

JOINT MUSIC MAKING: EFFECTS ON INTRA- AND INTER-GROUP RELATIONS

by

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A dissertation

presented to Ryerson University

in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

in the Program of

Psychology

Toronto, Ontario, Canada, 2016

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Psychology

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Abstract

Joint music making is an integral component of many social and cultural rituals. One compelling explanation for the prevalence of joint music making is that it has the capacity to enable social groups to develop and maintain social bonds, indexed by a more cooperative social group. While a growing body of literature supports this theory, what remains unknown is whether this social bonding capacity of joint music making can transcend salient intergroup boundaries and foster more positive intergroup relations. My central hypothesis integrates social identity theory and embodied social cognition with respect to joint music making. Specifically, I hypothesize that joint music making will generate a collective identity and promote cooperation across intergroup boundaries.

This dissertation consists of three research studies. Study 1 assessed the impact of joint music making on social categorization and cooperation in a minimal groups context established in a laboratory environment. Results demonstrated that joint music making fostered a collective identity and promoted cooperation across minimal intergroup boundaries. Studies 2 and 3 were field studies that considered the ecological validity of the impact of joint music making in elementary school children. Study 2 assessed the impact of joint music making on cooperation in a group of elementary school children with diverse ethnic and socio-economic backgrounds.

Results demonstrated that children who engaged in joint music making demonstrated more cooperative behaviours than children who engaged in group art or competitive games. Study 3 assessed the impact of joint music making on social categorization in a situation involving indirect contact between groups. This was investigated in the context of a cultural education program involving singing administered in a uni-cultural private school. Qualitative and quantitative data suggest that singing foreign songs encouraged the adoption of a collective identity across intergroup boundaries (i.e., a shared common humanity); however, no changes were found in behavioural intentions towards foreign children.

Together, these research studies provide preliminary evidence that joint music making can promote a collective identity and cooperative behaviours across intergroup boundaries. This dissertation contributes to the theoretical understanding of joint music making and its potential applicability to improve intergroup relations.

Acknowledgements

I would like to express my gratitude and appreciation to a number of key people that helped me along the way.

First and foremost, thank you to Dr. Frank Russo for your guidance and support as my PhD supervisor. I would not be where I am today if not for you. Thank you for believing in me and all of my research ideas. I have been inspired by your enthusiasm for music and your knack for research. You made the SMART lab home, and I have thoroughly enjoyed my time living there.

This dissertation is a product of, what I believe to be, the perfect trifecta of supervision:

Dr. Becky Choma, thank you for all of your valuable knowledge of intergroup relations, your enthusiasm for my research, and your encouragement that got me passed the finish line.

Dr. Kathleen Peets, thank you for all your valuable knowledge of child development and for all our coffee dates chatting about research and beyond.

Additional thanks to:

Kosha Bramesfeld for being a sideline mentor and always offering advice when I need it. Eric Hehman for your knowledge of multilevel modeling. Natalya Androsova for turning a seemingly never-ending dirt road into one made of yellow bricks... and for encouraging me to use more analogies. SMART people for your friendship, support, stimulating research discussions, and of course, our trips to the village idiot.

A special thanks goes to all the research assistants, research participants, the counsellors and campers of YMCA summer camp, and the teachers and students of Paul Penna Jewish Day School for willingly participating in this work.

Last but not least, my family. Thanks mom and dad for the constant encouragement, emotional support, and unconditional love (and mom, for being my go-to lay person). Thanks Chelsea for being an inspiring sister whom I look up to. Thanks Karl for giving me new energy at the end of this endeavor. You came into my life at the right time.

Dedication

I would like to dedicate this dissertation in memory of my grandfather, Vernon Rosenberg, to whom I owe my fascination of music.

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What did Henry Wadsworth Longfellow mean when he claimed, “*Music is the universal language of mankind*”?

Preface

Brief Overview

The universality of music throughout history indicates that it serves, or at least once served, an adaptive purpose. However, the evolutionary importance of music has generated much debate (see Fitch, 2006; Patel, 2010; McDermott, 2008). While some theorists speculate that music is biologically useless (Pinker, 1997), others speculate that music evolved due to its direct survival benefits and offer various adaptationist accounts. One cluster of theories considers the notion that music may be a tool that enables people to feel connected to others. For example, music facilitates bonding between mother and preverbal infants (Trehub, 2001). Another example is that music facilitates bonding within small groups of individuals. More specifically, joint music making appears to be an effective tool to foster social bonds, which is reflected by a more cooperative, prosocial, and coordinated social group (Huron, 2001; McNeil, 1995; Roederer, 1984; Wallin, Merker, & Brown, 2001).

While the perspective of music as a tool for survival no longer applies today, a growing body of research suggests that joint music making retains the capacity to foster social bonds. In this dissertation, I investigate whether these prosocial aspects of joint music making can extend across intergroup boundaries, ultimately improving intergroup relations. The objective of this dissertation is to develop a strong theoretical foundation and provide some preliminary evidence to validate this hypothesis.

Social perspective of music

Music is tremendously multifaceted and notoriously difficult to define. In order to ensure that the arguments being forwarded in this dissertation are fully understood, I would like to clarify my perspective taken here regarding music. Although one can engage with music in a wide range of receptive capacities (e.g. listening to an ipod; watching a orchestra), my perspective is participatory and community-based, referred to from here on as joint music making. In particular, joint music making involves the coordinated motoric engagement of the collective group. This form of engagement with music is both primal and universal, as exemplified by the universality of singing, producing rhythms using percussive instruments, and moving to rhythms in groups (Savage, Brown, Sakai, & Currie, 2015).

Clarification of terms

First, I will be using the term ‘intergroup relations’ to refer to relations on an individual level across intergroup boundaries (e.g., relations between a male and a female) rather relations on a group level (e.g., males and females). Second, the term ‘social bonding’ refers to the psychological experience of forming interpersonal relationships. On a group level, social bonding concerns the connection, cohesion, and closeness within a social group or community (McMillan & Chavis, 1986). I will be using the terms “collective identity” and “superordinate identity” interchangeably to refer to the psychological experience of social bonding across intergroup boundaries. The particular term I use in a given context is determined by the literature I am drawing from.

Outline of the dissertation

This dissertation is presented in a “sandwich model”, comprised of five sections: an introduction, three research studies, and a general discussion. The introduction is comprised of four subsections. First, I provide an overview of the psychology of intergroup relations, discussing reasons for why we may show bias towards different social groups and the implications of those biases. Second, I consider strategies for improving intergroup relations, focusing on positive intergroup contact, particularly as it applies to social recategorization (i.e., the generation of a more inclusive, superordinate identity). Third, I explore why joint music making may be a powerful strategy of intergroup contact. I call upon the embodied social cognition literature to explicate the concept of movement coordination as a key mechanism underlying the capacity of joint music making to foster social bonds. Finally, I end the introduction by explicitly highlighting the conceptual overlap between successful strategies of intergroup relations and the impact joint music making has on social bonding.

My three research studies aim to investigate the scope of the social bonding capacity by introducing joint music making in a variety of settings and circumstances (see Figure 1). Study 1 directly assessed the impact of movement synchrony on social categorization using artificially created groups in a controlled laboratory experiment. For the remaining two studies, I chose to focus on ecological validity rather than advance experimentation in the laboratory. Studies 2 and 3 took place in the field (summer camp and elementary school, respectively) in order to explore the social bonding capacity of joint music making in naturalistic environments. Study 2 explored the social impact of singing within a naturally diverse environment. In comparison, study 3 explored an indirect intergroup environment (e.g., a uni-cultural group of children singing foreign songs).

I chose to work with elementary school children in these two field studies because children in middle childhood (ages 9-11) have developed the necessary cognitive capacity to understand social hierarchies and adopt intergroup biases (Nesdale, 1999); however, at this age they also have several years of experiences in taking the perspective of others (Selman, 1980; Quintana 1998), making this an ideal age for an intervention that promotes positive intergroup relations.

My General Discussion considers how my three studies contribute to the wider body of literature that has informed the work. I also consider practical applications of the ideas developed in this dissertation, focusing in particular on combatting prejudice and discrimination.

Although joint music making may appear to be a Pollyannaish solution for these challenging issues, my arguments are based on a solid theoretical foundation and bolstered by a growing body of empirical research. My overarching ambition in the development of this dissertation has been to provide support for the notion that joint music making can be applied successfully to contemporary issues concerning intergroup relations. If music is the universal language of mankind, let's start talking.

Enjoy!

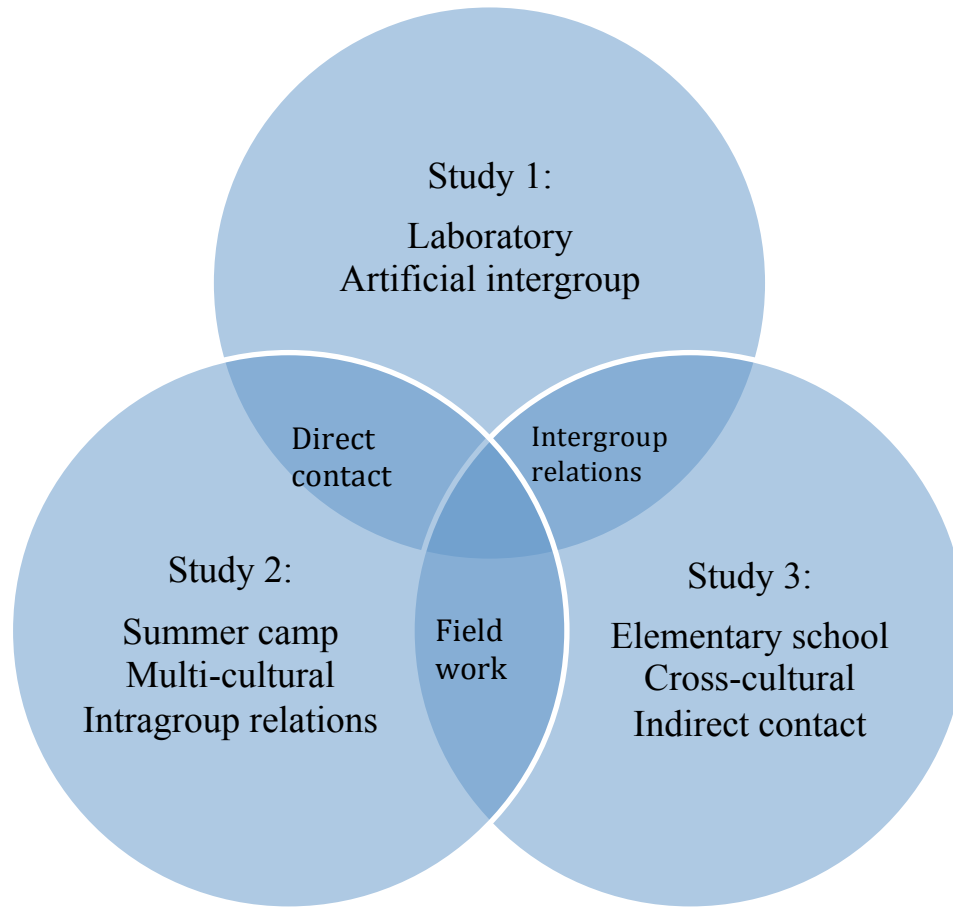


Figure 1. An overview of the scope of the current research. Three research projects were conducted to explore the social bonding capacity in a variety of different environments, including a controlled laboratory and two field studies (summer camp and elementary school). The contact theory was applied as either direct contact or indirect contact.

Chapter I. General Introduction

Social Identity Theory

Evolutionary perspectives of social psychology suggest that social survival affects physical survival. Given the instinctual drive to maintain social survival when competing for limited resources, individuals rely on a cognitive system of social categorization to quickly prejudge others to determine who to trust and who to fear; we trust those who are similar, and we fear those who are different (Tajfel & Turner, 1986). This dichotomization creates an ‘us’ versus ‘them’ mentality. In the modern world, intergroup relations are less often shaped by competition for resources than by a discrepancy of power and status between racial, ethnic and religious groups (Fiske, 2000).

The Social Identity Theory (SIT; Tajfel, 1978, Tajfel & Turner, 1979) is a prominent social psychological theory concerning the nature of intergroup relations. The SIT posits that when a person identifies as part of a social group (e.g. female), this becomes the in-group, while all other comparable social groups become the out-groups (e.g. male). The theory is based on three main processes: *social categorization*, *social identification*, and *social comparison*. Each of these processes will be discussed in turn below.

Social categorization is a cognitive process by which individuals organize and divide themselves into social groups (Tajfel, 1972). The likelihood that an individual will psychologically identify with a social group depends on the perceived similarity of group features to the self (Hogg & Terry, 2000). For this reason, individuals have the tendency to regard in-group members as more similar to themselves and out-group members as more dissimilar (Stets & Burke, 2000; Wilder, 1981). In order to systematically determine group membership, individuals rely on prototypical attributes, or stereotypes (Tajfel, 1981). Basing

social categorization on stereotypes implies homogeneity within the group, meaning there are more common attributes of members within a group than there are between groups (Tajfel, 1981). Intragroup homogeneity provides a shortcut to understanding others and an opportunity for social comparison (Brown, 2000; Devos, Comby & Deschamps, 1996).

Social identification is the process by which an individual adopts the identity of the group to which they belong (Tajfel, 1972). Individuals will assume the appropriate characteristics and behaviours that are perceived to be important to the identity of the group. For this reason, individuals develop an emotional attachment with their social identity, and the self-concept becomes reliant on a positive evaluation of it. It is important to note that an individual can identify as a member of multiple social categories (e.g. gender, age, ethnicity). Membership salience will depend on the pertinence of group characteristics within a given situation (e.g. nationality during an international sporting event like the Olympics).

The third process to consider with regard to SIT is social comparison. Social comparison concerns the observation that individuals seek to achieve a positive self-concept through a cognitive process of social comparison between in-group and out-group. In extreme cases, when an individual is not satisfied with their social identity, typically in lower status groups, one option is that they may express a desire to leave their group in search of a more positive social identity (Tajfel & Turner, 1986). However, in most cases, the process of social comparison between in-group and out-group will serve to bolster a positive social concept. Social comparison elicits a biased application of prototypical group attributes in order to enhance the positive evaluation of the in-group and the negative evaluation of the out-group (Tajfel &

Turner, 1989; Stets & Burke, 2000). These intergroup biases are called in-group favouritism and out-group derogation respectively (Tajfel & Turner, 1986; Hewstone Ruben, & Willis, 2002).

Intergroup biases

In-group favouritism. According to the SIT, the psychological desire for a positive social identity is the source of in-group favouritism (Tajfel & Turner, 1986). Accordingly, perceived similarity and shared group membership are associated with in-group biases. In particular, individuals experience more positive affect and are more trusting towards in-group members compared to out-group members (Otten & Moskowitz, 2000; Tajfel & Turner, 1986). Furthermore, individuals are more likely to exhibit prosocial, helping behaviours for members of the in-group than for members of the out-group (Dovidio et al., 1997; Worchel, et al., 1998).

Out-group derogation. In comparison, an absence of favouritism is the source of out-group derogation (Tajfel & Turner, 1986). Assumed dissimilarity and low levels of understanding of the out-group are associated with out-group biases (Islam & Hewstone, 1993; Stephan & Stephan, 1985). In particular, some individuals may assume negative outcomes with an out-group member in anticipation of, and during a contact situation. This assumption is known as intergroup anxiety and is often reported as a leading cause of prejudice and discrimination (Stephan & Stephan, 1984; 1985; Stephan, 2014).

Applying social identity theory to children

Children are susceptible to intergroup biases. For example, in a well-known social experiment in 1968, third grade teacher Jane Elliott divided her class into two social groups based on eye colour. When one social group was granted special privileges, students quickly began acting with prejudice and discrimination towards the newly defined out-group (Bloom,

2005). Elliott's work provided valuable insights that shaped future research on the nature of prejudice and intergroup relations in children.

Many social psychologists have since gone on to consider how to empirically investigate the development of prejudice and intergroup biases of children (e.g., Bigler, Jones, & Lobliner, 1997, Bigler, Brown, & Markell, 2001; Byrnes & Kiger, 1990; 1992; Nesdale & Flesser, 2001; Stewart et al., 2003; Weiner & Wright, 1973; Yee & Brown, 1992). Much like in the Jane Elliot example, researchers will often arbitrarily assign children's group membership. For example, Nesdale and Flesser (2001) arbitrarily assigned five and eight year old children to social groups on the basis of drawing ability. The hierarchy of social status was made explicit to the participating children. The children were asked to complete a questionnaire that obtained personal ratings of liking and perceived similarity towards members of the different groups, as well as their desire to change groups. Consistent with the SIT, results demonstrated that in-group members were significantly more liked and perceived as more similar than out-group members. Furthermore, children in the lower status group expressed a greater desire to switch group membership than did children in the higher status groups, suggesting that children are susceptible to social hierarchy and social comparison.

Although research shows that children are susceptible to intergroup biases, the age in which these processes emerge has not yet received formal consensus in the literature (For example, see Aboud, 1988; Nesdale, 1999; Quintana, 1998; 2007). According to Nesdale's (1999) social identity development theory (SIDT), children pass through four developmental phases: undifferentiated, ethnic awareness, ethnic preference, and ethnic prejudice. During the *undifferentiated* stage (<2-3 years), children have not yet learned to discern racial and ethnic cues. During the *ethnic awareness* stage (~3 years), children have learned how to identify and

label different social groups on the basis of physical characteristics, and they have also learned that they too belong to a particular group. During the *ethnic preference* stage (~4-5 years), children begin to understand that they belong to a particular ethnic group, which prompts intergroup biases. However, at this age, these biases appear to be driven by in-group preference rather than out-group derogation. During the *ethnic prejudice* stage (>7 years), prejudice of out-group members begins to develop and crystallize in the children who hold such attitudes. Although this is contrary to Aboud's (1988) socio-cognitive theory, which suggests that ethnic prejudice declines from 7 years onward, the crystallization of prejudice from 7 years onward has received considerable support in the literature (see Quintana 1999 for review).

In particular, Quintana (1999; 2007) suggests that during middle childhood (ages 9-11 years) children have fully developed an awareness of social hierarchies based on ethnicity and have adopted corresponding intergroup biases. They have also developed an understanding of intergroup relations and the consequences of prejudice and discrimination. Importantly, children at this age have had several years of experience with the concrete operations that permit an enhanced awareness of others' perspectives and attitudes, and they have developed an increased capacity to take on the perspective of other ethnic groups (see Quintana, 1998 for a more detailed description of the developmental stages; Selman, 1980). Thus, middle childhood may be an ideal age for an intervention that promotes positive intergroup relations. For this reason, I chose to conduct two field studies using elementary school children.

Social identity theory summary

To briefly summarize this section, social categorization is determined by a cognitive process of perceiving similarities between in-group members and the self and differences between out-group members and the self (Tajfel & Turner, 1986). In an effort to maintain a

positive social concept, individuals engage in social comparison, which greatly influences attitudes and behaviours towards others. According to SIT, people tend to demonstrate intergroup biases by liking, trusting, and helping members of their in-group, while fearing the out-group (Tajfel & Turner, 1986). In middle childhood, children have developed the necessary cognitive capacity to understand social hierarchies and adopt intergroup biases; however, they have also developed an increased capacity to take on the perspective of others, making this an ideal age for an intervention that promotes positive intergroup relations.

Intergroup Contact Theory

Social psychology research provides us with various strategies on how to promote positive intergroup relations. One of the more notable theories is the Contact Hypothesis (now Intergroup Contact Theory), which was originally developed by Allport (1954) and later refined by Pettigrew (1998). According to the intergroup contact theory, positive contact between groups is necessary to improve intergroup relations (Allport, 1954; Pettigrew, 1998). Miller and Brewer (1986) argue that positive interaction with an out-group member results in cognitive dissonance. The dissonance motivates a favourable change in attitude, thus restoring the cognitive balance (Dovidio, Gaertner, & Kawakami, 2003; Miller & Brewer, 1986).

Allport (1954) proposed that there are four ‘optimal’ conditions of positive intergroup contact. The first condition, *equal group status within the context*, is achieved when the contact situation minimizes the differential power and status ranks between groups; the second condition, *common goals*, is achieved when the efforts and/or resources of both groups are combined to accomplish a shared goal; the third condition, *intergroup cooperation*, is achieved when both groups are working together without competition to reach the shared goal; and the fourth condition, *authority support*, is achieved when an authority is supporting the intergroup contact (Pettigrew, 1998).

Direct intergroup contact

Pettigrew and Tropp (2006) conducted a meta-analysis to investigate the effectiveness of neutral and positive intergroup contact on improving intergroup relations. On the basis of this analysis incorporating 515 empirical investigations, they concluded that direct intergroup contact consistently led to lower prejudice. Furthermore, they found that not all of the optimal conditions of contact articulated by Allport (1954) are necessary for lower prejudice. A subset of the studies

included in the meta-analysis used structured programs that carefully manipulated at least one of the optimal conditions. These studies demonstrated that a program does not need to manipulate all four optimal conditions in order to foster lower prejudice.

The effects of intergroup contact on intergroup relations are well demonstrated with elementary school children, particularly in a classroom setting (e.g. Aronson & Patnoe, 1997; Blaney et al., 1977; Bridgeman, 1981; Johnson & Johnson, 1981; Johnson et al., 1984; Slavin & Cooper, 1999; Slavin & Madden, 1979). One of the most common strategies employed in the classroom is the cooperative learning technique, such as the Jigsaw method (Blaney et al., 1977, Slavin & Cooper, 1999). In cooperative learning, teachers assign heterogeneous groups of students to work together on various tasks. Points are awarded on the basis of group performance. These types of exercises provide an opportunity for students with diverse backgrounds to participate with equal status in the group and to work together towards a common goal (Slavin & Cooper, 1999). For example, Johnson and Johnson (1981) employed a cooperative learning technique by assigning small, ethnically diverse groups of students to work together on a worksheet. Compared to individual learning, cooperative learning led to more subsequent inter-ethnic helping behaviours. Through decades of research, cooperative learning has been shown to improve various indices of intergroup relations, including higher levels of empathy, intergroup friendships, prosocial behaviours, and positive intergroup attitudes (Blaney et al., 1977; Bridgeman, 1981; Johnson & Johnson, 1981; Slavin, 1995; Slavin & Madden, 1979; Weigel, Wiser, & Cook, 1975).

