practice, in order to ensure that children understood that spinners could be fair or biased, E tested children’s understanding of partiality. E introduced two spinners, one favouring the red group and one favouring the blue group. E then reminded the child that Charlie gets a sticker when the spinner lands on blue, and Sasha gets a sticker when it lands on red, before asking “Which spinner gives Sasha a better chance of winning the sticker, this one or this one?”, pointing at the spinners in turn. E provided feedback for the child’s response, and then put the spinner pair away. This was repeated with another pair of spinners.

**Minimal Groups.** E explained that there were two groups, the Yellow group and the Green group, and that children in the Yellow group get yellow scarves to wear and children in the Green group get green scarves to wear. The participant was then instructed to reach inside a bag and pull out one token, and was told that if the token was yellow, they would be in the Yellow group, and if the token was green, they would be in the Green group. After drawing a token, E asked what colour they got and checked children’s understanding of their group membership by asking what colour group they are in. E also checked whether children could visually identify their group by asking them to pick up the appropriate scarf (yellow or green) from the table in front of them and put it on.

**Spinner Choice.** E told the participant that they would give away more stickers now, placing a bowl of stickers in front of them. E then introduced the potential recipients, one as an ingroup member and the other as an outgroup member (e.g., “Mark is in the same group as you, the Green group, and Dan is in the other group from you, the Yellow group”). When introducing each recipient, E put down an envelope in their group colour with their name on it (see Figure 1). E then placed a set of seven yellow/green spinners in front of the participant, explaining that they will use one these spinners to decide who gets the sticker, the child in the Green group or the child in the Yellow group. E then asked “Which spinner do you think we should use to

decide who gets the sticker?” and pointed at each spinner in turn, left to right, asking “this one?” When the participant had chosen a spinner by pointing at or describing it, E asked “Why do you think we should use that spinner?” Following the participant’s response, E put away the spinner set and envelopes. E then put down another sticker and repeated the procedure above with two new recipient names and a different spinner set. This procedure was repeated for a total of eight spinner choice trials per participant. Finally, E thanked the children for their participation and told them that the groups did not matter anymore now, and that they could take off their scarves.



*Figure 1.* Experimental set-up for spinner choice trials. The red star represents the sticker. The child and the experimenter sat side by side in front of the display.

### ***Counterbalancing and Randomization***

When assigning participants to minimal groups, group allocation was made to appear random to participants, but was actually fixed and counterbalanced for each age group.

On spinner choice trials, the order of the spinner sets was randomized for every participant by shuffling them before each testing session. Following a fixed order that was counterbalanced between participants, half of all spinner sets were presented ranging from yellow to green left to right, the other half as ranging from green to yellow left to right. To aid children’s understanding, the yellow envelope was always placed close to the yellow spinner and the green envelope close to the green spinner. On each trial, whichever recipient’s envelope was on the left was introduced first, therefore the ingroup recipient was introduced first on half of the trials, while the other trials began with the outgroup recipient. Recipients’ names were always gender matched and alternated between boys’ and girls’ names.

### ***Coding***

Children’s responses were coded from video by E. Children’s responses to the comprehension checks for partiality understanding and minimal group membership were coded as pass/fail. For each trial of the main measure, children’s chosen spinner was assigned a score based on its

group representation (i.e., colour composition). Scores ranged from 1 (all green) to 7 (all yellow). Children rarely changed their spinner choice, but when they did, their last choice was recorded.

Participants were asked to justify each spinner choice, and all explanations provided were included in the analysis. Children's explanations were coded as referencing (1) fairness, (2) ingroup advantage, (3) outgroup advantage, or (4) personal advantage; when responses referenced none of these concepts or were uninterpretable they were coded as (5) other. Where responses referenced more than one of the concepts of interest (1-4) they were coded into both categories. Examples for each category are provided in Table 1.

Table 1

*Coding Category Examples from Children's Justifications*

Category	Example
Fairness	"because it gives each group a fair chance" "because they've both got a good chance of getting the sticker" "because that one's equal"
Ingroup advantage	"because it has all yellow and I'm in the Yellow group " "so that my team can get it " "cause the Green group's got more chance than the Yellow group" (GG)
Outgroup advantage	"because maybe the Green team will have another chance of getting the sticker" (YG) "just so the other team get one" "it's got more yellow" (GG)
Personal interest	"cause probably I would then get it" "because if I spin, I'm still gonna win" "cause I'm more likely to win"
Other	"I don't know" "cause it looks colourful" "cause they're both triangles"

*Note.* "GG" = quote from a Green group participant, "YG" = quote from a Yellow group participant.

Twenty-five percent of the data (n = 18) from the comprehension checks, the main spinner choice trials, and of children's justifications were second coded by a coder who was unaware of the hypothesis of the study. Interrater agreement was perfect for comprehension checks

(Cohen's Kappa = 1). It was also perfect for the main measure of spinner choice (Cohen's Kappa = 1). Agreement for the justifications was very good (Cohen's Kappa = 0.83).<sup>3</sup> All analyses were based on the first coding.

## Results

All children included in the analyses accurately reported their assigned group membership and correctly identified the appropriate yellow or green scarf. For each child, we calculated a mean spinner choice score across the eight trials of the main measure. In both studies, all reported *t*-test *p*-values are two-tailed, and  $\alpha = .05$  unless otherwise stated. Preliminary analysis revealed no effect of gender, therefore gender was excluded from further analyses.

### *Pre-registered Analyses*

Following our pre-registered analysis plan (<https://aspredicted.org/g2ar2.pdf>), an independent-samples *t*-test comparing mean spinner choice scores for participants in the Green group and the Yellow group revealed a significant difference,  $t(70) = 4.82$ ,  $p < .001$ , Hedge's  $g = 1.14$ . Participants in the Green group on average chose spinners with more green than yellow (i.e., spinners with scores below 4;  $M = 3.57$ ,  $SD = 0.79$ ), while participants in the Yellow group on average chose spinners with more yellow than green (i.e., spinners with scores above 4;  $M = 4.33$ ,  $SD = 0.53$ ). To increase power, we then reverse-scored spinner choice scores for all participants in the Green group and collapsed across colour groups for all further analyses. In a one-sample *t*-test, we compared mean spinner choice scores ( $M = 4.38$ ,  $SD = 0.67$ ) to the scale midpoint (4) (Figure 2), which represents fair spinner choices. Participants' mean scores differed significantly from fair,  $t(71) = 4.83$ ,  $p < .001$ , and this reflected a medium-sized effect, Cohen's  $d = 0.57$ . A further breakdown of children's performance by age and spinner choice score can be seen in Figure 3.

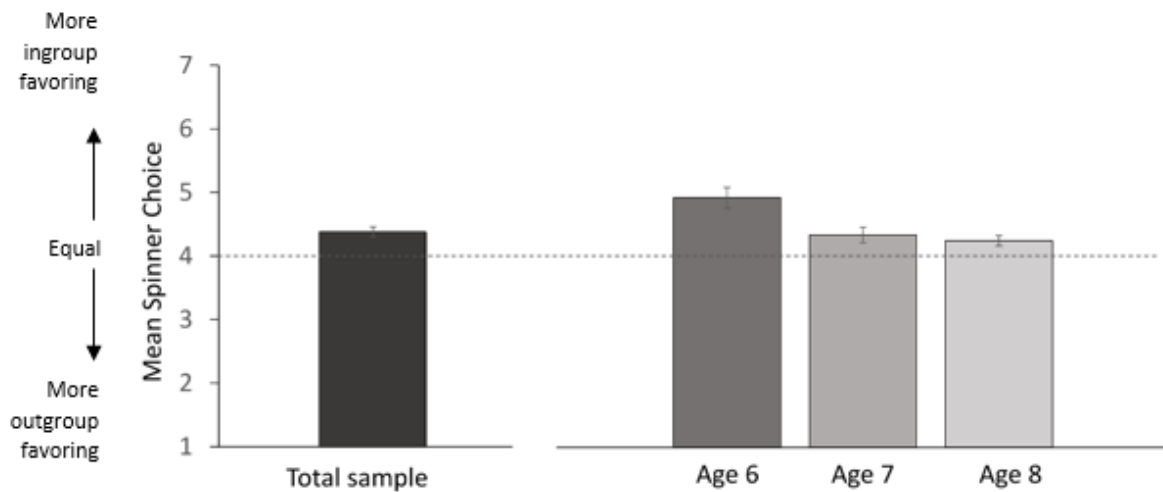
### *Additional Analyses*

To investigate the effect of age on participants' mean spinner choice scores, we conducted a one-way between-subjects ANOVA (Age: 6 vs 7 vs 8), which revealed a significant effect ( $F(2,$

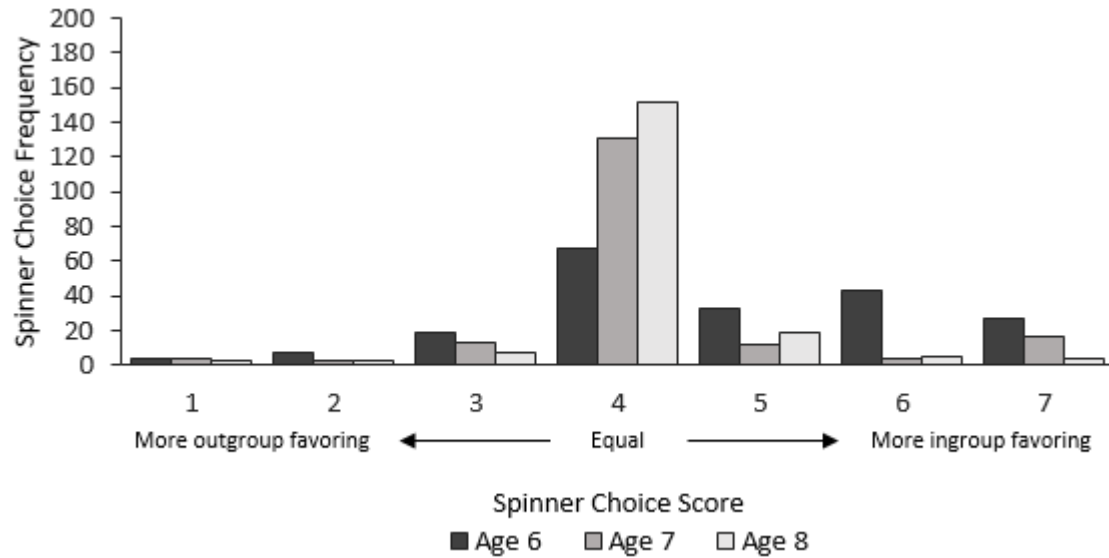
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<sup>3</sup> For interrater agreement analysis, justifications that were coded as referencing more than one concept of interest (i.e., given more than one score) were scored as (6) 'double coded'. There were four examples of mismatches in this category. In all four cases, both coders agreed on one coding score while one of the coders additionally assigned another score.

69) = 8.31,  $p < .001$ ,  $\eta^2 = .19$ ). Post-hoc comparisons (Bonferroni-corrected independent samples  $t$ -tests with adjusted  $\alpha$ -values) revealed significant differences between mean spinner choice scores of 6-year-olds and 7-year-olds ( $t(43) = 2.85$ ,  $p < .01$ , Hedges'  $g = 0.81$ ), and between 6-year-olds and 8-year-olds ( $t(35) = 3.68$ ,  $p < .001$ , Hedges'  $g = 1.04$ ), but not between 7-year-olds and 8-year-olds ( $t(45) = 0.62$ ,  $p = .538$ , Hedges'  $g = 0.18$ ). To further explore the age differences indicated by these findings, we compared each age group's mean spinner choice score to fair (i.e., spinner score of 4) in Bonferroni-corrected one-sample  $t$ -tests ( $\alpha$ -values adjusted; Figure 2). We found that 6-year-olds' ( $t(24) = 4.88$ ,  $p < .001$ , Cohen's  $d = 0.98$ ), but not 7-year-olds' ( $t(22) = 1.81$ ,  $p = .084$ , Cohen's  $d = 0.38$ ) and 8-year-olds' choices ( $t(23) = 1.64$ ,  $p = .115$ , Cohen's  $d = 0.33$ ) differed significantly from fair.



*Figure 2.* Mean spinner choice scores for the total sample (left) and each age group (right), collapsed across colour groups, compared to a fair choice, represented by the dashed line. Error bars represent the standard error of the mean.



*Figure 3.* Frequencies of children’s spinner choice scores by age, collapsed across colour groups. Higher spinner scores indicate more ingroup favouring spinner choices; a response of 4 indicates a fair spinner choice.

To further explore the association between age and children’s spinner choices, we conducted a Pearson correlation analysis. This indicated a significant negative correlation between children’s age in months and their mean spinner choice scores ( $r(70) = -.39, p = .001$ ). Further exploration of children’s spinner choices by trial and by spinner design is provided in the appendix.

To explore whether children’s explanations were related to their spinner choices, we examined the frequency of references to fairness, ingroup advantage, outgroup advantage, and personal advantage for fair, ingroup favouring, and outgroup favouring spinner choices (Table 2). Results revealed that across ages, children mostly explained fair spinner choices with reference to fairness concerns (6-year-olds 78% of the time, 7- and 8-year-olds 88% of the time). Occasionally, children referenced either ingroup or outgroup advantage when explaining fair spinner choices. Children’s explanations suggest that on these rare occasions, they sometimes mistook fair spinners for unequal spinners (e.g., “because I think it’s got slightly a bit more yellow”; “because it’s the green group’s”).

Six-year-olds, who chose ingroup favouring spinners more often than older children, frequently referenced ingroup advantage when justifying their ingroup favouring spinner choices (51% of the time). When explaining ingroup favouring spinner choices, 7-year-olds referenced ingroup advantage 44% of the time, but 8-year-olds only referenced ingroup advantage 3% of the time. When describing ingroup favouring choices, children sometimes

also referenced fairness concerns. Six-year-olds did this 15% of the time, 7-year-olds did this 16% of the time and 8-year-olds did this 31% of the time. Although it is important to be extremely cautious when interpreting these descriptive results, one possible explanation is that children recognized the importance of appearing fair even while choosing ingroup favouring spinners. Across ages, children only occasionally referenced personal advantage when explaining ingroup advantageous spinner choices; they never referenced personal advantage when making either fair or outgroup favouring choices.

On the rare occasions when children made outgroup favouring choices, they often referenced outgroup advantage. When making outgroup favouring choices, 6-year-olds referenced outgroup advantage 37% of the time, 7-year-olds referenced outgroup advantage 32% of the time and 8-year-olds referenced outgroup advantage 25% of the time. Explanations for outgroup favouring spinner choices also often alluded to fairness, saying things like “cause they'll get a random of yellow or green” and “because it's nearly half of each”. When explaining outgroup favouring spinner choices, fairness was referenced 23% of the time by 6-year-olds, 37% of the time by 7-year-olds, and 33% of the time by 8-year-olds.

Overall, these descriptions suggest that children had explicit awareness of their reasons for choosing the spinners that they did. However, given very small cell numbers for many of these categories (e.g., 7- and 8-year-olds mostly chose fair spinners), these findings should be interpreted with caution.

Table 2

*Frequencies (and Percentages, Rounded to the Nearest Percent) of Responses Falling Into Each Justification Category as a Function of Spinner Choice and Age*

		Justification				
		Fairness	Ingroup advantage	Outgroup advantage	Personal advantage	Other
Age 6	Fair	53 (78%)	2 (3%)	3 (4%)	0 (0%)	10 (15%)
	Ingroup advantage	16 (15%)	53 (51%)	0 (0%)	3 (3%)	32 (31%)
	Outgroup advantage	7 (23%)	0 (0%)	11 (37%)	0 (0%)	12 (40%)
Age 7	Fair	116 (88%)	1 (1%)	2 (2%)	0 (0%)	13 (10%)
	Ingroup advantage	5 (16%)	14 (44%)	0 (0%)	5 (16%)	8 (25%)
	Outgroup advantage	7 (37%)	0 (0%)	6 (32%)	0 (0%)	6 (32%)
Age 8	Fair	134 (88%)	3 (2%)	1 (1%)	0 (0%)	15 (10%)
	Ingroup advantage	9 (31%)	1 (3%)	0 (0%)	8 (28%)	11 (38%)
	Outgroup advantage	4 (33%)	0 (0%)	3 (25%)	0 (0%)	5 (42%)

## **Discussion**

In Study 1, we investigated how children balance concerns for fairness and ingroup favouritism in the context of procedural justice. When given a choice of resource allocation procedures ranging from ingroup favouring through fair to outgroup favouring, collapsed across age, 6- to 8-year-olds on average chose procedures that were advantageous for their ingroup. Notably, further analyses showed that this effect was driven by the youngest participants' choices. Specifically, only 6-year-olds' average spinner choices differed significantly from fair, whereas by age 7, children mostly chose fair procedures. Children's explanations suggest that they were explicitly aware of the implications of their choices for each recipient's chances of getting a desirable resource. In other words, the observed spinner choices appeared to be deliberate across ages, rather than younger children having made different choices due to a lack of understanding, compared to older children.

## **Study 2**

In Study 1, we investigated how children weigh concerns for fairness and ingroup favouritism. We found the majority of children's responses were either fair or ingroup favouring and that fair choices increased with age. In Study 2, we build on the results of Study 1 by investigating why 6- to 8-year-old children choose the procedures that they do. We were particularly interested in testing the hypothesis that children's reputational concerns may influence their procedure choices. In order to investigate this, we compared the procedures children choose in public and in private. A theory based on the importance of reputation management to children would predict that children will be more likely to choose ingroup favouring procedures in private than in public (Engelmann & Rapp, 2018; Shaw et al., 2014). Alternatively, a theory based on the importance of a genuine concern for fairness among children may predict that children will be equally likely to make fair choices in public and in private (Dunham et al., 2018). A third hypothesis is that children's ingroup favouring choices are driven by reputational concerns and that children seek a reputation as ingroup favouring (Misch et al., 2014). If this is the case, then children will choose ingroup favouring procedures more often in public than in private.

Our second study also addresses an additional question arising from Study 1. It is possible that older children did not choose ingroup favouring spinners in Study 1 because these children did not actually favour their minimal ingroup and therefore were not motivated to treat



ingroup members preferentially. Explicit ingroup favouritism has sometimes been found to peak in middle childhood and then decline (e.g., Raabe & Beelmann, 2011). To test whether levels of ingroup favouritism differ between the age groups investigated here, our second study also included a measure of ingroup favouritism. Our pre-registration for this study is available at AsPredicted (<https://aspredicted.org/pt8fu.pdf>).

## **Method**

### ***Participants***

One hundred and eighteen 6- to 8-year-olds were included in the study (age range: 6 years, 0 months to 8 years, 11 months). The sample size was based on an a priori power analysis, conducted in G\*Power 3.1.9.4 (Faul et al., 2007). This indicated that 117 participants would be required to detect an effect size of Cohen's  $f = 0.22$  for the 2 (within-subjects) x 3 (between-subjects) interaction with power = .95,  $\alpha = .05$ , and a correlation of 0.3 among repeated measures. The effect size estimate is based on an existing study on reputation management in procedural justice among 6- to 8-year-olds (see Experiment 3, Shaw et al., 2014). We pre-registered a sample size of 120 participants to allow for counterbalancing; however, due to unexpected circumstances (i.e., the Covid-19 pandemic), data collection had to be terminated just before reaching this mark. The final sample consists of 40 6-year-olds, 39 7-year-olds, and 39 8-year-olds, with 20 males per age group. An additional sixteen children participated but were excluded from the final analyses because they did not meet our pre-registered inclusion criteria (<https://aspredicted.org/pt8fu.pdf>): twelve failed comprehension and/or manipulation checks, one failed to follow instructions, one due to missing data, and two because they were tested in the wrong condition. Participants were recruited at two museums in northern England, were fluent in English, and of the participants included in the analyses, most were described by their parents as being of White British background ( $n = 102$ ).

### ***Materials***

The same red and blue spinners as in Study 1 were used for spinner practice and testing partiality understanding.

The public/private manipulation training trials employed seven stylized images of land animals presented in clear pouches on a large (A2 format) cardboard sheet, and another sheet of cardboard with seven stylized images of sea animals.

Group attitudes were measured on a 5-point Likert scale, with each point represented by a line drawing of a face with an expression ranging from smiling to frowning.

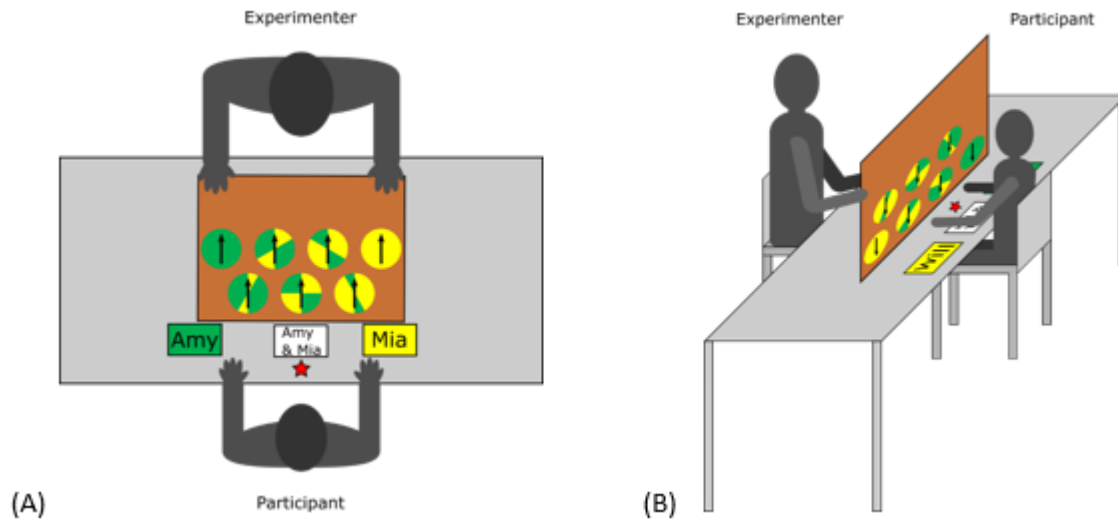
A total of twelve spinner sets, each consisting of seven spinners, were used for the main measure, one set for each trial. Of these, there were three sets with each of the four designs used in Study 1 (i.e., 3 x 2 colour sections of equal size, 3 x 2 colour sections of different sizes, 3 x 3 colour sections of equal size, and 3 x 3 colour sections of different sizes, see OSF [https://osf.io/2t9cu/?view\\_only=6be8a5d010b948d78142862637dcf7b8](https://osf.io/2t9cu/?view_only=6be8a5d010b948d78142862637dcf7b8)). For each spinner choice trial (main measure), the spinners were placed in clear pouches on a large cardboard sheet, making them easily removable. In order to fit them on the cardboard sheets, the spinners were arranged in two rows, one with three spinners and one with four, and spinners were arranged in colour order, starting with either all yellow or all green on the left. Both layout features were varied systematically across spinner boards (for an example, see Figure 4).

### ***Design***

As in Study 1, the main measure was children's spinner choice. The study employed a 2 (Condition: public vs private spinner choice) x 3 (Age: 6 vs 7 vs 8) design, with Condition as a within-subjects manipulation. Additionally, we measured children's ingroup and outgroup attitudes in a 2 (Attitude: ingroup vs outgroup) x 3 (Age: 6 vs 7 vs 8) design.

### ***Procedure***

Testing took place in a screened-off area in museums, and only the participant and E were present during testing. Participants were seated at a table across from E. As in Study 1, we employed a forced-choice task as our main experimental measure. On each trial, children were asked to choose which of the seven available spinners they thought we should use to decide who gets a sticker. To compare children's private to their public choices, the spinners were presented in a way that the participant knew E could see what they were choosing on half of the trials (public condition, Figure 4, panel A), and on the other trials, the participant knew E could not observe their choice (private condition, Figure 4, panel B).



*Figure 4.* Trial set-up during public trials, shown from above (panel A). Trial set-up during private trials, shown from the side (panel B). The red star represents the sticker.

**Training and Familiarization Phase.** Children first completed the same spinner training and test of partiality understanding as in Study 1. Then children were presented with the same set-up as during the spinner choice task and familiarized with the public/private condition differences. On the first familiarization trial (private condition), E placed an envelope saying ‘Favourite Land Animal’ in front of the participant. The participant was then presented with an opaque board featuring seven removable pictures of land animals. The board was held upright by E such that the participant could see the pictures but E could not, as the board created a visual barrier between the participant and E. The participant was asked to pick their favourite animal, take the picture off the board, put it into an envelope, and then place the envelope in a box. The box already contained other envelopes so that participants’ envelopes were not clearly identifiable. The experimenter told the participant that she would sometimes be able to see what they are choosing, and sometimes not, and then asked the child whether they think she knew which animal they picked now. E then provided feedback for the participant’s response (“Yes that’s right./No, when the board is like this I can’t see what you’re choosing, so can you let me know when you’re done?”). When the participant informed E that they were done, E put away the board without seeing the pictures. On the second familiarization trial (public condition), E put down a ‘Favourite Sea Animal’ envelope and placed a board with seven pictures of sea animals flat on the table in front of the child, allowing E to freely observe the participant’s actions. E then repeated the instructions from the previous trial, prompting the

participant to choose their favourite animal. E then asked “How about this time, can I see what you’re choosing?”, and provided feedback (“Yes that’s right./No, when the board is like this I can see what you’re choosing.”). E put away the board when the participant was done. This was then repeated for another private (third) and public (fourth) familiarization trial.