Indirect intergroup contact

Certain constraints, such as geographical separation, may restrict the scope of direct intergroup contact. These constraints have prompted an exploration of whether intergroup

contact can be achieved through indirect means. Recent research has demonstrated that indirect means of intergroup contact can effectively lower prejudice (Crisp & Turner, 2009; see Miles & Crisp, 2014 for a review; Vezzali et al., 2011)

Researchers have explored the effectiveness of various different types of indirect intergroup contact. One type, known as extended contact, pertains to the notion that the knowledge of an in-group member having a relationship with an out-group member will lead to lower prejudice (Wright et al., 1997). Extended contact typically involves media-mediated contact such as television or books (Cameron et al., 2006; 2007). For example, Cameron et al. (2006) tested this hypothesis by reading stories of intergroup friendships to elementary school children. This study found that the stories that included an intergroup friendship led to more positive intergroup attitudes than stories that did not contain an intergroup friendship.

Another type of indirect contact involves imagining positive encounters (Crisp & Turner, 2009; 2010; see Miles & Crisp, 2014 for a review; Vezzali et al., 2011). For example, Vezzali et al. (2011) investigated the impact of imagined contact on the explicit and implicit intergroup attitudes of elementary school children. Students spent thirty minutes each week imagining positive encounters with unknown immigrant peers over the course of three weeks. Compared to students in a control group, those who had engaged in imagined contact demonstrated more positive behavioural intentions and attitudes towards immigrants one week following the intervention. Taken together, these studies provide evidence that even when groups are not physically close; they can still be brought together psychologically in order to improve intergroup relations.

Mediators of intergroup contact

Researchers have identified several mediators for the effect of intergroup contact on lower prejudice. Resembling the ABC model of attitude change (Eagly & Chaiken, 1998), these mediators fall into three categories: Affective factors, Behavioural factors, and Cognitive factors (Dovidio, Gaertner, & Kawakami, 2003; Pettigrew & Tropp, 2006). These mediators can also be conceptualized as outcomes, specifically, indices of positive intergroup relations.

Affective factors. Affect has been found to be a consistent and powerful predictor of intergroup attitudes and behaviours (Batson et al., 1997; Johnson & Fredrickson, 2005; Pettigrew & Tropp, 2000; Stangor, Sullivan, & Ford, 1991). Intergroup affect can be influenced by intergroup contact in two ways. The first way is by enhancing the positive affect towards out-group members. Empirical evidence consistently reveals that positive exposure leads to an increase in positive affect (Bornstein, 1989; Harmon-Jones & Allen, 2001), which is referred to as the mere exposure effect (Zajonc & Rajecki, 1969). For example, Harmon-Jones and Allen (2001) applied the concept of mere exposure to a social sphere by manipulating the familiarity of photographs of women through the quantity of exposure. Physiological and self-reported affective responses demonstrated that levels of positive affect, or liking, were higher for familiar faces in comparison to unfamiliar faces.

The second way is by reducing the negative affect towards out-group members. For example, intergroup anxiety is a type of negative affect produced by an expectation of negative outcomes during contact (Dovidio, Gaertner, & Kawakami, 2003; Islam & Hewstone, 1993; Stephan & Stephan, 1984; 1985; Stephan, 2014). Under conditions of intergroup contact, an interaction may provide an opportunity to reduce these negative expectations and thus reduce intergroup anxiety. Indeed, Islam and Hewstone (1993) found that higher levels of qualitative (e.g.

closeness) and quantitative (e.g. amount of time) contact between Hindu and Muslim participants were associated with lower ratings of intergroup anxiety.

Behavioural factors. A change in behaviour is a crucial step for improving intergroup relations (Dovidio, Gaertner, & Kawakami, 2003; Eller & Abrams, 2004; Miller & Brewer, 1986). In a longitudinal study conducted by Eller and Abrams (2004), behaviours, such as being kind towards out-group members, were reported as one of the most influential factors in reducing prejudice and were highly correlated with the likelihood of intergroup friendships.

According to the intergroup contact theory, contact that includes a prosocial behavioural aspect, such as intergroup cooperation, encourages the development of new behavioural standards that will generalize past the initial interaction (Allport, 1954; Dovidio, Gaertner, & Kawakami, 2003). Research has substantiated that intergroup contact results in future prosocial behaviours (e.g. Slavin & Cooper, 1999) and behavioural intentions (e.g. Vezzali et al., 2011) towards out-group members. The mediating effect of behaviour on intergroup relations supports Allport's (1954) contention that cooperation is an essential condition of intergroup contact.

Cognitive factors. According to Dovidio, Gaertner, and Kawakami (2003), there are two cognitive mediators relevant to the intergroup contact theory. The first is learning new information about an out-group and the second is forming a new social categorization.

Learning new information. Early studies investigating the tenets of the intergroup contact theory revealed that simply learning more about an out-group improves intergroup attitudes (e.g. Pettigrew, 1998). Negative out-group biases and aggressions are often associated with a lack of understanding and awareness of the out-group (Struch & Schwartz, 1989).

Learning about an out-group may uncover a more factual understanding that is less rooted in stereotypes and prejudice (Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000).

However, some studies find that merely learning information may not be sufficient for improving intergroup relations (Katz & Zalk, 1978; Pettigrew & Tropp, 2008). Educational programs that are successful in improving attitudes tend to involve activities that foster an enhanced understanding of others thoughts and behaviours (Bridgeman, 1981; Doyle & Aboud, 1995; Stephan & Finlay, 1999). These programs often feature role-playing activities or other experiential exercises that involve perspective taking (i.e., not only learning but actually simulating another person's experience). Perspective taking is commonly associated with more prosocial behaviours (Bengtsson & Johnson, 1992; Hoffman, 2008; Oswald, 1996) and has been shown to lead to improvements in intergroup relations (Doyle & Aboud, 1995; Feshbach, 1989; Hodson, Choma, & Costello, 2009; Stephan & Finlay, 1999).

Forming a new social categorization. Since the process of social categorization plays a fundamental role in the formation of intergroup biases, managing this process has important implications for mitigating these biases. For this reason, a number of social categorization-based approaches to intergroup contact have been established. There are three distinct social-categorization based approaches to intergroup relations (Brown & Hewstone, 2005; Dovidio, Gaertner, & Kawakami, 2003). The first is *decategorization*, in which group boundaries are reduced in importance and individuals are encouraged to think of themselves as independent of group membership (Brewer & Miller, 1984; Miller, 2002). The second is *mutual intergroup differentiation*, in which members of separate groups have distinct yet complementary contributions towards a common goal (Hewstone & Brown, 1986). The third, and the main approach exploited in this dissertation, is *recategorization*, in which group boundaries are

broadened and individuals are encouraged to reorganize groups from subordinate identities (“us vs. them”), to a more inclusive, superordinate identity (“we”) (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993; Gaertner & Dovidio, 2000).

Intergroup contact theory summary

Allport (1954) suggested four optimal conditions of intergroup contact; however, a review of the literature reveals that not all of these conditions are necessary to decrease prejudice (Pettigrew & Tropp, 2006). Intergroup contact has been shown to be successful in both direct and indirect contact environments and appears to benefit prosocial aspects of affect, behaviours, and cognitions towards out-group members (Dovidio, Gaertner, & Kawakami, 2003). Research with elementary school children suggests that intergroup contact is effective with this age group (Slavin & Cooper, 1999).

Social recategorization: Generating a superordinate group identity

In his seminal paper, Allport (1954) argued that intergroup biases are more often the result of enhancing the in-group rather than derogating the out-group (also see Gaertner, Dovidio, & Bachman, 1996). This important distinction led researchers to develop different models that focus on broadening the boundaries of the in-group to form a superordinate identity (e.g. Gaertner & Dovidio, 2000; see Gaertner & Dovidio, 2005 for review). The *common in-group identity model* and the *dual identity model* are two alternative models that have been proposed.

Common Ingroup Identity Model (CIIM)

According to the CIIM, a replacement of subordinate group boundaries (such as ethnicity and race) with a more inclusive superordinate identity (such as humanity) will foster lower prejudice (Gaertner et al., 1993; Gaertner et al., 1994; Gaertner, Dovidio, & Bachman, 1996; Gaertner & Dovidio, 2000). The CIIM posits that a broadening of the in-group creates a cognitive shift that leads to more positive attitudes and behaviours towards individuals who would have formerly been considered members of the out-group (Chen et al., 2014; Dovidio et al., 1997; Gaertner et al., 1993; Gaertner & Dovidio, 2000; Gaertner & Dovidio, 2005; Hodson et al., 2009; Nier et al., 2001)

Gaertner and colleagues (1989; 1990) conducted several experiments exploring the effectiveness of the CIIM on intergroup relations. The researchers experimentally manipulated group membership by employing an experimental method called the minimal groups paradigm. Researchers randomly assign participants to arbitrary, essentially meaningless groups that were instructed to complete a team-building exercise in order to promote in-group cohesion. They were then brought together to form an aggregate under intergroup conditions that varied in emphasis of group boundaries using a strategic seating arrangement. The researchers also

manipulated whether a cooperative task was to occur during the intergroup contact situation. Results demonstrated that encouraging a superordinate identity enhanced participants' evaluations of former out-group members. Furthermore, the inclusion of cooperation during the intergroup contact facilitated this cognitive process (Gaertner et al., 1990).

Dual Identity Model (DIM)

The development of a superordinate identity does not necessarily require a renouncement of subordinate identities. According to the DIM, a dual identity can be cultivated through the adoption of a superordinate group while maintaining salience of the subordinate group (Gaertner et al., 1993; Nier et al., 2001; Gaertner et al. 1994; Gaertner & Dovidio 2000). Researchers suggest that the DIM may be a particularly effective approach for improving intergroup attitudes (Cameron et al., 2006; 2007; Gonzalez & Brown, 2003).

Social recategorization in children

The effects of encouraging a superordinate identity have been investigated in children. For example, the Green Circle Program was designed to explore the benefits of inducing a superordinate identity in elementary school children (Houlette et al., 2004). The program coordinators instructed students to conceptually include others in their in-group, described in the study as the 'circle of caring and sharing,' by emphasizing the importance of humanity as a superordinate group. Throughout the program, students learned that their in-group circle could grow to include more out-group members. Significant changes were found with respect to students' choice for 'preferred playmate' suggesting that the program caused children to cross group boundaries when socializing. However, there were no general differences in children's behaviour and attitudes towards out-group others. The program provided class-time instruction

on the topic of inclusion that was quite theoretical in nature. The theoretical focus may have detracted from the effectiveness of this program.

Cameron and colleagues (2006) compared different social recategorization approaches using indirect, extended contact in elementary school children. Participants read one of three versions of a story involving an in-group member becoming friends with a refugee. Each version of the story differed in the emphasis of group membership of the characters. The first story emphasized only the characters' subordinate identities (no recategorization); the second story emphasized the common school affiliation of the characters (common in-group identity); and the third story emphasized both subordinate identities and the common school affiliation (dual identity). Findings showed that the story that highlighted the dual identity elicited the most positive intergroup attitudes. This finding suggests that interventions for this age group should focus on encouraging a superordinate identity while simultaneously maintaining the salience of the subordinate identities.

Social recategorization summary

Approaches to intergroup contact that encourage the formation of a superordinate identity (e.g. humanity) are highly effective as they generalize in-group biases to include previously considered out-group others. In the next section, I will consider a novel way of inducing a superordinate identity, namely by harnessing the social bonding capacity of joint music making.

Joint music making as a strategy for intergroup contact

Joint music making may be a particularly effective strategy of intergroup contact for several reasons. First, joint music making involves a positive social interaction that effectively achieves some of the 'optimal' conditions outlined by Allport (1954). For example, in the case of

group singing, individuals are all using the same instrument, the voice, to create equality amongst singers (equal status), all the voices need to come together to create the sound of a choir (common goals), and singers are working together through a shared intentionality (cooperation) (Overy, 2012; Reddish, Fischer, & Bulbulia, 2013). Thus, I argue that joint music making provides a means for generating an environment of positive intergroup contact.

Moreover, joint music making may have a unique propensity to impact social categorization. In fact, several evolutionary theorists speculate that joint music making served as a tool that enabled groups of individuals to develop and maintain social bonds (Huron, 2001; McNeill, 1997; Roederer, 1984; Wallin, Merker, & Brown, 2001). Researchers suggest that when individuals join together to make music, a new collective social identity is created that may override the individual identity, at least during the period of music making. This collective identity is consistent with the way Gaertner et al. (1993) defined a superordinate identity. For this reason, I hypothesize that joint music making may be an effective approach to social recategorization.

Joint music making connects individuals through a shared affective and motoric experience. The affective experience refers to the way music can effectively convey mood, affect and emotion (Juslin & Sloboda, 2001; Juslin & Västfjäll, 2008). Engaging in joint music making may align this affective experience amongst those making music together. The motoric experience refers to the tendency to coordinate movements with others during joint music making. Movement coordination provides a framework for individuals to connect with each other through joint action, which has the propensity to promote social bonding (Demos, Chaffin, Begosh, Daniels, & Marsh, 2012; Marsh, Richardson, & Schmidt, 2009; Valdesolo, Ouyang, & DeSteno, 2010). My focus for this dissertation will be on the shared motor experience; however,

I must acknowledge that joint music making is part of a broader context of expression, involving affect among other variables. Thus, while I tend to assume that shared motor experience as the operative variable leading to effects on social bonding, my studies have not been designed in a manner that allows me to make conclusions about this assumption.

Movement coordination

In a review of the literature, Bernieri and Rosenthal (1991) discussed two important categories of movement coordination. The first category can be described as *behaviour matching*, namely mirroring or mimicry. This category focuses on the matching of relatively static behaviors, such as posture or facial expression. While behaviour matching can be a conscious action, people in social situations tend to unconsciously mirror one another's posture and facial expressions, which is reflective of a shared viewpoint. For example, an individual might wince upon viewing another individual getting hurt (Schefflen, 1964). Chartrand and Bargh (1999) coined the term the *chameleon effect* to refer to this unconscious mimicry. Mimicry has been found to support an understanding of another's state or perspective (e.g., Bavelas, Black, Lemery, & Mullett, 1986) and help to foster social relationships between individuals (Lakin, Jefferis, Cheng, & Chartrand, 2003; van Baaren, Janssen, Chartrand, & Dijksterhuis, 2009).

The second category of movement coordination can be described as *movement synchrony* (Bernieri & Rosenthal, 1991). This category focuses on the precise timing of movements during an interaction. Movement synchrony is somewhat difficult to observe in everyday social interactions, however, it is readily observed in rhythmic activities such as two individuals walking side by side or a group of individuals playing music together. During joint music making, movement synchrony can be seen as a physical manifestation of rhythmic entrainment, whereby performers internalize the external rhythmic pulse (Demos et al., 2012). This shared

internal rhythm then scaffolds and supports movement synchrony amongst those engaged in joint music making.

Movement synchrony may be overt and even exaggerated in some forms of joint music making (e.g., marching bands); however, movement synchrony may still exist even when not visibly perceptible. For example, in the case of singing, synchronization of laryngeal and orofacial movements is not visible but it is necessary for singing in unison. Another layer of synchrony is provided by way of the song's pitch interval structure, which exerts subtle influences on facial and head movements (Thompson & Russo, 2007). Furthermore, as the phrasing of lyrics will influence respiration, group singing will also lead to synchronization of respiratory patterns (Müller & Lindenberger, 2011). Thus, although movement synchrony tends to be thought of through a visual lens, some forms of movement synchrony can be perceived auditorily.

Some researchers have isolated movement synchrony as the key mechanism underlying the social impact of joint music making (Wiltermuth & Heath, 2009; Kokal Engel, Kirschner, & Keysers, 2010). For example, Wiltermuth and Heath (2009) directly compared conditions of asynchronous singing, synchronous singing, and synchronous singing-and-moving on measures of social bonding. They found that synchronous singing yielded more prosocial behaviours than asynchronous singing. Furthermore, there was no significant difference between the two synchronous groups, suggesting the relationship between movement synchrony and social bonding does not seem to depend on exaggerated movement; less visible forms of movement synchrony (i.e. singing) will yield the same effect.

Effects of movement coordination on social cohesion

Movement coordination has been found to influence social cohesion, particularly in situations where there is a high degree of movement synchrony (Bernieri, 1988; Hove & Risen 2009; Miles, Nind, & Macrae, 2009; Wiltermuth & Heath, 2009). For example, Hove and Risen (2009) conducted a series of experiments in which they explored the influence of movement synchrony on affiliation. Participants were simply asked to tap their finger along with a metronome. The experimenter tapped along either synchronously, asynchronously, or did not tap along with the participant. Results demonstrated that synchronous tapping positively predicted participant ratings of affiliation towards the experimenter.

Furthermore, observers tend to judge objects moving in synchrony higher on measures of social cohesion, or collectivity, than objects not moving in synchrony (Lakens, 2010; Lakens & Stel, 2011; Miles, Nind, & Macrae, 2009). In a study conducted by Lakens (2010), stick figures of differing sizes and colours were viewed waving their arms at varying levels of synchronization. Participants were asked to rate the strength of social cohesion of the stick figures. This study revealed three important findings. First, stick figures were rated higher on measures of cohesion when they were waving synchronously than when they were waving asynchronously. Second, and more noteworthy, ratings of cohesion remained high even when the stick figures were performing *different* movements to the same precise rhythmic timing. Third, social groupings based on movement synchrony took priority over groupings of size and colour. Participants were aware of the static factors such as size and colour; however, cohesion judgments were based primarily on the dynamic elements of the movement rhythm of the stick figures. These results suggest that there may be a natural tendency for dynamic factors, such as the rhythmic timing of movements, to generate a more powerful perception of collective identity

than static factors, such as skin colour (Brewer, Hong, & Li, 2004).

These studies suggest that movement synchrony elicits a shift in cognitive representation of the group, whereby the group moving together becomes a new, collective social unit (i.e. a superordinate identity). Moreover, these studies provide evidence that a collective identity is perceived both by those actively engaged in synchrony, as well as by third party observers.

Underlying mechanisms of social bonding hypothesis

The effects of movement coordination on social bonding may be effectuated by increased recognition of interpersonal similarity that arises from moving in synchrony. In other words, when individuals move alike, they feel alike. Indeed, research shows that movement synchrony elicits increasing levels of perceived similarity in terms of personal characteristics between an individual and their counterparts moving in unison (Valdesolo & DeSteno, 2011; Valdesolo, Ouyang & DeSteno, 2010). This effect of movement synchrony on perceived similarity has also been established in children (Rabinowitch & Knafo-Noam, 2015). Given the tendency for individuals to identify with those who are perceived as more similar (Tajfel, 1972), this may provide an explanation for why movement coordination promotes a collective identity.

Several other mechanisms may also contribute to the effect of movement synchronization on social bonding. For one, moving in synchrony with others may blur the distinction between the self and others (e.g., Sebanz et al., 2006). McNeill (1997) describes this notion as '*we-ness*' or '*boundary loss*.' It is through this loss of individual boundaries that a new collective identity is established. Another potential mechanism is that moving in synchrony with others may heighten the perception of the other person. Research has shown that moving in synchrony with others activates attentional and memory processes so that others are better remembered (Macrae

et al., 2008; Woolhouse et al., 2010; however, see Miles et al., 2009).

Effects of movement coordination on prosocial behaviours

The commonly held view that individuals tend to behave in ways that maximize their own self-interest (e.g., Jensen & Meckling, 1998) is challenged by the prevalence of group cooperation (Caporael et al., 1989). Caporael and colleagues (1989) argue that when an individual redefines him or her self as a member of a collective social group, they become more likely to behave in ways that primarily benefit the group. This argument is consistent with the CIIM literature, which posits that a superordinate identity will lead individuals to behave more prosocially towards formerly considered out-group others (Gaertner & Dovidio, 2000). Thus, if movement coordination supports the generation of a collective identity, it should also enhance the tendency for individuals to behave in ways that benefit the group. Indeed, a great deal of research demonstrates that *dyads* who had engaged in movement synchrony were subsequently more likely to help, share, and cooperate with their partner than those who had not engaged in movement synchrony (Anshel & Kipper, 1988; Cirelli, Einarson & Trainor, 2014; Kirschner & Tomasello, 2010; Kokal et al., 2011; Valdesolo & DeSteno, 2011).

Researchers have explored whether movement synchrony would lead to more altruistic and helping behaviours. For example, Valdesolo and DeSteno (2011) asked dyads of participants to engage in either synchronous or asynchronous finger tapping. Results demonstrated that those who were engaged in synchronous tapping were more likely to demonstrate empathic responding, such as enhanced compassion and concern for the well being of others, than those engaged in asynchronous tapping. In particular, individuals who had engaged in synchronous tapping with a victim (a confederate to the study) were more likely to offer help for longer periods of time than individuals who had engaged in asynchronous tapping with the victim.

Kokal et al. (2011) conducted a brain imaging study to investigate the neural basis of this relationship. Participants were asked to drum to a rhythm that was either synchronous or asynchronous to a rhythm produced by the experimenter. They found that only participants that had engaged in synchronous drumming experienced enhanced activity in the caudate nucleus, an area associated with the brain's reward system. Furthermore, the extent of this activation was correlated with subsequent helping behaviours (i.e. the number of dropped pencils that the participant helped to pick up).

Researchers have explored whether movement synchrony leads to more cooperative behaviours. The link between movement synchrony and cooperation has been investigated through the assessment of many different methodologies. For example, joint-action tasks provide insight into what extent a dyad is coordinated. Valdesolo, Ouyang, and DeSteno (2010) had participants rocking synchronously or asynchronously in rocking chairs. Following the synchrony manipulation, participants were split up into dyads and asked to complete a joint-action task. The task required dyadic cooperation as well as movement coordination. Results showed that the dyads that had previously engaged in synchronous rocking completed the joint-action task faster than those who engaged in asynchronous rocking.

Another methodology used to assess cooperation in dyads is strategic decision-making games, such as the prisoner's dilemma. These types of games capture whether an individual behaves in a manner that maximizes their own self-interest or primarily benefits the dyad. These games also provide insight into trust and loyalty towards others (see Axelrod & Hamilton, 1981). For example, Anshel and Kippur (1988) asked participants to play a prisoner's dilemma game following group singing, poetry reading, and watching a movie together. They found that group singing led to higher levels of cooperation compared to activities that did not involve movement

synchrony. Furthermore, singing also led to higher scores on a measure of trust than the other activities.

The prisoner's dilemma has been adapted for use in children (Matsumoto et al., 1986). In the children's version of the prisoner's dilemma, children must decide in each trial whether to cooperate or to compete. When both players decide to cooperate, both players will earn one token. When one player decides to cooperate while the other competes, the competitor will earn two tokens and the cooperator will earn nothing. When both players decide to compete, both players will earn nothing. While the children's version of the game has been simplified, it resembles the adult version in that cooperative action and trust are necessary in order to receive the highest payoffs.