**Minimal Groups and Group Attitude.** Participants were introduced to the Yellow and Green group as in Study 1 and made to believe they would be randomly allocated; however, all participants were assigned to the Green group. Then, children were asked to rate their ingroup and outgroup liking. E asked “How much do you like your group, the Green group? Do you really like them, kind of like them, think they’re okay, kind of don’t like them, or really don’t like them?” and then repeated this procedure for “the other group, the Yellow group”.

**Spinner Choice.** Participants completed twelve spinner choice trials. Each trial began with E placing three envelopes in front of the participant: A yellow one with the Yellow group recipient’s name, a green one with the Green group recipient’s name, and in the middle, a white one with both recipients’ names (half of all white envelopes stated the Green group recipient’s name first). As in Study 1, E introduced the (fictitious) recipients while putting down the coloured envelopes. E then placed a sticker in front of the participant. Then, E presented a spinner board and told the participant that “we’ll use one of these spinners to decide who gets the sticker, the child in the Green group or the child in the Yellow group”. E then asked the child to think about which spinner we should use, and when they know which one to use, to take the spinner off the board, put it inside the white envelope and then put the envelope in the box. While saying this, E pointed at the previously used box which also contained decoy spinner choice envelopes to make the child’s envelopes less easily identifiable. On all public trials, the board was presented flat on the table (see Figure 4, panel A), and E ended the trial after observing the child place the envelope into the box. On private trials, the spinner board was presented upright (see Figure 4, panel B), and E said “remember I can’t see you now, so let me know when you’re done” after asking the child to choose a spinner. Private trials ended when the child informed E that they were finished, prompting E to put away the spinner board. A shortened version of this script was repeated on subsequent trials. After 12 trials, E thanked the children for their participation and told them that the groups did not matter anymore now, and that they could take off their scarves.

### ***Counterbalancing and Randomization***

For the spinner choice measure, trials were blocked by condition (public/private), with two blocks (3 trials each) per condition presented in alternating order; the block order was counterbalanced across participants. The order of the spinner sets was randomized by shuffling them anew for each participant. Half of all spinner sets ranged from yellow to green left to right, the other half from green to yellow left to right. As in Study 1, the coloured envelopes were always placed near the colour-matching side of the spinner board, the ingroup recipient was introduced first on half of the trials, and recipients' names were gender matched and alternated between boys' and girls' names.

For the group attitude measure, children were always asked to rate their ingroup attitude before their outgroup attitude.

### ***Coding***

To make the privacy manipulation more convincing, the testing sessions were not video recorded. Once participants had left the testing area, E removed their envelopes containing spinners from the box which also held the (empty) decoy envelopes and photographed each chosen spinner next to the envelope that was labelled with the recipients' names. The order of recipients was fixed, therefore the trial number could be identified by the recipient names. Children's responses were coded from these photographs.

For the main measure, children's spinner choice on each trial was assigned a score from 1 (all yellow) to 7 (all green). A score of four represents a fair choice. Responses to the ingroup and outgroup attitude measure were each scored on a 5-point scale ranging from a strongly positive (scored as 5) to a strongly negative (scored as 1) group attitude.

Twenty-five percent of the comprehension checks ( $n=30$ ) for participants' understanding of partiality and public versus private choices, as well as of the group attitude scores and the main spinner choice trials, were second coded by a coder who was unaware of the hypotheses of the study. Interrater agreement was perfect for comprehension checks (Cohen's Kappa = 1), and near perfect for group attitudes (Cohen's Kappa = 0.95) and spinner choices (Cohen's Kappa = 0.99). All analyses are based on first coding.

## Results

### *Preliminary Analyses*

Preliminary analysis revealed no effect of gender, therefore gender was not included in further analyses. To check whether children were on average ingroup favouring (as pre-registered, <https://aspredicted.org/pt8fu.pdf>), we analysed children's group attitude scores in a 2 (Attitude: ingroup vs outgroup) x 3 (Age: 6 vs 7 vs 8) mixed-design factorial ANOVA.<sup>4</sup> This showed a significant main effect of Attitude ( $F(1, 114) = 17.23, p < .001, \eta^2 = .13$ ). On average, participants' ingroup attitude scores ( $M = 4.15, SD = 1.08$ ) were higher than their outgroup attitude scores ( $M = 3.43, SD = 1.23$ ). We did not find a main effect of Age ( $F(2, 114) = 1.29, p = .278, \eta^2 = .02$ ) nor an interaction ( $F(2, 114) = 1.04, p = .358, \eta^2 = .02$ ). This confirms that our minimal group membership manipulation was effective for all age groups.

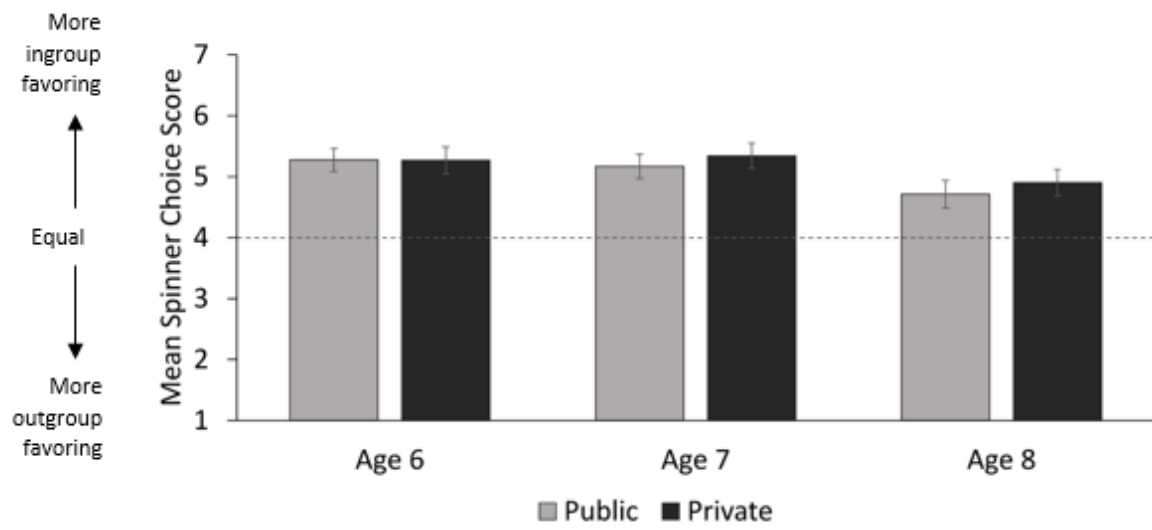
### *Main Analyses*

Main analyses are pre-registered on AsPredicted (<https://aspredicted.org/pt8fu.pdf>). To investigate the effects of condition and age on children's spinner choices, we conducted a 2 (Condition: private vs public) x 3 (Age: 6 vs 7 vs 8) mixed-design factorial ANOVA on participants' mean spinner choice scores. We found a small but significant main effect of Condition,  $F(1, 115) = 4.93, p = .028, \eta^2 = .04$ , with lower average spinner choice scores in the public ( $M = 5.05, SD = 1.31$ ) than private condition ( $M = 5.17, SD = 1.35$ ). There was no main effect of Age ( $F(2, 115) = 1.63, p = .201, \eta^2 = .03$ ), and no interaction ( $F(2, 115) = 1.43, p = .244, \eta^2 = .02$ ).

We then compared each age group's mean spinner choice score per condition to the scale midpoint (4), which represents a fair spinner choice, using one-sample *t*-tests. These showed that children tended to choose ingroup favouring spinners across age groups and conditions, with all means differing significantly from fair (see Figure 5; all  $ps < .01$ , Cohen's *ds* between 0.51 and 1.06). A further breakdown of children's spinner choice scores by age and condition can be seen in Figure 6.

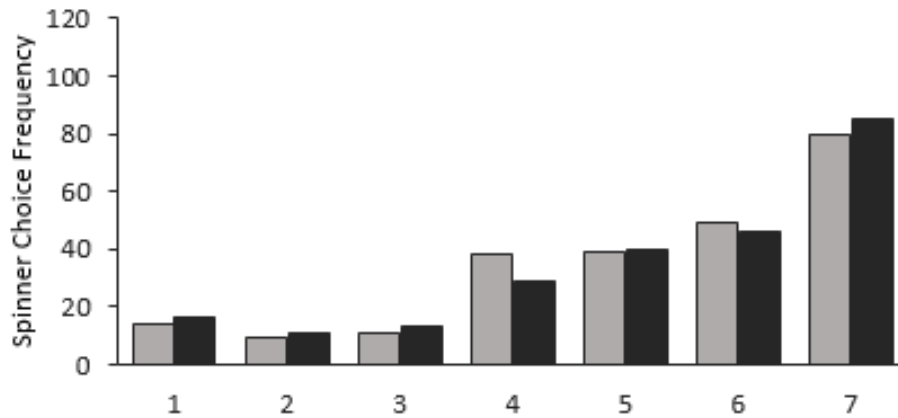
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<sup>4</sup> All group attitude analyses exclude one participant for whom intergroup attitude scores were not recorded due to experimenter error.

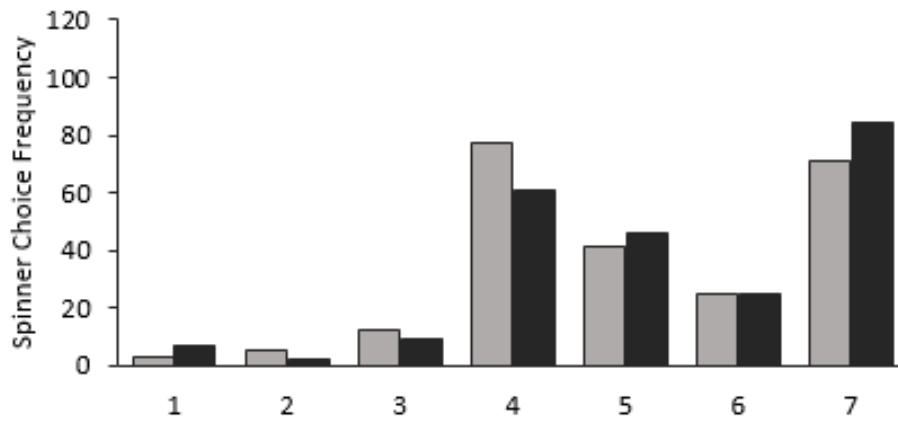


*Figure 5.* Mean spinner choice scores for each age group in the public and private condition. The dashed line represents fair spinner choices. Error bars represent standard errors of the mean.

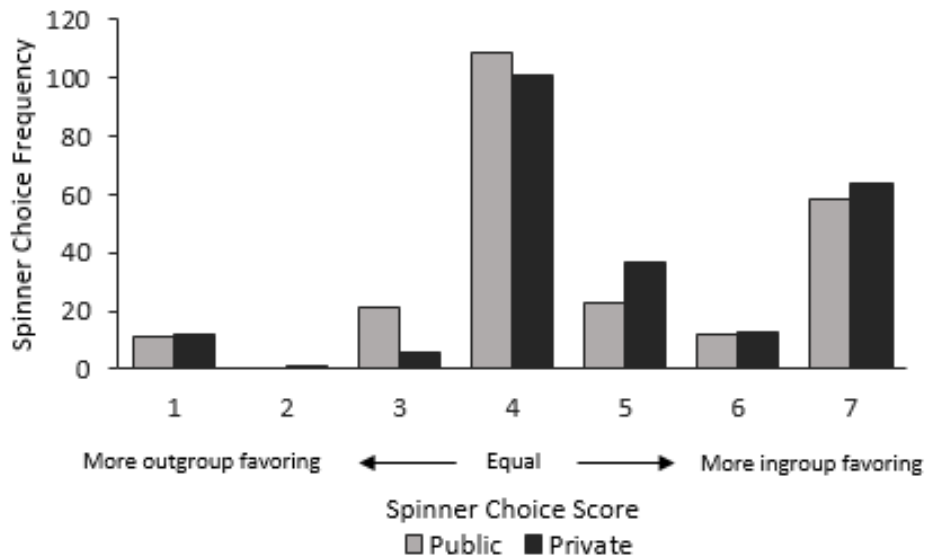
(A)



(B)



(C)



*Figure 6.* Frequencies of children's spinner choices scores by condition for (A) 6-year-olds, (B) 7-year-olds, and (C) 8-year-olds. Higher spinner scores indicate more ingroup favouring spinner choices; a response of 4 indicates a fair spinner choice.



### ***Additional Exploratory Analyses***

To explore the relationship between children's ingroup favouritism and their spinner choices, we first calculated an intergroup bias score for each participant by subtracting their outgroup attitude score from their ingroup attitude score. We then conducted two Pearson correlation analyses, one per condition. Children's intergroup bias scores were significantly positively associated with their mean spinner choice scores in the public ( $r(115) = .29, p = .001$ ) as well as the private ( $r(115) = .31, p = .001$ ) condition, and the strength of these two correlations did not differ ( $z = -.15, p = .884$ ).

To further explore the association between age and children's spinner choices, we conducted Pearson correlation analyses between children's age in months and their mean spinner choice scores in the public and private conditions. Two participants were excluded from these analyses because we did not have precise age information for them. The analyses indicated a small but significant negative association between age and public spinner choice scores ( $r(114) = -.19, p = .045$ ), as well as a very weak negative correlation between age and private spinner choice scores, but this did not reach statistical significance, ( $r(114) = -.13, p = .17$ ). Further exploration of children's spinner choices by trial and by spinner design is provided in the appendix.

### **Discussion**

Results from Study 2 show that 6- to 8-year-olds often choose ingroup favouring spinners and do this regardless of whether the decision is made in public or private. These results suggest that children are internally motivated to favour their ingroup. We also found modest support for the hypothesis that children would seek a reputation as fair. Children chose somewhat more ingroup favouring spinners in private than in public. Although the size of the observed effect is modest, it nonetheless suggests a motivation to appear fair is one factor influencing children's choices. Taken together, the findings from Study 2 suggest that in middle childhood, children prefer their ingroup but also show at least some tendency to manage their reputation in order to appear fairer than they would otherwise be. This also suggests that the form of reputation management that they engage in has more to do with appearing impartial rather than appearing to favour their ingroup.

## General Discussion

A collective commitment to procedural justice is crucial for the successful functioning of democracy as well as for ensuring fairness in the judicial system and economy (Tyler, 2000, 2003). As the large body of literature on prejudice reduction suggests (Paluck, Porat, Clark, & Green, 2021), in adults, a commitment to fairness can often be undermined by ingroup favouritism (e.g., Tajfel et al., 1971). We investigated how children weigh their concerns for procedural justice and for their ingroup when choosing resource allocation procedures. Across two studies and collapsed across age, children aged 6 to 8 on average chose ingroup favouring procedures when allocating resources between an ingroup and an outgroup child. Existing research shows that by age 6, children have a strong preference for impartial over partial procedures in third party allocation tasks (Shaw & Olson, 2014), and by age 8, they even choose fair procedures over ones that would advantage them personally in first-party allocation tasks (Dunham et al., 2018), thus prioritizing fairness over self-interest. However, in the current studies, ingroup favouritism outweighed children's preference for impartial procedures. This favouritism was particularly consistent for six-year-olds, who aided their ingroup in both studies. This finding extends research on children's distribution choices, which suggests that they tend to allocate more resources to members of their own group than to outgroup members (e.g., Fehr et al., 2008). Taken together, these studies provide strong evidence of ingroup favouritism in children's procedure choices in middle childhood.

In our second study, we further explored why children sometimes choose fair procedures in addition to ingroup favouring ones. Our findings suggest that 6- to 8-year-old children may be somewhat more likely to choose fair procedures when their decision is visible to the experimenter. The observed effect is very small and does not allow for strong conclusions, but we consider two possible explanations for this effect which future research could helpfully investigate. On the one hand, it is possible that children's procedure choices are not strongly affected by reputational concerns. However, it is also possible that reputational concerns could be enhanced by modifying certain aspects of the procedure. In contrast to other studies in this field (e.g., Yazdi et al., 2020), we did not emphasize that the experimenter observing children's choices was evaluating their sharing or their character; emphasizing this may have led to stronger reputation management effects in the public condition (Dutra et al., 2018; Yazdi et al., 2020). Our privacy manipulation may have also been less likely to elicit reputation management effects than other set-ups, such as those that allow multiple paths to maintaining a prosocial reputation in public while prioritizing other motives in private. For

example, Shaw et al. (2014) asked participants to choose between directly assigning or flipping a coin to allocate two prizes, a nicer and a less nice prize, between themselves and an absent recipient. Children who chose to use the fair procedure then flipped the coin entirely in private and self-reported the outcome. Here, participants could appear fair by choosing to flip the coin, but could then cheat by not flipping the coin at all and simply reporting that they won the better prize, or they could flip the coin but still misreport the outcome. The study found that children who chose to flip the coin reported winning the better prize more often than can be expected by chance, thus managing their reputation while using impartial procedures unfairly. Lastly, despite precautions (e.g., reminding children on every private trial that the experimenter cannot see them) and manipulation checks, our privacy manipulation may not have been entirely convincing to all children.

An outstanding question is why we found an age difference in Study 1 but not Study 2. In Study 1, collapsed across age, children on average chose ingroup advantageous procedures but this effect was primarily driven by 6-year-olds' ingroup favouring choices. This shift from frequently choosing ingroup favouring procedures at age 6 to mostly fair procedures at ages 7 and 8 in Study 1 could have been driven by an increase in fairness concerns with age, or a decrease in ingroup favouritism in older children. While the latter explanation cannot be ruled out, results from Study 2 show that favouritism for a minimal ingroup can easily be induced in children in middle childhood, and ingroup favouritism is associated with ingroup favouring procedure choices. In Study 2, all age groups chose ingroup favouring procedures. Although other differences between the studies preclude firm conclusions, one reasonable explanation for this difference is that 7- and 8-year-olds made more ingroup favouring choices in Study 2, compared to Study 1, because group membership was more salient in Study 2. In Study 2, we explicitly asked children about their preferences towards the two groups, which could have strengthened children's ingroup preference across ages. This suggested explanation fits well with propositions that using group labels to structure the environment increases the psychological salience of the grouping criterion (in this case, minimal group membership) which, in turn, is thought to contribute to the formation of intergroup bias (Bigler & Liben, 2007).

Other interesting questions for future research arise from our findings. One particularly fruitful direction for future work would be to directly compare how children's concerns for procedural justice relate to their concerns for distributive justice. For example, it will be important to investigate whether children are equally ingroup favouring in both situations, or

whether children may show a greater concern for fairness in the case of procedural justice. Procedural justice can serve to avoid conflict even when distributive justice is not possible (Tyler, 2000), and children and adults tend to prioritize procedural over distributive justice when they conflict (Dunham et al., 2018). This may be particularly important to examine in contexts where distributors are likely to be biased, such as during intergroup conflict and resource scarcity. Here, impartial procedures can prevent favouritism from guiding the decision process, making this an important arena for the application of procedural justice. Developmental research shows that by 8 years of age, children understand that partiality can influence people's judgments and decision-making in a way that threatens fairness (Mills et al., 2012; Mills & Grant, 2009; Mills & Keil, 2008). However, children may struggle to recognize their own biases (Elashi & Mills, 2015). With age, children appear to grow increasingly sceptical of others' impartiality but maintain a 'bias blind spot' for their own favouritism (Elashi & Mills, 2015). How to encourage the use of fair procedures in intergroup contexts is therefore another important question for future research.

Relatedly, future research should directly investigate how intergroup competition, threat and status influence concerns for procedural justice. In our study, we investigated how children weigh concerns for fairness and ingroup preference in minimal group settings. A considerable body of previous research has shown that intergroup biases are exacerbated in contexts marked by competition and threat (Chang et al., 2016; Dunham et al., 2011; Riek et al., 2006; Spielman, 2000). It would be interesting for future research to investigate whether these social factors would increase endorsement of ingroup favouring procedures among children. Other research has shown that status differences between groups impact the extent of intergroup biases (Bigler, Brown, & Markell, 2001; Shutts, 2015). Whereas members of high status groups often demonstrate high levels of ingroup preference, these effects are often reduced or sometimes even reversed among members of low status groups (Horwitz et al., 2014; Newheiser, Dunham, Merrill, Hoosain, & Olson, 2014; Newheiser & Olson, 2012; Shutts, Kinzler, Katz, Tredoux, & Spelke, 2011). It would be interesting for future research to investigate whether children are more likely to endorse impartial procedures, rather than ingroup favouring procedures, when they belong to low status groups. It would also be important to explore the procedure choices of members of high status groups, as those in power are likely to decide upon procedures. Understanding how such structural variables affect children's commitment to procedural justice can yield insights that inform research with real world groups (Cikara & van Bavel, 2014).

Future research should also investigate how concerns for procedural justice play out in real world intergroup contexts directly, including those that may entail pre-existing inequalities such as those based on race and gender. Research on resource distributions demonstrates that children sometimes perpetuate and sometimes rectify intergroup inequalities, depending on who has been disadvantaged (Elenbaas et al., 2016; Olson et al., 2011). This research has further shown that intergroup contexts can not only lead children to distribute less fairly by giving more to ingroup members, but especially older children can also use their increasing knowledge of societal intergroup inequalities to make *fairer* allocation decisions, particularly when others' welfare is at stake (Killen et al., 2017, 2018). For example, Elenbaas and Killen (2016a) found that after witnessing an unequal allocation of medical supplies, with age, American children systematically preferred to rectify (rather than perpetuate) the inequality when hospitals serving African Americans had been disadvantaged but not when hospitals serving European American children had been disadvantaged. This developmental shift was mediated by older children's greater awareness of wealth disparities between African Americans and European Americans in their society and more negative evaluations of medical supply disparities. It is not yet known how children's concerns about procedural justice will be influenced by their knowledge of real world groups and pre-existing inequalities, as well as by the importance of the resource for recipients' welfare.

Exploring procedural justice is especially important because biased procedures, even more so than one-off unequal distributions, can continually perpetuate inequality. This is because biased procedures, once established, may often remain in place for multiple interactions. An unfair hiring practice, for example, has the potential to affect many individuals while it is in operation. The potential long-term impact of unfair procedures raises the question of whether children will retain, or even enhance, a tendency to choose ingroup favouring procedures when they believe that the procedure will be used repeatedly or whether the high stakes will increase a concern for fairness.

Taken together, these studies demonstrate that children are concerned about fairness and ingroup advantage but, when faced with the choice, often choose ingroup favouring procedures over fair procedures, and that this tendency may be slightly stronger when choosing in private. Our research thus suggests that ingroup favouritism often trumps procedural justice in resource allocation tasks, especially for younger children and especially when reputation is not in play.

## **Chapter 3:**

# **Prosocial Behavioural Intentions and Group Identification During the Covid-19 Pandemic**

### **Abstract**

We explored group identification with, and prosocial intentions (donating money and volunteering time) towards, a local ingroup, an extended (national) ingroup, and an outgroup (other countries) in the United Kingdom over an extended period of the global Covid-19 pandemic between April 2020 and August 2021. During this time, we collected four separate samples (total N = 800). We examined the predictive validity of two competing hypotheses. On the one hand, the crisis may encourage people to focus on their ingroup, leading to increased intergroup bias in group identification and prosocial intentions. On the other hand, the internationally shared experience of hardship and the shared goal of overcoming the pandemic might increase identification and prosocial behaviour not only with ingroups, but also with other countries, possibly through recategorisation into a shared, superordinate ingroup. We found stronger identification with the local and national ingroups than with the international outgroup overall. Further, ingroup identification was highest at the start of the pandemic and then declined. Outgroup identification was consistently lower but remained stable across time. For money and time donations, intergroup biases were overall stronger at the beginning of the pandemic. Whereas prosocial intentions towards the local and national ingroup decreased over time, prosocial intentions towards the international outgroup increased towards the end of the time period examined. Overall, our results suggest that intergroup bias was strongest early on in the pandemic, when perceived threat from the pandemic was also highest, thus supporting hypotheses of increased intergroup bias in the face of threat.

### **Introduction**

The ongoing Covid-19 pandemic constitutes an international crisis which has led to enormous challenges within and across nations. The Sars-Cov19 virus was first reported from China on December 31<sup>st</sup>, 2019, and media attention focused on the outbreak there before infections in other countries led the World Health Organization to declare Covid-19 a pandemic on March 11<sup>th</sup>, 2020. In the United Kingdom (UK), Covid-19 cases had by then been confirmed and

infections rapidly spread. On March 23<sup>rd</sup>, 2020, the British Prime Minister announced a national lockdown, ordering people to stay at home and soon after legally enforcing these new rules. Importantly, the pandemic has not only affected peoples' health, but has also fundamentally changed many peoples' social lives. In-person social contact has been drastically reduced for many, often through mandatory physical distancing measures and stay-at-home orders. At the same time, widespread reports of offering help to others in need, including through volunteering and newly established mutual aid groups (Sin, Klaiber, Wen, & DeLongis, 2021; Wakefield, Bowe, & Kellezi, 2021), suggest that many people have sought out and engaged in prosocial behaviour. In the UK alone, thousands of mutual aid support groups sprang into action (Tiratelli & Kaye, 2020), and around 750,000 people volunteered to help the British National Health Service by the end of March 2020 (NHS England, 2020). However, such prosocial acts imply a cost to the provider (e.g., effort, time, money, or health risk if directly engaging with people in a pandemic) (Stürmer, Snyder, & Omoto, 2005; Wakefield et al., 2021), and to whom help is offered may vary depending on the interpersonal and social context as well as on how helpers relate to potential recipients (e.g., Dovidio et al., 1997; Flippen et al., 1996; Hornstein, Masor, Sole, & Heilman, 1971; Omoto & Snyder, 2002; Simon, Stürmer, & Steffens, 2000; Stürmer et al., 2005). In the present study, we investigated how identification with different social groups may have changed over the course of the pandemic, and how such changes relate to prosocial behaviour towards different recipient groups.

Social identity theory posits that seeing ourselves as a member of social groups is a fundamental part of our identity, and research supports this claim (e.g., Tajfel, 1978; Tajfel & Turner, 1979). Considering oneself to be a member of a group often leads to ingroup favouritism, which is evidenced by more positive affect as well as preferential treatment of ingroup members (see Dunham, 2018). Research on intergroup prosocial behaviour has shown that people often share more generously with ingroup members (e.g., Vaughan et al., 1981; Yazdi et al., 2020; see also Over, 2018) and help ingroup members more in a wide range of contexts (e.g., Dovidio et al., 1997; Levine, Cassidy, Brazier, & Reicher, 2002; Turner et al., 1987). For example, compared to outgroup members, adults are more willing to support unfamiliar, absent ingroup members in interpersonal laboratory tasks (e.g., Gaesser, Shimura, & Cikara, 2020) and field experiments (Hornstein, 1978), to aid distant ingroup disaster victims (Levine & Thompson, 2004), and even to help ingroup members in face-to-face emergency situations (Levine, Prosser, Evans, & Reicher, 2005). Further, identification with a group (e.g.,

one's community) has been found to predict providing support in the form of longer-term commitments such as volunteering (Omoto & Snyder, 2002, 2010). Greater prosociality for ingroup members is also reflected in donations, where charitable giving for local and national causes often substantially outweighs donations to international causes (Casale & Baumann, 2015; Hart & Robson, 2019). This has also been found to be the case in the context of the Covid-19 pandemic, where Cutler and colleagues (2021) found hypothetical donations for a national charity to outweigh donations for an international charity. During the current pandemic, as Covid-19 became prevalent in the United States, a sense of solidarity – an emerging social identity as a group facing a shared fate – was found to relate to donation intentions (Yue & Yang, 2021). Social identity (as opposed to personal identity) has often been found to become more salient in crises, with those affected perceiving themselves to form a social group with other affected individuals and showing enhanced solidarity and social support for affected (i.e., emergent ingroup) others (e.g., Drury, 2018; Jetten, Reicher, Haslam, & Cruwys, 2020).

However, which particular individuals we include as ingroup members may vary with context. As members of multiple social groups simultaneously (e.g., parent, academic, British, human), the most salient group membership and corresponding social associations (e.g., stereotype content) in a particular context may influence how social identity modulates affect, cognition and behaviour at any given time (e.g., Haslam et al., 1992; Oakes, 1987; Turner et al., 1987). Research based on self-categorisation theory (e.g., Turner et al., 1987) has demonstrated that social context influences group salience such that categorisations which are most meaningful in a given context are more likely to become most salient (Haslam & Turner, 1992; Turner et al., 1994). Further, the salience of group memberships for self-categorisation may be influenced by leaders and by people around us who we identify with, particularly by ingroup members (Reicher, Haslam, & Platow, 2018; Reicher, Haslam, & Hopkins, 2005). The Covid-19 pandemic may have affected both factors in important ways (Jetten et al., 2020). For instance, travel restrictions and guidelines to work from home led many people to spend more time in their local communities, thereby changing the social context in which self-categorisation for many people may take place. This may have made local communities more salient for social identity. How leaders frame the fight against Covid-19 may also affect which social identities become salient. Some leaders have emphasized an intergroup context at a sub-national level (Jetten et al., 2020). For example, then President of the United States Donald Trump long called Covid-19 the 'Chinese virus' (Rogers, Jakes, & Swanson, 2020).



Concurrently, reports of increased discrimination against Asian-Americans suggest that within nations, intergroup bias may have increased (see Noel, 2020). Other leaders, including the British Prime Minister Boris Johnson and Queen Elizabeth II, have emphasized national unity and solidarity (Vignoles, Jaser, Taylor, & Ntontis, 2021; see Braddick, 2020, and Davies, 2020, for examples). Leaders of international and supra-national organizations, including EU officials and the Director-General of the World Health Organization, have often emphasized an even more inclusive shared identity (e.g., Europeans, humans) (“Global cooperation” 2020; Associated Press, 2020).

The common ingroup identity model (Dovidio et al., 1993) suggests that re-categorisation into a superordinate (shared) ingroup can effectively attenuate intergroup bias (e.g., Nier et al., 2001). Making shared humanity salient has been found to improve intergroup attitudes (Wohl & Branscombe, 2005). What is more, Levine and colleagues (2005) found that after making a shared superordinate ingroup identity salient, intergroup helping in an emergency situation increased. The researchers found that when an (exclusive) social identity as a supporter of a specific football team was salient, participants helped ingroup members more than outgroup members (i.e., fans of a rival team). In contrast, when a superordinate (inclusive) identity as a football fan was salient, participants helped fellow football fans – both supporters of their own and of the rival team – more than those not showing any football affiliation. If a sense of shared fate (Drury, 2018) allows a superordinate social identity (i.e., that of humanity) to become salient during the pandemic (Dovidio et al., 2020; van Bavel et al., 2020), then intergroup bias in prosocial behaviour may thus be reduced or absent.

In the current research, we examine how intergroup biases develop over the first year and a half of the pandemic. Two competing hypotheses regarding changes in group identification and prosocial behavioural intentions over the course of the Covid-19 pandemic were tested. On the one hand, it is possible that during this crisis, people would tend to focus on their ingroups, leading them to identify with their local neighbourhood and country more strongly than with other countries, as well as being more willing to support an ingroup than an outgroup. Threats in general, and disease threat specifically, have been shown to sometimes increase expressions of intergroup bias (see Schaller & Neuberg, 2012). This may especially be the case if the pandemic is associated with perceived foreigners.

On the other hand, it is possible that the internationally shared experience of hardship and the shared goal of overcoming the pandemic might increase identification and prosocial behaviour not only with the local and national ingroup, but also with other countries. As other

theorists have suggested (see, e.g., Jetten et al., 2020; van Bavel et al., 2020), this may be possible if the global community is perceived to share a common fate in the face of the pandemic. Experiencing such a shared fate has been associated with an emergent shared social identity in the wake of disasters (Drury, 2018), and recategorisation into a superordinate social identity has even been found to reverse the commonly found increase in ingroup favouritism under threat (Giannakakis & Fritsche, 2011). Furthermore, from the rapid spread of the virus to supply chain issues, the global pandemic has demonstrated how interconnected the world is, which may also contribute to a heightened salience of shared identity. Over time, however, the need for group distinctiveness may render superordinate identity categories unstable (Dovidio et al., 2007).

In light of the above, investigation of these hypotheses over an extended time period is particularly interesting. Much previous research on prosocial behaviour and intergroup biases has taken place in laboratories or at least in the absence of real-world instability and resource scarcity (Vardy & Atkinson, 2019; for a recent review, see Moradi et al., 2020). The ongoing Covid-19 pandemic allows for a complementary approach with a more naturalistic investigation of this question as it unfolded over the first year and a half of a real-world crisis.

## **Method**

### **Data Collection**

The study took place online and was created and administered using Qualtrics (<https://www.qualtrics.com>), with participants recruited through Prolific (<https://www.prolific.co>). Informed consent was obtained at the start of each online session according to approved ethical procedures. Our pre-registration document can be found at: [https://aspredicted.org/RJ9\\_Q2G](https://aspredicted.org/RJ9_Q2G).

Data was collected at four time points: on April 9<sup>th</sup>, 2020 (Time 1), on May 18<sup>th</sup>, 2020 (Time 2), on May 23<sup>rd</sup>, 2021 (Time 3), and finally on August 23<sup>rd</sup>, 2021 (Time 4). We measured perceived pandemic-related threat at each time point (see procedure) on a scale of 0-100, with 0 indicating ‘not at all threatened’ and 100 indicating ‘extremely threatened’. Descriptions of the state of the Covid-19 pandemic as well as the reported level of perceived threat from the Covid-19 pandemic at each data collection time point are provided below for context.

### ***Contextual Summary and Associated Threat***

At Time 1 (T1), the first strict UK lockdown had been imposed for around one and a half weeks, after hospitalisations and deaths had risen dramatically. On April 9<sup>th</sup>, 4,675 positive Covid-19 test results were reported (UK Government, 2021a), and it was reported that 881 people who had contracted Covid-19 had died in the past 24 hours (Badshah, 2020). Vaccinations were not yet available. The British Prime Minister, Boris Johnson, was at this time in hospital receiving oxygen treatment for Covid-19 (Badshah, 2020). The previous day, the media had reported modelling data suggesting that the UK was to have the worst coronavirus death toll in Europe (Lyons, 2020). The mean rating of perceived threat from the Covid-19 pandemic at T1 was 64.0 ( $SD = 21.3$ ).

By Time 2 (T2), the UK was reported to have passed the ‘peak’ of the first wave of the Covid-19 epidemic (this was later determined to have been reached on April 8<sup>th</sup> (Oke & Heneghan, 2020), and Boris Johnson had recovered from the disease and returned to work. On May 18<sup>th</sup>, 2,684 new positive test results reported (UK Government, 2021a), and cumulative deaths from Covid-19 were reported to stand at 34,796, with 160 deaths recorded within the previous day (UK Government, 2020). Vaccinations were not yet available. Lockdown restrictions were still in place but conditional plans for easing of restrictions had been announced (Institute for Government, 2021). The mean rating of perceived threat from the Covid-19 pandemic at T2 was 56.9 ( $SD = 23.1$ ).

At Time 3 (T3), 2,235 positive test results within the past day had been reported, and 16 new Covid-19-related deaths were recorded with May 23<sup>rd</sup>, 2021 registered on the death certificate (UK Government, 2021b). Notably, by this time, 66.2% of the population had received at least one dose of a Covid-19 vaccination, and 39.8% had received two doses (UK Government, 2021d) (the national vaccination programme began between T2 and T3). Most indoor and outdoor businesses had been allowed to reopen the previous week (UK Government, 2021c), and reports of lifting lockdown restrictions in the coming month were circulating in the media (Boseley, 2021). The mean rating of perceived threat from the Covid-19 pandemic at T3 was 45.7 ( $SD = 25.7$ ).

Three months later, at Time 4 (T4), daily cases and deaths had again increased, with 31,914 new positive Covid-19 test results (UK Government, 2021a) and 116 new deaths (UK Government, 2021b) reported. By this time, 83.0 % of the population had received at least one dose of a Covid-19 vaccination, and 72.9% had received two doses (UK Government, 2021d). While some travel restrictions and government advisories were still in place, within the UK,

legal restrictions on public and private life, as well as on work and businesses, had been lifted (UK Government, 2021e). The mean perceived threat rating at T4 was 44.4 ( $SD = 25.3$ ).

A one-way ANOVA analysing the effect of Time (T1 vs T2 vs T3 vs T4, between subjects) on participants' threat scores showed that perceived threat differed significantly across data collection time points ( $F(3, 796) = 30.84, p < .001, \eta^2 = .104$ ). Bonferroni-corrected pairwise-comparison follow-up analyses (two-tailed,  $\alpha = .05$ ) showed that perceived threat was significantly higher at T1 ( $M = 64.0, SD = 21.3$ ) than at all later time points (T2:  $M = 56.9, SD = 23.1, p = .018$ ; T3:  $M = 45.7, SD = 25.7, p < .001$ ; T4:  $M = 44.4, SD = 25.3, p < .001$ ). Threat ratings at T2 were also significantly higher than at T3 and T4 ( $ps < .001$ ). Perceived threat did not differ between T3 and T4,  $p = 1$ .

In summary, our measures indicated that perceived threat declined between early April 2020 (T1) and late May 2020 (T2), declined further between May 2020 (T2) and May 2021 (T3), but then remained stable until late August 2021 (T4).

## Participants

We collected data from different participants at four different time points between April 2020 and August 2021. Participants who had participated at a previous data collection time point were prevented from participating again at later time points. To be eligible for the study, participants had to be fluent in English, at least 18 years old, and UK nationals residing in the UK. As pre-registered, 200 participants were included in the sample at each data collection time point, leading to a total sample of 800 participants across time points. Participants were compensated £0.75 ( $\approx$  US \$1), a rate of around £10.64 ( $\approx$  US \$14.6) per hour. Across time points, the gender and age composition of our samples was broadly similar.

At T1, our sample consisted of 143 female and 54 male participants, 1 participant who identified as non-binary, and 2 participants who did not disclose their gender. The mean age was 33.7 ( $SD_{Age} = 12.0$ ).

At T2, 138 female and 60 male participants, 1 transgender female, and 1 participant who preferred not to disclose their gender participated in the study. The mean age was 34.2 ( $SD_{Age} = 11.2$ ).

At T3, 126 female and 72 male participants, 1 participant who identified as non-binary, and 1 participant who did not disclose their gender identity participated in the study. The mean age was 36.0 ( $SD_{Age} = 14.1$ ).

At T4, 126 female and 72 male participants, 1 participant who identified as non-binary, and 1 participant who did not disclose their gender identity participated in the study. The mean age was 31.5 ( $SD_{Age} = 10.6$ ).

## Materials

Participants were presented with two scales measuring their prosocial behavioural intentions (money and time donations, respectively) and one scale measuring their group identification. All participants answered three questions per scale which were identical, except for a changing target group (i.e., the local neighbourhood, the UK, or other countries). On the money donation scale, participants were asked “How much money would you be willing to donate to a charity providing aid to *[target group]* during the current Covid-19 pandemic situation?” On the time donation scale, participants were asked “How much time would you be willing to give for a cause providing care to *[target group]* during the current Covid-19 pandemic situation?” The scales were labelled as ranging from £0 - £100/0 minutes - 100 minutes, with the centre labelled as 50 for each. For each scale, the starting value was £0/0 minutes and participants could see the value they had selected once they moved the slider. They were able to change their response until they moved on to the next question.

On the group identification scale, participants were asked to “Indicate the extent to which you agree with each statement about your relationship with each of the groups, from 0 (not at all) to 100 (very much so).” They were then presented with three statements, “I identify with my local neighbourhood”, “I identify with my country (UK)”, and “I identify with other countries”. The sliding scale was labelled as ranging from 0 (“Not at all”) to 100 (“Very much so”), but the chosen value was not visible to participants.

## Design and Counterbalancing

The study employs a 3 (Target Group: local vs national vs international, within subjects) x 4 (Time point: T1 vs T2 vs T3 vs T4, between subjects) design. Following our pre-registered analysis plan, group identification, monetary donations, and time donations were each analysed using mixed-design Analyses of Variance (ANOVAs).

The order of the prosocial question blocks (money/time donations) was counterbalanced, such that for half of the participants, the money donation questions appeared

first, whereas for the other half of participants, the time donation questions appeared first. We also counterbalanced the order of target groups for both the prosocial measures and the group identification measures, with three set target group orders: 1) local, national, international; 2) national, international, local; and 3) international, local, national. In total, we therefore created six counterbalance orders.

## **Procedure**

Participants were informed that the study was designed to help us understand how people identify with different social groups and intend to act towards them during this time of social distancing in the Covid-19 pandemic. Once informed consent was obtained, demographic (age, gender) information was collected and eligibility given pre-defined screening criteria (English fluency, current country of residence = UK, nationality = UK) was confirmed. Participants were then asked brief questions relating to the Covid-19 pandemic: Are you currently following government regulations relating to social distancing/quarantine during the COVID-19 pandemic? Are you primarily confined to the house as a result of government regulations during the COVID-19 pandemic? Are you a key worker? Participants did not have to answer these questions. Participants then first completed an unrelated task about leadership preferences, as well as providing a perceived threat rating (see data collection section above) before reaching the current task. Participants first completed the two prosocial blocks (money donations, time donations). Each block consisted of three questions which only differed in donation recipient group (target group): local (“your local neighbourhood”), national (“your country (the UK)”), and international (“other countries”). Following the prosocial blocks, participants completed the group identity measure for the local, national, and international target groups. Finally, participants were debriefed and redirected to Prolific for payment.

## **Results**

### **Sample Characteristics and the Impact of the Covid-19 Pandemic**

To allow for the comparison of sample characteristics across time points, we first report descriptive statistics for participants’ responses to questions about how they were affected by the pandemic.

At T1, almost all participants (199/200) said they were currently following government regulations relating to social distancing/quarantine and most (163/200) said they were currently primarily confined to the house as a result of government regulations. About a quarter were key workers (54/200). At this time, key workers were permitted to commute to their place of work, even when lockdown government regulations stipulated that non-key workers should stay at home.

At T2, almost all participants (197/200) said they were currently following government regulations relating to social distancing/quarantine and most (144/200) said they were currently primarily confined to the house as a result of government regulations. About a quarter were key workers (48/200).

At T3, as at T1 and T2, almost all participants (189/200) said they were currently following government regulations relating to social distancing/quarantine. Only about a quarter (53/200) of participants stated that they were currently primarily confined to the house as a result of government regulations. Fewer participants were likely primarily confined to the house in the currently sample, compared to the T1 and T2 samples, because most businesses had recently been allowed to reopen. This likely led many people to return to their place of work outside of the house (rather than, for example, working from home or being furloughed). As in previous samples, about a quarter of participants reported that they were key workers (55/200).

At T4, as before, almost all participants (188/200) stated they were currently following government regulations relating to social distancing/quarantine. Only a minority (33/200) of participants reported that they were currently primarily confined to the house as a result of government regulations. This may have been the case for people who had been instructed to self-isolate because they had tested positive for Covid-19, had been in contact with someone who tested positive for Covid-19, or because they had recently travelled to the UK from abroad (Office for National Statistics, 2021). As in previous samples, about a quarter of participants stated that they were key workers (54/200).

Overall, a comparison of participants' responses suggests that self-reported compliance with government regulations relating to social distancing/quarantine during the pandemic was high across samples, and that sample characteristics were broadly similar across time points.

## Group Identification and Prosocial Intentions

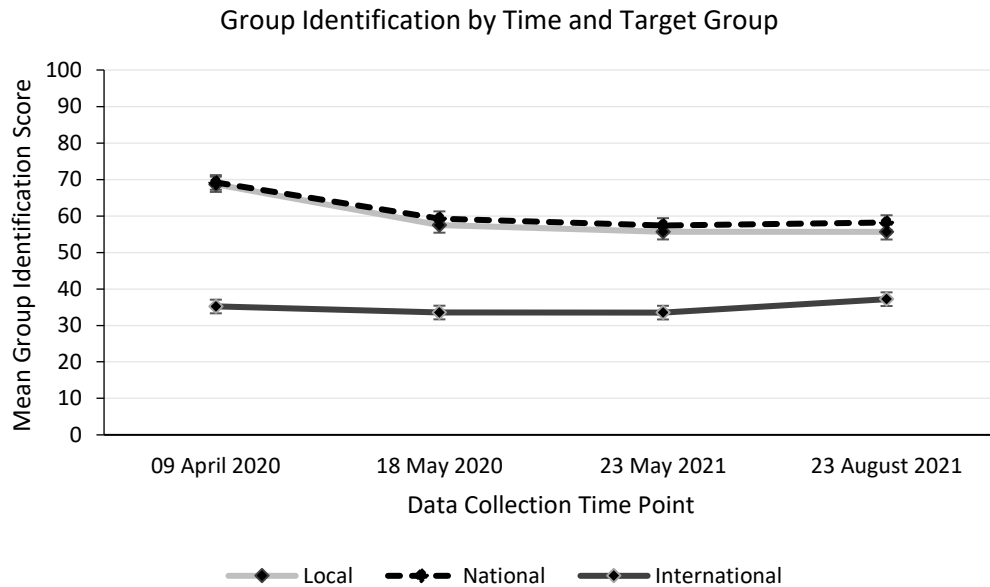
Unless otherwise stated, all tests were two-tailed and performed with  $\alpha = .05$ . All post-hoc tests reported here were Bonferroni-corrected and we report adjusted  $p$ -values for these tests. Where the assumption of sphericity has been violated, we report Greenhouse-Geisser-corrected degrees of freedom and  $p$ -values.

### *Group Identification*

To test whether identification with each target group changed over the course of the pandemic, we conducted a 3 (Target Group: local vs national vs international, within subjects) x 4 (Time: T1 vs T2 vs T3 vs T4, between subjects) mixed-design factorial ANOVA on participants' group identification scores. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated,  $\chi^2(2) = 55.34, p < .001$ .

The ANOVA indicated a main effect of Target Group ( $F(1.87, 1491.70) = 310.48, p < .001, \eta^2 = .281$ ), such that group identification with the local neighbourhood ( $M = 59.4, SD = 30.1$ ) and with the national ingroup ( $M = 61.0, SD = 28.7$ ) was higher than with the international group ( $M = 34.9, SD = 26.5, ps < .001$ ). We also found a main effect of Time ( $F(3, 796) = 7.57, p < .001, \eta^2 = .028$ ), with higher group identification scores at T1 ( $M = 57.7, SD = 31.4$ ) than at T2 ( $M = 50.1, SD = 30.2, p = .002$ ), T3 ( $M = 48.9, SD = 31.0, p < .001$ ), and T4 ( $M = 50.3, SD = 30.1, p = .002$ ). These main effects were qualified by an interaction between Target Group and Time ( $F(5.62, 1491.70) = 4.40, p < .001, \eta^2 = .016$ ) (Figure 7). To understand this interaction, we conducted post-hoc analyses by Time and by Target Group.





*Figure 7.* Mean group identification scores by target group and data collection time point. Error bars = standard error of the mean (SE). At each time point, identification with the local and national groups was stronger than with the international group. Local and national group identification did not differ at any time. Intergroup bias in identification declined over time.

**Group Identification by Sampling Time Point.** Pairwise comparisons showed that at each data collection time point (T1, T2, T3, T4), group identification with the local and with the national group was significantly stronger than identification with the international group (all  $ps < .001$ ). Identification did not differ between local and national groups at any time (all  $ps \geq .62$ ).

Across time points, participants thus identified more strongly with their local and national ingroups compared with the international outgroup, and group identification did not differ between the local and national ingroups.

**Group Identification by Target Group.** Pairwise comparisons revealed that group identification with local groups was significantly higher at T1 ( $M = 68.7$ ,  $SD = 27.6$ ) than at T2 ( $M = 57.5$ ,  $SD = 29.2$ ,  $p = .001$ ), T3 ( $M = 55.7$ ,  $SD = 31.6$ ,  $p < .001$ ), and T4 ( $M = 55.6$ ,  $SD = 30.1$ ,  $p < .001$ ), respectively. Group identification with the national group was also significantly higher at T1 ( $M = 69.2$ ,  $SD = 27.2$ ) than at T2 ( $M = 59.2$ ,  $SD = 28.3$ ,  $p = .003$ ), T3 ( $M = 57.4$ ,  $SD = 28.3$ ,  $p < .001$ ), and T4 ( $M = 58.2$ ,  $SD = 29.5$ ,  $p = .001$ ), respectively. All other time point comparisons of group identification with the local and national groups did not

differ significantly (all  $ps = 1$ ). Group identification with the international group did not differ between data collection time points (all  $ps \geq .99$ ). Participants therefore identified more strongly with their local and national ingroups early in the pandemic compared to at later time points, while identification with the international outgroup was stable over the time period examined.

Taken together, the results from our group identification analyses indicate that over the course of the pandemic examined here, levels of identification with the local ingroup (local neighbourhood) were consistently similar in magnitude to levels of identification with the extended ingroup (national group), while levels of identification with the international outgroup were consistently lower. However, ingroup identification declined after April 2020 (T1) while outgroup identification remained stable across time points. These results support the hypothesis that intergroup bias in group identification (i.e., the difference in strength of identification with ingroups and outgroups) was strongest early on in the pandemic and later declined as a result of diminished ingroup identification.

### ***Donations***

We conducted a 2 (Donation Type: money vs time, within subjects) x 3 (Target Group: local vs national vs international, within subjects) x 4 (Time: T1 vs T2 vs T3 vs T4, between subjects) mixed-design factorial ANOVA on participants' donation scores. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated for Target Group,  $\chi^2(2) = 213.18$ ,  $p < .001$ , and for the Target Group X Donation Type interaction,  $\chi^2(2) = 125.05$ ,  $p < .001$ .