Cooperation in Groups. While joint music making typically occurs in groups larger than two, research exploring whether movement synchrony fosters cooperation in a group is more limited. In one exception, Wiltermuth and Heath (2009) assessed the impact of movement synchrony on cooperation in groups by using the public goods game. In the public goods game, participants must decide how much money to contribute to a public account and how much to keep in a private account. Individual earnings are maximized when the individual keeps their money in the private account, while group earnings are maximized when everyone contributes to the public account. Wiltermuth and Heath (2009) asked participants in groups of three to walk around campus either in step (synchrony) or not in step (asynchrony). Following the synchrony manipulation, participants were asked to play the public goods game. Groups of participants who had engaged in movement synchrony tended to choose the cooperative strategies that primarily benefitted the collective group compared to groups that had not engaged in movement synchrony. Furthermore, individuals who had engaged in movement synchrony reported higher feelings of

being on the ‘same team’ than individuals who had not engaged in movement synchrony. This study suggests that movement synchrony encouraged individuals to work cooperatively and develop a more collective identity when making decisions in a group.

Effects of movement coordination on anti-social behaviours

It is important to acknowledge that the influence of movement synchrony on social bonding may not always be pro-social; the effect may be used with malicious intent. For example, there are historic accounts of dictators tapping into this effect by using movement synchrony to encourage coordination among large groups of people and obedience to authority that is destructive in nature. Indeed, recent experimental evidence corroborates with these historic accounts of anti-social behaviour. For example, Wiltermuth (2012) found that participants who had synchronized movements with a ‘leader’ were more likely to feel social connected to him and were subsequently more likely to kill bugs at the leader’s request. This study highlights that the bonding effects of movement synchrony may be used to promote destructive disobedience when employed under such circumstances.

Effects of movement coordination in children

The social impact of movement coordination, particularly movement synchrony, has been also explored in children. For example, Kirshner and Tomasello (2010) had young children play games in partners that either involved singing in unison (synchrony) or no singing. Following this manipulation, the dyads were asked to complete a joint-action task that could be completed independently or cooperatively. The task involved two steps: the first was to drop a marble down a slide and the second was to pull on a string on the other end of the slide to acquire the marble. The apparatus consisted of two different coloured slides. Given that there were two slides, the children could work independently by dividing the slides and walking around the apparatus to

each complete both roles, or they could work cooperatively by each coordinating their actions with one child on either end of the slide. The study demonstrated that children who had engaged in singing were more likely to work cooperatively on this joint-action task than if they had not engaged in singing. Furthermore, the children who sang together were also more likely to engage in spontaneous helping behaviours towards their partners and continue helping until the problem was solved.

The social impact of movement coordination appears to be present even in infancy. Cirelli, Einarson and Trainor (2014) conducted a study whereby 14-month old infants were rhythmically bounced up and down either synchronously or asynchronously with the experimenter. Following the synchrony manipulation, the infants were given an opportunity to help the experimenter by picking up an object that had been dropped. Results demonstrated that infants were more likely to help the experimenter following synchronous movements than asynchronous movements. Furthermore, this study demonstrated that matched phase coherence was not necessary to enable the effect. A consistent lag in the movements of one individual and the next is fine, so long as the movements are following a consistent oscillatory pattern (i.e., lag does not vary). Only asynchronous bouncing conditions resulted in helping behaviours dropping to control levels. These findings reinforce the importance of movement synchrony over movement symmetry.

Effects of movement coordination in intergroup settings

Two recent studies explored joint music making in intergroup settings (Pearce et al., 2016; Tunçgenç & Cohen, 2016). Pearce et al. (2016) found that singing led to increased levels of perceived closeness towards members of an out-group, regardless of whether singing was cooperative (singing together) or competitive (who can sing the loudest). Tunçgenç and Cohen

(2016) explored whether activities involving movement synchrony would facilitate bonding in minimally constructed groups. Compared to activities that did not involve movement synchrony, those that did involve movement synchrony led to higher feelings of social bonding and perceived closeness with the out-group. While these studies demonstrate that the social bonding capacity of movement synchrony may transcend intergroup boundaries, the full scope of this impact, particularly on cooperative behaviours, is still largely unknown.

Movement coordination summary

Joint music making connects individuals through a shared affective and motoric experience. In particular, joint music making facilitates the coordination and synchronization of movements across individuals, which has the propensity to impact social bonding. Research demonstrates that movement coordination influences social categorization as it generates a collective identity, likely due to increased levels of perceived similarity amongst those moving together. Moreover, movement coordination promotes cooperative and prosocial behaviours. This effect is evident even in children.

Dissertation Objectives and Hypotheses

1. Intergroup contact theory and a considerable body of empirical research show that positive intergroup contact facilitates favourable intergroup relations (e.g. Pettigrew & Tropp, 2006). Joint music making seems to address many of Allport's (1954) contact conditions, such as common goals and cooperation. Given the conceptual overlap between joint music making and the 'optimal' conditions of intergroup contact, I predict that when joint music making is applied in an intergroup setting, it will be an effective means to promote positive intergroup relations. This dissertation explores the use of joint music making as a strategy of both direct and indirect intergroup contact.
2. Inducing a superordinate identity is a successful approach to improving intergroup relations. Joint music making provides a framework that encourages movement synchrony, which appears to effectively promote a collective identity amongst those moving together. I predict that movement synchrony in an intergroup context will influence social categorization and can be used strategically to encourage a superordinate identity.
3. While movement synchrony has been found to promote cooperation, there has been little exploration on whether this effect will transcend intergroup boundaries. I predict that joint music making in an intergroup context should enhance the tendency for individuals to cooperate across intergroup boundaries, presumably due to the development of a new collective identity.

Research studies

Three research studies were conducted to investigate the social impact of joint music making in various intergroup settings. The first study was an experiment designed to examine more closely the potential of movement synchrony to influence social categorization. I hypothesized that intergroup contact via movement synchrony would encourage individuals to adopt a superordinate identity across minimal group boundaries. I also predicted that intergroup movement synchrony would lead to higher levels of cooperation across intergroup boundaries.

The second and third studies were field studies that consider the ecological validity of the social impact of joint music making across intergroup boundaries. The second study applied joint music making (i.e. movement synchrony) as a method of direct intergroup contact in an ethnically diverse group of elementary school children. I predicted that joint music making would promote more cooperation on a prisoner's dilemma game than group colouring (visual art) or competitive games.

The third study incorporated singing foreign songs as a method of indirect intergroup contact in a uni-cultural group of elementary school children. Singing foreign songs may provide a framework for children to simulate the movements of an out-group other. I predicted that singing foreign songs would lead to the adoption of a superordinate identity across cultures (i.e. humanity). Furthermore, I predicted that joint music making would lead to higher levels of behavioural intentions (e.g., an invitation to play) towards the formerly considered out-group others.

Chapter II: STUDY 1

Movement synchrony influences intergroup relations in a minimal groups paradigm

Manuscript submitted to: *Journal of Experimental Social Psychology*

Abstract

Synchronizing movements with others during group activities such as joint music making seems to encourage a collective social identity, leading to a more cooperative social group. The current study investigated whether movement synchrony can impact social categorization and cooperation across intergroup boundaries. Two small groups were brought together under movement synchrony conditions designed to emphasize different representations of the aggregate: (1) emphasize the superordinate identity (all individuals moved to the same musical beat); (2) emphasize the minimal group identity (each minimal group moved to a different musical beat); or (3) emphasize the individual identity (each individual moved to a different musical beat). Results demonstrate that inducing a superordinate identity in the intergroup synchrony condition fostered higher levels of cooperation across intergroup boundaries than the other two conditions. Movement synchrony in a joint music making task also influenced social categorization. Implications for approaches to intergroup relations are noted.

Keywords: Movement synchrony, cooperation, social cohesion, intergroup

Introduction

Joint music making is an integral component of many social and cultural rituals. One compelling explanation for the prevalence of joint music making is that the synchronization of movements during these activities enables social groups to develop a collective identity, indexed by a more cooperative social group (Durkheim, 1915; Huron, 2001). What remains unclear, however, is whether movement synchrony can transcend salient intergroup boundaries and foster more positive intergroup relations. To explore this possibility, the current study examines whether movement synchrony has the capacity to alter social categorization and induce a collective identity when intergroup boundaries are made salient through a minimal groups paradigm.

Social categorization leads to intergroup biases

According to Social Identity Theory (Tajfel & Turner, 1986), individuals categorize themselves and others into social groups, which can lead to an ‘us versus them’ mentality. Consequently, people tend to demonstrate intergroup biases by exhibiting cooperative, prosocial behaviors towards members of their own social group (in-group), while fearing and derogating members of other social groups (out-groups) (see Hewstone et al., 2002 for review). These intergroup biases are even present in the most minimal conditions when researchers randomly assign participants to arbitrary, socially meaningless groups. A considerable amount of evidence has been amassed using this minimal groups paradigm (Tajfel, 1970) establishing that minimal groups are capable of generating intergroup biases that resemble those derived by a discrepancy of power and status between racial, ethnic and religious groups (see Brewer, 1979; Hewstone et al., 2002 for reviews).

Group membership salience, or the conceptualization of group boundaries, depends on the pertinence of group characteristics within a given situation (e.g. nationality during an international sporting event). Managing this process of social categorization may have important implications for mitigating intergroup biases. As such, a number of social categorization-based approaches to reducing intergroup biases have been established. Among these approaches are *decategorization* and *recategorization* (for a review see Brown & Hewstone, 2005). In *decategorization*, group boundaries are reduced in importance and individuals are encouraged to think of themselves as independent of group membership (Brewer & Miller, 1984; Miller, 2002). In *recategorization*, group boundaries are broadened and individuals are encouraged to reorganize groups from “us versus them” to a more inclusive “we” (e.g. Gaertner & Dovidio, 2000; Gaertner et al., 1993).

The Common Ingroup Identity Model (CIIM) is a well-developed formalization of the recategorization approach (Gaertner & Dovidio, 2000). According to the CIIM, changing the focus of social categorization from subordinate groups (e.g. ethnicity and religion) to a broader superordinate group (e.g. humanity) is an important step for improving intergroup relations. The induction of a superordinate identity is proposed to create a cognitive shift that ameliorates attitudes and behaviors towards individuals who would have formerly been considered as members of the out-group (see Gaertner & Dovidio, 2005 for review). In other words, encouraging in-group boundaries to be a more inclusive “we” seems to eliminate the circumstances for out-group derogation. A substantial body of research demonstrates that inducing a superordinate identity effectively improves intergroup relations in various intergroup contexts, including minimal (e.g. Dovidio et al., 1997; Gaertner et al., 1989; 1990), and natural (e.g. Chen et al., 2014; Nier et al., 2001) group boundaries.

What is the best way to induce a superordinate identity in an intergroup context? In some situations, a superordinate identity can be achieved simply by highlighting an existing common group membership, such as university affiliation (e.g. Nier et al., 2001). In other situations, a superordinate identity can be achieved by introducing conditions of intergroup contact, such as intergroup cooperation or common goals (Allport, 1954). For example, Gaertner et al. (1990) found that the inclusion of a cooperative problem-solving task requiring a consensus solution during intergroup contact resulted in the most improved intergroup relations. While these types of manufactured intergroup contact strategies are effective, they may not always be a practical option outside of the laboratory.

Inducing a superordinate identity using movement synchrony

Joint music making is a natural group behaviour that involves movement synchrony and may offer a particularly powerful, easily implemented strategy for promoting a superordinate identity. Engaging in movement synchrony not only requires cooperation amongst those moving together, but it also provides an opportunity for joint action (Demos, Chaffin, Begosh, Daniels, & Marsh, 2012; Reddish, Fischer, & Bulbulia, 2013). In particular, movement synchrony provides a framework for individuals to connect with others through a shared physical experience involving precise temporal coordination.

Movement synchrony in joint music making has been found to promote social bonding. For example, Hove and Risen (2009) found that participants who tapped synchronously with an experimenter reported higher levels of affiliation towards the experimenter than participants who had tapped asynchronously. In another example, Wiltermuth and Heath (2009) found that individuals who engaged in joint music making reported higher feelings of being on the ‘same team’ than individuals who engaged in nonsynchronous group activity. Together, these studies

suggest that movement synchrony such as the type necessary in joint music making elicits a shift in social categorization, whereby the group moving together becomes a collective social unit. Importantly, this shift in social categorization is consistent with the conceptualization of a superordinate identity (Gaertner et al., 1989; Gaertner & Dovidio, 2000).

Since individuals are more likely to exhibit prosocial behaviours towards members of their own social group, movement synchrony should enhance the tendency for prosociality between individuals who move together. Indeed, a great deal of research demonstrates that *dyads* who engage in movement synchrony are subsequently more likely to help, share, and cooperate with their partner than those who do not engage in movement synchrony (Cirelli, Einarson & Trainor, 2014; Kirschner & Tomasello, 2010; Kokal et al., 2011; Valdesolo & DeSteno, 2011).

While joint music making typically occurs in groups larger than two, research exploring whether movement synchrony fosters cooperation in a group is limited. In one exception, Wiltermuth and Heath (2009) assessed the impact of movement synchrony on cooperation in a group by using the public goods game. In the public goods game, participants must decide how much money to contribute to a public account and how much to keep in a private account. Individual earnings are maximized when the individual keeps their money in the private account, while group earnings are maximized when everyone contributes to the public account. Thus, the public goods game captures whether an individual behaves in a manner that maximizes their own self-interest or primarily benefits the group (see Axelrod & Hamilton, 1981). Wiltermuth and Heath (2009) found that small groups of participants who had engaged in movement synchrony tended to choose the cooperative strategies that primarily benefitted the group compared to groups that had not engaged in movement synchrony. Although their study suggests that movement synchrony promotes cooperation in a small group, it is still unclear as to whether this effect will

have an impact when *intergroup* boundaries are salient (see however, Pearce et al., 2016; dance study).

The current study

The current study examined whether movement synchrony would influence group cooperation by emphasizing different group boundaries in an intergroup context. Two small groups were established using the minimal groups paradigm and were subsequently brought together under movement synchrony conditions designed to emphasize different categorizations of the aggregate. (1) In the intergroup synchrony condition, all individuals moved to the same piece of music (emphasize the superordinate identity); (2) in the intragroup synchrony condition, each minimal group moved to a different piece of music (emphasize the minimal group identity); (3) in the asynchrony condition, each individual moved to a different piece of music (emphasize the individual identity). We predicted that intergroup synchrony would encourage cooperation across minimal group boundaries and that intragroup synchrony would encourage cooperation within minimal group boundaries. We expected asynchrony to discourage cooperation within minimal group boundaries. However, because of competing predictions derived from the social categorization literature and the movement synchrony literature, we did not have a clear expectation regarding the effect of asynchrony on cooperation across minimal group boundaries.

Method

Participants and Procedure

A power analysis with 3 variables based on a medium/small effect size based on meta-analysis by Pettigrew and Tropp (2008) recommended a minimum sample size of 30 participants per condition. Participants ($n=102$, $mean_{age}=20.5$, $SD=3.91$) were undergraduates who participated in exchange for course credit. The procedure consisted of three stages (Figure 1). In

stage 1 (minimal group formation), participants were randomly assigned into two groups of three people and wore group-specific color coded pinnies (red or blue). The facilitator (research assistant) for each group instructed members to get acquainted by introducing themselves and disclosing one piece of personal information (“*what is something about yourself that people might consider surprising*”). Each group then completed a cooperative team building exercise.

In stage 2 (movement synchrony manipulation), the minimal groups were brought together to form one aggregate group of six participants. They were positioned around a table such that each participant sat next to members from the other minimal group. Next, participants were provided with personal headphones and asked to tap their hand to the musical beat they heard. Each aggregate group was randomly assigned to one of three movement synchrony conditions: (1) intergroup synchrony (all individuals tapped to the same musical beat); (2) intragroup synchrony (each minimal group tapped to different musical beat), or (3) asynchrony (each individual tapped to a different musical beat).

In stage 3 (public goods game and questionnaire), participants played a public goods game to assess willingness to cooperate within and across group boundaries. Participants were instructed to divide 10 tokens among a private account, a minimal-group account, or an aggregate-group account. Because confusion is often cited as a limitation for this exercise (Andreoni, 1995), four practice rounds were played to ensure that participants understood the game, including the incentives. Participants were given anonymous feedback regarding how many tokens were contributed to each minimal-group account and the aggregate group account following each round. The fifth round was used as the outcome measure of cooperation. Finally, participants completed a questionnaire consisting of several measures for the purposes of a larger study (see Appendix A for supplementary materials). To measure perceived social categorization,

participants were asked to choose whether they perceived the aggregate as (a) one group/individuals on the same team, (b) two groups, or (c) six separate individuals (Gaertner et al., 1989).

Results

Cooperation

Three participants were removed from the cooperation analysis because they failed to complete the task correctly. To determine whether intergroup synchrony affected cooperation *across* intergroup boundaries, a one-way ANOVA was run with movement synchrony condition as the between-subjects factor and number of tokens allotted to the aggregate-group account as the dependent variable. There was a main effect of condition, $F(2, 98)=2.96, p=.057, \eta_p^2=.06$, although this effect was marginally significant. As predicted, planned comparisons revealed that participants in the intergroup synchrony condition ($M=4.77, SD=3.33$) contributed more tokens to the public account than did those in the intragroup synchrony ($M=3, SD=2.69, p=.020$), but not those in the asynchrony condition ($M=3.56, SD=2.95, p=.105$) (Figure 2a).

To determine whether intragroup synchrony led to cooperation *within* intergroup boundaries, a one-way ANOVA was run with movement synchrony condition as the between-subjects factor and number of tokens allotted to the minimal-group account as the dependent variable. There was a main effect of condition, $F(2, 98)=6.543, p=.002, \eta_p^2=.12$. As predicted, planned comparisons revealed that participants in the intragroup synchrony condition ($M=3.85, SD=3.06$) contributed more tokens to the minimal group account than did those in the intergroup synchrony ($M=1.58, SD=1.63, p<.001$) and marginally more than those in the asynchrony condition ($M=2.74, SD=2.62, p=.07$) (Figure 2b).

Social categorization

A chi-square test of independence was conducted on the frequency of responses to the social categorization question to assess whether: (a) intergroup synchrony induced a superordinate identity; (b) intragroup synchrony induced minimal group identity; and (c) asynchrony induced an individual identity. Twelve participants missed this section of the questionnaire. Results revealed that the distribution of cognitive representations selected varied across conditions, $\chi^2(4)=10.96, p=.027$. As hypothesized, when participants were asked how they perceive the aggregate group (one group, two groups, or six separate individuals), a considerable percentage of participants selected the option consistent with their condition (Figure 3).

Discussion

The current study illustrates that movement synchrony in a joint music making task influences group cooperation and social categorization. Most notably, intergroup synchrony fostered cooperation across intergroup boundaries. This prosocial effect appears to have happened as a result of generating a superordinate identity. There are two lines of evidence in support of this conclusion.

First, in a public goods game, those that synchronized their movements with the aggregate group (intergroup synchrony) showed more cooperation *across* minimal group boundaries than participants in the other conditions. In other words, joint music making with former out-group members fostered intergroup cooperation. Moreover, participants who synchronized their movements with members of their minimal group condition (intragroup synchrony) showed more cooperation *within* minimal group boundaries than participants in the other conditions. Cooperation did not differ between intergroup and asynchrony conditions. This finding is consistent with research suggesting that *decategorization* and *recategorization* are both

effective ways of fostering positive intergroup relations (Gaertner, Kawakami, Dovidio, 2003).

Second, movement synchrony affected the cognitive representation of the aggregate group in the expected way. Although group boundaries were established through a minimal groups paradigm, intergroup synchrony led participants to perceive the aggregate as one superordinate identity, suggesting successful group recategorization. Correspondingly, intragroup synchrony led participants to perceive the aggregate as two separate groups, suggesting that the minimal group boundaries were successfully maintained. Moreover, asynchrony led participants to perceive the aggregate as six separate individuals, suggesting successful group decategorization.

Limitations and Future directions

To our knowledge, this is the first study to demonstrate that movement synchrony has the capacity to transcend intergroup boundaries. However, some limitations should be considered. First, the dynamics of game play during the public goods game (e.g. the feedback provided at the end of each round) provided insight into whether participants were cooperating within or across group boundaries. This may have impacted the pattern of responses selected on cognitive representations of the aggregate. Second, the group boundaries were established in an artificial manner. It is uncertain whether these interventions might impact more meaningful group boundaries, like ethnic or religious groups.

Implications and conclusions

Several theorists have proposed that joint music making evolved as an adaptive tool that enables groups to foster social bonds, ultimately leading to cooperative behaviors (Huron, 2001; McNeill, 1995). The current study suggests that the social bonds generated in joint music making

may also transcend intergroup boundaries. Given that joint music making is easily implemented, it appears to be a powerful social tool that may be used in a variety of circumstances to improve intergroup relations.

Table 1*Group descriptives*

Condition	Sample size	Mean Age(SD)	Male/Female/Missing
Intergroup Synchrony	34	20.03(2.84)	7/26/1
Intragroup Synchrony	34	20.32(3.05)	8/26
Asynchrony	33	21.21(5.37)	7/25/1

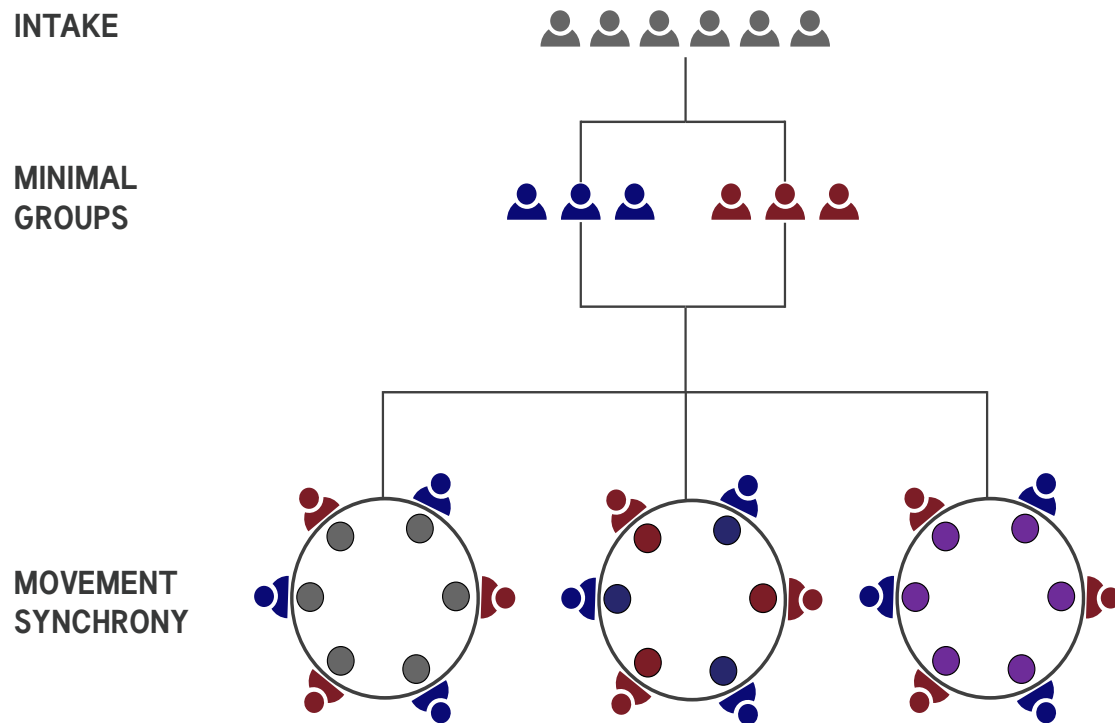


Figure 1. Overview of the study design. Six participants were brought into the lab and divided into two groups using a minimal groups paradigm (blue and red). The groups were then brought together under three conditions of movement synchrony: asynchrony, intragroup synchrony, intergroup synchrony.

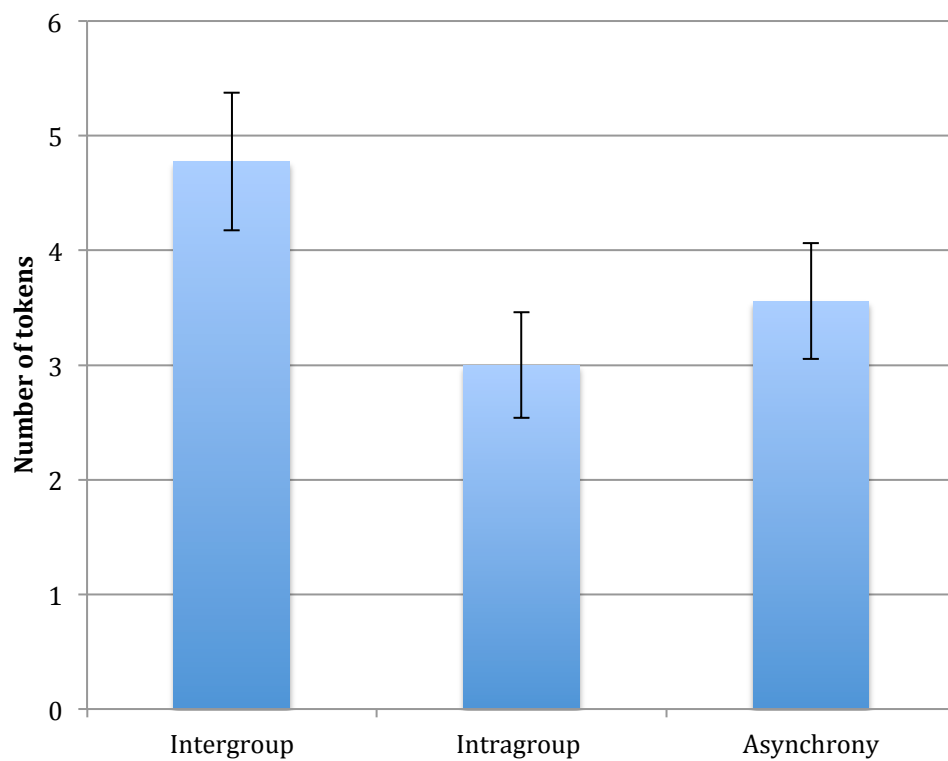


Figure 2a. Number of tokens contributed to the aggregate account in each synchrony condition

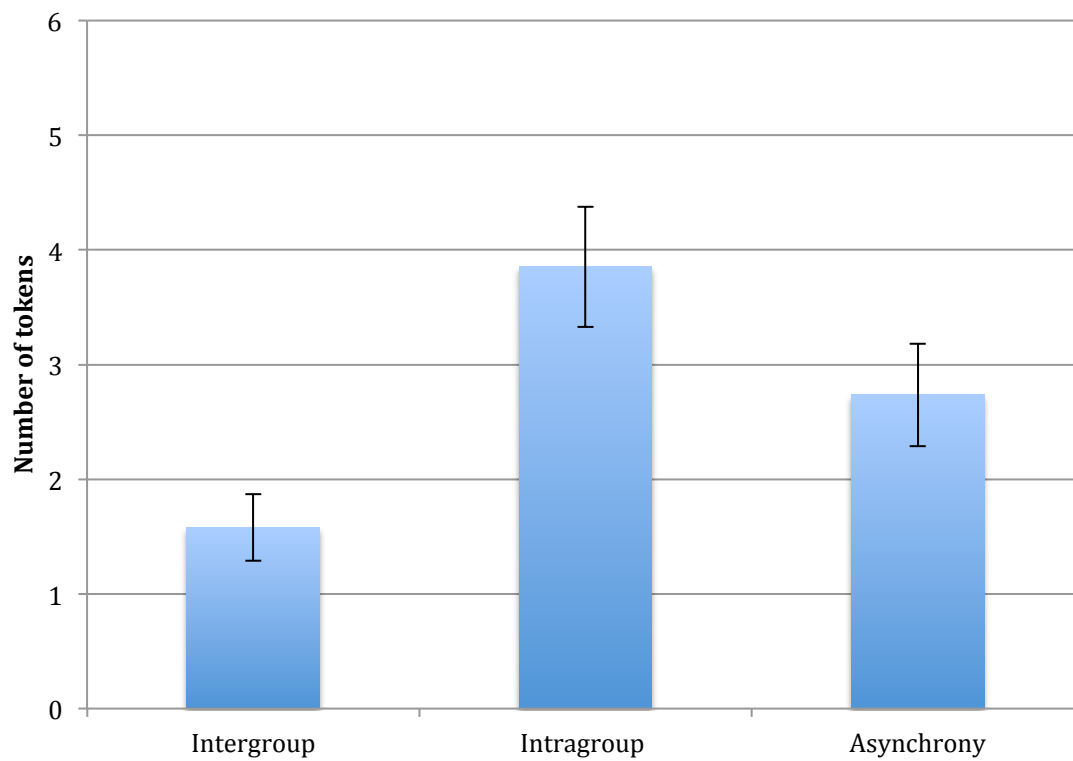


Figure 2b. Number of tokens contributed to the minimal group account in each synchrony condition

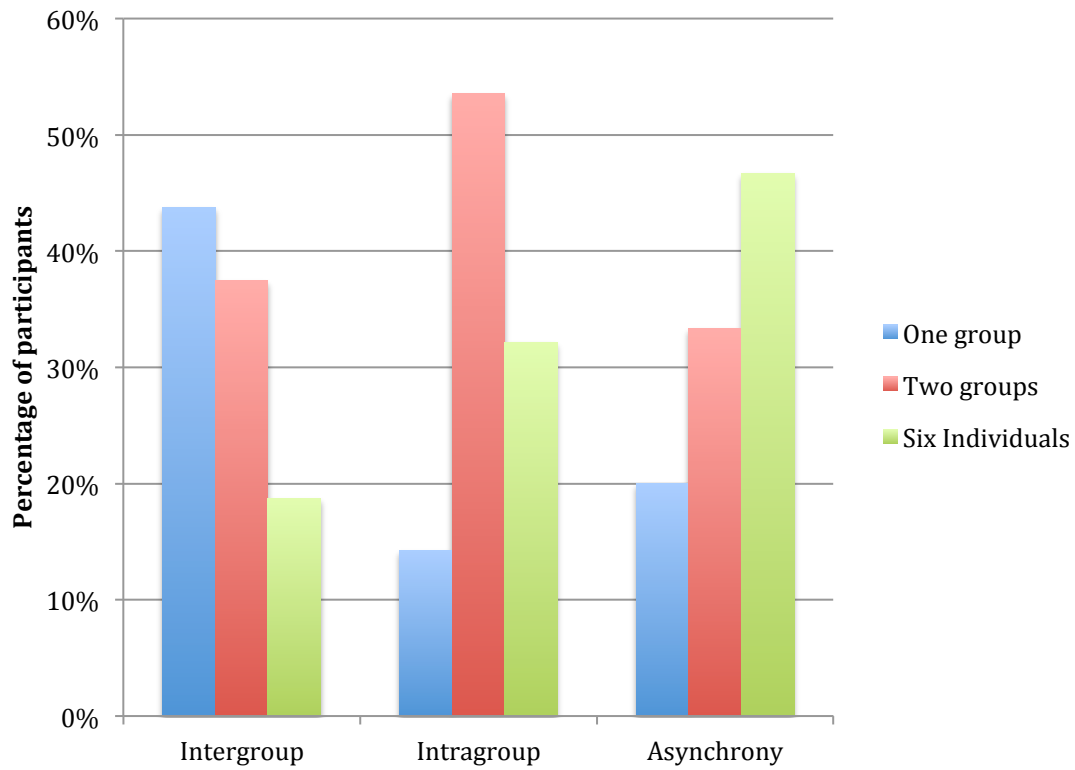


Figure 3. Percentage of participants in each condition that perceive the aggregate as one group, two groups, or six separate individuals.

Additional information

Please refer to Appendix A for the full methods and supplementary materials.

Please refer to Appendix B for additional analyses that were run.

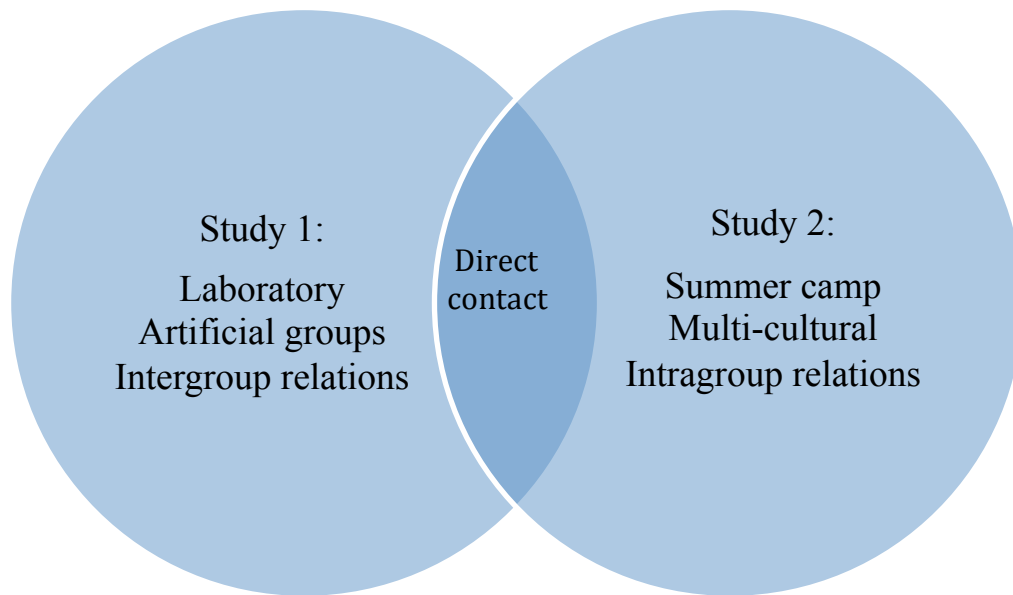


Figure 4. In this chapter, I learned that applying a joint music making task as a form of direct intergroup contact in a controlled laboratory setting altered social categorization and promoted cooperation across artificially created groups. In the next study, I wanted to explore the ecological validity of this effect by exploring whether joint music making in a naturally diverse environment would promote cooperation within the group.

Chapter III: STUDY 2

Singing promotes cooperation in a diverse group of children

Manuscript accepted for publication in: *Social Psychology*

Abstract

Previous research involving pre-school children and adults suggests that moving in synchrony with others can foster cooperation. Song provides a rich oscillatory framework that supports synchronous movement and may thus be considered a powerful agent of positive social relations. In the current study, we assessed this hypothesis in a group of primary-school aged children with diverse ethnic and socio-economic backgrounds. Children participated in one of three activity conditions: group singing, group art, or competitive games. They were then asked to play a prisoner's dilemma game as a measure of cooperation. Results showed that children who engaged in group singing were more cooperative than children who engaged in group art or competitive games.

Keywords: Movement synchrony, singing, cooperation, children

Introduction

The universality of music indicates that it serves, or at least once served, an adaptive purpose. Several theorists have proposed that music functions as a social tool that enables groups to develop and preserve bonds, ultimately leading to cooperative behaviors within the group (e.g. Huron, 2001; McNeill, 1995; Roederer, 1984). Indeed, a considerable amount of research provides evidence in support of music's capacity for social bonding (e.g. Kirschner & Tomasello, 2010). Singing is perhaps the most pervasive and accessible form of music. It lends itself well to performance by large groups and can be accomplished without formal training. The current study investigates the social benefits of group singing in the context of a diverse group of children in middle childhood.

What features differentiate group singing from other types of group activity? Group singing typically requires a high level of cooperation among members but so too do many other types of group activity. Other salient features include the emphasis on creative expression and the need for synchronization of body movements. This latter aspect is closely related to rhythmic entrainment, whereby performers internalize the external rhythmic pulse (Demos et al., 2012). For example, singing in unison requires synchronization of laryngeal muscles (Echternach et al., 2016). Another layer of synchrony is provided by way of the song's pitch interval structure, which exerts subtle influences on facial and head movements (Thompson & Russo, 2007). Finally, as the phrasing of lyrics will influence respiration, group singing will also lead to synchronization of respiratory patterns (Müller & Lindenberger, 2011).

Social psychological research conducted over the last twenty years has explored movement synchrony as one explanation for the social bonding capacity of joint musical activity. Movement synchrony appears to influence interpersonal affiliation (Bernieri, 1988; Hove &

Risen, 2009; Marsh, Richardson, & Schmidt, 2009; Miles, Nind, & Macrae, 2009). For example, Hove and Risen (2009) conducted a series of experiments in which they measured participants' affiliation with the experimenter following various degrees of movement synchrony. Participants were asked to tap their finger in time with a metronome. The experimenter manipulated movement synchrony by tapping along synchronously, asynchronously, or not tapping along with the participant. Results demonstrated that movement synchrony positively predicted participant ratings of affiliation towards the experimenter.

The effects of joint-music making on affiliation may be mediated by increased recognition of interpersonal similarity arising from movement synchrony. Perceived similarity between individuals has been shown to increase following a task where individuals are required to move in unison (Valdesolo & DeSteno, 2011; Valdesolo, Ouyang & DeSteno, 2010). This effect of movement synchrony on perceived similarity has also been established in children (Rabinowitch & Knafo-Noam, 2015).

Joint music making may also generate a shift in social categorization whereby the group moving together becomes a collective social unit. McNeill (1995) describes this as *boundary loss* or *we-ness*. Caporael and colleagues (1989) argue that when an individual redefines him or her self as a member of a collective social group, they become more likely to behave in ways that primarily benefit the group. Given that movement synchrony may support the generation of a collective social group, it should also enhance the tendency for individuals to behave in ways that benefit the group. Indeed, research demonstrates that movement synchrony encourages prosocial and cooperative behaviours (Anshel & Kipper, 1988; Cirelli, Einarson & Trainor, 2014; Kirschner & Tomasello, 2010; Kokal et al., 2011; Valdesolo & DeSteno, 2011; Wiltermuth & Heath, 2009).

The link between movement synchrony and cooperation has been investigated through the assessment of many different prosocial and cooperative tasks. Strategic decision-making games, such as the prisoner's dilemma, are particularly effective as they evaluate whether an individual behaves in a manner that maximizes their own self-interest or that of the group. These games also provide insight into trust and loyalty towards others (see Axelrod & Hamilton, 1981).

Wiltermuth and Heath (2009) assessed cooperation using a strategic decision making game following conditions of synchronous singing, synchronous singing-and-moving, asynchronous singing, and no singing or moving. Results demonstrated that cooperation was significantly higher in the synchronous conditions compared to the asynchronous and no moving conditions. Notably, the two synchronous conditions led to statistically comparable levels of cooperation suggesting that group singing is just as effective without accompanying gross motor movements. Furthermore, individuals who had engaged in the synchronous conditions reported higher feelings of being on the 'same team' relative to the other conditions, indicating the development of a collective identity.

The social benefits of joint music making also appears to be present in young children (Kirschner & Tomasello, 2010) and even infants as young as one year (Cirelli, et al., 2014; Tuncgenc, Cohen, & Fawcett, 2015). Taken together, these studies demonstrate that joint music making is a powerful social force capable of promoting cooperative behavior across various segments of the population.

The current study is novel in that it explores the effects of group singing on cooperation in middle childhood (ages 6-11 years). Although the age in which intergroup biases emerge has not received formal consensus in the literature (for example, see Aboud, 1988; Nesdale, 1999;

Quintana, 1998; 2007), there are several reasons why middle childhood was selected as our target population. According to Quintana (1998; 2007), children at this age have reached a stage of socio-cognitive development in which they understand social hierarchies and have adopted corresponding intergroup biases. Critically, children at this age have also developed the concrete operations that give them access to an enhanced awareness of others' perspectives and attitudes, including individuals perceived to be part of a different social group (Quintana, 1999). Thus, middle childhood may be an ideal age for an intervention that promotes prosociality in a diverse environment.

Current study

In the current study, we assessed whether group singing would foster cooperation in a diverse group of children in middle childhood. Children in predetermined groups were assigned to one of three activity conditions: group singing, group art, or competitive games. The addition of the group art activity allows us to disentangle the prosocial benefit of movement synchrony from the prosocial benefit of cooperative and creative expression. While the singing and art conditions are both positive social interactions that involve cooperation and creative expression, singing offers an additional mechanism to promote prosocial behaviors as it embodies a rhythmic and melodic framework that may encourage movement synchrony. Therefore, we expected that group singing would lead to more prosocial outcomes than group art.

Methods

Participants and procedure

Fifty children from a YMCA summer camp in Toronto, Canada participated in this study. See Table 1 for participant descriptives. Participants were recruited through the YMCA summer

camp located in downtown Toronto, Canada. This camp was chosen for its highly diverse camper population drawing from neighborhoods that are socioeconomically and ethnically diverse. All parents and children were informed about the procedures of the study and provided consent and assent respectively. The design was quasi-experimental, whereby children were already assigned to predetermined camp groups based on age range and program-specific camp. The study was conducted with a total of twelve different camp groups throughout the summer. Pre-determined camp groups were pseudo-randomized to activity conditions ensuring that ages and program-specific camps were equally represented. The study consisted of three activity conditions: group singing, group art or competitive games. In the group singing condition, each child was asked to write down a few things they love about living in Toronto. As a group, the children incorporated these thoughts and ideas into a song that they all performed together. In the group art condition, each child was asked to write down a few things they love about living in Toronto. As a group, the children incorporated these thoughts and ideas into a mural that they all coloured together. Care was taken to ensure that the group singing and group art conditions involved a similar level of cooperation. In the competitive condition, children were engaged in competitive games (e.g., coin tossing). Activities in all three conditions lasted about 30 minutes.

Dependent Measure

Immediately following the activities, children were randomly assigned into dyads and were asked to play a children's version of the prisoner's dilemma game developed by Matsumoto et al. (1986). Each child was given a red card and a blue card. The red card represented competition and could defeat the blue card. The blue card represented cooperation. In each round, players decided to play the red card or the blue card resulting in three potential outcomes. When one player decided to compete (red card) and the other to cooperate (blue card), the competitor

won the round and earned two gems, while the cooperator earned nothing (competitive). When both players decided to compete by playing the red card, both players earned nothing (stalemate). When both players decided to cooperate by playing the blue card, both players earned one gem (equalization). Children were told that the winner of the game could trade in their gems at the end of the game for prizes. Each dyad began the game with three trial rounds to ensure that everyone understood how to play the game. Once it was clear that all participants understood the rules, the game was played for twenty trials. Participants were permitted to discuss strategy with their partner. Research assistants observed the interactions in real time and marked down the choices made by participants on each trial. While the children's version of the game has been simplified, it resembles the adult version in that cooperative action and trust are necessary in order to receive the highest payoffs. All participants were compensated with a nominal gift at the end of the study regardless of gem total.

Scoring

Each child was given a score from 1 to 4 on each trial of the game that was determined on the basis of cooperation. One point was awarded for betrayal, wherein the child played a red card despite a strategic discussion indicating cooperative intentions. Two points were awarded for competition, wherein the child played a red card without any strategic discussion. Three points were awarded for cooperation, wherein the child played a blue card without any strategic discussion. Four points were awarded for collaboration, wherein the partners had a strategic discussion indicating cooperative intentions and acted loyally, regardless of whether a red or blue card was played. The cooperation score for each participant was then computed by averaging the scores on 20 trials. Camp counselors were asked to rate the level of pre-activity friendship of each dyad on a scale of zero (not friends at all) to five (very good friends) in order to control for

any pre-existing friendships among the participants.

Results

A break down of the mean number of trials at each level of cooperation (1-4) is seen in Figure 1. Two dyads were removed from subsequent analyses because at least one partner received scores greater than three times the interquartile range of their condition. Because cooperative behavior was nested within dyads ($ICC = .188$), we analyzed our hypotheses within a multilevel framework. Cooperation was regressed on condition, friendship, gender, and age. Condition and friendship were fixed whereas gender and age were entered as random factors. Consistent with our hypothesis, we found a main effect of condition on cooperation ($B = -.291$, $SE = .01$, $p = .008$), but no effects of age ($B = -.045$, $SE = .047$, $p = .35$), gender ($B = .06$, $SE = .083$, $p = .47$) or friendship ($B = .042$, $SE = .083$, $p = .52$). Pairwise comparisons revealed that individuals in the singing condition ($M = 2.9$, $SD = .49$) exhibited significantly higher levels of cooperation than those in the art condition ($M = 2.36$, $SD = .26$), ($t(23.15) = 3.87$, $p = .001$) and those in the competitive condition ($M = 2.34$, $SD = .3$), ($t(24.6) = 3.95$, $p = .001$). No difference was found in cooperation between the art condition and the competitive condition ($p = .82$).

To examine how cooperation might have evolved over time across trials, a follow-up analysis was run with time included in the multilevel model. There was a significant interaction between condition and trial ($B = -.022$, $SE = .005$, $p < .001$). As may be seen in Figure 2, cooperation increased across trials for the singing condition ($B = .044$, $SE = .008$, $p < .001$) only. In contrast, cooperation did not change across trials for the art ($B = -.017$, $SE = .011$, $p = .123$) or competition conditions ($B = .00$, $SE = .006$, $p = .941$).

Discussion

The current study explored the influence of group singing on cooperation in a diverse group of children. Children in pre-determined groups were randomly assigned to a 30-minute activity involving group singing, group art, or competitive games. Group singing led to the highest levels of cooperation. Group art and competitive games were not distinguishable with respect to cooperation.