The ANOVA indicated a main effect of Donation Type ( $F(1, 796) = 354.39$ ,  $p < .001$ ,  $\eta^2 = .308$ ), with higher time donation scores ( $M = 42.8$ ,  $SD = 33.6$ ) than money donation scores ( $M = 24.9$ ,  $SD = 25.1$ ,  $p < .001$ ). We also found a main effect of Target Group ( $F(1.62, 1288.85) = 239.84$ ,  $p < .001$ ,  $\eta^2 = .232$ ), with higher donation scores for the local neighbourhood ( $M = 40.4$ ,  $SD = 32.8$ ) than for the national ingroup ( $M = 35.5$ ,  $SD = 30.3$ ,  $p < .001$ ), for which donations were in turn higher than for the international group ( $M = 25.5$ ,  $SD = 27.6$ ,  $p < .001$ ). We also found a main effect of Time ( $F(3, 796) = 7.13$ ,  $p < .001$ ,  $\eta^2 = .026$ ), with higher donation scores at T1 ( $M = 37.9$ ,  $SD = 33.2$ ) and T4 ( $M = 36.7$ ,  $SD = 31.1$ ) than at T2 ( $M = 30.7$ ,  $SD = 29.7$ ,  $ps \leq .031$ ) and T3 ( $M = 30.0$ ,  $SD = 28.9$ ,  $ps \leq .012$ ).

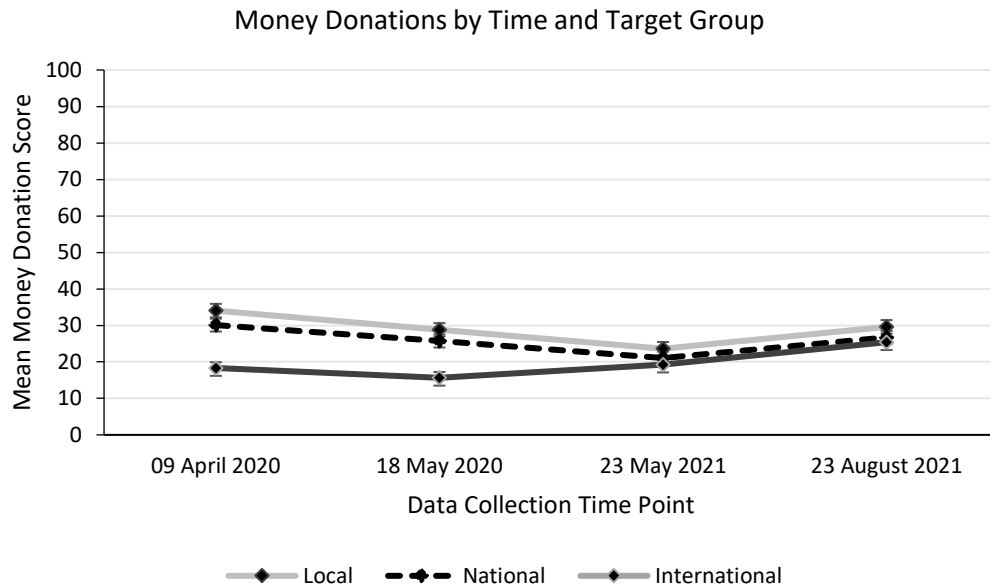
These main effects were qualified by interactions between Target Group and Time ( $F(4.86, 1288.85) = 16.56$ ,  $p < .001$ ,  $\eta^2 = .059$ ) and between Target Group and Donation Type ( $F(1.75, 1389.73) = 91.17$ ,  $p < .001$ ,  $\eta^2 = .103$ ). These interactions were further qualified by

a significant Target Group x Donation Type x Time interaction,  $F(5.24, 1389.73) = 2.48, p = .028, \eta^2 = .009$ . The interaction between Donation Type and Time was not significant,  $F(3, 796) = 1.92, p = .13, \eta^2 = .007$ .

To examine the significant three-way interaction between Donation Type, Target Group, and Time, we performed separate ANOVAs by Donation Type, testing the effects of Time and of Target Group on monetary donations (Figure 8) and on time donations (Figure 9), respectively.

**Money Donations.** To test whether prosocial behavioural intentions in the form of monetary donations to each group changed over the course of the pandemic, we conducted a 3 (Group Target: local vs national vs international, within subjects) x 4 (Time: T1 vs T2 vs T3 vs T4, between subjects) mixed-design factorial ANOVA on participants' money donation scores. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated,  $\chi^2(2) = 163.02, p < .001$ .

The ANOVA indicated a main effect of Target Group ( $F(1.69, 1343.01) = 93.20, p < .001, \eta^2 = .105$ ), with higher donation scores for local ( $M = 29.0, SD = 26.4$ ) than national recipients ( $M = 25.9, SD = 25.1, p < .001$ ), which were in turn higher than for international recipients ( $M = 19.7, SD = 22.8, p < .001$ ). We further found a main effect of Time ( $F(3, 796) = 3.85, p = .009, \eta^2 = .014$ ), such that money donation scores were higher at T1 ( $M = 27.5, SD = 27.2$ ) and T4 ( $M = 27.2, SD = 25.4$ ) than at T3 ( $M = 21.3, SD = 22.1, ps \leq .039$ ). Collapsed across target groups, money donations at T2 did not differ from any other time point, T2 ( $M = 23.4, SD = 24.9$ );  $ps \leq .355$ . These main effects were qualified by an interaction between Target Group and Time ( $F(5.06, 1343.01) = 11.22, p < .001, \eta^2 = .041$ ) (Figure 2). To understand the interaction between Target Group and Time, we analysed money donations by time point and by target group.



*Figure 8.* Mean money donation scores by target group and data collection time point. Error bars = SE. At each time point, money donations towards the local ingroup were higher than towards both national and international recipients, although this comparison did not reach significance for national recipients in May 2021. Intergroup bias in money donations declined over time.

**Money Donations by Sampling Time Point.** Pairwise comparisons showed that at T1, money donation scores were significantly higher for local recipients ( $M = 34.1$ ,  $SD = 28.7$ ) compared to both national recipients ( $M = 30.1$ ,  $SD = 26.5$ ;  $p = .001$ ) and international recipients ( $M = 18.3$ ,  $SD = 23.7$ ;  $p < .001$ ), and significantly higher for national than international recipients ( $p < .001$ ). Similarly, at T2, money donation scores were significantly higher for local recipients ( $M = 28.8$ ,  $SD = 26.5$ ) compared to both national recipients ( $M = 25.7$ ,  $SD = 25.5$ ;  $p = .018$ ) and international recipients ( $M = 15.6$ ,  $SD = 20.6$ ;  $p < .001$ ), and significantly higher for national than international recipients ( $p < .001$ ). At T3, money donation scores were significantly higher for local recipients ( $M = 23.6$ ,  $SD = 24.0$ ) than international recipients ( $M = 19.3$ ,  $SD = 20.2$ ;  $p = .024$ ) and trended towards differing significantly between local and national recipients, with higher scores for local than national recipients ( $M = 21.1$ ,  $SD = 21.9$ ;  $p = .066$ ). In contrast to earlier time points, at T3, money donation scores did not differ between national and international recipients ( $p = .59$ ). At T4, money donation scores were significantly higher for local recipients ( $M = 29.6$ ,  $SD = 25.3$ ) compared to both national recipients ( $M = 26.7$ ,  $SD = 25.5$ ;  $p = .028$ ) and international recipients ( $M = 25.4$ ,  $SD = 25.3$ ;  $p = .031$ ) but did not differ between national and international recipients ( $p = 1$ ).

In summary, across time points, participants rated their monetary donation intentions for charities supporting their local ingroup during the pandemic as higher than for both national and international recipients (although this comparison did not reach significance for national recipients at T3). Money donation intentions for national recipients were greater than for international recipients at the beginning of the pandemic (T1 and T2) but not later on (T3 and T4).

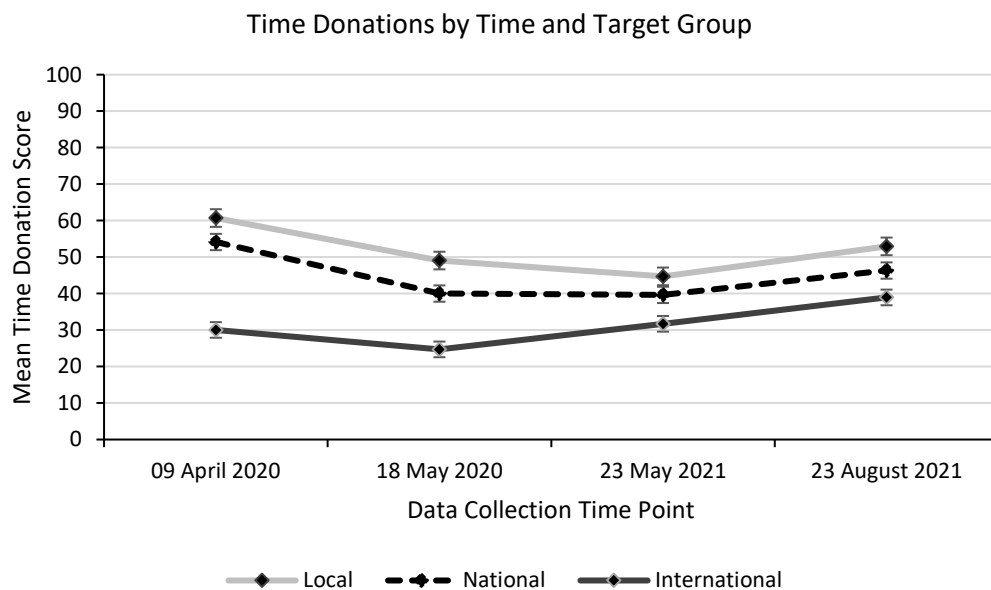
**Money Donations by Target Group.** Pairwise comparisons revealed that for local recipients, money donation scores were significantly higher at T1 than at T3 ( $p < .001$ ), but at all other time point comparisons did not reach significance ( $ps \geq .13$ ). Similarly, money donations for national recipients were higher at T1 than at T3 ( $p = .002$ ), but did not differ between other time points ( $ps \geq .14$ ). Contrasting these patterns, for international recipients, money donation scores were significantly higher at T4 compared to T1 ( $p = .011$ ), T2 ( $p < .001$ ), and T3 ( $p = .04$ ), respectively. All other time point comparisons of money donation scores for international recipients did not reach significance (all  $ps \geq .65$ ).

These results reveal that changes in monetary donation intentions over the course of the pandemic differed for local and national recipients, compared to international recipients. For local and national beneficiaries, the intended monetary donation amount decreased from T1 (April 2020) to T3 (May 2020), but money donation intentions at our last sampling time point (T4, August 2021) did not differ significantly from earlier time points. In contrast, for international recipients, intended money donations were highest at the end of the examined time period, a year and a half after the start of the pandemic in the UK (at T4, compared to Times 1, 2, and 3).

**Time Donations.** To test whether prosocial behavioural intentions in the form of volunteering time changed over the course of the pandemic, we conducted a 3 (Group Target: local vs national vs international, within subjects) x 4 (Time: T1 vs T2 vs T3 vs T4, between subjects) mixed-design factorial ANOVA on participants' time donation scores. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated,  $\chi^2(2) = 201.67, p < .001$ .

The ANOVA indicated a main effect of Target Group ( $F(1.63, 1300.59) = 262.68, p < .001, \eta^2 = .248$ ), with higher time donation scores for local ( $M = 51.9, SD = 34.6$ ) than national recipients ( $M = 45.0, SD = 32.1, p < .001$ ), for whom time donation intentions were in turn

higher than for international recipients ( $M = 31.4, SD = 30.7, p < .001$ ). We also found a main effect of Time ( $F(3, 796) = 6.73, p < .001, \eta^2 = .025$ ), such that time donation scores were higher at T1 ( $M = 48.3, SD = 35.5$ ) and T4 ( $M = 46.1, SD = 33.4$ ) than at T2 ( $M = 37.9, SD = 32.3, ps \leq .026$ ) and T3 ( $M = 38.7, SD = 32.1, ps \leq .058$ ). These main effects were qualified by an interaction between Target Group and Time ( $F(4.90, 1300.59) = 13.71, p < .001, \eta^2 = .049$ ) (Figure 3). To understand the interaction between Target Group and Time for time donations, we again performed post-hoc analyses by time point and by target group.



*Figure 9.* Mean time donation scores by target group and data collection time point. Error bars = SE. At each time point, time donations towards the local ingroup were higher than towards the national ingroup, which in turn were higher than time donations towards the international outgroup. Intergroup bias in time donations declined over time.

***Time Donations by Sampling Time Point.*** Pairwise comparisons showed that at each data collection time point (T1, T2, T3, T4), time donation scores for local recipients ( $M_s = 44.7 - 60.7, SD_s = 33.8 - 34.6$ ) were significantly higher than for both national ( $M_s = 39.7 - 54.1, SD_s = 30.2 - 33.2; ps \leq .002$ ) and international ( $M_s = 24.7 - 39.0, SD_s = 27.5 - 32.6; ps < .001$ ) recipients, and higher for national than international recipients ( $ps < .001$ ). Intentions to give time to support charities aiding the local neighbourhood thus consistently outweighed willingness to give time to support to the national ingroup, which in turn outweighed intended time contributions for international aid.

**Time Donations by Target Group.** Pairwise comparisons revealed that for local recipients, time donation scores were significantly higher at T1 ( $M = 60.7$ ,  $SD = 34.3$ ) than at T2 ( $M = 49.1$ ,  $SD = 34.1$ ,  $p = .004$ ) and T3 ( $M = 44.7$ ,  $SD = 34.6$ ,  $p < .001$ ). No other time point comparisons of time donation scores for local recipients reached significance ( $ps \geq .098$ ). Similarly, time donation scores for national recipients were significantly higher at T1 ( $M = 54.1$ ,  $SD = 33.2$ ) compared to both T2 ( $M = 40.0$ ,  $SD = 30.2$ ,  $p < .001$ ) and T3 ( $M = 39.7$ ,  $SD = 30.6$ ,  $p < .001$ ), but all other time point comparisons for national recipient time donations did not reach significance (all  $ps \geq .081$ ). In contrast, for international recipients, time donation scores were significantly higher at T4 ( $M = 39.0$ ,  $SD = 32.6$ ), compared to both T1 ( $M = 30.0$ ,  $SD = 31.3$ ,  $p = .02$ ) and T2 ( $M = 24.7$ ,  $SD = 27.5$ ,  $p < .001$ ), while all other time point comparisons for international recipient time donations did not reach significance (all  $ps \geq .103$ ).

The results reveal that changes in intentions to give time to charities aiding local and national groups differed from time donation intentions for international beneficiaries. For local and national beneficiaries, intended time donations were higher at T1, compared with T2 and T3, but time donation intentions at our last sampling time point (T4) did not differ significantly from earlier time points. In contrast, for international recipients, intended time donations were highest at the end of the examined time period (at T4, compared to T1 and T2).

**Summary of Results for Analyses of Donations.** In sum, across measures (time and money donations) and time points, donation intentions to aid the local ingroup consistently outweighed those to aid both the national ingroup and the international outgroup. Money and time donation intentions aiding the national ingroup were also greater than those aiming to support the international outgroup at the beginning of the pandemic (early April and late May 2020). Later on (late May and late August 2021), this trend only continued for time donations, while monetary donation intentions no longer differed between charities aiding the national and international groups.

The results further reveal that changes in both money and time donation intentions over the course of the pandemic differed for local and national recipients, compared to international recipients. For local and national beneficiaries, the intended monetary and time donation value decreased between early April, 2020 (T1) and late May, 2021 (T3) but recovered by late August, 2021 (T4; local and national donation intentions at this time did not differ from any earlier time point). In contrast, for international recipients, intended donations were highest at the end of the examined period of the pandemic (at T4, compared to earlier time points). While

the intended money and time donations for local recipients (and time donations for national recipients) still outweighed those for international recipients at the end of the time period examined here (in late August 2021), crucially, this difference between donations by target group declined over time.

### ***The Relationship Between Intergroup Bias and Donations***

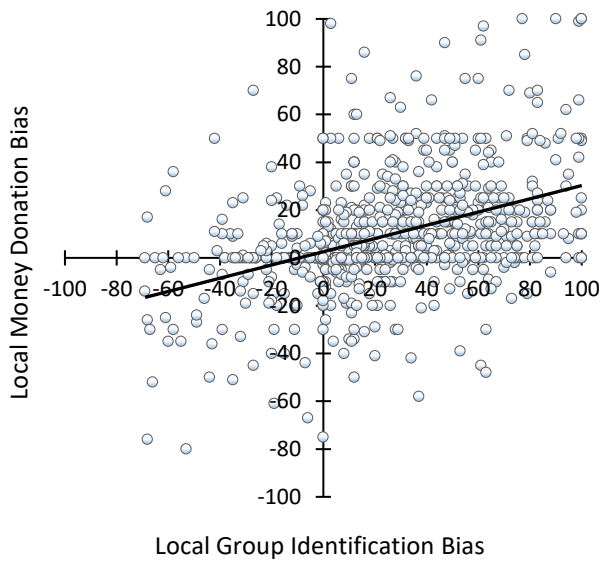
To analyse the relationship between group identification and donation intentions, we first calculated difference scores to indicate intergroup biases in group identification and donation intention scores. For each measure (group identification, money donations, time donations), we calculated two different bias scores. One bias score quantifies the difference between a participant's scores for local versus international target groups on a given measure (i.e., local intergroup bias score). The other bias score quantifies the difference between a participant's scores for national versus international target groups on a given measure (i.e., national intergroup bias score). For group identification bias scores, we subtracted participants' international group identification scores from their local and their national group identification scores, respectively. For donation bias scores, we subtracted participants' donation scores (money/time) for international recipients from their corresponding donation scores for local or national recipients, respectively. We then conducted Pearson's correlation analyses to measure the relationships between ingroup favouritism in group identification and in prosocial intentions. We collapsed across time points for these analyses. Reported  $p$ -values are Bonferroni-corrected for multiple comparisons.

There was a significant positive correlation between the relative increase in group identification for the local ingroup compared to the international outgroup (i.e., local - international identification score) and the relative increase in monetary donation intentions for the local ingroup compared to the international outgroup (i.e., local - international money donation score),  $r(798) = .42, p < .001$  (Figure 10, panel A). Similarly, there was a significant positive correlation between local group identification bias and local time donation bias (i.e., local - international time donation scores),  $r(798) = .44, p < .001$  (Figure 10, panel B).

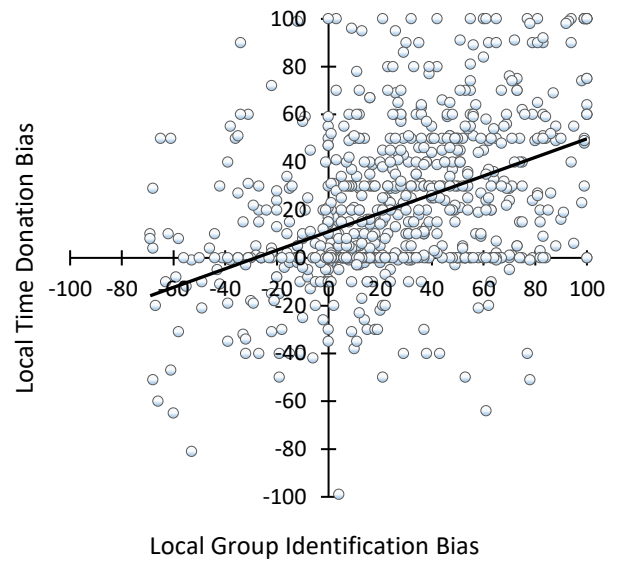
Correlation analyses also showed significant positive relationships between national group identification bias (i.e., national - international identification score) and national money donation bias (i.e., national - international money donation score),  $r(798) = .36, p < .001$  (Figure 10, panel C), as well as between national group identification bias and national time donation bias,  $r(798) = .40, p < .001$  (Figure 10, panel D).



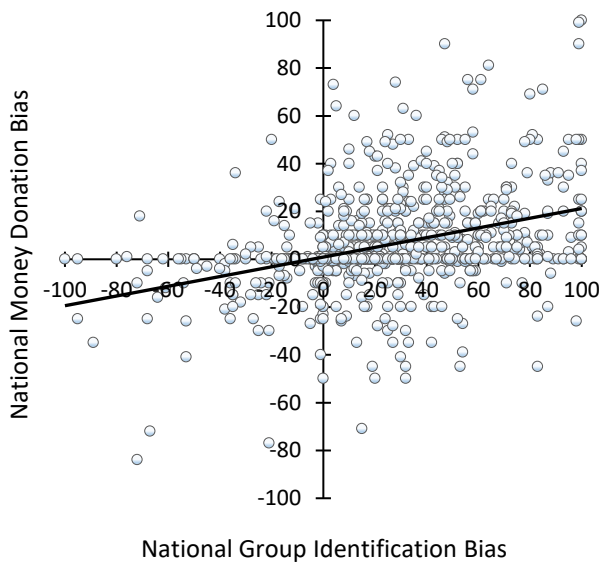
A)

Local Group Identification Bias and  
Local Money Donation Bias

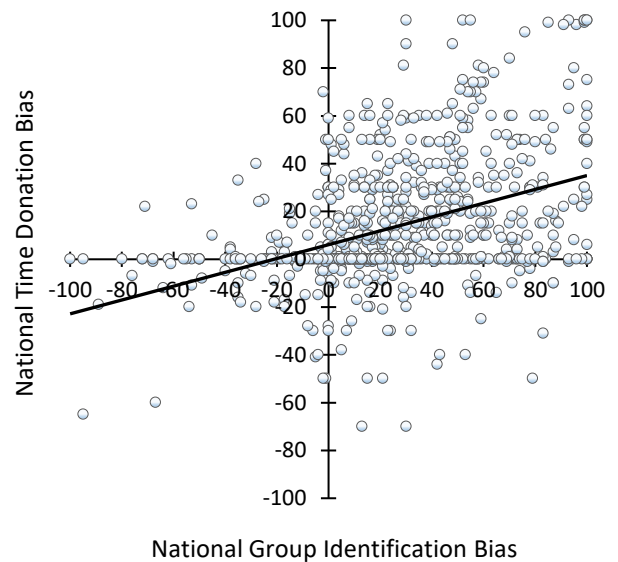
B)

Local Group Identification Bias and  
Local Time Donation Bias

C)

National Group Identification Bias and  
National Money Donation Bias

D)

National Group Identification Bias and  
National Time Donation Bias

*Figure 10.* Correlations between group identification bias scores and prosocial intention bias scores, with fitted trend line. Panel A depicts the relationship between local group identification bias scores and local money donation bias scores. Panel B depicts the relationship between local group identification bias scores and local time donation bias scores. Panel C depicts the relationship between national group identification bias scores and national money donation bias scores. Panel D depicts the relationship between national group identification bias scores and national time donation bias scores.

These results show that, collapsed across time points, greater ingroup favouritism towards the local and the national ingroup on the group identification measure was associated with greater ingroup favouritism towards the respective ingroup in monetary and time donation intentions.

## Discussion

Our study examined group identification with, and donation intentions towards, a local ingroup (the local neighbourhood), an extended (national) ingroup (the UK), and an outgroup (other countries) in the UK over an extended period of the global Covid-19 pandemic between April 2020 and August 2021. We were interested in measuring the predictive validity of two competing hypotheses. One possibility was that the crisis would encourage people to focus on ingroup members, leading them to identify with their local neighbourhood and their country more strongly than with other countries, as well as being more willing to support ingroup than outgroup members. On the other hand, it was possible that the internationally shared experience of hardship and the shared goal of overcoming the pandemic might increase identification and prosocial behaviour not only with the local and national ingroup, but also with other countries.

Replicating a great deal of previous research (see Dunham, 2018; Fiske, 2002; Hewstone, Rubin, & Willis, 2002; Moradi et al., 2020), we found stronger identification with the local and national ingroups than with the international outgroup overall. More importantly, we found that ingroup identification for both local and national ingroups was highest at the start of the pandemic (measured at our first data collection time point) and then declined. Outgroup identification was consistently lower but remained stable over the four data collection time points. Intergroup bias in group identification therefore declined over time. For money and time donations, the pattern of results differed somewhat between time points. However, a general pattern emerged. For both measures, intergroup biases were stronger at the beginning of the pandemic. The decline of intergroup bias in prosocial intentions was first driven by a decrease in prosociality towards the local and national ingroups between April 2020 (Time 1) and May 2021 (Time 3). While prosocial intentions towards both ingroups then returned to early (Time 1) levels by August 2021 (Time 4), donations towards the international outgroup also increased by the final data collection time point. Overall, the difference between ingroup and outgroup donations therefore diminished over time.