Previous research has demonstrated the positive influence of joint music making on cooperative behavior in children (Kirschner & Tomasello, 2010); however, the current study is the first to empirically demonstrate such benefits in middle childhood. This is a potentially important finding especially in the diverse classroom because of the increased reliance of ethnic and racial categories at this age (see Quintana, 1999; 2007).

In as much as cooperation is linked to social cohesion, it seems possible that the singing may have also helped to foster a collective identity. While the current study emphasized a superordinate identity (i.e. Torontonians) in both the singing and the art conditions, children in the singing condition were more likely to cooperate, suggesting collective group membership. Thus, it appears likely that group singing was more effective than group art at altering the focus of group boundaries and inducing a sense of *we-ness*. Moreover, singing appears to have set children on a trajectory leading to an enhancement of cooperation over time.

Limitations and future research

The current study has some limitations that should be considered when interpreting the results. First, the study does not provide a means of deciphering the extent to which hedonic factors may have been responsible for the social benefits of group singing. Future research

should consider taking a measure of enjoyment or mood that would allow for statistical control over the influence of hedonic factors. Second, our interpretation of the results would have benefited from inclusion of a control group whereby children completed no activity. Third, the current study investigated cooperation in a diverse environment; however, we were not able to directly manipulate an intergroup variable. Future research would benefit from a design that systematically assigns participants to intergroup dyads in order to directly assess the benefits of singing on intergroup cooperation.

Conclusions

Group singing appears to foster an increase in cooperative behaviors in a diverse group of children. We argue that these cooperative gains are the result of movement synchrony. The findings of this study have important implications for fostering positive social relations in the diverse classroom.

Table 1*Group descriptives*

Condition	Sample size	Mean Age(SD)	Male/Female
Group singing	16	7.125(1.26)	3/13
Group art	16	8.06(1.73)	6/10
Competitive	18	8.44(1.38)	7/11

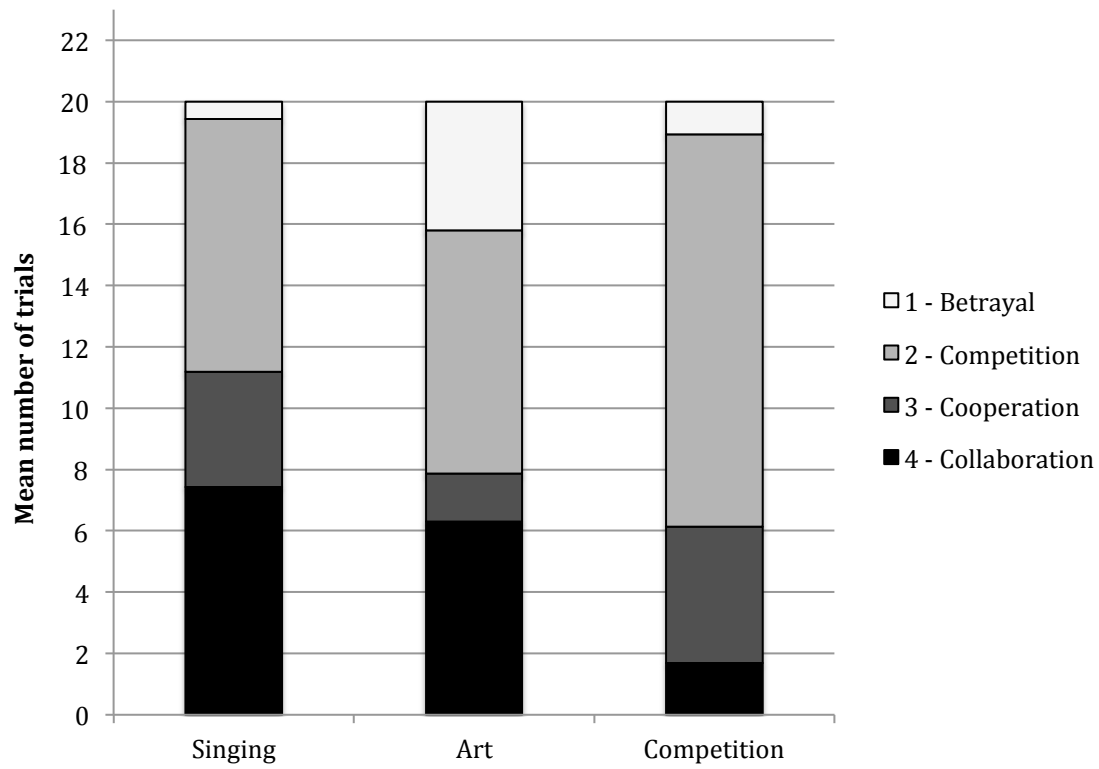


Figure 1. Mean number of trials (out of twenty) for each level of cooperation on the prisoner's dilemma game following three activity conditions.

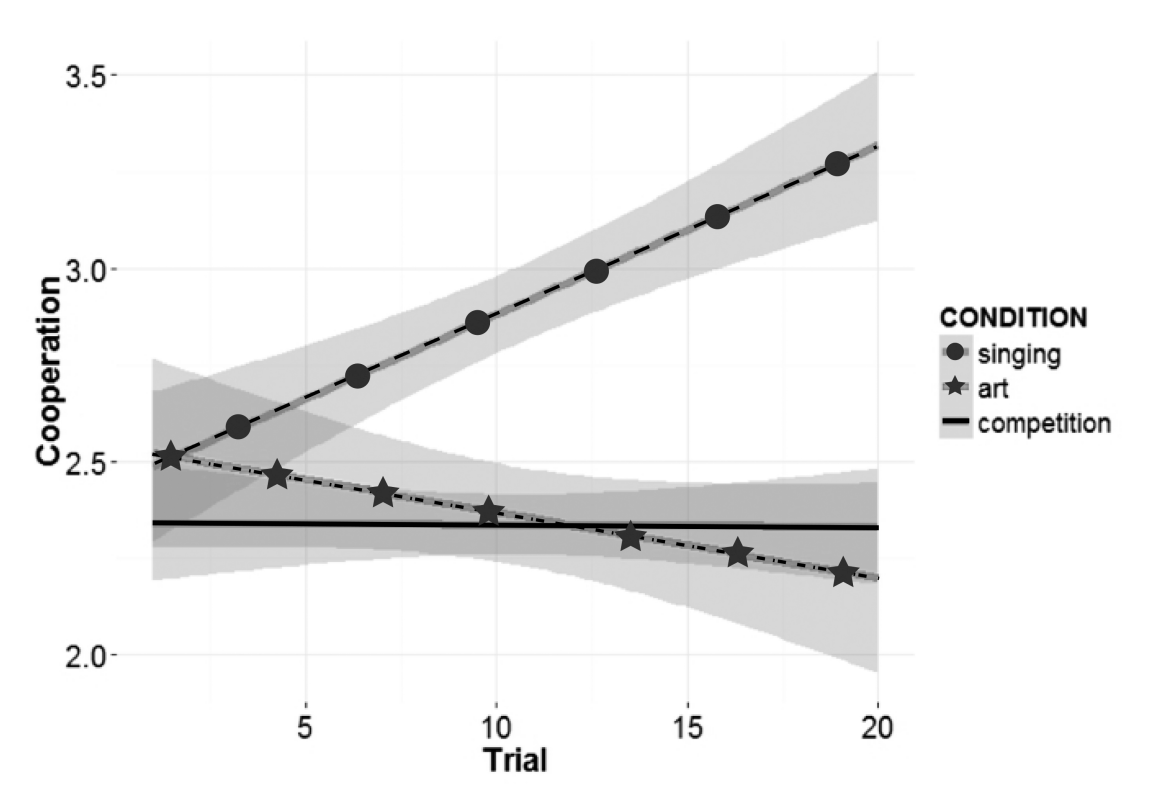


Figure 2. Mean level of cooperation across 20 trials. Grey shading represents standard error.

Additional Information

Please refer to Appendix C for supplementary materials, including an additional questionnaire that was administered but not used in any further analyses due to a lack of validity on the measure.

Please refer to Appendix D for additional analyses that were run.

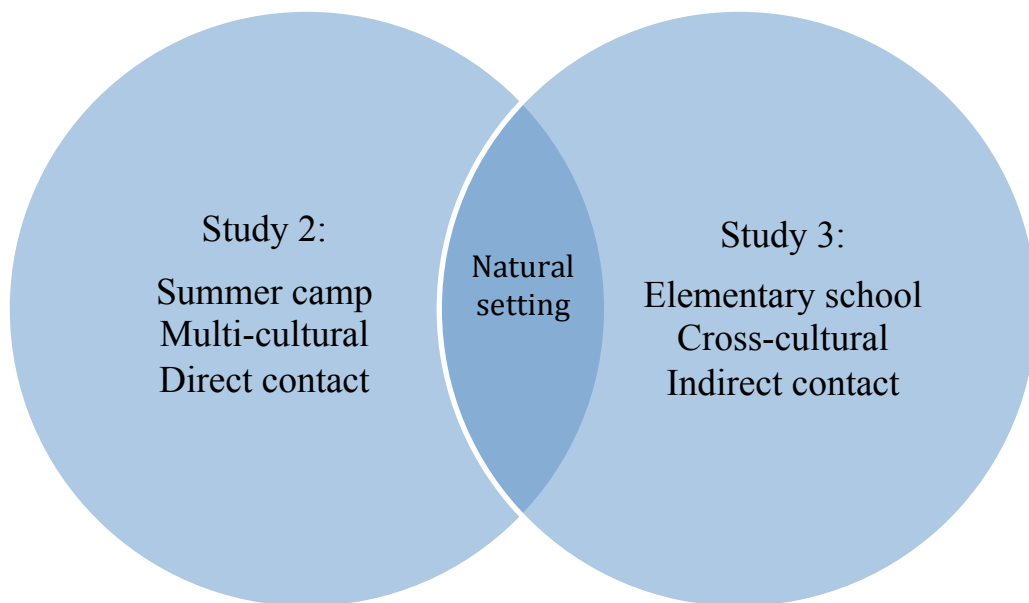


Figure 3. In this chapter, I learned that applying joint music making in an urban camp environment promoted cooperation within the naturally diverse group. In the next study, I wanted to extend the scope of this effect by exploring whether singing foreign songs could act as a form of indirect contact between naturally occurring cultural groups.

Chapter IV: STUDY 3

Singing foreign songs promotes a shared common humanity in children

Abstract

Several studies support the notion that singing songs of foreign cultures can improve intergroup relations in elementary school children. The current study was designed to provide insight regarding two potential mediators of this effect: increased perceived similarity with the out-group and the formation of a more inclusive collective identity. Elementary school children in two pre-determined groups participated in a six-week, crossover study in which they received two music interventions: (1) singing songs from the foreign (out-group) cultures and (2) singing songs from their own (in-group) culture. Qualitative and quantitative data analyses demonstrate that singing foreign songs led to higher levels of perceived similarity towards out-group others and promoted the adoption of a collective identity. Furthermore, interviews elucidated that singing foreign songs encouraged children to appreciate the unique identity of each culture while acknowledging their shared common humanity, suggesting the cultivation of a dual identity. Theoretical and practical implications of these results are discussed.

Introduction

Singing foreign songs appears to be an effective way to reduce prejudice in elementary school children (Chen-Hafteck et al., 2016; Ilari et al., 2013; Sousa, Neto, & Mullet, 2005). For example, Sousa, Neto, and Mullet (2005) investigated the use of song in a program designed to reduce prejudice and negative cultural stereotypes in elementary school children. Children in Portugal underwent a program focusing on learning and understanding the culture of the Cape Verdians, a racial minority in Portugal. Compared to a control group who underwent a regular cultural education curriculum, children who learned to sing Cape Verdian songs showed significantly fewer negative stereotypes and less prejudice towards the minority culture. These results and others (Chen-Hafteck et al., 2016; Ilari et al., 2013) suggest that supplementing prejudice-reduction programs with foreign songs yields benefits.

The social identity theory (SIT) may be especially relevant in understanding these benefits. According to the SIT, when an individual perceives similarities between group features and the self, they will psychologically identify as a member of that group (Tajfel & Turner, 1986). This group becomes known as the in-group, while all other comparable groups become known as the out-groups. This dichotomization creates the ‘us versus them’ mentality that can lead to prejudice and discrimination (see Hewstone, 2002 for review). Importantly, the saliency of group membership depends on the pertinence of group characteristics within a given situation (e.g. nationality during an international sporting event like the Olympics may override subordinate identities, like ethnicity).

Consistent with the SIT, it seems likely that singing foreign songs may generate a collective identity across cultures. In particular, singing foreign songs may increase perceived

similarities amongst cultures and encourage recategorization from subordinate groups (such as ethnicity and race), to a broader superordinate group (such as humanity), which is an index of improved intergroup relations (Gaetner et al., 1994; Gaertner, Dovidio, & Bachman, 1996).

Reducing intergroup attitudes through social recategorization

Social categorization can bias our attitudes and behaviours towards others. In particular, assumed similarity and shared group membership are associated with in-group biases. For example, in an effort to maintain a positive self-concept, individuals tend to like, trust, and help members of their in-group (Dovidio et al., 1997; Tajfel & Turner, 1986). In comparison, assumed dissimilarity and low levels of out-group understanding are associated with out-group biases (Dovidio, Gaertner, & Kawakami, 2003; Islam & Hewstone, 1993; Sue & Sue, 1999). For example, some individuals may expect negative outcomes with an out-group member in anticipation of, and during a contact situation. This expectation is known as intergroup anxiety (Stephan & Stephan, 1985; see Stephan, 2014 for review) and is often reported as a leading cause of prejudice and discrimination (Stephan & Stephan, 1984; 1985, 2000).

Since the process of social categorization plays a fundamental role in the formation of intergroup biases, managing this process has important implications for mitigating intergroup biases (Hewstone, 2002). As such, a number of social categorization-based approaches to reducing intergroup biases have been established. In particular, the *recategorization* approach suggests that altering the boundaries from subordinate groups ('us vs. them') to a broader superordinate group ('we') will be a highly effective way to mitigate intergroup biases (Gaertner et al., 1993; Gaertner & Dovidio, 2000).

The Common Ingroup Identity Model (CIIM) is a well-developed formalization of the

recategorization approach (Gaertner & Dovidio, 2000). According to the CIIM, the induction of a superordinate identity creates a cognitive shift that ameliorates attitudes and behaviors towards individuals who would have formerly been considered as members of the out-group (see Gaertner & Dovidio, 2005 for review). In other words, encouraging the in-group to be a more inclusive “we” seems to diminish the circumstances for out-group derogation. It is important to note that *a dual identity* can also be cultivated through the adoption of a superordinate identity while maintaining salience of the subordinate identities (Dovidio et al., 2000; Gaertner et al., 1990; Gaertner & Dovidio 2000; Wright et al., 1997). A substantial body of research demonstrates that inducing a superordinate identity effectively improves intergroup relations (e.g. Dovidio et al., 1997; Gaertner et al., 1989; 1990; Nier et al., 2001).

Indirect intergroup contact may be used to induce the superordinate identity

Intergroup contact involving certain conditions, such as cooperation and common goals, appears to be most effective at bringing groups together (Allport, 1954; see Pettigrew, 1998). Drawing on tenets of the SIT, a contact environment that highlights similarities between individuals or an existing common group membership (e.g. school affiliation or humanity) may facilitate the formation of a superordinate identity (e.g. Nier et al., 2001).

However, constraints (e.g., geographical separation) that restrict the scope of direct contact between groups have prompted an exploration of indirect means of intergroup contact. Indeed, various different means of indirect intergroup contact, including imagined encounters (Crisp & Turner, 2009; 2010; see Miles & Crisp, 2014 for a review; Vezzali et al., 2011) and media-mediated contact, such as television or books (Cameron et al., 2006; 2007), seem to effectively foster positive intergroup relations. For example, Vezzali et al. (2011) found that elementary school children who had imagined a positive interaction with an unknown immigrant

peer demonstrated more positive attitudes and behavioural intentions towards immigrants compared to a control group. In another example, Cameron et al. (2006; 2007) found that children who had read a story that highlighted a common group membership among the characters had a more positive attitude towards the out-group character compared to a control group. Taken together, these studies suggest that groups at a physical distance can be brought together psychologically to improve intergroup relations.

Singing foreign song as a strategy of indirect contact

Singing songs is a universal activity that can easily be shared amongst individuals from different cultures. Foreign song and dance is often rich with cultural information that may be effective for generating a positive cultural learning experience. As such, singing foreign songs may provide an opportunity for indirect contact with a foreign culture. Moreover, singing songs promotes social bonding (e.g., Kirschner & Tomasello, 2010), and may be a particularly effective way to generate a superordinate identity.

One element unique to musical activity is the proclivity to move to music (Demos, et al., 2012; Reddish, Fischer, & Bulbulia, 2013). In particular, the rhythmic pulse of song induces a shared internal rhythm in participating individuals, which stimulates the coordination of body movements. For example, singing in unison requires synchronization of laryngeal muscles (Echternach et al., 2016). Another layer of synchrony is provided by way of the song's pitch interval structure, which exerts subtle influences on facial and head movements (Thompson & Russo, 2007). Finally, as the phrasing of lyrics will influence respiration, group singing will also lead to synchronization of respiratory patterns (Müller & Lindenberger, 2011). Although movement coordination is occurring indirectly, singing foreign songs involves simulating the physical experiences by embodying the movements of another culture. Connecting with others

through the shared physical experience of movement coordination has been shown to be an effective tool for social bonding (Demos, et al., 2012; Reddish, Fischer, & Bulbulia, 2013).

The impact of movement coordination on social bonding is an idea that has received considerable attention within the field of social psychology over the last twenty years. Research has demonstrated that movement coordination promotes social bonding in a variety of different populations and contexts (Hove & Risen, 2009; Good & Russo, *in press*, 2016; Kirshner & Tomasello, 2010; Wiltermuth & Heath, 2009). For example, Wiltermuth and Heath (2009) found that groups of participants who sang together were more likely to feel like they were on ‘the same team’ compared to participants that did not sing together. Movement coordination has also been shown to improve indices of a collective identity, including prosocial behaviours and cooperation, in children (Good & Russo, *in press*, 2016; Kirshner & Tomasello, 2010). Furthermore, although relatively unexplored, researchers have demonstrated that forms of movement coordination, such as movement mimicry, can have prosocial benefits across intergroup boundaries (Inzlicht et al., 2011).

The social bonding capacity of movement coordination appears to be mediated by increased interpersonal similarity. Research shows that movement coordination elicits increasing levels of perceived similarity in terms of personal characteristics amongst those moving together (Demos et al., 2012; Hove & Risen, 2009; Rabinowitch & Knafo-Noam, 2015; Valdesolo & DeSteno, 2011; Valdesolo, Ouyang & DeSteno, 2010). For example, Rabinowitch and Knafo-Noam (2015) found that children who had engaged in coordinated tapping via metronome with a partner reported higher levels of similarity compared to those who had not engaged in coordinated tapping. Simply put, individuals who move the same, feel the same. Given the tendency for individuals to identify with those who are perceived as more similar (Tajfel &

Turner, 1986), this may be one explanation for why singing songs promotes a collective identity.

The current study

Although movement coordination has been shown to induce a collective identity amongst those directly moving together, it is currently unknown whether this same effect will occur if the movement coordination is occurring indirectly. The current study assesses whether singing foreign songs highlights similarities and induces a superordinate identity (e.g. a shared common humanity) across intergroup boundaries. Over a six week period, children in two classes (grade five and grade six) participated in two, three-week music interventions: (1) songs from the in-group culture (Jewish) and (2) songs from foreign out-group cultures (Kenyan and Chinese) as a form of imagined contact with these cultures. The study utilized a crossover design whereby both classes participated in the two music interventions. The study had three hypotheses. First, I predicted that singing foreign songs would lead children to perceive that they are more similar to out-group others than they previously thought. Second, I predicted that singing foreign songs would encourage a social recategorization based on the superordinate identity (e.g. a shared common humanity) as compared to before singing foreign songs. Third, I predicted that singing foreign songs would lead to improved behavioural intentions towards individuals from the target out-group.

Methods

Participants

Twenty-nine children from a private, Jewish day school in Toronto, Canada participated in the study. Children were recruited from two predetermined classes. Each class was randomly assigned to an order of music intervention: out-group/in-group intervention (Out-In condition) or in-group/out-group intervention (In-Out condition). The Out-In condition consisted of 14

children, 8 males and 6 females (mean age=11.36 years). The In-Out condition consisted of 15 children, 6 males and 9 females (mean age=10.1 years). At the start of the study, children were asked to identify what culture they belong to. The question was administered in an open-ending format. The majority of children (90%) self-identified as Canadian and/or Jewish (one participant self-identified as Scottish, and two participants failed to answer the question).

Music Intervention

All parents and children were informed about the procedures of the study and provided consent and assent respectively. Children in both conditions participated in a six-week music intervention whereby they learned to sing songs from different cultures. See Figure 1 for an overview of the procedure. For the first three weeks of the study (stage 1), one class sang songs from the out-group cultures (The Out-In condition) and the other sang songs from the in-group culture (the In-Out condition). The in-group music intervention allowed for control over demand characteristics and mood changes following singing that might have influenced the ratings¹. For the second three weeks of the study (stage 2), the two classes switched interventions.

The singing sessions took place once per week during a regularly scheduled, 45-minute music class, resulting in a total of six singing sessions. The same teacher taught the songs in both conditions using keyboard accompaniment. During the first half of each singing session, children learned the lyrics and melody of the songs. Children were provided with a handout containing lyrics along with an English translation (refer to Appendix E for songs and lyrics). Each line of the song was taught in a ‘repeat-after-me’ method whereby the teacher stopped at the end of each line in order for students to repeat back the lyrics. During the second half of the singing session,

¹ While it would have been ideal to include a no-music control group, a compromise needed to be struck in order to meet the curriculum needs of the school.

children learned the accompanying dance moves to each song. The remaining time in the class was spent practicing singing and dancing the song. The out-group intervention included songs from foreign countries (including Kenya and China²); the in-group intervention included Hebrew songs from Israel. Songs used in the study were selected based on several criteria, including ubiquity within the culture and lyrical themes of social relations (e.g., making friends, being welcome). During the out-group intervention, the teacher showed the class a demonstration video of children from the target countries singing and dancing to their songs. Although children were not explicitly told to imagine singing with children from the out-group, media-mediated contact provided a means of indirect contact.