Interestingly, participants reported that they felt most threatened by the pandemic at Time 1, when intergroup biases were also high. When threat was lower towards the final

periods of data collection, intergroup biases were also somewhat less pronounced. The threat posed to the self and the local ingroup by the pandemic may have lead people to focus their actions on their inner circle (Yue & Yang, 2021) until later on in the pandemic. While our design was correlational and does not allow for strong causal inferences, this pattern of results offers some support for the hypothesis that intergroup biases are particularly strong during periods of threat. This accords with previous research suggesting that threats in general (e.g., Giannakakis & Fritsche, 2011), and disease threat specifically, increase expressions of intergroup bias (see Schaller & Neuberg, 2012). Other research on the Covid-19 pandemic has suggested similar patterns. In a longitudinal study conducted in Germany, Rudert and Janke (2021) found that perceived subjective threat from the pandemic positively predicted having engaged in prosocial behaviours a few weeks later. In an experimental study, Jin and Ryu (2021) further found that inducing mortality salience by making the threat from Covid-19 salient for participants led to higher levels of prosocial behaviour, including greater time and money donations, which is consistent with our finding of increased donation intentions at times of heightened perceived threat. Our results complement and extend this work by measuring prosocial behaviour over a longer time period and in an intergroup context.

We did not find convincing support for the possibility that the pandemic led to a recategorisation of international outgroups into a superordinate, shared social identity category in our British sample (Dovidio et al., 2020; Greenaway, 2020; van Bavel et al., 2020; Vignoles et al., 2021; Wakefield et al., 2021). Identification with the international outgroup was consistently lower than ingroup identification. What is more, the strength of outgroup identification did not change over time. While we cannot rule out the possibility that outgroup identification was even lower before the beginning of the examined time period and increased in response to the pandemic, the persistent ingroup favouritism and the consistent, lower level of outgroup identification found here do not provide support for hypotheses of increased identification with other countries or recategorisation.

More broadly, our findings of stronger local ingroup identification and of favouritism towards the local ingroup (compared to the national ingroup and the international outgroup) in prosocial intentions complement and extend research on community identification and prosocial behaviour in the Covid-19 pandemic. A consistent pattern from this research is that community identification predicts prosocial intentions. In one particularly relevant study, Vignoles and colleagues (2021) collected data from UK adults between April and May 2020, during the first UK lockdown, on (among other measures) group identification and prosocial

actions performed within the previous week. They found community identification to be the most reliable predictor of helping behaviours, predicting helping actions for both proximal and distal others. Other studies further support the relationship between community identification and prosocial behaviour during the Covid-19 pandemic. For example, in a longitudinal study, Stevenson et al. (2021) found that pre-pandemic community identification indirectly predicted providing pandemic-related emotional support during the first lockdown in the UK, in May 2020. In an international sample, Wakefield and colleagues (2021) further found that community identification before the first wave of the pandemic in most countries (February 2020) predicted later volunteering to support the community during the Covid-19 pandemic (May 2020) for people who had previously already volunteered in their communities. These findings are further consistent with qualitative research from before the pandemic (Bowe et al., 2020) which found that volunteers describe their connection to their communities as an important motivator for their voluntary work.

It is worth noting that a difference in specificity of the donation targets may have been one possible factor contributing to the higher ingroup than outgroup donation intentions observed in the current research. For ingroup donations, participants may have felt that their donations were going to a considerably more specific target group (a charity providing aid to ‘your local community’/‘your country’), compared to their international donations (a charity providing aid to ‘other’, unidentified countries). Research shows that people often prefer to aid more (versus less) specific beneficiaries, especially when the beneficiary belongs to their ingroup (Kogut & Ritov, 2007), as was the case for local and national donations here. However, it is worth noting that despite this difference in target specificity, monetary donations toward the national ingroup no longer differed from those toward the unspecified international outgroup at later time points (in May and August 2021). Differences in target specificity therefore cannot fully explain the observed patterns in intergroup bias in donation intentions.

It is further important to note that the pattern of results we observed was complex and differed somewhat across measures. One interesting question that arises from our findings is why prosocial intentions towards the outgroup increased at the end of the time period examined, even though outgroup identification remained stable. This discrepancy in patterns of outgroup identification and prosocial intentions suggests that changes in group identification did not drive the observed changes in prosocial intentions at this time. Rather, the changes in prosocial intentions were likely driven by other factors. Our measures of prosocial intentions (willingness to donate money and willingness to volunteer time) are partially dependent on

additional variables that we did not measure and thus did not control for. For example, responses to these variables may be influenced by participants' income level, as well as the number of hours they spent in employment each week, their health, child care commitments and other caring responsibilities. For many people, the amount of time they had available and the amount of spare income they had varied over the course of the pandemic. Some studies from during the pandemic have found demographic characteristics, including socio-economic status and employment status, to be important predictors of prosocial intentions (e.g., Yue & Yang, 2021). While the timeframe of our data collection is in many respects a strength of our design, allowing us to track intergroup biases over the first 18 months of the pandemic in the UK, it does exacerbate problems with measurement and render our variables noisy estimates of participants' prosocial intentions.

It is interesting to consider whether similar patterns would emerge cross-culturally as those observed in this study. Theorists have suggested that forming a superordinate identity might be possible if groups are perceived to share a common fate due to the pandemic (Dovidio et al., 2020; Greenaway, 2020; van Bavel et al., 2020; Vignoles et al., 2021; Wakefield et al., 2021). Van Bavel and colleagues (2020) and Jetten and colleagues (2020) have suggested that during the pandemic, uniting all people in a shared social category, humanity, facing a common fate in the face of the threat from the pandemic (i.e., "us against the virus") could be particularly beneficial. Negative representations of outgroups by some popular British news outlets, for example emphasising fears of foreigners (particularly Chinese people) carrying the virus (e.g., Carr, 2020; Day, 2020), may have hindered recategorisation into a shared group and also identification with outgroups. Including negatively viewed groups in one's ingroup may threaten the positive valence associated with ingroup membership (Wohl & Branscombe, 2005), which may hinder recategorisation. A need for positive differentiation of the ingroup from outgroups (e.g., Dovidio et al., 1998; Tajfel & Turner, 1979) may have further impeded outgroup identification in the UK, particularly at the beginning of the pandemic, when we observed stronger intergroup bias in identification. The UK recorded higher excess mortality rates than any other country in Europe at the time (Morgan, 2020). This negative comparison, which was prominently reported in the British media (e.g., "Coronavirus: England" 2020; Cuthbertson, 2020; Sparrow & Mohdin, 2020), may have strengthened the need for positive ingroup differentiation from other groups in our British sample. This can be achieved through comparisons with more negatively viewed outgroups (Wills, 1981), potentially making such outgroups particularly salient points of comparison. It is possible that the patterns of intergroup

bias in other countries, where messaging was less focused on this divisive idea, may have been different.

The Covid-19 pandemic has been a defining event for this generation. While the consequences have been dire, it has offered social scientists an opportunity to further understand intergroup dynamics in real world situations including those in which perceived threat is high. Taken together, our results suggest that ingroup favouritism in group identification as well as in prosocial intentions towards a local and a national ingroup, compared to an international outgroup, was strongest early on, in the first wave of the Covid-19 pandemic in the UK, when the pandemic was particularly severe and threatening. Facing a common threat from the pandemic does not appear to have increased international outgroup identification or recategorisation into a shared, superordinate social category. Intergroup bias persisted in group identification, as well as in time donation intentions, over the first year and a half of the pandemic, but declined in strength over time.

## **Chapter 4:**

# **Leadership Preferences and Perceived Threat During the Covid-19 Pandemic**

### **Abstract**

Who is likely to be selected as a leader can vary by social context. Threat, in particular, has been hypothesised to increase preferences for dominant leaders. We measured whether the complex threat context of the Covid-19 pandemic led to changes in preferences for dominant leaders. In the current study, we explored dominant leader preferences and their relation to perceived threat over the first year and a half of the pandemic in the United Kingdom. During this time, we collected four separate samples (total  $N = 800$ ). We employed two leader preference measures, a forced-choice face preference task and a rating scale. We also measured perceived threat from the Covid-19 pandemic. We found that dominant leader choices did not differ over time in the face choice task. Responses on the rating scale indicate that dominant leader preferences decreased over the time period examined, as did perceived threat. Participants' threat perceptions were not related to their dominant leader preferences, as measured by either the face choice task or the rating scale. Our results do not provide strong or consistent evidence for the hypothesis that perceived threat from the pandemic relates to changes in dominant leader preferences and thereby suggest that lab-based findings may not consistently generalise to this complex, real-world context.

### **Introduction**

The Covid-19 pandemic constitutes a global crisis that poses a threat to people around the world, threatening not only their physical health but also their economic security, mental health, and sense of control over their lives (Jetten et al., 2020; Mukhtar, 2020; van Mulukom, Muzzulini, Rutjens, van Lissa, & Farias, 2021). Leaders have an important role to play in responding to crises such as the Covid-19 pandemic (Haslam, 2020; van Bavel et al., 2020; Vignoles et al., 2021; Wilson, 2020), but the crisis may also affect who is likely to become a leader.

Research grounded in evolutionary psychology suggests that there are two distinct paths to leadership: prestige and dominance (Cheng & Tracy, 2014; Cheng et al., 2013, 2010;

Henrich & Gil-White, 2001; Maner, 2017). Prestigious individuals have been found to be high in agreeableness, conscientiousness, achievement, advice-giving, generosity, and altruism (Cheng & Tracy, 2014; Cheng et al., 2010). They can gain a following by sharing desired knowledge and skills (Henrich & Gil-White, 2001) and garner respect and admiration by serving as role models (Cheng & Tracy, 2014; Henrich & Gil-White, 2001). In contrast, dominance is associated with being decisive, assertive, controlling, aggressive, and disagreeable (Cheng et al., 2010; Maner & Case, 2016). Leadership through dominance can be achieved through intimidation and coercion (Cheng & Tracy, 2014; Cheng et al., 2013). However, many important leader selections are decided through elections, and leaders' effectiveness is dependent on their following. Leadership success therefore depends on followership, and followers may be more likely to prefer either prestigious or dominant leaders, depending on the challenges their group faces (Little, Burriss, Jones, & Roberts, 2007; van Vugt & Grabo, 2015).

Research suggests that social context influences who is likely to be selected as a leader (e.g., Little, 2014; Little, Roberts, Jones, & DeBruine, 2012; Spisak, Grabo, Arvey, & van Vugt, 2014; Van Vugt & Grabo, 2015). Specifically, experiencing threat or uncertainty, such as intergroup threat or economic hardship, has been hypothesised to increase preferences for dominant leaders (e.g., Little et al., 2007; Spisak, Dekker, Krüger, & van Vugt, 2012; Spisak, Homan, Grabo, & Van Vugt, 2012; van Vugt & Grabo, 2015). According to this viewpoint, during times of crisis, dominant individuals may be preferred as leaders because they may be better suited to resolving the situation (Little, 2014). For example, dominant leaders are expected to be better at enforcing contributions from ingroup members to prevent free-riding (Bøggild & Laustsen, 2016), and at making difficult (e.g., costly and thus unpopular) decisions that are ultimately beneficial for the ingroup (Maner & Case, 2016). Dominant leaders may further be preferred because they are expected to pursue an aggressive strategy that may be detrimental to other groups (Laustsen & Petersen, 2017; see also Halevy et al., 2012). Deferring to a dominant leader may also aid in regaining a sense of control, thereby somewhat ameliorating the negative effects of uncertainty (Kakkar & Sivanathan, 2017; Mirisola, Rocco, Russo, Spagna, & Vieno, 2014; but see Safra, Baumard, & Chevallier, 2018). This hypothesis is supported by research by Kakkar and Sivanathan (2017), who found that support for dominant leaders increased with economic uncertainty, as measured by macroeconomic indicators. For instance, in one of their studies, even after controlling for other factors including income and political orientation, economic uncertainty predicted a preference for voting for



Donald Trump, the candidate perceived to be more dominant, over Hillary Clinton, the more prestigious candidate (Kakkar & Sivanathan, 2017). It is worth noting that such context-dependent leadership preferences are predicted by – and compatible with – evolutionary accounts of an evolved heuristic of contingent followership, but also with social learning accounts of leader preferences. Dominance tends to be associated with masculinity (Todorov, Olivola, Dotsch, & Mende-Siedlecki, 2015). Learnt stereotypic associations between threat and males serving as competent agents and protectors may therefore provide an alternative explanation to evolutionary accounts for findings of dominant leader preferences in the face of threat (Over & Cook, 2018).

Notably, evaluations of leaders are not always exclusively based on candidates' records. Traits and attributes are rapidly inferred from facial appearance, and these judgments have been found to be related to leader preferences (Ballew & Todorov, 2007; Banducci et al., 2017; Chiao, Bowman, & Gill, 2008; Lawson, Lenz, Baker, & Myers, 2010; Olivola & Todorov, 2010; Todorov, Mandisodza, Goren, & Hall, 2005; Todorov et al., 2015). When asking 5-year-olds to select a leader for a game (i.e., a captain for a simulated trip) among face pairs of electoral candidates, children's leader preferences have been found to predict election winners with the same level of accuracy as adults' leader preferences (Antonakis & Dalgas, 2009). Among the many traits inferred from facial features, dominance, trustworthiness, competence, and health and attractiveness have been identified as being particularly influential for leadership decisions (van Vugt & Grabo, 2015). Dominance as a trait is quickly inferred from facial features and is associated with 'masculine' features (Todorov et al., 2015) including a squared face, strong jaw line, thin lips, and small eyes (van Vugt & Grabo, 2015).

Leader preferences based on facial features have been found to vary by social context (e.g., Spisak, Homan, et al., 2012). For example, Little and colleagues (2007) found that transposing the face shape of George W. Bush and John Kerry, respectively, onto a neutral face allowed them to predict which of these candidates would win an election. Crucially, leader preference varied with the context. Bush, who was perceived to have the more masculine and dominant facial features, received more votes during a threat context (i.e., war), whereas Kerry, with comparatively more feminine features and perceived as more attractive, likeable, forgiving, and intelligent, received more votes during peace time (Little et al., 2007). This finding is further supported by studies using morphed (Spisak, Dekker, et al., 2012; Spisak, Homan, et al., 2012) as well as real (Spisak, Dekker, et al., 2012) faces. Taken together, this

work predicts that perceived threat from the Covid-19 pandemic may be related to preferences for more dominant leaders.

However, Laustsen and Petersen (2015) argue that while intergroup conflict should increase preferences for dominant leaders, coordination among groups to overcome challenges of nature, such as natural disasters, may not place the same demands on leaders. This is because unlike when facing natural challenges, success in a conflict with another group is determined by the ingroup's performance (i.e., strength, effort, investment of resources, coordination, etc.) *relative to* the outgroup's performance, which leads to an "arms race" between groups (Laustsen & Petersen, 2015, p. 287). Intergroup threat, compared to other threats, therefore demands particularly high levels of cooperation among ingroup members, which can be enforced by dominant leaders, and it can be tackled through aggressive behaviour towards outgroup members, which dominant leaders may be suited to lead (Laustsen & Petersen, 2017). Dominant leaders may therefore be preferred when facing intergroup conflict. However, in the absence of intergroup threat, the costs of selecting a dominant leader may outweigh the benefits (Laustsen & Petersen, 2015) because dominant leaders may be more likely to exploit their followers and prioritise their personal benefit over shared group goals (Bøggild & Laustsen, 2016; Chen et al., 2014; Maner & Mead, 2010; Petersen & Laustsen, 2020). Laustsen and Petersen (2015) found support for this hypothesis in studies showing that participants more often selected the more dominant face in a face pair as the leader when threatened by a hypothetical intergroup conflict, compared with a natural hazard threat. The hypothesis was further supported by research showing that compared to no prime, an intergroup conflict prime significantly increased preferences for a dominant leader in a face choice task, whereas leader preferences did not differ between a natural hazard prime (i.e., being threatened by flooding) and the no prime condition (Laustsen & Petersen, 2017). Additionally – and of pertinence to the current research – an experimental study did not find differences in dominant leader preferences between a disease threat condition, a personal safety threat condition (i.e., imagining an intruder in the house), and a control condition (White et al., 2013). Taken together, these laboratory studies suggest that different threats may affect dominant leader preferences differently. However, it is not clear whether these lab-based findings generalise to the complex context of a real-world, global pandemic, which may lead to perceptions of disease threat, but also of economic uncertainty and resource scarcity.

One interpretation of the Covid-19 pandemic is that it poses a shared, natural threat to societies around the world, which requires peaceful cooperation to tackle. However, certain

aspects of the pandemic may share important characteristics with some intergroup conflicts, such as competitions over scarce resources. For example, shortages in health care resources (e.g., protective equipment, ventilators) demand decisions about the international and local distribution of these necessary resources (van Bavel et al., 2020). The nature of the pandemic thus raises the question of whether, and if so how, perceived threat from the pandemic will be related to changes in leader preferences. To date, contextual effects on leadership preferences have mostly been investigated within laboratory-based settings using experimental manipulations and fictional scenarios such as vignettes to induce threat, with three notable exceptions. Laustsen and Petersen (2017) examined leader preferences among Poles and Ukrainians in the intergroup conflict context of the Crimea crisis of 2014. The study found that those who were more directly affected by the conflict and who were more inclined towards an aggressive response tended to prefer more dominant leaders. However, as noted above, these findings from a context of overt intergroup conflict may not generalise to the context of threat from a global pandemic. Kakkar and Sivanathan (2017), described above, found that experiencing economic threat predicted dominant leader preferences, but the study did not measure perceived threat directly. Instead, broad macroeconomic indicators of uncertainty were used as indicators of threat. Lastly, White, Kenrick, and Neuberg (White et al., 2013) investigated the relationship between disease threat and leader preferences using real-world voting data (i.e., candidate images and vote outcomes for a US congressional election, and proxy measures of population health) in addition to experimental manipulations. While this context is particularly relevant to the current research, it only examined attractiveness as a predictor of election outcomes in relation to disease threat with real-world data, whereas dominant leader preferences were only examined using experimental threat manipulations. The Covid-19 pandemic offered an opportunity to test questions of how complex threat (e.g., to health, life, job security, economic stability, etc.) affects dominant leader preferences within a naturalistic setting in which there were periods of severe threat and periods of lesser threat. Given the importance of leaders in addressing crises, understanding leader preferences in this context is important for understanding patterns of leader emergence, but also as an indication of what followers may expect from leaders in these circumstances.

In the current study, we examine whether preferences for dominant leaders change over the first year and a half of the Covid-19 pandemic in the United Kingdom (UK). We investigate this question in two tasks, a forced choice face preference task and a rating scale. We also measure perceived threat from the Covid-19 pandemic and examine whether changes in

perceived threat are related to dominant leader preferences. This allows us to investigate the relationship between threat and leadership preferences in a real-world quasi-experiment.

## **Method**

### **Data Collection**

The study took place online and was created and administered using Qualtrics (<https://www.qualtrics.com>). Participants were recruited through Prolific (<https://www.prolific.co>). Informed consent was obtained at the start of each online session in line with procedures approved by the ethics committee of the Department of Psychology, University of York. The pre-registration document for this study can be found at: [https://aspredicted.org/8F8\\_X9T](https://aspredicted.org/8F8_X9T).

Data was collected at four time points: on April 9<sup>th</sup>, 2020 (Time 1), on May 18<sup>th</sup>, 2020 (Time 2), on May 23<sup>rd</sup>, 2021 (Time 3), and finally on August 23<sup>rd</sup>, 2021 (Time 4).

### ***Contextual Summary***

At Time 1 (T1), the first strict UK lockdown had been imposed for around one and a half weeks, after hospitalisations and deaths had risen dramatically. On April 9<sup>th</sup>, 4,675 positive Covid-19 test results were reported (UK Government, 2021a), and it was reported that 881 people who had contracted Covid-19 had died in the past 24 hours (Badshah, 2020). Vaccinations were not yet available. The British Prime Minister, Boris Johnson, was at this time in hospital receiving oxygen treatment for Covid-19 (Badshah, 2020). The previous day, the media had reported modelling data suggesting that the UK was to have the worst coronavirus death toll in Europe (Lyons, 2020).

By Time 2 (T2), the UK was reported to have passed the ‘peak’ of the first wave of the Covid-19 epidemic (this was later determined to have been reached on April 8<sup>th</sup> (Oke & Heneghan, 2020), and Boris Johnson had recovered from the disease and returned to work. On May 18<sup>th</sup>, 2,684 new positive test results reported (UK Government, 2021a), and cumulative deaths from Covid-19 were reported to stand at 34,796, with 160 deaths recorded within the previous day (UK Government, 2020). Vaccinations were not yet available. Lockdown restrictions were still in place but conditional plans for easing of restrictions had been announced (Institute for Government, 2021).

At Time 3 (T3), 2,235 positive test results within the past day had been reported, and 16 new Covid-19-related deaths were recorded with May 23<sup>rd</sup>, 2021 registered on the death certificate (UK Government, 2021b). Notably, by this time, 66.2% of the population had received at least one dose of a Covid-19 vaccination, and 39.8.1% had received two doses (UK Government, 2021d) (the national vaccination programme began between T2 and T3). Most indoor and outdoor businesses had been allowed to reopen the previous week (UK Government, 2021c), and reports of lifting lockdown restrictions in the coming month were circulating in the media (Boseley, 2021).

Three months later, at Time 4 (T4), daily cases and deaths had again increased, with 31,914 new positive Covid-19 test results (UK Government, 2021a) and 116 new deaths (UK Government, 2021b) reported. By this time, 83.0 % of the population had received at least one dose of a Covid-19 vaccination, and 72.9% had received two doses (UK Government, 2021d). While some travel restrictions and government advisories were still in place, within the UK, legal restrictions on public and private life, as well as work and businesses, had been lifted (UK Government, 2021e).

## **Participants**

We collected data from different participants at four different time points between April 2020 and August 2021. Participants who had participated at a previous data collection time point were prevented from participating again at later time points. To be eligible for the study, participants had to be fluent in English, at least 18 years old, and UK nationals residing in the UK. As pre-registered, 200 participants were included in the sample at each data collection time point, leading to a total sample of 800 participants across time points. Participants were compensated £0.75 ( $\approx$  US \$1), a rate of around £10.64 ( $\approx$  US \$14.6) per hour. Across time points, the gender and age composition of our samples was broadly similar.

At T1, our sample consisted of 143 female and 54 male participants, 1 participant who identified as non-binary, and 2 participants who did not disclose their gender. The mean age was 33.7 ( $SD_{\text{Age}} = 12.0$ ).

At T2, 138 female and 60 male participants, 1 transgender female, and 1 participant who preferred not to disclose their gender participated in the study. The mean age was 34.2 ( $SD_{\text{Age}} = 11.2$ ).

At T3, 126 female and 72 male participants, 1 participant who identified as non-binary, and 1 participant who did not disclose their gender identity participated in the study. The mean age was 36.0 ( $SD_{Age} = 14.1$ ).

At T4, 126 female and 72 male participants, 1 participant who identified as non-binary, and 1 participant who did not disclose their gender identity participated in the study. The mean age was 31.5 ( $SD_{Age} = 10.6$ ).

## Materials

Participants were presented with 10 face pairs with neutral facial expressions. All face stimuli, which were photographed under standardized conditions (including consistent lighting and clothing), were retrieved from the Chicago Face Database (Ma, Correll, & Wittenbrink, 2015). The database provides ratings of the photographed faces for a range of dimensions, including perceived attributes and traits. For the images used, ratings were provided by between 25 and 94 ( $M = 54.2$ ) independent raters per photograph. Based on these subjective ratings, each pair was matched as closely as possible on age (which can serve as an important cue to competence; Spisak et al., 2014; van Vugt & Grabo, 2015), trustworthiness, and attractiveness but faces differed in perceived dominance. To confirm that this matching process was successful, we conducted Bonferroni-corrected paired samples *t*-tests for each attribute rating ( $\alpha = .05$ , two-tailed; we report adjusted *p*-values here). The results show that the pairs differed significantly in perceived dominance ( $t(9) = 12.29, p < .001$ ), but not in perceived age ( $t(9) = 1.85, p = .39$ ), trustworthiness ( $t(9) = -1.91, p = .35$ ), or attractiveness ( $t(9) = 0.35, p = 1$ ).

In addition, participants completed a 6 item scale adapted from Kakkar and Sivanathan (2017) and Cheng and colleagues (2010). In this scale, six items are rated on a scale from 0, 'not at all' to 100, 'very much'. Item examples include "I prefer a leader who enjoys control over other members", "I prefer a leader who tries to control other members rather than permit them to control him/her", and "I prefer a leader who is known to others as someone it is best to let have his/her own way".

Participants also completed a perceived threat measure, rating how threatened they feel by the current COVID-19 pandemic from 0, 'not at all threatened', to 100, 'extremely threatened'.

## **Design and Counterbalancing**

The study employs a between-subjects design, with sampling time point (4: T1 vs T2 vs T3 vs T4) as the independent variable. We had three dependent variables: dominant leader face choice preference, dominant leader preference scale ratings, and perceived threat.

For the leadership preference forced choice task, the dominant face appeared on the left in half of the face pairs and on the right in the other half. We created two counterbalancing conditions such that faces that were on the left in one condition were on the right in the other condition. For both counterbalanced conditions, the order in which the face pairs appeared was randomized. For the leader preference scale, scale items appeared in a fixed order.

Following our pre-registered analysis plan, differences between data collection time points in each dominant leader preference measure, as well as perceived threat ratings, were analysed using one-way Analyses of Variance (ANOVAs). As pre-registered, we also tested the relationship between levels of perceived threat and dominant leader preferences.

## **Procedure**

Participants were informed that the study was designed to help us understand people's leadership choices during this time of social distancing due to the Covid-19 pandemic. Once informed consent was obtained, demographic (age, gender) information was collected and eligibility given pre-defined screening criteria (English fluency, current country of residence = UK, nationality = UK) was confirmed. Participants were then asked brief questions relating to the Covid-19 pandemic: Are you currently following government regulations relating to social distancing/quarantine during the COVID-19 pandemic? Are you primarily confined to the house as a result of government regulations during the COVID-19 pandemic? Are you a key worker? Participants did not have to answer these questions. Participants then completed the leadership forced choice face task. On ten trials, participants were presented with the question "Who do you think would make the better leader in the current situation?" A face pair appeared below this question and participants were asked to select one face by clicking on it (Figure 1).

Who do you think would make the better leader in the current situation?



*Figure 11.* Example trial of our forced choice task measure of leadership preference. Participants had to select the face that they thought would make the better leader across ten trials. In half of the trials dominant faces were on the left and in the other half were on the right.

Participants then completed the dominant leader preference scale. Then, participants were asked to rate how threatened they currently feel by the Covid-19 pandemic. Following this, participants completed an unrelated task about prosocial intentions and group identification. Finally, participants were debriefed and redirected to Prolific for payment.

## Results

### Sample Characteristics and the Impact of the Covid-19 Pandemic

To allow for the comparison of sample characteristics across time points, we first report descriptive statistics for participants' responses to questions about how they were affected by the pandemic.

At T1, almost all participants (199/200) said they were currently following government regulations relating to social distancing/quarantine and most (163/200) said they were currently primarily confined to the house as a result of government regulations. About a quarter were key workers (54/200). At this time, key workers were permitted to commute to their place of work, even when lockdown government regulations stipulated that non-key workers should stay at home.

At T2, almost all participants (197/200) said they were currently following government regulations relating to social distancing/quarantine and most (144/200) said they were currently



primarily confined to the house as a result of government regulations. About a quarter were key workers (48/200).

At T3, as at T1 and T2, almost all participants (189/200) said they were currently following government regulations relating to social distancing/quarantine. Only about a quarter (53/200) of participants stated that they were currently primarily confined to the house as a result of government regulations. Fewer participants were likely primarily confined to the house in the currently sample, compared to the T1 and T2 samples, because most businesses had recently been allowed to reopen. This likely led many people to return to their place of work outside of the house (rather than, for example, working from home or being furloughed). As in previous samples, about a quarter of participants reported that they were key workers (55/200).

At T4, as before, almost all participants (188/200) stated they were currently following government regulations relating to social distancing/quarantine. Only a minority (33/200) of participants reported that they were currently primarily confined to the house as a result of government regulations. This may have been the case for people who had been instructed to self-isolate because they had tested positive for Covid-19, had been in contact with someone who tested positive for Covid-19, or because they had recently travelled to the UK from abroad (Office for National Statistics, 2021). As in previous samples, about a quarter of participants stated that they were key workers (54/200).

Overall, a comparison of participants' responses suggests that self-reported compliance with government regulations relating to social distancing/quarantine during the pandemic was high across samples, and that sample characteristics were broadly similar across time points.

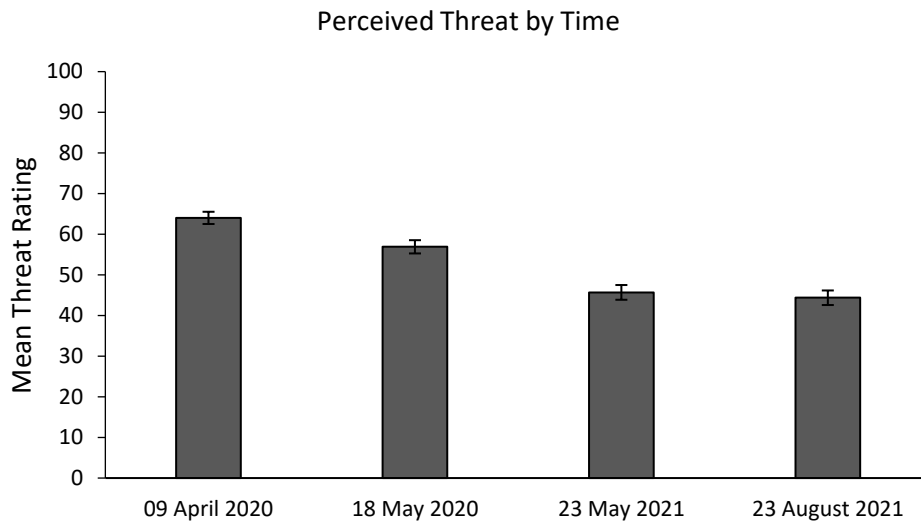
## **Leader Preferences and Perceived Threat**

Unless otherwise stated, all tests were two-tailed and performed with  $\alpha = .05$ . All post-hoc tests reported here were Bonferroni-corrected and we report adjusted  $p$ -values for all Bonferroni-corrected tests.

### ***Perceived Threat***

We first tested whether perceived threat from the Covid-19 epidemic indeed differed across data collection time points. We tested this in a one-way ANOVA analysing the effect of Time (T1 vs T2 vs T3 vs T4, between subjects) on participants' threat scores. Perceived threat was

found to differ significantly across data collection time points ( $F(3, 796) = 30.84, p < .001, \eta^2 = .104$ ) (Figure 2).

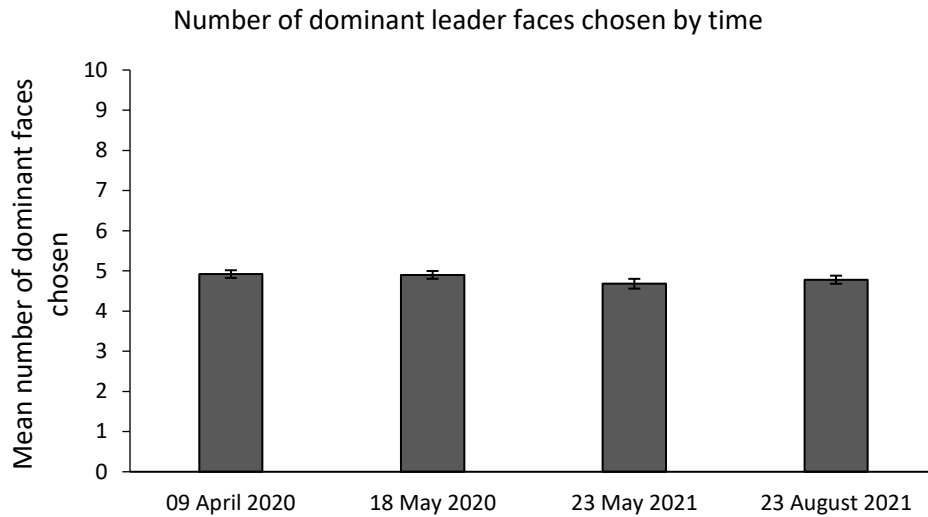


*Figure 12.* Mean perceived threat ratings by data collection time points. Error bars = standard error of the mean (SE). Perceived threat was higher at earlier time points (April & May 2020) than at later time points (May & August 2021).

Pairwise-comparisons showed that perceived threat was significantly higher at T1 ( $M = 64.0, SD = 21.3$ ) than at all later time points (T2:  $M = 56.9, SD = 23.1, p = 018$ ; T3:  $M = 45.7, SD = 25.7, p < .001$ ; T4:  $M = 44.4, SD = 25.3, p < .001$ ). Threat ratings at T2 were also significantly higher than at T3 and T4 ( $ps < .001$ ). Perceived threat did not differ between T3 and T4,  $p = 1$ . These results indicate that perceived threat declined between early April 2020 (T1) and late May 2020 (T2), and declined even further between May 2020 (T2) and May 2021 (T3) but did not change further by late August 2021 (T4).

### ***Leader Preference Face Choice Task***

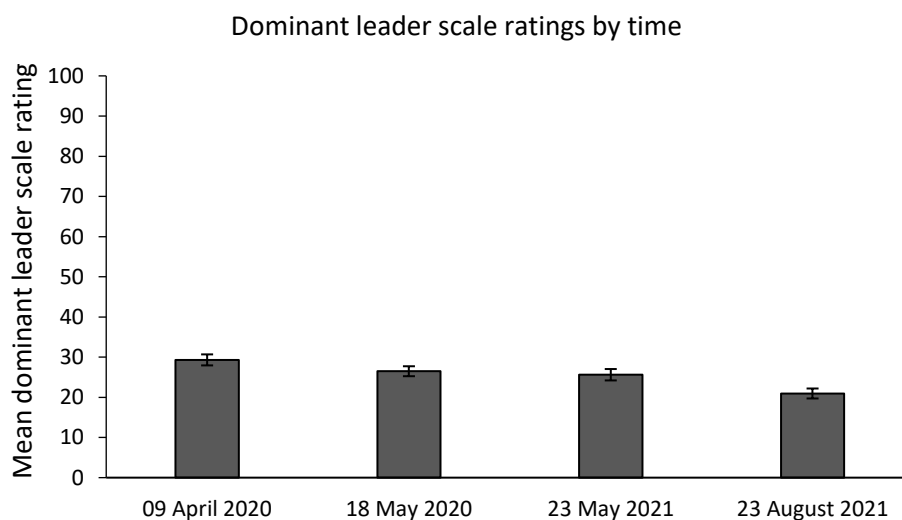
To test whether participants' responses on the leader preference face choice task differed across data collection time points, we conducted a one-way ANOVA analysing the effect of Time (T1 vs T2 vs T3 vs T4, between subjects) on participants' dominant leader face choice scores, which is the number of times a participant chose the more dominant of the two faces across the 10 choice trials (see Figure 3). Participants' face choice scores did not differ across time points ( $F(3, 796) = 1.15, p = .33$ ).



*Figure 13.* Mean number of dominant faces chosen by data collection time point. Error bars = Standard error (SE). Mean dominant face choice scores did not differ between time points.

### ***Dominant Leader Preference Scale***

To investigate whether participants' responses on the dominant leader preference scale differed across data collection time points, we conducted a one-way ANOVA analysing the effect of Time (T1 vs T2 vs T3 vs T4, between subjects) on participants' mean leadership preference scale scores (see Figure 4). We found a significant effect of Time,  $F(3, 796) = 6.94, p < .001$ .

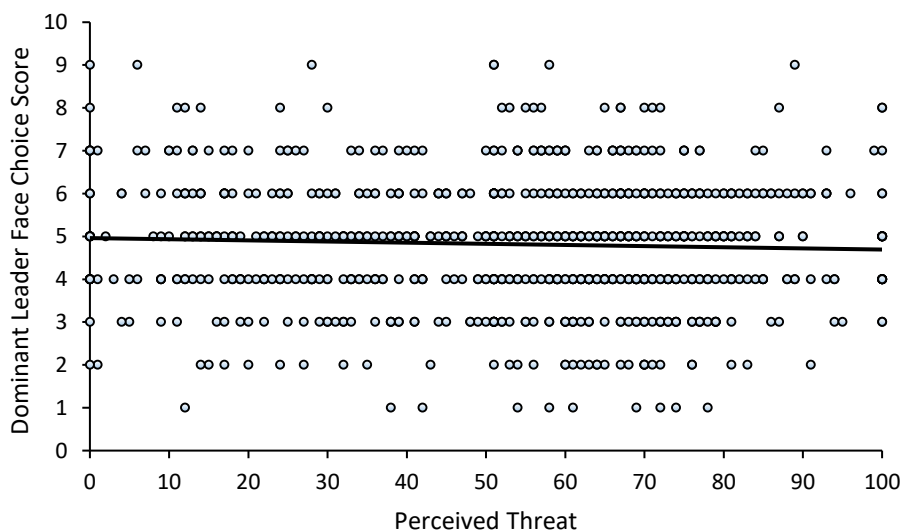


*Figure 14.* Mean dominant leader scale ratings by data collection time point. Error bars = SE. Higher scores indicate stronger preferences for dominant leaders. Mean dominant leader scale ratings were higher at earlier time points than at the final time point.

To follow up on the significant effect of Time, we performed pairwise comparisons. These indicated that mean dominant leader preference scale scores were significantly higher at T1 ( $M = 29.3, SD = 19.3, p < .001$ ) and at T2 ( $M = 26.5, SD = 17.6, p = .018$ ), and marginally (though not significantly) higher at T3 ( $M = 25.6, SD = 20.1, p = .074$ ), compared to T4 ( $M = 20.9, SD = 17.5$ ). All other comparisons did not reach significance,  $ps \geq .291$ . These results suggest that preferences for dominant leaders, as measured on the dominant leader preference scale, were lower in late August 2021 than at earlier time points in the pandemic.

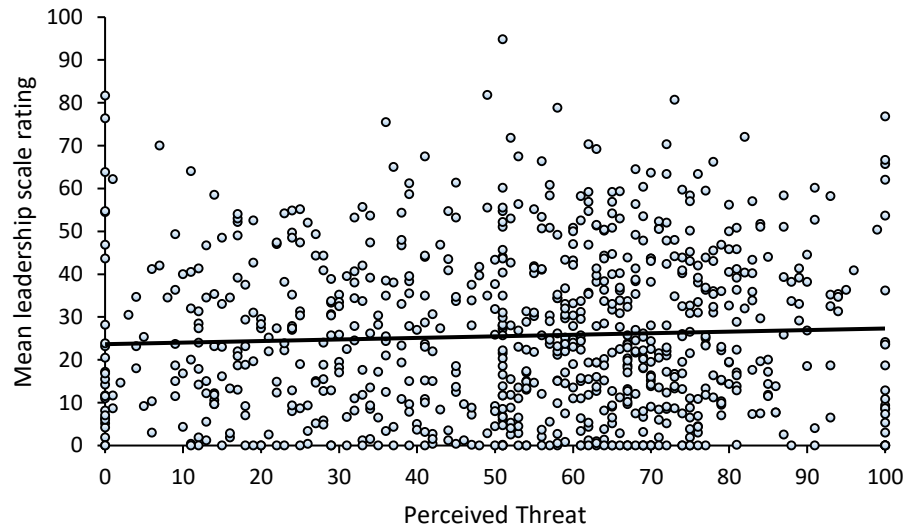
### ***The Relationship between Perceived Threat and Dominant Leader Preferences***

In a Pearson correlation, we tested whether, collapsed across data collection time points, participants' threat scores were associated with their dominant leader face choice score. Threat scores and face choice scores were not found to be correlated ( $r(798) = -.05, p = .198, 95\% \text{ CI } [-.12, .03]$ , see Figure 5).



*Figure 15.* The relationship between participants' perceived threat ratings and dominant leader face choice scores, with fitted trendline. There was no significant relationship between perceived threat ratings and dominant leader face choice scores.

Again collapsed across data collection time points, we also tested whether participants' threat scores were associated with their scores on the leadership preference scale. Threat scores were not found to be related to mean leader preference scale scores ( $r(798) = .05, p = .167, 95\% \text{ CI } [-.02, .12]$ , see Figure 6).



*Figure 16.* The relationship between participants' perceived threat ratings and mean dominant leader preference scale ratings, with fitted trendline. There was no significant relationship between perceived threat ratings and mean leadership scale ratings.

## Discussion

Our study explored changes in dominant leader preferences and perceived threat from the Covid-19 pandemic in the UK over an extended period of the global Covid-19 pandemic between April 2020 and August 2021. Experiencing threat has been found to increase preferences for more dominant leaders (e.g., Little et al., 2007; Spisak, Dekker, et al., 2012; Spisak, Homan, et al., 2012; van Vugt & Grabo, 2015). Based on this finding, it may be hypothesized that increased threat from the Covid-19 pandemic will be related to increased preferences for more dominant leaders. However, the complexity of threats arising from the Covid-19 pandemic, which encompass threats to the health and lives, but also the livelihoods of people worldwide, raises the question of whether experimental findings and real-world findings from other threat contexts generalize to this complex, real-world context.

We collected four separate samples at different time points for comparison, the first in early April 2020 (Time 1), the second in late May 2020 (Time 2), the third in late May 2021 (Time 3), and the last in late August 2021 (Time 4). At each of these time points, we asked participants to rate how threatened they feel by the current Covid-19 pandemic, and we assessed preferences for a dominant leader on two measures. In one task, we presented participants with gender-matched face pairs which were closely matched on age,

trustworthiness, and attractiveness but differed in perceived dominance. Here, participants were asked to select the person (i.e., the face) who they believe would be the better leader in the current situation. For the second task, participants rated their preferences for dominant leaders on a scale. We did not find changes in how frequently the more dominant face in the face pairs was chosen across sampling time points. When measured on the rating scale, preferences for dominant leaders were higher earlier on in the pandemic (particularly at Times 1 and 2) than at the end of the time period examined here (Time 4). Similarly, perceived threat was highest at our earliest sampling time point and then declined. Importantly, however, our individual difference measures suggest that perceived threat was not related to dominant leader preferences, whether measured in the face choice task or on the scale.

Taken together, our results do not provide consistent support for the hypothesis that perceived threat from the Covid-19 pandemic led to heightened preferences for dominant leaders. We found group-level scale ratings of dominant leader preferences to be lower at the end of the time period examined, in August 2021, when perceived threat from the pandemic was also lower than earlier on. However, leader preference ratings were not related to perceived threat ratings at the individual level. Furthermore, dominant leader choices, as measured in the forced face choice task, did not differ across time. Additionally, leader face choices were not related to perceived threat. The predictions of laboratory-based research thus do not seem to consistently generalise to the real-world setting of the Covid-19 pandemic.

Considering the absence of a relationship between threat and dominant leader preference in the current research in light of relevant previous research raises interesting questions that future research should aim to address. Previous research suggests that the challenges a group faces affect leader preferences. Of particular relevance for the current research are studies comparing the effect of different threats on dominant leader preferences. Laustsen and Petersen (2015) found that participants more often selected the more dominant face in a face pair as the leader of their group when facing intergroup conflict rather than a natural hazard, with a small to medium effect size (Study 1:  $d = 0.53$ , Study 2:  $d = 0.29$ ). This finding is further supported by research showing that compared to no prime, an intergroup conflict prime significantly increased preferences for a dominant leader in a face choice task ( $d = 0.39$ ), whereas leader preferences did not differ between a natural hazard prime (i.e., being threatened by flooding) and the no prime condition ( $d = 0.06$ ) (Laustsen & Petersen, 2017). This research suggests that especially conflict-ridden intergroup relations may lead to increases

in dominant leader preferences, while other threats, such as natural hazard threats, may not have the same effect.

However, other research suggests that non-intergroup threats can also exert a significant, albeit small effect on dominant leader preferences. For example, after controlling for other factors, including income and duration of residence in the community, Kakkar and Sivanathan (2017) found a small but significant effect of economic uncertainty on dominant leader preferences. Specifically, economic uncertainty positively predicted preference for a dominant over a prestigious leader ( $d = 0.20$ ) and negatively predicted preference for a prestigious over a dominant leader ( $d = 0.24$ ), as measured on the same rating scale employed in the current research (Cheng et al., 2010). In another study, economic uncertainty was found to predict a preference for voting for Donald Trump, the candidate perceived to be more dominant, over Hillary Clinton, the more prestigious candidate, even after controlling for other factors including income and political orientation ( $d = 0.24$ ) (Kakkar & Sivanathan, 2017). While contexts of intergroup conflict may thus exert stronger effects on dominant leader preferences, other threats may still lead to smaller but significant effects. That said, here we did not observe a relationship between perceived threat from the Covid-19 pandemic and dominant leader preferences as measured in our face choice task ( $d = -0.10$ ) or the rating scale ( $d = 0.10$ ). Our findings are therefore comparable with some previous research in which the leader selection context was not primarily framed as an ingroup conflict but nevertheless called for heightened intragroup cooperation (e.g., facing a natural hazard threat versus a no prime condition, Laustsen & Petersen, 2017) but differ from other particularly relevant research, such as studies finding effects of economic uncertainty on dominant leader preference ratings (Kakkar & Sivanathan, 2017). The Covid-19 pandemic caused substantial economic uncertainty. Why such economic threat appears to sometimes, but not always, lead to increased dominant leader preferences is an interesting question for future research to address.

Given the correlational design of this study, we cannot draw strong causal conclusions from this finding. It is possible that our threat measure, which asked participants to rate how threatened they currently feel by the Covid-19 pandemic, led participants to focus on other aspects of the pandemic in their ratings, such as health and disease threats. However, it is also possible that the nature of the Covid-19 pandemic meant that leader traits other than dominance were prioritised at this time. As the rapid spread of the virus across countries, as well as supply chain shortages and the threat of newly emerging virus variants in countries with low vaccination rates demonstrate, cooperation across societies is crucial in addressing this crisis.

Dominance may not be a desired characteristic in leaders in this context. Indeed, research suggests that preferences for dominant leaders during times of crisis are driven by the intuition that such leaders will more likely pursue, and prevail in, an offensive strategy to address the source of threat (Laustsen & Petersen, 2017). In the absence of a threat that can be combatted with measures of aggression (e.g., intergroup threat), selecting non-dominant leaders appears to be the ‘default’ preference (Laustsen & Petersen, 2017). Instead, other traits may have been favoured over dominance in the current context. Trustworthiness has been suggested to be particularly important for leaders aiming to achieve or maintain peace and diplomatic relations (van Vugt & Grabo, 2015). Attractiveness may have also been particularly important at this time (van Vugt & Grabo, 2015). Evidence suggests that when disease threat is present, people are particularly inclined towards attractive leaders because attractiveness is thought to convey health information (White et al., 2013). Followers depend on leaders (more than on most ingroup members), and sickness or death of a leader may be detrimental to the group’s goals. As risks to a leader’s health are heightened by disease threat, selecting leaders with robust health – as indicated by attractiveness – may be especially important in this context (White et al., 2013). Our study was not designed to investigate preference changes in these traits (e.g., we matched face pairs on these attributes) and therefore cannot speak to them. Future research could helpfully investigate how a range of leader traits vary in relation to complex, real-world threats.

In addition to the important leader traits and attributes that we matched face pairs on (i.e., age, trustworthiness, and attractiveness), other traits may have varied between the faces within a face pair, and these differences may have been important in participants’ face choices. For example, competence is often inferred from faces and plays an important role in leader choices (Todorov et al., 2005, 2015; van Vugt & Grabo, 2015). Both dominance (which we investigated) and age (which we matched face pair stimuli on) contribute to competence inferences (Chen et al., 2014; Spisak et al., 2014; van Vugt & Grabo, 2015), but they may not fully account for differences in perceived competence. Such additional variance between matched stimuli may account for the discrepancy between our findings of dominance preference changes measured on the rating scale, which differed significantly across time, and the face choice measure, where no significant effect of time was found.

While imperfect matching of face pairs is a limitation of the current study, matching images of real people for face choice tasks has some advantages. Most studies in this field either rely on pairs of artificial images where the same base face is morphed to vary only along



a single trait or attribute dimension (e.g., a higher and a lower dominance version of the same face), or face pairs encompass photographs of election candidates, which are not systematically matched on any attributes (for a recent review, see Todorov et al., 2015). Even studies that use photographs (rather than face morphs) sometimes make these images more uniform and less naturalistic, for example by presenting black-and-white images or cropping the image to remove hair and ears (see, e.g., Spisak, Dekker, et al., 2012). While these stimuli certainly have advantages, studies using matched, unaltered images (albeit taken under consistent photographic conditions) can be a step towards increasing the external validity of face choice measures while maintaining high internal validity. To achieve this, future research should aim to match stimuli on a wider range of traits and attributes, and to use a large number of face pairs. This can address concerns that something particular about the specific images used drove observed effects, as may have been the case in the current research.

Beyond investigating and accounting for a wider range of attributes, future research should also investigate leader preferences across genders. In the current study, we were not able to investigate leader preferences with female faces because the stimulus matching process for female face pairs was not successful. Specifically, we were not able to match a sufficient number of female faces provided in the chosen stimulus database (Ma et al., 2015) on age, trustworthiness, and attractiveness, while maintaining a significant difference in dominance. However, leader gender has sometimes been found to interact with leadership emergence. For example, one study found that in same-sex dyads collaborating on a task, the more dominant partner tended to emerge as the leader (Ritter & Yoder, 2004). In contrast, in mixed-sex dyads, males emerged as leaders more often than females. Specifically, non-dominant males tended to emerge as leaders, over dominant females, not only when the task was stereotypically masculine, but also when it was not congruent with feminine or masculine stereotypes (i.e., gender neutral). Other research has found that facial cues of masculinity and femininity are better predictors of context-dependent leadership preferences than cues of sexual dimorphism (i.e., cues for being male or female; Spisak, Dekker, et al., 2012).