Data collection

Quantitative data (questionnaire). Perceived similarity and behavioural intentions were assessed using a questionnaire designed for this study (refer to appendix F for complete methodology and supplementary materials). Students completed the questionnaire at three different times: before the first singing session, one-week after stage 1 (prior to commencing stage 2), and one-week after stage 2. The questionnaire asked the children to “*Imagine there is a new student in your class. This student is [target culture].*” Each page presented an imaginary new student from a different culture. The questionnaire incorporated the target out-group cultures (Chinese and Kenyan), as well as the in-group culture (Jewish). The questionnaire utilized a Likert-type scale ranging from one (definitely not) to five (definitely), including one item to measure perceived similarity (“*I think I would have a lot in common with the new student*”) as well as three items assessing behavioural intentions (e.g., “*I would invite the new*

² We had set out to study three out-group cultures; however, due to time constraints and other limitations, the lyrics and melody from Brazil were not properly learned. As such, this culture was omitted from quantitative analysis. However, see Appendix G for analyses with Brazil.

student over to my house after school). Composite means of these three items were calculated as the rating of behavioural intention (pretest, $\alpha=.703$; stage 1, $\alpha=.707$; stage 2, $\alpha=.771$).

Qualitative data (interview). The experimenter conducted one-on-one interviews with all the participants in order to qualitatively explore the effectiveness of the intervention. Interviews took place in a private room and followed a semi-structure, open-ended design. Students were asked to elaborate on their experiences during the intervention, how much they learned, what they learned, and how it affected the way they feel about in-group and out-group cultures. Each interview lasted approximately 10 minutes. All participants were interviewed following stage 1; however, resources were only available to interview participants in the In-Out condition following stage 2. The second round of interviews with the In-Out condition was prioritized as it provided an opportunity to compare pre- and post- out-group intervention interviews.

Coding of qualitative data. The interview data were subjected to a thematic analysis following an immersion/crystallization approach (Crabtree & Miller, 1999). The first author and a second coder (who analyzed de-identified transcripts) read through the interview transcripts, immersed in the experiences of the participants until themes and patterns emerged. Analysis was guided by an apriori framework, with special attention paid to themes of perceived similarity and social categorization. Cohen's κ was run to determine if there was agreement between two coders. There was substantial level agreement between the two coders' judgments on perceived similarity ($\kappa = .761, p < .0005$) and social categorization ($\kappa = .638, p < .0005$).

Results

Quantitative analysis

Perceived similarity. See Figure 2 for ratings of perceived similarity. One child in the Out-In condition did not fill out the questionnaires and one participant was removed from subsequent analyses because they received a score greater than three times the interquartile range of their condition resulting in 13 participants in the Out-In condition. Perceived similarity ratings were entered into a mixed-design ANOVA with Intervention Order (In-Out/Out-In) as a between-subjects factor and Time as the within-subjects factor (pretest, stage1, stage2). A quadratic interaction ($F(1, 25) = 6.913, p=.008, \eta_p^2=.21$) was found between conditions, suggesting that the pattern of effect differed for each intervention order depending on the time of testing. Secondary analyses revealed that between pretest and stage 1, the Out-In condition increased in similarity ($p=.05$), whereas the In-Out condition remained unchanged ($p=.414$). The pattern reversed from stage 1 to stage 2 such that the Out-in condition remained unchanged ($p=.35$), whereas the In-Out condition increased in similarity ($p=.015$).

Behavioural intentions. Behavioural intention ratings were entered into a mixed-design ANOVA in the same manner as above. Mauchley's test indicated that the assumption of sphericity had been violated ($\chi^2(2)=8.79, p=.012$); therefore, degrees of freedom were corrected using the Greenhouse-Geisser correction. Neither an effect of time ($F(1.5, 40.1) = 1.4, p=.26$), nor interaction ($F(1.5, 40.1) = .77, p=.47$) were observed.

Qualitative analysis: Thematic codes

Four major themes emerged from thematic analysis of the qualitative data: Enjoyment, effective cultural education, perceived similarity, and superordinate identity. Below we present

the results. To help illustrate themes, we include excerpts from the interviews (see table 2 for qualitative themes).

Enjoyment. Participants reported enjoying the cultural learning through song. 100% of the participants in the Out-In condition explicitly reported enjoying learning about different cultures and different languages (*“I liked learning different language...and it sounds cool to hear songs from other countries”* and *“You got to learn cool stuff like songs from other places, which was fun”*). During stage-2 interviews, the In-Out condition reported that they enjoyed the second half of the study more than the first (*“I liked it more than the first part –it was kind of more like fun because the first time we always learn Hebrew songs this time was a bit different it was fun learning new things”*). Furthermore, 60% of the participants explicitly reported that they enjoyed the experience of learning about different cultures and languages (*“I liked learning what different cultures sing and what their songs are”*).

Effective cultural education. Participants reported having learned more about the target cultures through their songs. In the Out-In condition, while 14% of participants reported that they did not learn anything from the intervention, the remaining 86% of the participants reported that the out-group songs taught them something about the target cultures. Participants reported learning about musical culture (*“I learned about the different types of music and their dances”*) and language (*“I learned a lot of stuff – I learned how to say hello in Swahili.”*). Of particular interest, several of the participants specifically noted the effectiveness of learning about different cultures through songs (*“[The songs] can tell me kinda like the personality kind of the country. The way the song flows is kind of how they flow I guess”*).

This theme was also evident during the stage-2 interview with the In-Out condition. 100% of the participants reported that the out-group songs taught them something about the target cultures. Participants reported learning about musical culture (*“I learned that there are a lot of traditional songs in other countries”*) and language (*“[I know] a little more about the language- probably. Because I learned a little of the language in the song.”*) Participants in this condition also made the explicit connection between having learned the songs and knowing a little more about the culture (*“I feel like it tells you a bit about who the people are based on the songs that they write”*).

Explicit gain in insight. Furthermore, several participants specifically reported gaining insight following the out-group music intervention. This theme was noted when a participant explicitly stated that their way of thinking had been changed by the invention (*“It changed the way I think about the countries – now I have more of a relationship with them”*).

Perceived Similarities. Participants were asked to consider *“What are the similarities between you and the children from these countries?”* Given large differences in the quality of responses to this question, we grouped the statements into three categories of perceived similarity. The first category included vague, perfunctory statements about what the children have in common (*“I think similarities is that we are all nice”*); the second category included general way of life/kid stuff (*“maybe if you are in grade 5 somewhere else you learn the same stuff”* or *“We all like to play and do sports and we all go to school”*); a final category included specific statements about musicality as being something that everyone has in common. (*“They are just like us, learning songs and performing them at the end of the year”* and *“Everyone has songs that they learn, like nursery rhymes and stuff. Everyone likes to put on a show”* and *“We both have songs and people like sometimes like to sing those songs so they could just relax and*

sing”). See Figure 3 for an illustration of the percentage of participants that reported similarities broken down by category. After learning out-group songs, children were much more thoughtful when discussing similarities. Of particular interest, participants in both conditions noted musicality as being something that the different cultures have in common.

Social Categorization. We grouped the statements into three categories of social categorization.

The first sub-theme is intergroup categorization, which included statements that highlighted differences between the different countries (*“Me and the people from Kenya, we would have different personalities, they probably like colouring and sports but we are more privileged...”*).

The second sub-theme is the common ingroup identity, which included statements of shared humanity or an identity that everyone fits into (*“We’re all kids”* and *“We are both human obviously”*). The third sub-theme is the dual identity, which included statements that implied an

understanding that individuals can hold a dual identity. This theme required an

acknowledgement of both subordinate as well as superordinate identities in the same statement

(*“they not are a lot different than us, they just grew up in different place”* and *“Just because their skin is darker than mine doesn’t mean that they couldn’t be just like me”*). See Figure 4 for

the percentage of participants that reported social categorization broken down by category.

Participants in both conditions made statements that implied a common ingroup identity;

however, the theme of dual identity was most prevalent after learning out-group songs.

Discussion

The current study investigated whether singing foreign songs increases perceived similarity, induces a superordinate identity, and improves behavioural intentions across cultures in elementary school children. We found evidence to support two of our three hypotheses. First, we found that singing foreign songs increases levels of perceived similarity with out-group others.

Second, we found evidence to suggest that singing foreign songs induces a superordinate identity across cultures, namely a dual identity. However, contrary to our third hypothesis, we found limited evidence that singing foreign songs improves behavioural interventions towards out-group others.

Singing foreign songs provided an opportunity for children to recognize the similarities across cultures. Our quantitative findings regarding the effect of singing foreign songs on perceived similarity was validated by the qualitative interviews. Children were found to discuss similarities with the out-group more thoughtfully after the out-group music intervention. More specifically, children seemed to become aware that singing is a universal activity that can be easily shared across foreign cultures. Given that perceived similarity is one of the fundamental criteria for self-categorization in a social group (Tajfel, 1970), findings from this study suggest that singing foreign songs may encourage the development of a superordinate identity, on the order of humanity.

Indeed, interviews substantiated that children became more likely to adopt a superordinate identity after the out-group music intervention. However, rather than adopting a common ingroup identity, which seemed to be evident in children even prior to the out-group music intervention, findings demonstrated the adoption of a dual identity. More specifically, while children recognized the similarities across cultures, they also noted the unique qualities of each culture. Singing foreign songs appears to have effectively maintained the saliency of each subordinate identity by giving insight into the lifestyle, behaviours, and belief system of each culture (e.g., Lomax, 1959; Merriam, 1964; Whiteley, Bennett, & Hawkins, 2004).

Although ‘colorblind’ ideologies, whereby ethnic and racial boundaries are deemphasized are more widely accepted in school settings (see Firebaugh & Davis, 1998), recent research has

provided convincing evidence that group memberships should not only be acknowledged, but also celebrated (Richeson & Sussbaum, 2003; see Schofield, 2006 for review). Singing foreign songs is an easy and accessible way to achieve this end. For this reason, singing foreign songs may be a particularly powerful classroom tool for prejudice reduction.

Limitations

First, the lack of a control group, whereby the children are exposed to foreign cultures through conventional methods of teaching, limits our ability to draw conclusions regarding the effects of movement coordination. Second, given the sensitive nature of the concepts involved in the current study, we acknowledge the potential presence of demand characteristics. Children at this age are beginning to develop an understanding of intergroup relations and the consequences of prejudice and discrimination (Quintana, 2008). Third, singing foreign songs was not effective at improving behavioural intentions towards a member of the out-group. One important limitation of the current study is that the indirect contact did not explicitly ask children to imagine a positive encounter with a member of the out-group. Previous interventions that successfully improve behavioural intentions involve explicit scenarios of positive encounters with a member of the out-group (e.g., Cameron et al., 2007; Vezzali et al., 2011). Future research should explore the role of more explicit forms of indirect contact using foreign songs. For example, children could be asked to imagine singing the songs with children from each target culture.

Conclusion

The current findings provide insight into a potential mechanism for the effectiveness of supplementing cultural education programs with foreign songs. Singing foreign songs is a fun and engaging way for individuals to learn about the similarities and the unique differences of foreign cultures. Furthermore, it seems to encourage the adoption of a superordinate identity,

which theoretically diminishes the opportunity for out-group derogation. Singing foreign songs is easily implemented in a cultural education classroom and appears to be an effective way of connecting individuals, even at a distance.

Table 1*Group descriptives*

Condition	Sample size	Mean Age(SD)	Male/Female
Out-In	14	11.36(1.26)	8/6
In-out	15	10.1(1.73)	6/9

Table 2*Qualitative themes from participant interviews*

Themes	Subthemes	Definition	Example statement
Enjoyment	Cultures/language	Expression of enjoyment – i.e. cultures and languages	“I enjoyed learning about all the different cultures – I never thought all those things would be so much fun...”
	Foreign songs	Expression of enjoyment – i.e. singing the foreign songs	“It was so fun. So fun! I like learning all the songs”
Cultural learning	No learning	Statement that no learning had occurred	“Too much stuff to remember”
	Culture/language	Statement of learning – i.e. culture/language	“The languages they speak and what words mean.”
	Music/songs	Statement of learning – i.e. foreign songs	“I learned a lot of new songs that I never knew”
	Learned more than music	Explicit connection that learning foreign songs helped in understanding a culture	“I feel like it tells you a bit about who the people are based on the songs that they write”
Similarities	Perfunctory	Little to no thought in answering the question	“We are all nice”
	Kidstuff	Statement of experiences shared by all kids around the world	“We both maybe go to school”
	Musicality	Statement that cultures share musicality and all enjoy music	“We both have songs and people like sometimes like to sing those songs...”
Social categorization	Intergroup identity	Statement of different, subordinate identities	“ Me and the people from kenya, we would have different personalities...”
	Common in-group identity	Statement of only one, superordinate identity	“We are all kids”
	Dual identity	Statement of superordinate identity and subordinate identities	“We are all the same inside, but just how we live is different”

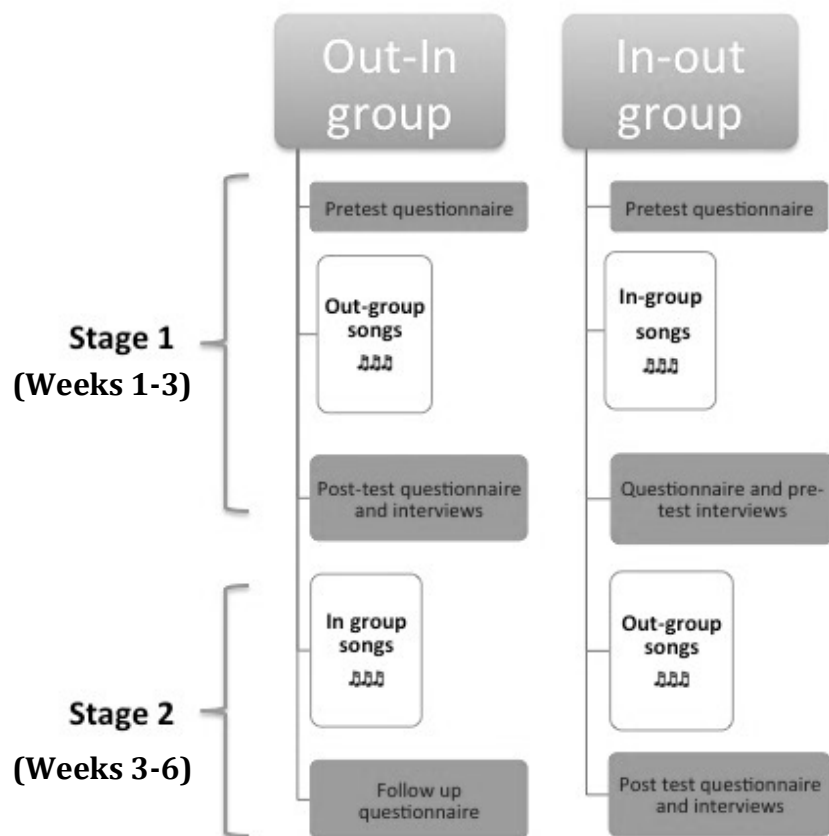


Figure 1. Overview of study procedures

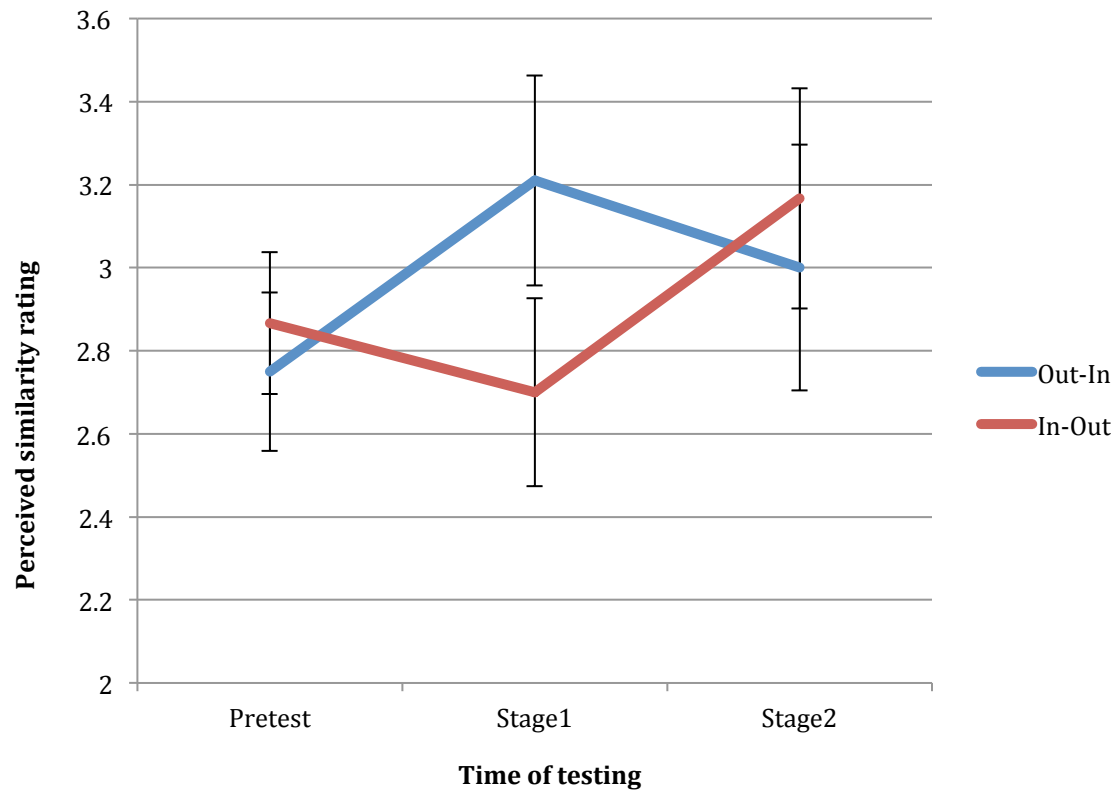


Figure 2. Ratings of perceived similarity towards children from foreign countries.

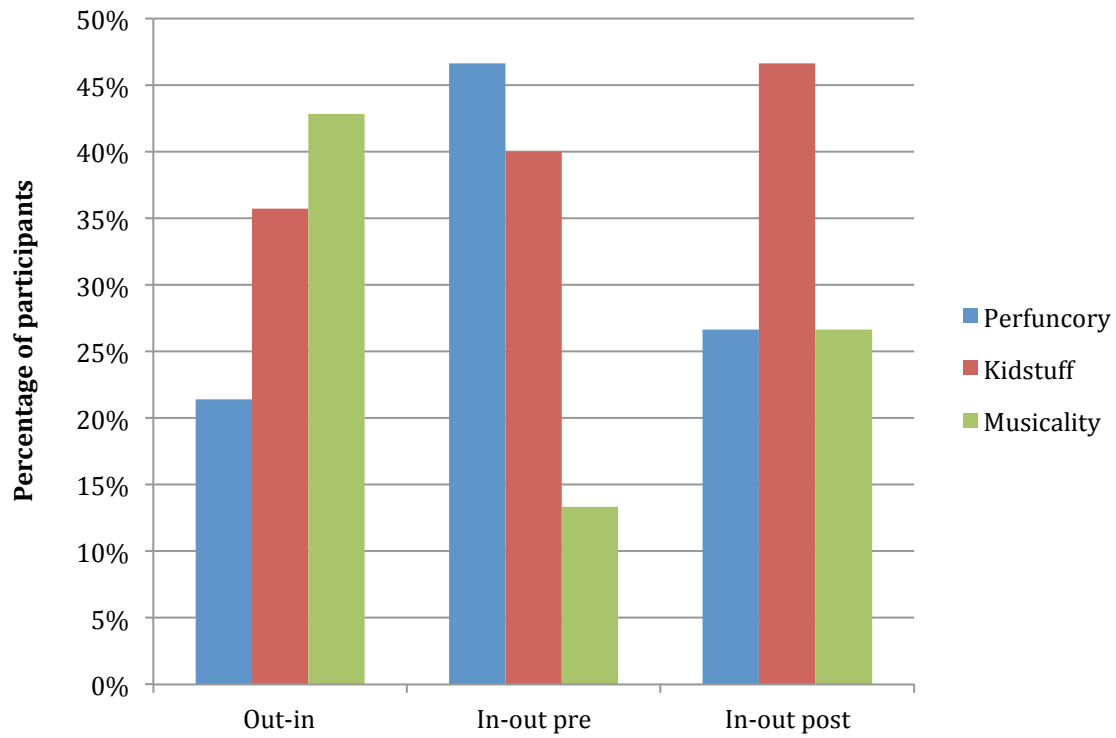


Figure 3. Percentage of participants discussing perceived similarities (broken down by category) towards children from foreign countries. Data collected from the blind second coder.

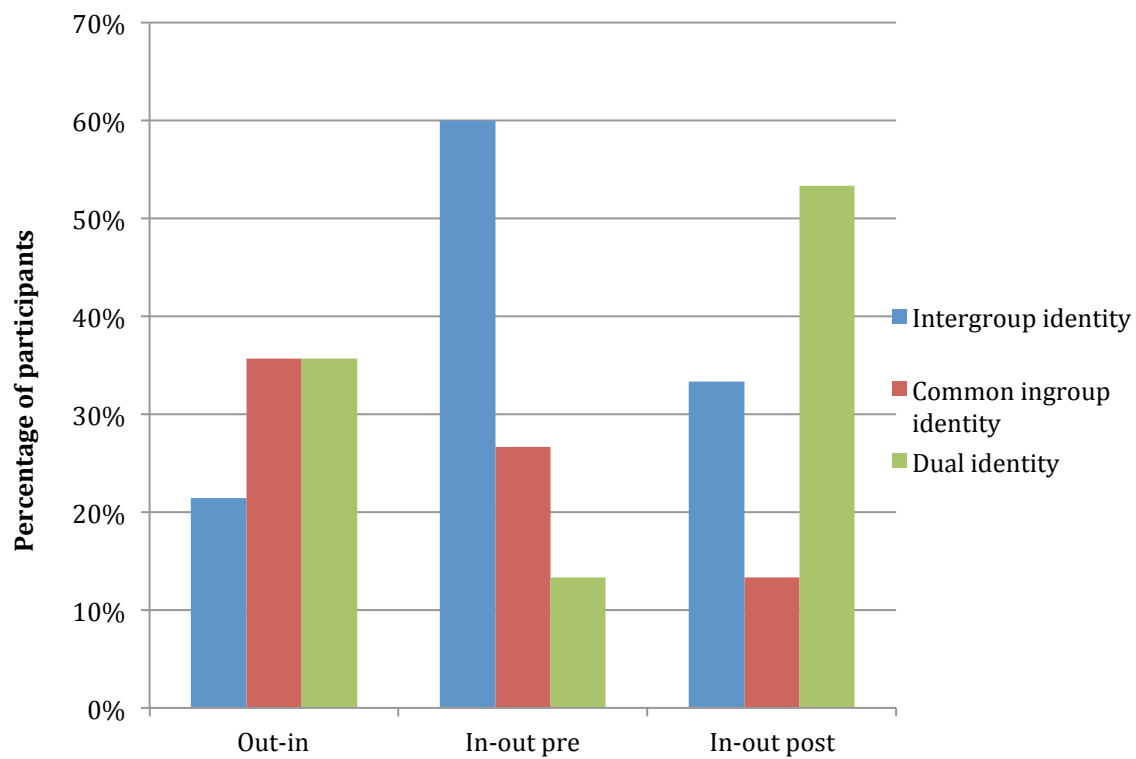


Figure 4. Percentage of participants discussing social categorization (broken down by category). Data collected from the blind second coder.