The Covid-19 pandemic has further led to renewed calls for ‘androgynous leadership’ (Blake-Beard, Shapiro, & Ingols, 2020; Somvichian-Clausen, 2020). Leaders are called upon to combine leader characteristics classified as ‘masculine’ (i.e., stereotypically associated with males), such as decisiveness, aggressiveness, risk-taking, and dominance, and ‘feminine’ leader traits (i.e., stereotypically associated with females), such as compassion, loyalty, and sympathy (Bem, 1974; Blake-Beard et al., 2020). Angela Merkel, the Chancellor of Germany,

has been suggested to have exhibited such an androgynous leadership style during the pandemic, whereas Donald Trump, the US President during the first year of the pandemic, and Jair Bolsonaro, the President of Brazil, have been characterized as over-relying on ‘masculine’ leader traits. Notably, female national leaders, including Angela Merkel and Jacinda Ardern, have been lauded for performing better overall during the pandemic, compared with their male counter parts (e.g., Garikipati & Kambhampati, 2020; Henley, 2020; Henley & Ainge Roy, 2020; Somvichian-Clausen, 2020; Taub, 2020; Windsor et al., 2020). It is possible that widely publicized successes of female leaders over the course of the pandemic may have affected our scale ratings of dominant leader preferences, as dominance tends to be associated with masculinity (Todorov et al., 2015). Systematic analyses of leader traits and performances during the Covid-19 crisis are, however, still outstanding. Another interesting avenue for future research arises from differences between evolutionary-contingency theories and social learning accounts of preferences for dominant leaders in times of threat. Social learning accounts may predict that contextual differences in dominant leader preferences are moderated by individual differences in gender bias, such that those with stronger gender bias show greater context-variability in their preferences for leaders with gender-stereotyped traits, including dominance. Future research could fruitfully investigate such complex interactions between sex, gender, stereotypes, and leader preferences.

The Covid-19 pandemic has drastically changed societies across the world, posing threats to people’s health, as well as their economic certainty. Our findings suggest that at least in the UK during the first year and a half of the pandemic, increased threat from the pandemic did not lead to increased preferences for more dominant leaders.

## Chapter 5: General Discussion

### Summary of Findings

The aim of my doctoral research was to examine how social context affects important aspects of group membership – namely, intergroup bias, its effects on prosocial behaviour, and leadership preferences. The findings from my empirical research studies have important theoretical and, potentially, practical implications.

In the first set of studies (Chapter 2), I found that in middle childhood, children often prioritised advantaging their minimal ingroup over fairness in their choices of resource allocation procedures. Importantly, comparing children’s procedure choices in public and in private, I found suggestive evidence that across ages, children make somewhat more ingroup advantageous procedure choices in private, compared to in public. Reputational concerns therefore appear to affect children’s social preferences. Although the effect was modest, if replicated, this would suggest that children in middle childhood already take the social context into account when weighing their concerns for ingroup favouritism and procedural justice.

Following the pervasive changes that the Covid-19 pandemic caused to social contexts, but also to research practices, my research then turned to investigating potential social changes in the context of the Covid-19 pandemic. In my next study (Chapter 3), I tested the predictive validity of two competing hypotheses. On the one hand, the crisis may enhance intergroup bias in group identification and prosocial intentions as people focus on their ingroup (Flippen et al., 1996; Fritsche et al., 2011; Riek et al., 2006; Rios et al., 2018). On the other hand, the shared experience of crisis and threat, as well as the shared goal of overcoming the pandemic, might increase identification and prosocial behaviour not only with ingroups, but also with other countries, possibly through recategorisation into a shared, superordinate ingroup (Jetten et al., 2020; van Bavel et al., 2020; Vignoles et al., 2021; Wakefield et al., 2021). I tested these predictions by analysing differences between group identification and prosocial intentions at four different time points, with a total of 800 British participants in the UK. I found that overall, intergroup bias in group identification and in prosocial intentions decreased over the first year and a half of the Covid-19 pandemic in the UK. Although strong causal inferences are precluded by the study’s correlational design, this finding suggests that the context of the pandemic led to heightened intergroup bias early on, when perceived threat from the pandemic was also highest. This finding contrasts some theorists’ hypotheses that facing a shared threat from the global Covid-19 pandemic may lead to reductions in intergroup bias, or to

recategorisation of ingroups and outgroups into a shared, superordinate identity category (Jetten et al., 2020; van Bavel et al., 2020).

In my final study (Chapter 4), I tested whether perceived threat from the Covid-19 pandemic predicted preferences for dominant leaders over the first year and a half of the pandemic in the UK. Research has found that preferences for dominant leaders increase in the face of threat, but this research relies on experimental manipulations of threat or measures of singular, isolated threats (e.g., disease threat *or* economic uncertainty) (e.g., Kakkar & Sivanathan, 2017; Laustsen & Petersen, 2015). Comparing differences in perceived threat and dominant leader preferences at four different time points with a total of 800 participants, I found that in the current context of complex threat from the Covid-19 pandemic, perceived threat did not consistently predict dominant leader preferences. This finding suggests that even though levels of perceived threat from the Covid-19 pandemic decreased over the time period examined here, the complex, real-world threat context of the pandemic did not systematically lead to changes in dominant leader preferences. This raises questions about the generalizability of findings from lab-based research and from research investigating the effects of isolated threats to contexts of complex, real-world threats such as the Covid-19 pandemic.

More detailed discussions of these empirical findings can be found in my empirical chapters (Chapters 2 – 4). Here, I will focus on discussing important additional considerations that may have affected my findings across empirical studies and that point to important avenues for future research.

### **Developmental Changes in Intergroup Bias, Prosocial Behaviour, and Leader Selection**

Explicit intergroup bias has been observed to develop early in childhood, increase in strength until middle childhood, and then decline after around age 7 (Fehr et al., 2008; Raabe & Beelmann, 2011). Some of the findings in the current research (Chapter 2) using minimal groups, without status differences or intergroup conflict, are broadly consistent with such a developmental arch. In Study 1 of Chapter 2, we found that 6-year-olds on average chose ingroup favouring procedures to allocate a resource between an ingroup and an outgroup recipient, whereas older children, aged 7 to 8 years old, mostly chose fair procedures. This is consistent with the commonly observed decline in explicit intergroup bias in middle childhood. In Study 2 of Chapter 2, however, both younger and older children (aged 6 to 8 years old)

mostly chose ingroup favouring procedures and favoured their ingroup on an explicit attitude measure.

Possible reasons for this discrepancy between Study 1 and Study 2 of Chapter 2 have been discussed briefly in the general discussion of Chapter 2. To reiterate, a possible explanation for older children's more ingroup favouring choices in the follow-up study, compared to the first study, is that asking children to think about and explicitly state how much they like their ingroup and the outgroup, respectively, may have made group membership more salient in the second study. It is worth noting here that this explanation draws on developmental theories of intergroup bias that emphasize children's active construal of bias (for example, developmental intergroup theory; Bigler & Liben, 2007), rather than simple imitation or passive learning (e.g., Allport, 1954). While asking children to think about their group attitudes may have made these groups more salient, the question did not convey information about group attitudes or norms of intergroup competition. If the increase in salience did indeed lead to increases in children's intergroup bias, this change would be driven by children's own construal of bias and would thus support construal-based theories of bias development. In future research, it would be interesting to investigate intergroup biases in procedural justice and intergroup preferences over a wider age range (for example, with 4- to 10-year-olds). Working with a wider age range, combined with more nuanced measures of preference, would allow for a more accurate understanding of age related changes in ingroup favouritism and procedural fairness.

Turning to Chapter 3, it would be interesting to investigate age-related changes in prosociality and intergroup bias across the lifespan. In the current research on changes in intergroup biases in group identification and prosocial behavioural intentions in adults during the Covid-19 pandemic (Chapter 3), we did not investigate age differences. Recent research examining age-related change in prosociality in adulthood in the context of the Covid-19 pandemic has found that prosociality overall increased with age (Brañas-Garza et al., 2020; Cho, Daley, Cunningham, Kensinger, & Gutchess, 2021; Sin et al., 2021). For example, in a large, international sample spanning 67 countries, a particularly relevant study by Cutler and colleagues (2021) found that older adults were overall more prosocial than younger adults, including on measures of intended donations to hypothetical charities. Importantly, however, older adults also showed stronger ingroup favouritism, both in their attitudes and in their donations. Specifically, participants across ages intended to donate more to a charity organization serving their national ingroup than towards a charity providing international

support, but this intergroup difference was greater for older adults. These findings suggest that although developmental change is particularly pronounced in childhood, research on lifespan development can make valuable contributions to our understanding of intergroup bias in prosociality throughout development. To better understand age-related changes in intergroup bias and prosociality throughout adulthood, future research should use a wide range of prosociality measures, including effortful helping, comforting, and non-material sharing (e.g., information sharing). This would be informative of the generality of older adults' intergroup bias in prosocial behaviour, and differences between measures may be indicative of possible factors contributing to age-related increases in intergroup bias in prosociality.

Reflecting on the research reported in Chapter 4, where we analysed changes in dominant leader preferences during the Covid-19 pandemic, it would be interesting to investigate preferences for different types of leaders across the lifespan. Previous work on the development of leader preferences shows that children already make adult-like inferences about leadership-relevant attributes from faces. For example, by 3 years of age, children already recognize facial dominance (Cogsdill, Todorov, Spelke, & Banaji, 2014). Children of this age have also been found to prefer learning from prestigious models over models who receive less attention from bystanders (Chudek, Heller, Birch, & Henrich, 2012) and from confident over less confident models (Birch, Akmal, & Frampton, 2010; Jaswal & Malone, 2007; see Cheng & Tracy, 2014). Children from Western cultural contexts thus already recognize and value certain leader attributes, including dominance, prestige, and confidence. Furthermore, as young as age 5, children's leader preferences in a face choice task have been found to predict election winners with the same level of accuracy as adults' choices (Antonakis & Dalgas, 2009). This suggests that young children and adults utilize at least some of the same cues when selecting leaders based on facial features. Some aspects of leader selection thus appear to emerge early in development.

Future research could aim to investigate individual differences and environmental influences on the development of leader preferences. Differences in childhood environment have been found to relate to leader preferences. For example, in a face choice task, 6- to 8-year-olds growing up in deprived neighbourhoods have been found to show stronger preferences for more dominant and less trustworthy leaders than children from non-deprived neighbourhoods (Safra et al., 2017). Correlational data further suggests that, even after controlling for current resources, individuals who experienced poverty as children are more likely to prefer more dominant and less trustworthy leaders as adults and to endorse extreme

authoritarianism, compared to those who grew up less resource deprived. Longitudinal research could helpfully extend such correlational findings and test whether individual differences in leader preferences in childhood are stable into adolescence and adulthood. Relative stability would suggest that adult leader preferences can be predicted from childhood preferences, and that adults' preferences are formed early in development (Antonakis & Dalgas, 2009; Safra et al., 2017). In future research it would further be interesting to test whether individual differences in gender biases in childhood are related to differences in leader preferences over time. Some traits that can be influential in leader selections are differentially stereotypically associated with gender (e.g., dominance with masculinity, trustworthiness with femininity; Sutherland et al., 2013). The strength with which children make such stereotypical attributions may predict context-dependent variability in their leader preferences. For example, how strongly children associate dominance with masculinity may interact with their perception of a given leadership context (e.g., conflict versus peacetime) to predict how strongly they prefer a masculine over a feminine leader in this context. This would be a fruitful avenue for future research.

### **Social Learning and Social Norms**

Social learning and learnt social norms may have played an important role in our findings across studies. To what extent, and how, social learning contributes to the development of intergroup bias is the subject of ongoing academic debate (Degner & Dalege, 2013; Dunham, 2018; Over & McCall, 2018). The range of intergroup biases that follow from arbitrary allocations to minimal groups suggest that membership in an unfamiliar, novel group alone sets in motion cognitive, affective, and behavioural processes (Dunham, 2018). Related to this, our findings in Chapter 2 show that randomly assigning children to a novel group, with no indication of prospects to interact with other group members in the future, is sufficient to elicit explicit ingroup preferences in attitudes and behaviour. Notwithstanding, social learning may have played a role in our findings, as social and cultural messages may have shaped children's preferences (Blake, 2018). One particularly interesting question is whether social learning may have contributed to older children mostly choosing fair procedures in Study 1 of Chapter 2.

Theorists have argued that what is surprising and requires explanation is not that people show ingroup favouritism, but rather that they often act prosocially, even towards outgroup members (see Shaw, DeScioli, & Olson, 2012). Many explanations for ingroup favouritism are rooted in the assumption that ingroup favouritism is adaptive because it builds coalitions, which

in turn offer enhanced coordination (Balliet et al., 2014). Research shows that ingroup favouritism and group loyalty emerge early (Misch et al., 2014; Misch, Over, & Carpenter, 2018; Over, 2018). In contrast to adults, children have sometimes even been found to think that it is nicer to share with ingroup members than with outgroup members (Yazdi et al., 2020). Yet, despite their ingroup preference and loyalty, and thinking that sharing with ingroup members may be particularly nice, children are often willing to share their resources with outgroup members, thereby forgoing benefits to their group for the sake of fairness. Children's willingness to share, or to choose fair over advantageous procedures, is likely influenced by social learning. At least in Western samples, distributive justice research shows that, with increasing age, children tend to share resources that they could have kept for themselves more generously (House et al., 2013; House & Tomasello, 2018). Importantly, however, their generosity does not continue to increase until they reach the limit and give up all of their resources; rather, children's sharing tends to only increase until it reaches social norms of sharing in their society (Blake, 2018; House et al., 2013; House & Tomasello, 2018; McAuliffe, Raihani, & Dunham, 2017). Learnt social norms of fairness likely also contributed to children's fair procedure choices in the current research (Chapter 2). The developmental trajectory of children's procedure choices in intergroup contexts, and the potential role of learnt social norms in this development, have yet to be explored. Understanding the role of social learning in establishing norms that may constrain expressions of intergroup bias in procedure choices can aid in developing effective interventions to reduce bias and thus seems like a particularly important endeavour for future research (Over & McCall, 2018). This could be investigated by testing whether modelling norms of procedural justice or establishing ingroup norms of procedural fairness reduce ingroup favouritism in procedure choices. Cross-cultural comparisons, discussed in the next section of this general discussion, may also be indicative of the influence of social norms on procedural justice.

Learnt social norms of prosocial behaviour may have also contributed to our findings in Chapter 3. Here, we found that although national ingroup identification consistently equalled local ingroup identification, prosocial intentions (i.e., willingness to donate money and volunteer time) towards the local ingroup were consistently higher than towards the national ingroup. It is possible that observing other peoples' prosocial behaviour in one's immediate social environment – that is, within the local ingroup, one's local neighbourhood – played a role in this effect. Because the social behaviour of proximate others is easier to observe than the behaviour of distal others, local ingroup members' prosocial behaviours may have been



more salient than the prosocial behaviour of national (extended) ingroup members. As in childhood, observed social norms guide prosocial behaviour among adults (House et al., 2013). For instance, a longitudinal study conducted in Germany at the beginning of the pandemic found that descriptive social norms – that is, the perceived behaviour of proximal others - predicted prosocial behaviour over time (Rudert & Janke, 2021). This finding provides supportive evidence for the hypothesis that the pattern of prosocial behaviour observed in the current research may have been influenced by observed social norms by differentially increasing giving towards the local ingroup, compared to the national ingroup, despite equal group identification. In future research, it would be helpful to ask participants to report what they perceive the social norms of prosociality among proximal (e.g., local ingroup) and more distal (e.g., national ingroup) others to be in order to test the relationship between perceived social norms within and prosociality towards different groups.

Interestingly, we also found that prosocial intentions towards the local ingroup and the national ingroup were higher early on in the pandemic, when perceived threat was also highest, compared to later on in the pandemic. Research has found that increasing perceived threat increases norm compliance (Giannakakis & Fritsche, 2011). If social norms of prosocial behaviour towards ingroups were salient in the UK during the time period examined in the current research, then the heightened threat we observed early on in the pandemic may have led to increased compliance with these norms, thereby contributing to higher ingroup donation intentions at this time, compared to later on in the pandemic. Moreover, we found that prosocial intentions towards the national ingroup only consistently outweighed those towards the international outgroup for volunteering time, but not for donating money. This continued ingroup favouritism towards the national ingroup in volunteering intentions, but not in money donation intentions, could have been influenced by perceived norms of prosocial behaviour for volunteering time towards ingroups. Particularly the overwhelmingly popular NHS volunteering scheme, which was widely reported to have attracted unexpectedly high numbers of community volunteers (e.g., Butler, 2020; Murphy, 2020), may have made volunteering time to support the nation a salient social norm. Although this interpretation of these complex findings is certainly speculative, it is possible that learning about prosocial behavioural norms may have contributed to the observed patterns of intergroup bias in prosocial intentions. Examining the power of social norms to elicit prosocial behaviour in crises may have important practical applications (van Bavel et al., 2020). For example, saliently communicating norms of enhanced prosocial behaviour – towards both ingroup and outgroup members – may reduce

intergroup bias in global crises. Testing which norms are most effective (e.g., descriptive versus prescriptive; House & Tomasello, 2018), *how* such prosocial norms are most effectively communicated, and by *whom*, will be important for designing effective interventions (for a recent review, see Tankard & Paluck, 2016). For example, it will be important to test whether prosocial norms of ingroup and outgroup giving can be communicated together, or whether this leads to a focus on norms to aid the ingroup during crises, thereby reducing the effect of the communicated intergroup sharing norms. It will also be important to test who can most effectively communicate prosocial norms for each group, for example by testing whether outgroup giving is more effectively encouraged by ingroup social referents or by prominent outgroup members, such as salient outgroup leaders.

Lastly, leader selections may also be influenced by social learning in important ways. As mentioned in Chapter 4, social learning mechanisms may account for many of the same findings that research based on evolutionary models and bio-social models has produced. Although leader preferences emerge early in development (Antonakis & Dalgas, 2009) and responses on leader selection tasks can be made rapidly (Olivola & Todorov, 2010), neither early emergence nor rapid occurrence necessarily imply that underlying cognitive mechanisms are evolutionarily evolved (Eggleston, Flavell, Tipper, Cook, & Over, 2020). As briefly discussed in Chapter 4, social learning mechanisms could offer an alternative explanation to evolutionary models for context-dependent leader preferences. In particular, preferences for gender-stereotyped attributes, such as associations of masculinity with more aggressive behaviour and femininity with caring and peaceful approaches to solving problems, could explain why more masculine, dominant individuals are preferred when a leader is expected to pursue a more aggressive strategy (Laustsen & Petersen, 2017; Over & Cook, 2018). Future research should aim to test these competing theoretical models of contingent leader preferences, for example by testing whether preferences for more dominant leaders in the face of some threats are moderated by individual differences in gender bias (see discussion of Chapter 4) and consistent across cultural contexts. As mentioned in the discussion of developmental change, it would further be interesting to test this question in both children and adults in order to illuminate how leader preferences develop and whether they are consistent across development.

## **The Influence of Cultural Context on Intergroup Prosocial Behaviour and Leader Preferences**

Questions about the role of social learning and social norms are closely related to questions about the importance of cultural contexts in shaping preferences and behaviours. Future research should aim to examine cross-cultural consistencies and differences in the development of procedural justice concerns. Cross-cultural comparisons can illuminate the role of socio-cultural factors in the development of cooperation and sharing (Slocombe & Seed, 2019). Additionally, they indicate to what extent research findings drawn mostly from White, educated, industrialised, rich, and democratic (WEIRD, Henrich, Heine, & Norenzayan, 2010) societies generalize to other populations. In the last decade, psychology in general, and developmental psychology in particular, has repeatedly been criticised for its overreliance on WEIRD samples (e.g., Henrich et al., 2010; Nielsen, Haun, Kärtner, & Legare, 2017). As most research on children's resource distributions has been conducted in such societies, and since my own research samples are drawn from a WEIRD population, my thesis has focused on research with this population. However, in light of the above criticisms and the value that cross-cultural comparisons offer for theory development by identifying features that are not universal, I believe it is important to consider findings from cross-cultural comparisons.

Cross-cultural research on the development of prosocial behaviour has mostly focused on distributive justice in interpersonal contexts rather than on procedural justice or intergroup contexts. Overall, such investigations suggest that non-costly and low-cost prosocial behaviour as well as disadvantageous inequity aversion (i.e., rejecting resource allocations in which one receives less than another recipient) emerge early in development and universally; in contrast, the development of costly prosociality and advantageous inequity aversion (i.e., rejecting self-advantageous allocations) differs between cultures and has a later onset (Blake et al., 2015; for a review, see Callaghan & Corbit, 2018). This was for instance found by House and colleagues (2013), who examined children's and adults' sharing in a forced-choice task. The study found that non-costly prosocial sharing increased steadily between the ages of 3 and 14 across six highly diverse societies. In contrast, costly sharing decreased across all participant groups as children approached middle childhood and diverged thereafter, with children's costly sharing increasingly resembling that of adults in their societies. Notably, adult's sharing choices differed substantially across cultures. Urban Americans, Shuar (Amazonian horticulturalists), and Aka (nomadic hunter-gatherers in western Africa) were more likely to share generously

than Fijian (marine forager-horticulturalists) and Himba (Namibian seminomadic agro-pastoralists) adults when choosing allocations for themselves and a peer partner (adult data for the sixth society, Martu - sedentized foragers from Australia - is missing). Although these findings do not directly speak to the generalizability of research on intergroup prosocial behaviour or procedural justice, they do demonstrate that cultural norms can shape prosocial behaviour, especially as children grow older and increasingly adhere to these norms. Especially our finding that older children, aged 7- to 8-years old, tended to choose fair rather than ingroup favouring resource allocation procedures when group membership was not particularly salient (Chapter 2, Study 1) may therefore not replicate in other cultures where fair sharing is less commonly prioritized over ingroup loyalty. This may, for instance, be the case in societies that frequently experience intergroup conflict or competition for scarce resources, which tends to increase intergroup bias (Hewstone et al., 2002; Moradi et al., 2020; Sherif et al., 1988). It is also possible that ingroup favouritism in procedure choices is more acceptable in societies with low market integration, where costly prosociality (e.g., costly sharing and advantageous inequity aversion) is less common (e.g., among the Quichua, horticulturalists from the north-western tropical forests of South America; Cowell et al., 2017; Henrich et al., 2005). As crucial trade relationships are more direct in these societies, compared to more integrated societies in which trade partners are often distal and anonymous, it may be more important to maintain cooperative relationships through favouritism than to remain impartial through procedural fairness. Conducting cross-cultural comparisons of the developmental trajectory of children's procedure choices in intergroup contexts could be a valuable objective for future research. Future research could also directly test whether the strength of preferences for costly distributive and procedural justice in resource sharing co-vary across societies. This could advance our understanding of how distributive and procedural justice norms relate to one another. As procedural justice is a central element of social functioning in many societies (Tyler, 2000, 2003), testing whether this is universally the case is an important step in understanding how interactions between fairness concerns and intergroup bias shape societies around the world.

Turning to Chapter 3, it is interesting to consider whether the patterns observed in the UK would have been found in other countries. For example, we observed higher donations to the local ingroup than to the national ingroup, despite equally strong identification with the local and national ingroups. It is possible that in countries with a particularly strong emphasis on national unity and solidarity (e.g., China), local donations may not have outweighed national

donations. We also observed significantly lower but stable outgroup identification in the UK throughout the time period examined. In the current research, we did not make any particular foreign country salient when measuring outgroup identification, instead asking about identification with ‘other countries’. Negatively viewed outgroups may have been particularly salient to our British sample, for example due to an emphasis on foreigners (particularly Chinese people) as carrying the virus in some British media outlets (e.g., Carr, 2020; Day, 2020) or due to a need to positively distinguish the ingroup from outgroups (e.g., Dovidio et al., 1998; Tajfel & Turner, 1979). It is possible that in other countries, identification with the international outgroup would have been higher overall or would have varied over the time period examined. For example, in European Union (EU) member states with largely favourable views of the EU (e.g., Poland; Wike, Fetterolf, & Fagan, 2019), superordinate category membership as ‘Europeans’ may be chronically more accessible. Identification with other countries may therefore have been higher among such European nations, compared to our UK sample, if other EU countries were a salient comparison group (Levine & Thompson, 2004). If this was the case, outgroup identification may have further varied over time for EU members, for example in response to leaders’ calls for solidarity among EU countries (Associated Press, 2020). As more research on intergroup biases and prosociality during the Covid-19 pandemic is published, quantitative reviews may allow for comparisons between countries. Such analyses could aid in assessing the generalisability of our (and other) research findings. Future experimental research could further test whether increased outgroup identification or recategorisation into a shared, superordinate group (e.g., Europeans) is more likely to occur in some countries (e.g., EU member states) than others (e.g., European countries which are not EU members, such as the UK).