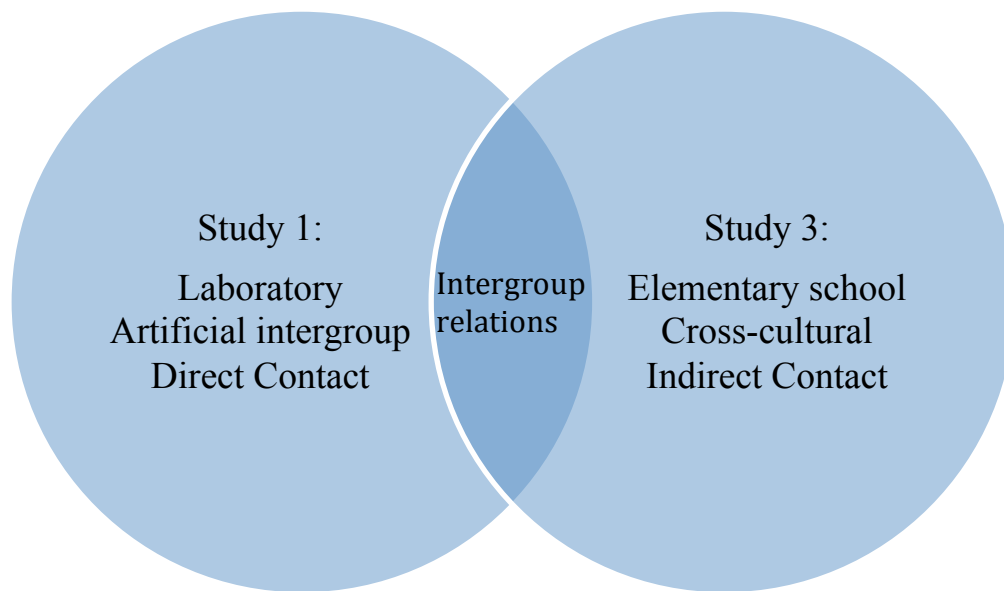


Figure 5. In this study, I found that singing foreign songs influences social categorization between naturally occurring groups. This study provides ecological support in corroboration with findings from study 1 and extends the scope of this effect by applying singing as a form of indirect intergroup contact.

Chapter V. General discussion

While researchers have convincingly demonstrated that joint music making has the capacity to impact social bonding within groups, the main goal of this dissertation was to investigate whether this social bonding capacity will extend across intergroup boundaries. My central hypothesis was that joint music making will foster a superordinate identity and promote cooperation across intergroup boundaries. My hypothesis was derived from a strong theoretical foundation, drawing from the social identity theory and the embodied social cognition literature. Three research studies provide preliminary empirical evidence that joint music making promotes a superordinate identity and cooperative behaviours across intergroup boundaries.

Recapitulation of the three studies

This dissertation consisted of three research studies that explored the social bonding capacity of joint music making in various intergroup contexts, including, (1) minimal groups created in a controlled laboratory (Study 1), (2) an ethnically diverse camp environment (Study 2), and (3) a cultural education program in a uni-cultural classroom (Study 3).

In study 1, two minimal groups were brought together under conditions of movement synchrony designed to encourage participants to perceive the aggregate as one group (intergroup synchrony), two groups (intragroup synchrony), or six separate individuals (asynchrony). The main finding of this study is that movement synchrony successfully altered the saliency of group boundaries in the intended way. Furthermore, the movement synchrony condition influenced cooperation. In particular, intergroup movement synchrony fostered more cooperation across intergroup boundaries than the other two conditions.

Studies 2 and 3 were field studies that investigated the social bonding capacity of joint music making in elementary school children in natural intergroup contexts. Study 2 assessed the

influence of group singing on social bonding in an ethnically and socio-economically diverse environment. In this study, groups of elementary school children participated in one of three activity conditions: group singing (involving cooperation and synchrony), group art (involving cooperation but no synchrony), and competition (neither cooperation nor synchrony). The main finding of this study is that group singing led to the highest levels of cooperation, an index of collective identity, compared to the activities in the other two conditions.

Study 3 assessed the potential of singing foreign songs on social bonding at a distance. In a pre-post design, singing foreign songs was employed as a strategy of indirect, imagined intergroup contact. The main findings of this study are that singing foreign songs encouraged children to notice the similarities between cultures and emphasized a superordinate identity across intergroup boundaries.

Taken together, these findings advance our understanding of the social bonding capacity of joint music making and provide a compelling demonstration that this capacity can be harnessed across intergroup boundaries. While a couple of studies have recently explored the social impact of joint music making across intergroup boundaries (Pearce et al., 2016; Tunçgenç & Cohen, 2016), the current work provides the first demonstration of the impact on social categorization and cooperative behaviour. The next section will provide a discussion of the theoretical context for these findings.

Joint music making as a strategy of intergroup contact

The intergroup contact theory (Allport, 1954) is a leading theoretical framework for understanding intergroup relations. Its application to the promotion of contact across intergroup boundaries has received considerable support in the literature (e.g. Pettigrew 1998; 2006; 2008).

Joint music making is a positive social interaction that theoretically achieves the optimal conditions of positive intergroup contact - equal status, common goals, cooperation, and authority support - outlined in Allport's (1954) original hypothesis. For example, in the case of group singing where all members are singing in unison, individuals use the same instrument and sing the same song (equal status); each individual must learn to perform the song to the best of their ability (common goals); individuals must work together to optimize their sound as a collective (cooperation); and in the specific case of singing in a camp environment or classroom, the counselors or teachers are implicitly sanctioning the activity (authority support).

For these reasons, I argue that these three research studies can be interpreted through the lens of the intergroup contact theory. More specifically, in the case of studies 1 and 2, individuals coordinated their movements with others physically located in the same space. As such, joint music making was used as a means of achieving direct intergroup contact. In the case of study 3, individuals simulated the movements of others not physically located in the same space (i.e., foreign cultures). Thus, it can be argued that singing foreign songs was used as a means of achieving indirect, imagined intergroup contact (e.g., Miles & Crisp, 2014).

Joint music making influences social categorization

One major finding across all three studies is that joint music making impacted the cognitive process of social categorization. Previous research suggests that positive intergroup interactions can encourage the generation of a superordinate identity (Gaertner et al., 1990). Likewise, intragroup interactions can strengthen the cohesion of the in-group leading to enhance behavioural biases (Gaertner & Schopler, 1998). The current work provides evidence that joint music making can be used as a strategy of interaction that can influence social categorization. Study 1 provided the most direct evidence in support of this notion. This study demonstrated that

movement synchrony strategically altered the cognitive representation of an aggregate group when intergroup boundaries had been made salient through a minimal groups paradigm. More specifically, movement synchrony emphasized group boundaries in the following way: intergroup synchrony induced the superordinate identity; intragroup synchrony maintained the minimal group identity; and asynchrony induced the individual identity.

While study 1 investigated the effect of a joint music making task on social categorization in arbitrarily created minimal groups, studies 2 and 3 tested this effect amongst groups of children in naturally existing groups. These studies found evidence that joint music making generated a collective identity amongst those moving together (directly and indirectly). Although study 2 did not include a specific measurement of social categorization (perhaps a limitation of the experiment), the study demonstrated the positive impact group singing has on prosocial behaviour in the prisoners' dilemma game, which measures whether dyads think and behave in a collective way.

Study 3 provided insight into one potential mechanism for why joint music making generated a collective identity. Specifically, singing foreign songs highlighted the similarities across different cultures. This finding was elucidated during the interviews whereby children were more likely to provide thoughtful and specific (rather than perfunctory) statements regarding the similarities across cultures after learning the foreign songs. Not surprisingly, the human propensity to enjoy participating in musical activities was the most prevalent theme to bridge the gap between foreign cultures.

Unfortunately, given the lack of a proper control group whereby students were exposed to the cultures through conventional learning techniques, the exact reason for the increase in

similarity can only be speculated. One potential explanation for this finding is individuals who move the same, feel the same. This explanation would be consistent with previous research demonstrating that movement coordination elicits increasing levels of perceived similarity in terms of personal characteristics between an individual and their counterparts moving in unison (Rabinowitch & Knafo-Noam, 2015; Valdesolo & DeSteno, 2011; Valdesolo, Ouyang & DeSteno, 2010). Another potential explanation for this finding is that exposure to foreign culture through a universal activity (i.e., singing) highlighted an existing commonality across cultures. Future research should consider assessing perceived similarity following other activities involving music (e.g., passive listening to music), or other universal activities (e.g., cultural art) in order to isolate the role of movement coordination.

The common thread across the studies is that movement coordination fostered a collective identity amongst those moving together, even when intergroup boundaries were salient. This finding has important implications for intergroup relations. Managing the cognitive process of social categorization can mitigate intergroup biases (see Brown & Hewstone, 2005 for review). In particular, broadening the conceptualization of the in-group ('we') channels the same positive in-group bias to previously considered out-group others and theoretically diminishes the circumstances for out-group derogation. Since joint music making appears to induce a collective group identity across intergroup boundaries, the current research provides evidence that this may be an effective tool for diminishing out-group derogation and improving intergroup relations.

Joint music making influences cooperation

Caporael and colleagues (1989) argue that when an individual redefines him or her self as a member of a collective group, they become more likely to behave in ways that benefit the group. For this reason, one by-product of the social bonding capacity of joint music making is

the tendency to behave cooperatively and prosocially (e.g. Kirschner & Tomasello, 2010). The findings from the current research provide some support that this effect transcends intergroup boundaries.

Studies 1 and 2 demonstrate two novel findings for the effect of joint music making on cooperation. Study 1 found that movement synchrony influences cooperation in a group. More specifically, movement synchrony with members of the in-group promoted cooperation *within* group boundaries, and movement synchrony with members of the out-group promoted cooperation *across* group boundaries. Study 2 found support that this effect can be applied in a natural environment with a diverse group of children. Furthermore, study 2 teases apart the prosocial benefit of movement synchrony from the prosocial benefit of other forms of intergroup contact. In particular, group art achieves the same conditions of intergroup contact as group singing; however, the critical difference is that group singing involves movement synchrony while group art condition does not. Since group singing led to higher levels of cooperation than group art, results of Study 2 suggest that movement synchrony contributes something additional to the ‘optimal’ conditions of intergroup contact.

However, the results of Study 3 did not find evidence that joint music making improved children’s responses on a measure related to cooperation, namely behavioural intentions towards foreign children. For this reason, joint music making may have been limited as a strategy of indirect intergroup contact. Previous interventions that find improvements on behavioural intentions involve explicit scenarios of positive contact with a member of the out-group (e.g., Vezzali et al., 2011). The current research did not include explicit instructions to imagine positive contact with the target out-groups, which may be a reason for this lack of effect.

Field research: strengths and limitations

Studies 2 and 3 were conducted in the natural environments of a summer camp and an elementary classroom setting respectively. This aspect of the research contributes to the ecological validity of the findings, and in particular, demonstrates how the research findings have direct applicability to educational practice in this age group. Nonetheless, I must acknowledge that conducting research in a natural environment also imposed certain limitations, including small sample sizes and greatly reduced experimental control. Despite my initial motivations in regard to the design of Study 2, I was ultimately unable to strategically assign children from different backgrounds (pre-established groups) to intergroup dyads. Consequently, this study was limited in its ability to generate conclusions that are specific to intergroup relations. Future research exploring this topic should manipulate dyads to vary in terms of whether partners are members of the same or different social groups (e.g. ethnicity or gender), in order to directly assess the influence of group singing on cooperation across group boundaries.

With regards to study 3, a strict curriculum in the school restricted the implementation of an ideal research design. For example, due to scheduling limitations, there was not enough time allotted to learning each song (only 45 minutes per song). In particular, the song from Brazil was not well learned and had to be removed from subsequent analyses (however, see Appendix G for analyses that include Brazil). Moreover, it would have been ideal to include a control group that enabled the comparison of singing foreign songs with conventional methods of teaching about foreign cultures; however, school authorities did not sanction time for the study outside of the 45-minute music class.

Future directions of research

There are several additional variables that are critical to a thorough understanding of the impact joint music making might have on intergroup relations. Although I could not include all of these variables within the scope of the current dissertation, I would like to acknowledge a few of the relevant variables and offer suggestions for future investigations.

The role of mood in song. While the current work focused on movement synchrony, it is unknown whether other factors of joint music making, namely the mood of the music, contributed to the effect. Music is a powerful tool of mood induction (Juslin & Sloboda, 2001; Juslin & Västfjäll, 2008). Future research in this field could explore whether the mood induced by the song will influence social bonding. For example, in the current research, the target songs were all upbeat and contained lyrical themes of social bonding and community. Future work can manipulate the mood of the song by altering the tempo, the mode of the melody (e.g., major versus minor mode), or the lyrical content in order to determine the role of mood on the social outcomes.

Perspective taking and the self-other overlap. The development of perspective taking abilities is an on-going process throughout childhood. While the ability to take on the perspective of others appears to be partially present around four years, development continues into middle childhood (Selman, 1980). Perspective taking is a critical ability for social relations as it increases the overlap between representations of the self and others (i.e. the self-other overlap), which appears to lead to more positive evaluations of others (Davis, Conklin, Smith, & Luce, 1996). An increased self-other overlap has implications for intergroup relations as it also leads to more positive evaluations of an out-group as a whole (Galinsky & Moskowitz, 2000; Vescio, Sechrist, & Paolucci, 2003).

Movement coordination has been found to promote a better understanding of another's perspective (Bavelas, Black, Lemery, & Mullett, 1986), even when coordinating with an out-group other (Inzlicht, Gutsell, & Legault, 2012). For this reason, researchers have suggested that designing music programs for children in middle childhood should feature synchronized movements so as to increase perspective taking, and potentially the self-other overlap (Behrends, Müller, & Dziobek, 2012; Rabinowitch, Cross, & Burnard, 2013). Since an increase in the self-other overlap may play an important role in improving intergroup relations, future research in this area should consider the role of self-other overlap when investigating the impact of joint music making on intergroup relations.

Other indices of intergroup relations. Pettigrew (1998) outlined three indices of positive intergroup relations. These indices include intergroup affect, prosocial behaviours, and the cognitive representation of a group. According to the embodied social cognition literature, movement coordination can increase positive affect (e.g. Hove & Risen, 2009), prosocial behaviours (e.g. Kirshner & Tomasello), and the social bonding of a group (e.g. Lakens & Stel, 2011). These particular social constructs adhere faithfully to the indices of positive intergroup relations outlined by Pettigrew (1998). While the current research provides some evidence for the impact of joint music making on cooperation and social bonding across intergroup boundaries, future work should systematically explore the influence of joint music making on these indices of intergroup relations, namely intergroup affect and prosocial behaviours beyond strategic decision making games.

Implications and practical considerations

The findings of this dissertation have important implications for development of theory regarding the social consequences of movement coordination as well as the application to

prejudice reduction programs in and out of the classroom. First, the current work offers novel insight into the social bonding capacity of joint music making by providing a compelling demonstration of how this capacity can extend across intergroup boundaries. These results help to lay the foundation for an emerging subfield of research that explores how music can be used to promote positive intergroup relations (Pearce et al., 2016; Tunçgenç & Cohen, 2016).

Second, my findings contribute to a growing body of literature emphasizing the importance of musical activity as an education tool. Singing and other musical activities are often used to support classroom instruction as they can be hedonically, cognitively, and socially stimulating (Hallam, 2010). More specifically, in a cultural education classroom, singing has been demonstrated to enhance cultural awareness (Failoni, 1993), promote foreign language learning (Good, Russo, & Sullivan, 2015; Ludke, Ferreira, & Overy, 2014), and reduce prejudice (Chen-Hafteck et al., 2016; Ilari et al., 2013; Sousa et al., 2005). The current work suggests that singing may also encourage children to adopt a more inclusive social identity and to behave prosocially across group boundaries. A country like Canada has an increasingly diverse community, and unfortunately, many individuals continue to experience prejudice and discrimination. It is important to generate new methods for promoting positive intergroup relations. Joint music making is easily implemented in environments beyond the classroom and may thus be considered a powerful social tool that is capable of uniting individuals across intergroup boundaries.

Conclusions

In sum, the current dissertation suggests that joint music making in an intergroup context can lead to social bonding and higher levels of cooperation across intergroup boundaries.

Returning to the famous quote about music that was referred to at the outset of the dissertation (*“Music is the universal language of mankind”*), perhaps Longfellow was referring to the capacity for music to unite people within and across intergroup boundaries due to the universal propensity to coordinate movements.

Appendix A – Study 1 full methods/supplementary materials

Additional information for Stage 1:

The facilitator introduced the cooperative team building exercise comprised of a winter survival scenario (Johnson & Johnson, 1975) and a list of items that were to be ranked in order of importance for survival. Groups were instructed to create a team name, followed by a discussion of ranking the survival items. It was emphasized that all members of the group must agree on the final ranking. The minimal group formation stage of the study took twenty minutes.

Additional information for Stage 2:

The mean tempo of beats was 120 bpm, ranging from 80 to 150 bpm. Two rounds of tapping were completed, each lasting 90 seconds. To ensure that participants were adhering to their own beat (rather than their neighbours), a video camera was positioned overhead as a prop, and participants were led to believe that their tapping would be assessed for accuracy.

Additional information for Stage 3:

Public goods game. Each token invested in the private account yielded a payout of \$0.50 for the individual. Each token invested in the minimal-group account yielded \$1.00 to be split among the three-person minimal group. Each token invested in the public account yielded \$2.00 to be split among the six-person aggregate group. The most economically astute decision would be to consistently invest tokens in the private account while benefiting from the public contributions of others. As such, the game measures how willing the participants are to cooperate with either the minimal group or the aggregate group. Participants were entered into a draw following each round. The winner of the draw received an amount in cash equivalent to their earnings from one trial.

Questionnaire. Following the public goods game, participants completed a questionnaire that contained a number of other measures, including to what extent they felt the aggregate group was tapping in synchrony. Other measures are outlined below.

In-group/Out-group Attitudes. Participants were asked to evaluate from 1-not at all to 7 – very much their perception of the other participants on four concepts, including liking, similarity, trust, and honesty. The rating scale was completed for in-group members ($\alpha=.858$) (those in the same colour pinny) and out-group members ($\alpha=.828$) (those in a different colour pinny).

Perspective-Taking Scale & Empathy (Hodson et al., 2009; Batson et al., 1997)
The 6-item perspective-taking scale involved participants rating how much they agree with statements concerning perspective taking from 1-strongly disagree to 7-strongly agree (e.g., “*I can view the world as others view the world*”) ($\alpha=.885$), and the 6-item ($\alpha=.691$) empathy scale involved participants rating the extent to which they possess empathic traits (e.g. sympathy, compassion, warmth) from 1-not at all to 7-very much.

Cognitive Representations (based on Gaertner et al., 1996). The four-item scale is designed to assess the cognitive representation of the aggregate group. Participants responded on a scale from 1- strongly disagree to 7 –strongly agree. Two items ($r=.5$) were used to measure perceived superordinate identity (e.g., *Although there were different groups, it felt as though we were all playing on the same team*”),

Universal Orientation scale UOS (Phillips & Ziller, 1997). The 20-item ($\alpha=.664$) Universal Orientation Scale (UOS) is designed to assess non-prejudice. Participants responded using a scale from 1-strongly disagree to 5-strongly agree (e.g., “*When I meet someone I tend to notice similarities between myself and the other person.*”)

Appendix B – Study 1 additional analyses

Dependent Variables

Table B1

Mean(SD) and one-way ANOVA testing with condition as between-subjects variable.

Measure	Intergroup synchrony	Intragroup synchrony	Asynchrony	F-value significance
Outgroup attitudes	4.51(1.14)	4.61(1.05)	4.3(1.26)	F(2, 98)=.654, $p=.522$
Ingroup attitudes	5.00(0.89)	5.06(1.02)	5.01(1.2)	F(2, 98)=.029, $p=.971$
Empathy	5.19(.73)	5.38(.69)	5.34(.69)	F(2, 98)=.642, $p=.53$
Perspective taking	5.1(.90)	5.2(.83)	5.27(.86)	F(2, 97) = .322, $p=.73$
Cognitive representation	5.16(1.13)	4.47(1.68)	4.7(1.3)	F(2,98) = 2.178, $p=.119^*$
Universal Orientation	3.54(.33)	3.47(.37)	3.67(.36)	F(2, 81) = 2.23, $p=.114$

***Cognitive representation**

Planned comparisons on the cognitive representation of the aggregate as a superordinate identity revealed a significant difference between intergroup synchrony and intragroup synchrony ($p=.043$).

Correlations

Table B2

Correlation coefficient values (pearsons r) between four cognitive measures and contributions made to the aggregate account.

Measures	1	2	3	4
1. Perceived synchrony with aggregate	--			
2. Mean empathy	-.04	--		
3. Mean perspective taking	-.02	.75**	--	
4. Universal orientation	-.16	.55**	.38**	--
5. Contributions to the aggregate account	.06	-.02	-.05	.22**
Intergroup synchrony				.33*
Intragroup synchrony				.00
Asynchrony				.37**

Note. * $p < .01$, ** $p < .001$

Universal orientation results and discussion

While positive relationships were found between UOS and contributions to the aggregate account for the asynchrony ($r = .37, p = .039$) and intergroup synchrony ($r = .33, p = .073$) conditions, the relationship disappeared entirely in the intragroup synchrony condition ($r = .00, p = .98$). This finding suggests that the typical positive relationship between universal orientation and contributions to the aggregate account is disrupted when minimal groups are further reinforced by intragroup movement synchrony. Although some researchers have proposed that the effectiveness of these types of interventions may be reduced for individuals who are highly prejudiced and intolerant (e.g. Allport, 1954; however, see Hodson, 2011), the current study suggests that the effect of movement synchrony on cooperation in the current study was not limited by this characteristic.

Appendix C – Study 2 full methods/supplementary materials

Procedure

During the two group activities, although children contributed thoughts and ideas to the final creative product (i.e. a song or a mural), the counselor facilitated the process. To be specific, in the case of the song, the counselor pre-wrote the melody and ideas were incorporated into the pre-existing melodic structure; In the case of the mural, the counselor drew the outline of the ideas and the children were asked to colour in the lines.