The generalizability of findings from Chapter 4 should also be considered in light of cross-cultural comparisons and research with non-WEIRD samples. In the current examination, we did not find consistent evidence that heightened levels of perceived threat from the Covid-19 pandemic were related to increases in preferences for more dominant leaders in our British sample. Cross-cultural examinations of leadership emergence reveal some consistency. For example, many leadership attributions based on facial features appear to be consistent across cultures (Lawson et al., 2010; Spisak, Dekker, et al., 2012; Todorov et al., 2015). Studies show that leader preferences in face choice tasks measured in one country (e.g., India, Brazil) can predict a pictured candidate’s election successes in a different country (e.g., USA) (Lawson et al., 2010). Furthermore, both dominance and prestige appear to be

viable paths to leadership in diverse cultures. Leadership styles resembling the concepts of dominance and prestige have been documented in non-WEIRD cultures, such as among the Tsimane, a highly egalitarian population of semi-sedentary forager-horticulturalists living in the Bolivian Amazon (von Rueden, 2020; see also Henrich & Gil-White, 2001). Importantly, preferences for dominant leaders have also been found to vary with threat context in diverse cultures (e.g., Kakkar & Sivanathan, 2017; Laustsen & Petersen, 2017). For example, some native American tribes have been documented to have more aggressive, masculine, and younger leaders during times of conflict and more diplomatic, older leaders in times of peace (Price & van Vugt, 2014). Interestingly, a recent analysis of data from studies across 60 populations tested support for different models of leadership and found that dominance was cross-culturally associated with warfare, while prestige was associated with skill, respect, and knowledge (Garfield, Hubbard, & Hagen, 2019).

Although these findings suggest that these leadership styles *can* emerge in vastly different cultures, whether this is likely to happen may still vary by cultural context. For instance, cultural norms of equality and respect can dictate that individuals gain leadership positions through merit alone, by providing value to the group they represent (Cheng & Tracy, 2020). Such cultural norms can prevent the emergence of leadership through dominance, as may be the case in companies with a strict anti-bullying code (Cheng & Tracy, 2020). Further evidence that the same behaviour can affect leadership prospects differently in different cultures comes from a recent study spanning 19 countries (Stamkou et al., 2019). Stamkou and colleagues (2019) found that in more collectivistic and in ‘tighter’ cultures, where traditions are particularly important (e.g., Japan), following cultural and social norms is highly valued in leaders, whereas this is not as important in more individualistic and ‘looser’ cultures (e.g., Brazil), where violating norms is associated with power. Despite some cross-cultural consistency, culture can thus be expected to shape leadership emergence and leader selection (van Kleef & Cheng, 2020). One particularly important avenue for future research, related to previous discussions throughout this thesis, is to examine cross-cultural differences in gender-stereotyped preferences for leaders. For instance, it may be that in matriarchal societies, where female leadership – including in times of aggressive intergroup conflict – is common, masculinity may be less strongly associated with leadership eligibility during intergroup crises. This would pose a challenge to evolutionary models, such as bio-social contingency models of leadership (Spisak, Dekker, et al., 2012; Spisak, Homan, et al., 2012), which propose that preferring masculine leaders when facing conflict is an evolved psychological mechanism for

context-dependent leader selection and should hence be universal. If experiences with female leadership in crises shape leader preferences for such contexts, this may limit the generalizability of the current findings that higher perceived threat from the Covid-19 pandemic was not directly related to higher preferences for more dominant leaders. For instance, it is possible that in countries with even less experience with strong female leaders than the UK, perceived threat would have been more strongly related to dominant leader preferences. Cross-cultural differences in the importance of gender-stereotyped traits in leader selection could be tested by comparing leader selection in countries with (e.g., Germany, New Zealand) and without (e.g., USA, France) a female leader. This question could also be examined longitudinally by examining change in leader preferences before and after a female leader comes into power.

### **Emotional Influences on Intergroup Biases and Social Preferences**

One topic that has recently garnered considerable attention in research on intergroup bias and prosocial behaviour is the role of emotions. Emotions play an important role in intergroup attitudes and behaviour (Mackie et al., 2008), including prosocial behaviour (Hewstone et al., 2002; Silk & House, 2011; Vaish, 2018). In particular, research has found that empathy is related to intergroup helping (e.g., Cuddy, Rock, & Norton, 2007; Kogut & Ritov, 2007; Stürmer, Snyder, Kropp, & Siem, 2006), and interventions have targeted its potential to reduce discrimination (Bruneau & Saxe, 2012; Paluck, 2009). We are less likely to experience empathy for outgroup members than ingroup members (Avenanti, Sirigu, & Aglioti, 2010; Cikara, Bruneau, van Bavel, & Saxe, 2014; Cikara, Bruneau, & Saxe, 2011), even for minimal outgroups (Cikara et al., 2014; Masten, Gillen-O’Neel, & Brown, 2010). Especially in the context of intergroup competition, individuals may often even experience pleasure in response to others’ misfortunes (i.e., *schadenfreude*), and this experience has been linked to an increased willingness to harm outgroup members (Cikara et al., 2014; Cikara, Botvinick, & Fiske, 2011). In a particularly relevant set of studies, Bruneau, Cikara, and Saxe (2017) further found that parochial empathy – the difference in empathy towards ingroup versus outgroup members – mediated the relationship between social identity (i.e., intergroup bias in identification) and a range of intergroup behaviours at a later time point (Bruneau et al., 2017). Specifically, parochial empathy negatively predicted supporting an outgroup through altruistic actions, donations, and political support, and positively predicted support for outgroup-harming policies one week later (Bruneau et al., 2017). Taken together, these findings suggest that an

intergroup empathy bias may have some explanatory power for our current findings in Chapter 2 and Chapter 3.

In the current research, we did not measure ingroup or outgroup empathy towards minimal (Chapter 2) or real-world (Chapter 3) group members. We did, however, measure ingroup and outgroup attitudes in Study 2 of Chapter 2, and ingroup and outgroup identification in Chapter 3. In Study 2 of Chapter 2, greater intergroup attitude bias was positively related to children's more ingroup favouring procedure choices. In Chapter 3, greater intergroup identification bias was positively related to bias in adults' prosocial intentions. Drawing on Bruneau et al.'s (2017) findings, it is possible that these relationships between biases in intergroup attitude (Chapter 2) and identification (Chapter 3), respectively, and intergroup prosocial behaviour, were mediated by an intergroup empathy bias. Specifically, participants who empathised with outgroup members more strongly and with ingroup members less strongly may have chosen fairer resource allocation procedures (Chapter 2) and intended to volunteer more time and donate more money to support outgroup members, relative to ingroup helping (Chapter 3). In contrast, participants who experienced stronger intergroup bias in their empathy may have chosen more ingroup advantageous resource allocation procedures (Chapter 2) and reported higher ingroup donation intentions, relative to outgroup donations (Chapter 3). This raises the question of whether reducing the intergroup empathy bias could reduce intergroup bias in prosocial behaviour here.

It has been argued that if we can *increase* empathy, then we can *decrease* intergroup bias because empathy compels support and prosociality, thereby reducing both apathy and active harm (Cikara, Bruneau, et al., 2011; see Bruneau et al., 2017). Some interventions have effectively targeted empathy to reduce bias (e.g., Bruneau & Saxe, 2012; Paluck, 2009). However, the assumption that more empathy reliably leads to less intergroup bias has recently attracted considerable doubt (Bloom, 2017). Of particular importance for the current research (Chapters 2 & 3), increasing empathy for one's ingroup may actually increase intergroup bias further (Bruneau et al., 2017). That is, when social identity is salient, empathy can motivate individuals to act in their ingroup's interest, which can encompass actions that are harmful to the outgroup (Bruneau et al., 2017). What is more, increasing empathy does not always lead to increased outgroup helping, even with empathy-based interventions that successfully increase ingroup helping (e.g., portraying a single identified victim rather than a group; Kogut & Ritov, 2007; Stürmer et al., 2006). Notably, increasing empathy with the outgroup can sometimes even backfire, leading to more negative responses towards outgroup members during



interactions because empathising with the outgroup can activate meta-stereotypes, which are assumptions that the outgroup holds negative stereotypes about the ingroup (Vorauer & Sasaki, 2009). This has been observed for individuals with relatively high levels of prejudice (Vorauer & Sasaki, 2009), who would be particularly important to target in an intervention. Future research could test whether reducing highly prejudiced individuals' meta-stereotypes as well as meta-prejudice (i.e., assumed negative attitudes of outgroup members towards the ingroup) can curtail negative effects of increased empathy towards the outgroup in real-life intergroup interactions, especially in situations of conflict. Meta-perceptions about outgroup negativity towards the ingroup are often exaggerated during intergroup conflict (Lees & Cikara, 2020; Moore-Berg, Ankori-Karlinsky, Hameiri, & Bruneau, 2020), and correcting negative meta-perceptions has been found to reduce negative outgroup attributions (Lees & Cikara, 2020). The effect of such meta-perception corrections on empathy interventions has yet to be explored. Future research should further extend the findings of improved outgroup *attributions* following meta-perception corrections by testing the effectiveness of such interventions for changing intergroup *behaviour* as a step towards designing effective parochial empathy interventions on discrimination.

Emotional influences may also explain some of our findings in Chapter 4. Here, we did not find convincing, consistent evidence that the levels of perceived threat experienced by our British sample in response to the Covid-19 pandemic were related to their preferences for more or less dominant leaders in the present context. It is possible that participants' emotional responses to the experienced threat moderated their responses, leading to an overall inconsistent relationship between perceived threat and leader preferences in the current research (Chapter 4). Support for this hypothesis comes from research conducted with a Ukrainian sample during the Russian invasion of Ukrainian Crimea in 2014. Here, Laustsen and Petersen (2017) found that for those living in conflict regions in Ukraine (i.e., those more directly threatened by the conflict), experiencing anger and hatred in response to the crisis predicted stronger preferences for more dominant leaders in a face choice task. In contrast, these fight-related emotions did not predict dominant leader preferences for those less directly affected (i.e., those living further away from the conflict regions). Crucially, experiencing fear and anxiety predicted a preference for non-dominant leaders for those living in conflict regions and those in non-conflict regions. Taken together, this suggests that those who are directly affected by threat and are inclined towards more aggressive responses, driven by emotional responses of anger and hatred, may prefer more dominant leaders. In contrast, people who are

not directly threatened and people who are scared of the source of threat tend to prefer leaders who are less likely to respond aggressively, for example by aggravating an outgroup. Emotional responses to perceived threat therefore differentially affected the leader preferences of individuals who were proximally affected by the conflict. Similarly, in the current research (Chapter 4), some participants may have responded to the perceived threat from the pandemic with fear and anxiety and sought out leaders likely to pursue a cooperative strategy, while others may have responded more aggressively and in turn sought out leaders expected to pursue their groups' interests more aggressively, for example when securing scarce medical supplies and vaccines in international trade or by closing national borders to foreign visitors. In the current research (Chapter 4), the role that followers' emotional responses to their circumstances play in their leader preferences could have been assessed by asking participants to report their emotional state in response to the crisis and testing how emotional responses relate to leader preferences. Future research should seek to clarify the role that emotions play in contingent leader preferences in a wide range of crises in order to test the generalisability of findings from intergroup conflict (Laustsen & Petersen, 2017) to other contexts.

### **Conclusion**

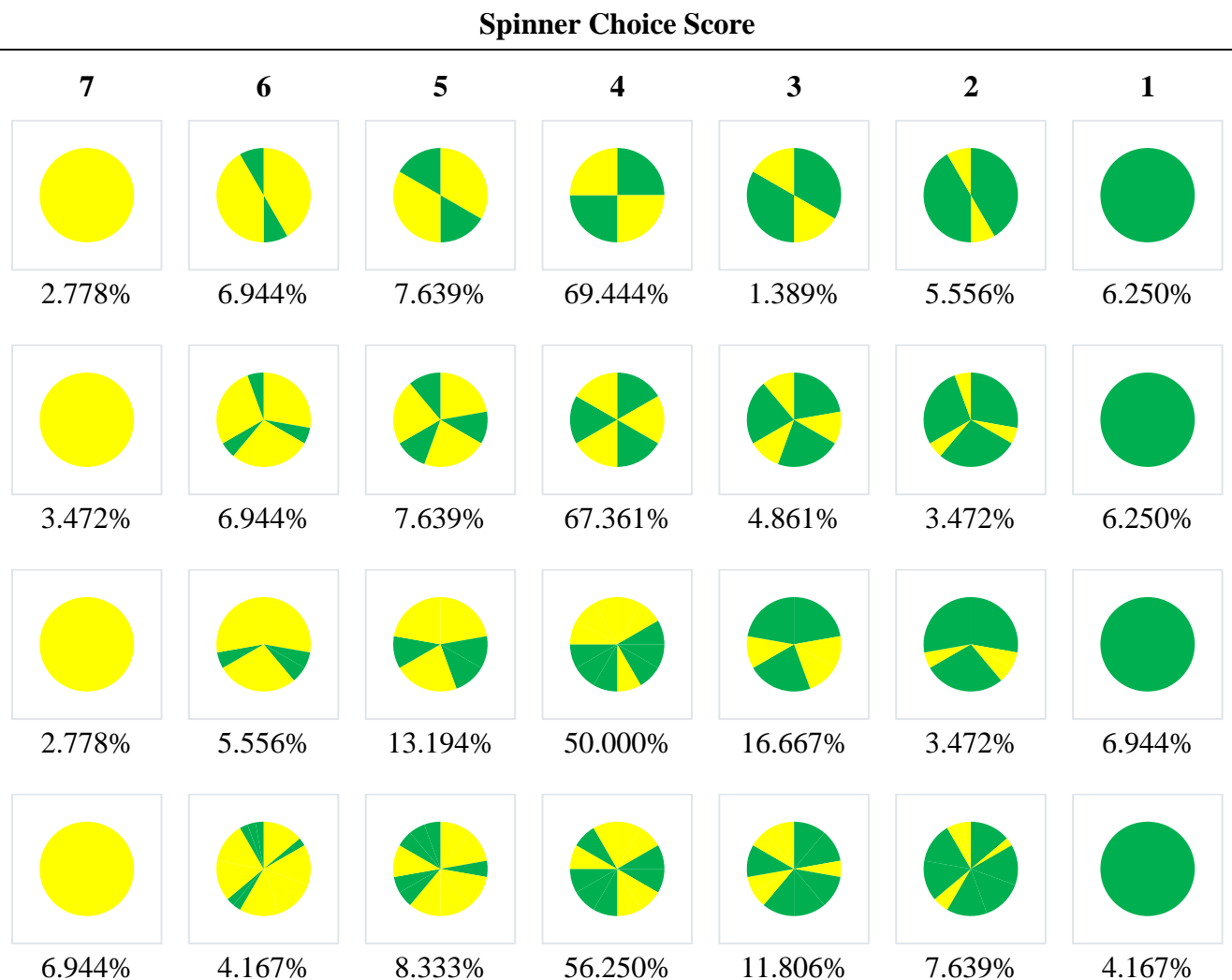
To sum up, in my doctoral studies, I have shown that social context can affect intergroup biases and social preferences in important ways. For example, concern for reputation may influence prosociality, and experiencing a complex real-world crisis such as the Covid-19 pandemic can modulate intergroup biases. Importantly, my research also shows that findings from experimental research may not always consistently generalize to real-world social contexts, and that research from a specific social context may not always generalize to a different social context. Taken together, this research therefore demonstrates the importance of taking the social context in which research takes place into account when interpreting findings and assessing their generalizability. I hope that these studies also illustrate the complementary value of conducting both rigidly controlled experimental research and research *in situ*, as both approaches offer unique advantages for gaining insight into human psychology.

## Appendix

### Chapter 2: Spinner Choices by Spinner Design

#### Study 1

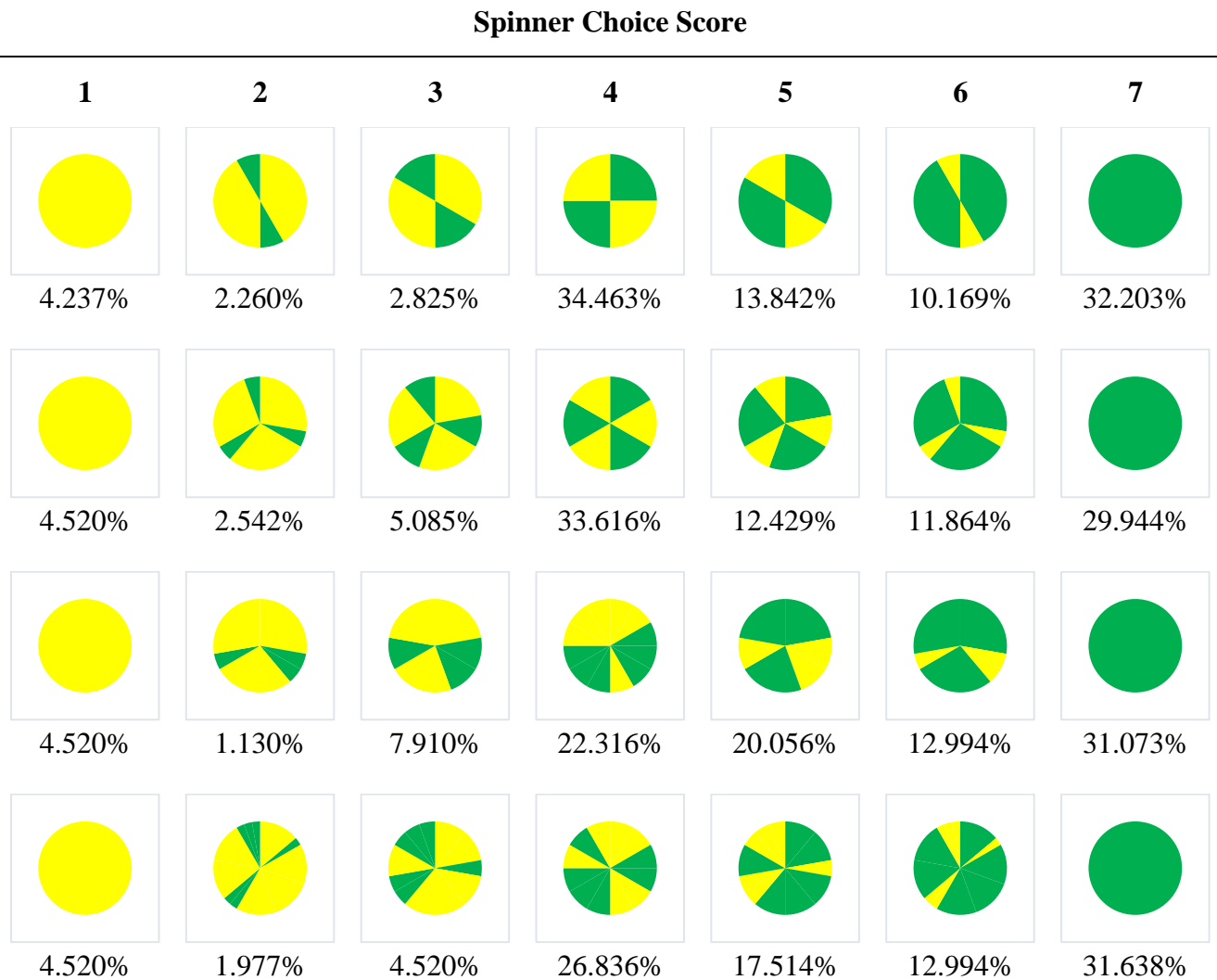
The spinner choice by spinner design data for Study 1 (Figure 1) is collapsed across colour groups (Yellow and Green). For half of the participants, a score of 7 therefore represents a fully ingroup favouring spinner choice, whereas for the other participants, a score of 1 represents a fully ingroup favouring spinner choice. On three trials, a participant did not choose any spinner.



*Figure A.* Percentage of trials on which each particular spinner design was chosen among the set of seven spinners presented, out of the total number of trials in which the spinner set was used.

## Study 2

The spinner choice by spinner design data for Study 2 (Figure 2) is collapsed across conditions (public vs private). Higher spinner scores indicate more ingroup favouring spinner choices.



*Figure B.* Percentage of trials on which each particular spinner design was chosen among the set of seven spinners presented, out of the total number of trials in which the spinner set was used.

## Chapter 2: Spinner Choices by Trial

### Study 1

Table A

*Participants' Spinner Choices by Age and Trial, Collapsed Across Colour Groups*

		Spinner Choice Score						
		1	2	3	4	5	6	7
Trial 1	Age 6	0	1	4	12	1	3	4
	Age 7	0	0	1	18	0	1	3
	Age 8	0	0	2	19	2	0	1
Trial 2	Age 6	1	0	1	6	8	5	4
	Age 7	0	0	1	17	2	1	2
	Age 8	1	0	1	17	3	1	1
Trial 3	Age 6	0	3	3	9	4	4	2
	Age 7	0	0	4	15	0	0	4
	Age 8	0	1	1	18	4	0	0
Trial 4	Age 6	0	0	3	5	5	9	3
	Age 7	0	1	1	19	0	0	2
	Age 8	0	0	1	20	2	0	1
Trial 5	Age 6	1	1	5	7	1	3	7
	Age 7	0	0	1	14	3	2	2
	Age 8	0	0	1	19	2	1	0
Trial 6	Age 6	1	1	0	10	5	7	1
	Age 7	1	0	2	17	2	0	0
	Age 8	1	0	0	21	1	0	1
Trial 7	Age 6	0	0	2	10	5	5	3
	Age 7	1	0	0	20	0	0	2
	Age 8	0	1	1	18	3	1	0
Trial 8	Age 6	1	1	1	8	4	7	3
	Age 7	2	1	3	11	5	0	1
	Age 8	0	0	0	20	2	2	0

## Study 2

Table B

*Six-year-olds' Spinner Choices by Trial and Condition*

	Spinner Choice Score													
	1		2		3		4		5		6		7	
	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv
Trial 1	1	1	0	1	0	1	3	3	2	4	4	2	10	8
Trial 2	2	1	1	1	0	3	2	3	5	3	4	1	6	8
Trial 3	0	1	0	0	3	0	3	6	4	4	4	1	6	8
Trial 4	2	2	1	1	1	0	4	2	1	3	4	3	7	9
Trial 5	0	2	1	0	0	0	3	1	6	2	5	9	5	6
Trial 6	1	2	1	1	1	3	3	0	3	2	3	5	8	7
Trial 7	1	1	0	1	1	1	2	2	5	6	4	3	7	6
Trial 8	4	0	2	0	1	1	3	4	1	4	3	3	6	8
Trial 9	1	2	0	0	0	2	4	2	3	4	4	5	8	5
Trial 10	0	2	0	1	2	1	4	2	4	2	4	5	6	7
Trial 11	1	0	1	4	0	0	4	2	4	2	5	5	5	7
Trial 12	1	2	2	1	2	1	3	2	1	4	5	4	6	6

Note. Pub = Public Condition, Priv = Private Condition.

Table C

*Seven-year-olds' Spinner Choices by Trial and Condition*

	Spinner Choice Score													
	1		2		3		4		5		6		7	
	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv
Trial 1	0	2	1	0	2	0	5	5	3	3	3	1	5	9
Trial 2	0	1	0	0	3	1	4	5	5	4	2	3	5	6
Trial 3	0	1	0	0	1	0	8	7	3	2	2	2	5	8
Trial 4	0	0	0	0	0	0	6	6	5	4	1	4	8	5
Trial 5	1	0	0	1	1	1	9	6	1	5	2	1	6	5
Trial 6	0	0	2	0	1	3	6	2	3	6	2	1	6	7
Trial 7	0	0	0	1	1	1	6	5	4	1	1	4	7	8
Trial 8	0	1	1	0	0	0	10	7	1	4	1	2	6	6
Trial 9	1	1	0	0	0	0	7	6	3	3	2	2	6	8
Trial 10	0	0	0	0	2	2	5	3	4	5	4	1	5	8
Trial 11	1	0	0	0	0	0	6	4	6	6	2	2	5	7
Trial 12	0	1	1	0	1	1	5	5	3	3	3	2	7	7

Note. Pub = Public Condition, Priv = Private Condition.

Table D

*Eight-year-olds' Spinner Choices by Trial and Condition.*

	Spinner Choice Score													
	1		2		3		4		5		6		7	
	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv
Trial 1	1	0	0	0	0	1	12	10	1	1	2	3	3	5
Trial 2	1	1	0	0	2	1	11	8	0	3	1	1	4	6
Trial 3	1	1	0	0	2	1	10	7	0	4	2	0	4	7
Trial 4	1	1	0	0	0	1	8	9	5	2	1	0	5	6
Trial 5	1	2	0	0	2	0	7	10	1	2	2	1	7	4
Trial 6	1	1	0	0	1	1	8	9	5	3	0	1	5	4
Trial 7	1	1	0	0	3	0	9	6	2	5	1	2	3	6
Trial 8	1	1	0	0	3	0	7	6	3	5	1	2	4	6
Trial 9	1	0	0	0	2	1	11	7	0	5	1	0	4	7
Trial 10	0	1	0	1	2	0	8	8	1	3	1	1	8	5
Trial 11	2	2	0	0	1	0	9	10	3	2	0	1	5	4
Trial 12	0	1	0	0	3	0	9	11	2	2	0	1	6	4

*Note.* Pub = Public Condition, Priv = Private Condition.

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