Sharing

At the end of the prisoner's dilemma game, participants were asked whether they would like to ostensibly donate any of their earned gems to other campers who did not have the opportunity to play the game. The percentage of gems that the participants chose to donate was used as a measure of willingness to share.

Social cohesion questionnaire

In addition to the prisoner's dilemma game, children completed a short questionnaire *before* and *after* the camp activities. Questions were designed to tap into constructs of social cohesion and superordinate group identity, including social attraction, similarity, in-group favoritism, proximity, and belongingness/commitment of individuals in the group. This questionnaire was created specifically for this dissertation project by adapting questions from various measures in the literature (e.g. Group Attitude Scale, Evans & Jarvis, 1986). However, due to a lack of validity on the measure, possibly due to an inappropriate age group, it was not used in any further analyses. See questionnaire below.



Project on Camp Activities and Intergroup Cohesion

You do not need to write your name on this questionnaire. So feel free to express your **true** opinion in this booklet.

Group _____

Age _____

☐

I am a Boy.

☐

I am a Girl.

INSTRUCTIONS: Think about how much you agree with each sentence. Please check only one box in each line.

Thank you for participating in the project!

Overall, how much did you like the activity that you just did. Circle one.



Awesome



I liked it a lot



It was OK



I didn't really like it



I hated it

Look around at all the kids in your camp group. Please check how much you agree with each of the following sentences.



Really agree



Kind of agree



I'm not sure



Kind of disagree



Really disagree

1. We are all alike

☐
☐
☐
☐
☐

2. We are all friends

☐
☐
☐
☐
☐

3. I feel close with the other kids

☐
☐
☐
☐
☐

4. We all like to help each other

☐
☐
☐
☐
☐

5. We have the best camp group

☐
☐
☐
☐
☐

6. We all like to do the same things

☐
☐
☐
☐
☐

7. I can trust the other kids in my group

☐
☐
☐
☐
☐

8. I feel really different than the other kids

☐
☐
☐
☐
☐



Really agree



Kind of agree



I'm not sure



Kind of disagree



Really disagree

9. I wish I were in a different group

☐☐☐☐☐

10. I would share my toys with the other kids

☐☐☐☐☐

11. I like the other kids in my group

☐☐☐☐☐

12. I would invite the other kids to my birthday party

☐☐☐☐☐

13. I feel like I fit in

☐☐☐☐☐

Name three words that you would use to describe the other kids in your camp group?

Name three ways that you are similar to the other kids in your group.

Name three ways that you are different from the other kids in your group.

Appendix D – Study 2 additional analyses

Strategic discussion

Since participants were permitted to discuss strategy with their partner, I analyzed the frequency with which participants discussed a strategy with their partners (i.e. the total number of ones and fours each participant obtained over twenty trials) in order to determine any differences in likelihood that participants had a strategic discussion. An one-way ANOVA revealed a significant main effect of condition, $F(2, 45) = 7.85, p = .001$, such that both singing ($M = 8, SD = 5.98$) and art ($M = 10.5, SD = 7.02$) conditions yielded significantly higher rates of strategic discussion compared to the control condition ($M = 2.75, SD = 3.26$), p 's $< .05$. No significant difference was found between the singing and art condition. Of the trials in which there was a strategic discussion, I analyzed the percentage of collaborative outcomes (i.e. the percentage of fours). An ANOVA revealed a significant main effect of condition, $F(2, 39) = 6.41, p = .004$, wherein the singing condition had higher rates of collaborative outcomes (91.29%, $SD = .12$) than did art (57.81%, $SD = .31$) or control (54.08%, $SD = .41$) conditions, p 's $< .005$. No significant difference was found between the art and control condition.

The two cooperative conditions (singing and art) yielded higher levels of strategic discussion than the control condition. The cooperative group activities seemed to have generated a type of social interaction that enabled participants to feel comfortable discussing strategy with their partners. The critical difference lies in the ratio of collaboration to betrayal. Our findings suggest that when dyads discussed a strategy, only participants in the singing condition were more faithful towards their partners than were participants in the other two conditions.

Sharing

The sharing score was only analyzed for participants in the younger age group (i.e. under the age of ten years). A percentage score was calculated for each participant based on how many of their earned gems they chose to share with the other campers. A marginal main effect of condition was found $F(2, 39)=3.00, p=.062$. Pairwise comparisons revealed that the singing condition chose to share a significantly larger percentage of their gems ($M=38.25\%$, $SD=.07$) compared to the art condition ($M=11.91\%$, $SD=.052, p=.021$); however, no other significant differences between conditions were found (p 's $<.1$).

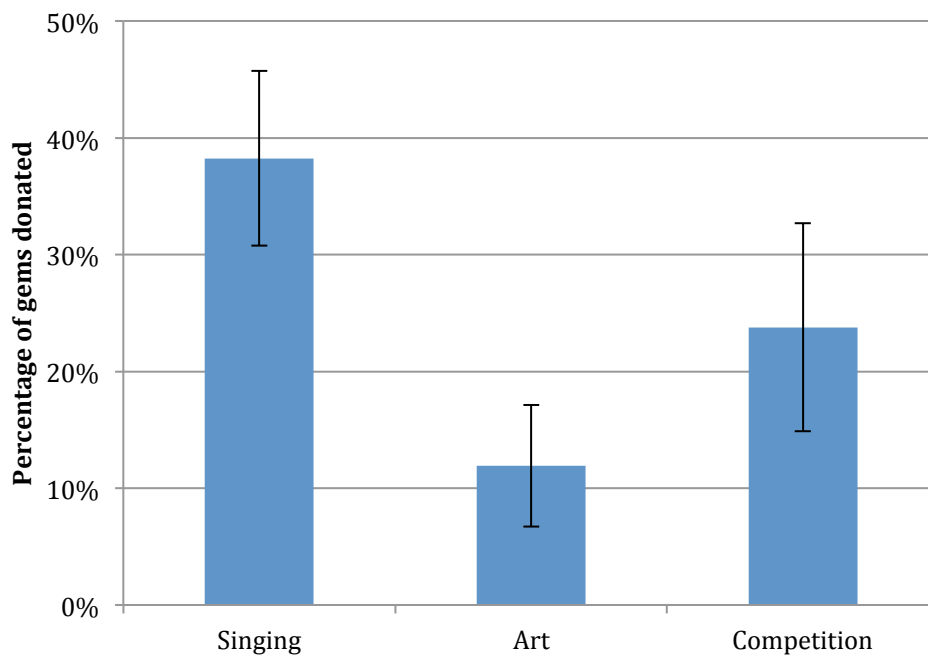


Figure D1. Percentage of earned gems that participants chose to share with the other campers.

OUT-GROUP CHINA

Song: 找朋友 (looking for a friend)

找朋友
(大众乐谱网制谱)

1=C 5 6 5 6 5 6 5 5 1̇ 7 6 5 3
找 呀 找 呀 找 呀 找， 找 到 一 个 朋 友，

5 5 3 4 5 5 3 5 5 3 4 5 5 3
敬 个 礼 啊 握 个 手 敬 个 礼 啊 握 个 手，

1 4 3 2 1 2 1
你 是 我 的 好 朋 友。

Lyrics:	Translation
zhǎo ya zhǎo ya zhǎo péng yǒu, 找 呀 找 呀 找 朋 友，	Look for, look for look for a friend
zhǎo dào yí gè hǎo péng yǒu 。 找 到 一 个 好 朋 友。	Find a good friend
jìng gè lǐ yā , wò wò shǒu yā, 敬 个 礼 呀，握 握 手 呀，	Give a salute shake hands
nǐ shì wǒ de hǎo péng yǒu。 你 是 我 的 好 朋 友。	You are my good friend
zài jiàn! 再 见！	

OUT-GROUP BRAZIL

Song: Pezinho (Little foot)

Ai bo - ta, a - qui, ai bo - ta, a - li o teu pé - zi - nho

O teu pé - zi - nho bem jun - ti - nho com o meu

E de - pois não vá di - zer

que vo - cê já me es - que - ceu que cer - ceu

Lyrics:	Translation
Ai bota aqui, ai bota ali O seu pezinho O seu pezinho bem juntinho Com o meu	Oh! Put it here, oh! Put it there Your little foot Your little foot, your little foot well close To mine
E depois nao va dizer Que voce ja me esqueceu	And don't say after this play That you now forgot my friendship
E ao chegar bem junto a ti Um abraco quero eu	And when I dance very close A big hug I want from you
Agora que estamos juntinhos Da um abraco e uns beijinhos	And now we are very close Give me a hug and little kisses

IN-GROUP ISRAEL

Song: Etzleinu Bechatzer (In our garden)

Lyrics:	Translation
Etzleinu bechatzer betzel atzei hazayit ba'im bederech k'lal hamon orchim lakayitz	In our garden in the shade of olive trees usually many guests come for the summer
Lechol echad mehem safah mishelo vederech mishelo lehagid shalom. (x2)	And each one of them has their own language and their own way to say hello. (x2)

IN-GROUP ISRAEL

Song: Zum Gali Gali

Lyrics:	Translation
Zum, gali-gali-gali, Zum gali-gali, Zum, gali-gali-gali, Zum gali-gali,	Zum, gali-gali-gali, Zum gali-gali, Zum, gali-gali-gali, Zum gali-gali,
Hechalutz lema'an avodah avodah lema'an hechalutz Hechalutz lema'an avodah avodah lema'an hechalutz	Pioneers all work as one Work as one all pioneers Pioneers all work as one Work as one all pioneers
Zum, gali-gali-gali, Zum gali-gali, Zum, gali-gali-gali, Zum gali-gali,	Zum, gali-gali-gali, Zum gali-gali, Zum, gali-gali-gali, Zum gali-gali,
Hechalutz lema'an avodah avodah lema'an hechalutz Hashalom lema'an ha'amin Ha'amin lema'an hashalom	Pioneers all work as one Work as one all pioneers Peace shall be for all the world All the world shall be for peace

Appendix F - Study 3 full methods

Additional quantitative data

Children's intergroup attitudes were assessed using a questionnaire designed for this study. Students completed the questionnaire at three different times: before the first singing session, one-week post stage 1, and one-week post stage 2. The full questionnaire incorporated seven cultures, including the three target out-group cultures (Chinese, Kenyan, Brazil), three secondary out-group cultures (Egyptian, Mexican, and Indian), and the in-group culture (Jewish) (see page 116 for sample culture on the questionnaire). In addition to perceive similarity and behavioural intentions, the questionnaire measured other dependent variables including intergroup anxiety, empathy and perspective taking, intended friendship, and trust (pretest, $\alpha=.824$; stage 1, $\alpha=.723$; stage 2, $\alpha=.717$).

Intergroup attitudes. The children were asked to rate how much an individual from the out-group would possess certain traits. Children were presented with the dichotomization of seven traits (not helpful/helpful, stupid/smart, mean/nice, ugly/ good-looking, unfriendly/friendly, dirty/clean, and not honest/honest) on a scale from one (most negative) to five (most positive) (pretest, $\alpha=.794$; stage 1, $\alpha=.814$; stage 2, $\alpha=.895$) Adjectives were taken from the Preschool Racial Attitude Measure II (Williams et al., 1975).

Self-identification. In addition, the children's own cultural identity was measured using six questions. One question was removed as it was misunderstood by the participants. A composite mean self-identity score was obtained for each child by collapsing across the six questions (pretest, $\alpha=.678$; stage 1, $\alpha=.523$; stage 2, $\alpha=.704$) See page 117 for self-identification survey)

*Imagine there is a new student in your class. This new student is:



Jewish






First, what do you think this new student would be like? Please put a check mark on each line to best describe the new student.

Not helpful	I-----I-----I-----I-----I	Helpful
Stupid	I-----I-----I-----I-----I	Smart
Mean	I-----I-----I-----I-----I	Nice
Ugly	I-----I-----I-----I-----I	Good-looking
Unfriendly	I-----I-----I-----I-----I	Friendly
Dirty	I-----I-----I-----I-----I	Clean
Not honest	I-----I-----I-----I-----I	Honest

Now,
your

what are
feelings






about the new student? Please put a check mark with the face that best reflects your opinion. Check only once on each line.

	 Definitely not	 Maybe not	 Not sure	 Maybe	 Definitely
1. I think I would be friends with the new student					
2. I think I would have a lot in common with the new student					
3. I would feel scared to meet the new student					
4. I can understand what the new student might be going through					
5. I would invite the new student over to my house after school					
6. I would trust the new student with a secret					
7. I would be happy to meet the new student					
8. I can imagine how the new student might be feeling					

Now think about your own culture

In terms of my own culture, I consider myself to be: _____

Please think about how you feel about your culture. Please put a check mark with the face that best reflects your opinion. Check only once on each line

	 Definitely	 Maybe	 Not sure	 Maybe not	 Definitely not
1. I have a lot of pride in my culture					
2. I feel a connection to my culture					
3. I participate in my cultural traditions (like food and music)					
4. I feel good about my culture					
5. If I could choose, I would prefer to be part of a different culture					
6. I feel like I fit in with my culture					

Appendix G - Study 3 Analyses with Brazil

Perceived similarity

Perceived similarity ratings were averaged across the three target out-groups (Kenya, Brazil, China). These mean ratings were entered into a mixed-design ANOVA with Intervention Order (In-Out/Out-In) as a between-subjects factor and Time as the within-subjects factor (pretest, stage1, stage2). A marginally significant quadratic interaction ($F(1, 26) = 3.379, p=.077, \eta_p^2=.115$) was found between conditions, suggesting that the pattern of effect differed for each intervention order depending on the time of testing. Secondary analyses revealed that the Out-In condition did not increase in perceived similarity from pretest to stage 1 ($p=.267$) nor stage 1 to stage 2 ($p=.603$), whereas the In-Out condition remained unchanged from pretest to stage 1 ($p=.695$); however, significantly increased in perceived similarity from stage 1 to stage 2 ($p=.034$).

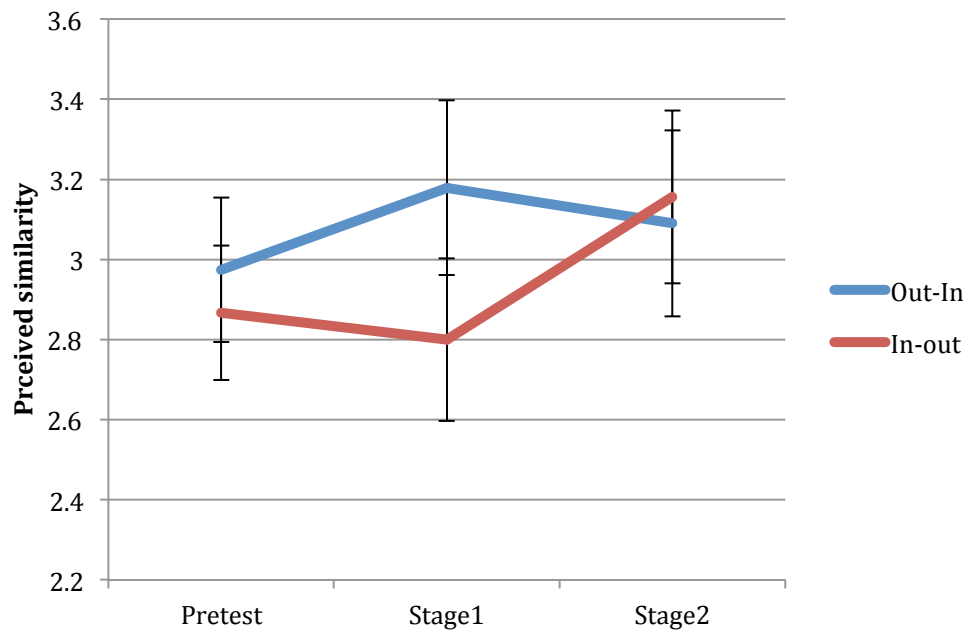


Figure G1. Mean level of perceived similarity across three cultures (Kenya, China, Brazil)

To explore any impact of the program on attitudes towards Brazilian children, I entered perceived similarity ratings for Brazil alone into a mixed design ANOVA. No significant increases in perceived similarity or interactions were found.

Table G1

Mean level of perceived similarity of Brazil only

Condition	Pretest	Stage1	Stage2
Out-In	3.23(.29)	3.15(.23)	3.27(.23)
In-out	2.87(.31)	3(.24)	3.13(.24)

Appendix H – Study 3 additional analyses

Table H1

Correlation coefficient values (pearsons r) between four measures and strength of self-identification

Measures (pretest)	1	2	3	4
1. Perceived similarity	--			
2. Intergroup Anxiety	-.29	--		
3. Empathy	-.34*	-.06	--	
4. Behavioural intentions	-.9**	-.36	.58**	--
5. Strength of self-identification	.11	-.42*	.17	.28

Note. * $p < .01$, ** $p < .001$

Since intergroup anxiety was significantly correlated with strength of self-identification, I ran a mixed design ANOVA on intergroup anxiety with strength of self-identification as a covariate. Mauchly's assumption was violated $\chi(2) = 7.71$, $p = .02$, as such, a greenhouse-geisser correction was applied to the degrees of freedom. An interaction between intergroup anxiety over time and self-identification was found $F(1.56, 39.2) = 4.15$, $p = .032$. These findings are consistent with evidence supporting the SIDT that the tendency to demonstrate out-group biases is dependent on the strength of self-identification (Nesdale, Durkin, Maass, & Griffiths, 2005).

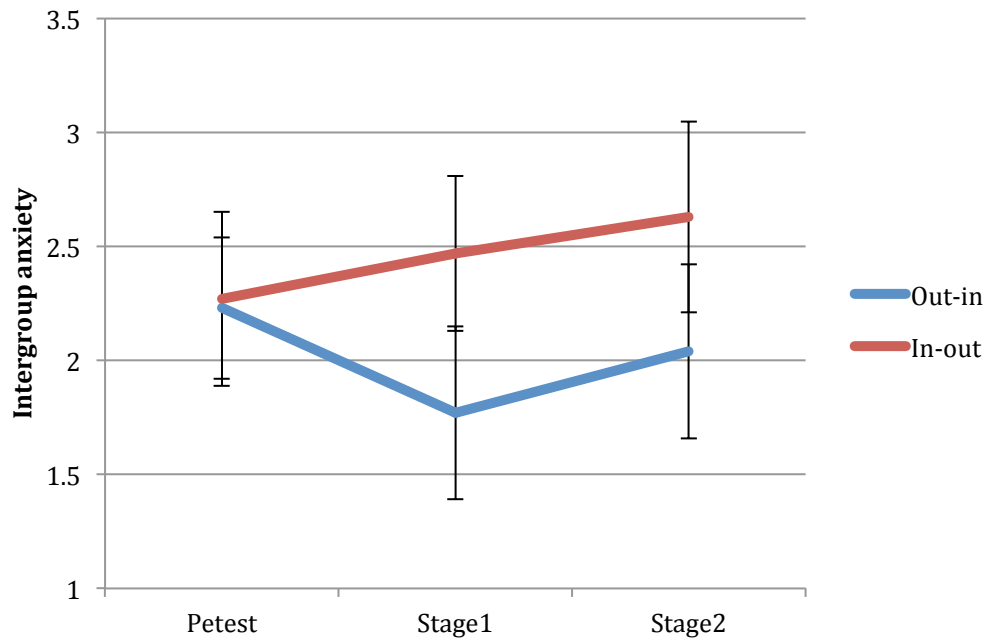


Figure H1. Mean level of perceived anxiety

Other measures

Table H2

Descriptive statistics: Mean(SD)

Measure	Condition	Pretest	Stage1	Stage2
Intergroup attitudes	Out-in	3.53(.33)	3.6(.37)	3.81(.44)
	In-out	3.55(.35)	3.63(.4)	3.72(.47)
Empathy	Out-in	3.79(.88)	3.53(1.1)	3.73(1.19)
	In-out	3.5(1.15)	2.82(.99)	3.26(1.02)
Trust	Out-in	2.51(1.04)	2.83(.87)	2.54(.95)
	In-out	2.97 (1.34)	2.87(1.25)	2.8(1.03)
Friend	Out-in	3.35(.85)	3.23(.93)	3.29(1.01)
	In-out	3.77(1.07)	3.87(1.16)	3.77(1.03)

Cleanliness

Disgust has been reported as a strong predictor for negative out-group attitudes (Hodson et al., 2011). For this reason, I chose to run a separate analysis on the perceived cleanliness of the out-group other. While there was no main effect of time ($F(2, 52) = 2.5, p=.09$) or interaction ($F(2, 52) = 1.69, p=.19$), trends were in the right direction. In particular, the in-out condition significantly increased their perceptions of cleanliness after the out-group music intervention ($p=.015$), which drove a positive trend over time.

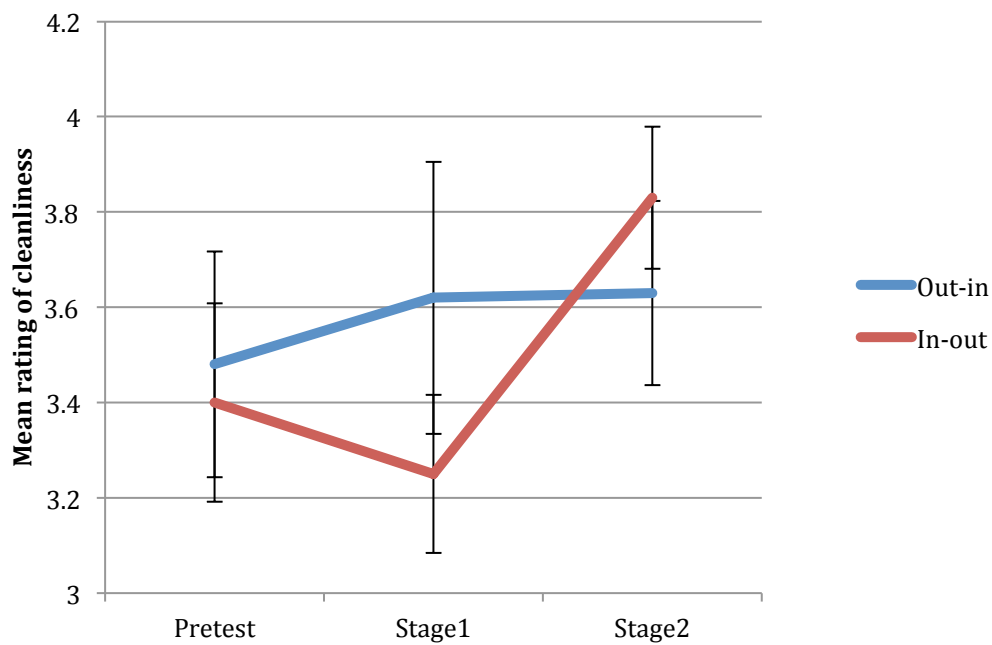


Figure H2. Mean level of perceived cleanliness

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