

**Contact and Self-Segregation in Ethnically Diverse Schools:
A Multi-Methodological Approach**

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TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	II
TABLE OF CONTENTS.....	III
LIST OF TABLES	VI
LIST OF FIGURES.....	VII
ABSTRACT	IX
DETAILED ABSTRACT	X
CHAPTER ONE: CONTACT AND SELF-SEGREGATION	1
ABSTRACT	1
ACCULTURATION AND INTEGRATION	1
INTERGROUP CONTACT THEORY	4
<i>Global Context: Segregation</i>	4
Segregation in the United States of America.	4
Apartheid in South Africa.	5
<i>Intergroup Contact Theory: Gordon Allport</i>	5
<i>Intergroup Contact Theory: Supporting Evidence</i>	6
<i>Concerns in Real-World Settings</i>	9
<i>Diversity and Contact: Conclusion</i>	11
SELF-SEGREGATION	12
<i>Macro-Level: Residential Self-Segregation</i>	12
<i>Micro-Level: Interpersonal Self-segregation</i>	14
<i>Self-Segregation: Conclusion</i>	18
SOCIAL NETWORK ANALYSIS.....	20
<i>Social Network Analysis: Conclusion</i>	22
DEVELOPMENTAL CONSIDERATIONS	23
PRESENT RESEARCH	26
<i>Context: Oldham, Greater Manchester</i>	26
<i>Research Overview</i>	28
CHAPTER 2: MICRO-ECOLOGICAL OBSERVATIONS OF INTEGRATION	30
ABSTRACT	30
INTRODUCTION	30
<i>Contact Theory</i>	30
<i>Segregation Literature</i>	32
<i>Research Setting: Oldham</i>	35
<i>The Present Research</i>	36
STUDY 1: SIXTH FORM COLLEGE MAIN CAFETERIA OBSERVATIONS	39
<i>Method</i>	39
Sample and context	39
Materials.	40
Procedure	40
<i>Results</i>	45
Cross-ethnic adjacencies: aggregation <i>I</i>	45
Social units: exposure <i>P</i>	47
Dissimilarity <i>D</i>	52
Summary results	54

<i>Discussion</i>	55
Ethnicity exposure.....	55
Gender exposure.....	58
Aggregation.....	58
Segregation by cafeteria area.....	60
Study summary.....	60
STUDY 2: SIXTH FORM COLLEGE SPATIALLY-EXTENDED CAFETERIA OBSERVATIONS	62
<i>Method</i>	62
Sample and context.....	62
<i>Results</i>	64
Aggregation <i>I</i>	64
Exposure <i>P</i>	64
Dissimilarity <i>D</i>	68
Summary results.....	69
<i>Discussion</i>	70
Ethnicity and gender exposure.....	70
Aggregation.....	72
Study summary.....	73
STUDY 3: MERGER SCHOOL CAFETERIA OBSERVATIONS	75
<i>Method</i>	75
Sample and context.....	75
Materials.....	75
Procedure.....	75
<i>Results</i>	78
Ethnicity and gender exposure.....	78
Summary results.....	80
<i>Discussion</i>	81
CHAPTER 3: HOMOPHILY AND SOCIAL NETWORKS IN THE MERGER SCHOOL	85
ABSTRACT.....	85
INTRODUCTION	85
<i>Homophily</i>	86
<i>Social Network Data</i>	89
Background.....	89
Analysis.....	90
<i>Social Networks in Self-Segregation Research</i>	91
<i>Present Research</i>	92
Context.....	92
Hypotheses.....	92
STUDY 4: SOCIAL NETWORK ANALYSIS IN A MERGER SCHOOL.....	93
<i>Method</i>	93
Sample and context.....	93
Materials and procedure.....	94
Measures.....	94
Analyses	95
<i>Results</i>	95
All nominated ties	98
Reciprocal ties	100
Participants in all waves	102
<i>Discussion</i>	104
CHAPTER 4: SELF-REPORT LIKELIHOOD OF CAFETERIA INTEGRATION	109
INTRODUCTION	109

<i>Context: Studies 1 and 2</i>	109
<i>Previous Research: Integration Surveys</i>	109
<i>Current Research: Cafeteria Integration Scenarios</i>	113
Aims.....	113
Hypotheses.....	114
METHOD	116
<i>Sample and Context</i>	116
<i>Materials and Procedure</i>	116
<i>Measures</i>	117
RESULTS	119
<i>Habitual Seating Preferences</i>	119
<i>Cafeteria Table Vignettes</i>	119
<i>Discussion</i>	132
Habitual seating preferences.	132
Cafeteria table vignettes.	132
CHAPTER 5: THESIS DISCUSSION	137
ABSTRACT	137
SELF-SEGREGATION AND HOMOPHILY	137
<i>Between Gender</i>	139
<i>Between Ethnic Groups</i>	139
<i>Between Age Groups: Developmental Perspective</i>	142
COMPARING ETHNIC AND GENDER SELF-SEGREGATION	144
INTERIM SUMMARY: SELF-SEGREGATION IN THE PRESENT RESEARCH	147
RESEARCHING SELF-SEGREGATION: METHODOLOGICAL CONSIDERATIONS	148
(1) <i>Implications for Observational Research</i>	148
(2) <i>The Importance of Longitudinal Research</i>	149
(3) <i>The Value of Triangulation</i>	150
LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH	153
<i>Future Research: Summary</i>	157
THESIS SUMMARY AND CONCLUSION	159
REFERENCES	162
APPENDICES	175
APPENDIX 1: EXAMPLE CODED MAP OF THE SIXTH FORM COLLEGE MAIN CAFETERIA.....	175
APPENDIX 2: PHOTO OF SIXTH FORM SMALL CAFETERIA	176
APPENDIX 3: EXAMPLE OF CODED MAP OF THE SIXTH FORM SMALL CAFETERIA	177
APPENDIX 4: EXAMPLE CODED MAP OF THE MERGER SCHOOL CAFETERIA	178
APPENDIX 5: SOCIAL NETWORK QUESTIONNAIRE	179
APPENDIX 6: SOCIAL NETWORK QUESTIONNAIRE WITH RETROSPECTIVE NETWORK	180
APPENDIX 7: EXAMPLE VIGNETTE FROM THE SIXTH FORM COLLEGE SURVEY.....	181
APPENDIX 8: TABLE OF MEAN APPROACH LIKELIHOOD (0-100) FOR THE SIXTH FORM CAFETERIA SURVEY	182

LIST OF TABLES

Table 1: Code for colour version of maps showing gender and ethnicity	43
Table 2: <i>I</i> values for White-Asian adjacencies in Study 1. Dashes indicate time intervals where no Asian students were present in the main cafeteria	47
Table 3: Study 1 exposure indices for exposure by ethnicity (shaded) and gender (unshaded). Dashes indicate time intervals when no Asian students were present in the main cafeteria.	50
Table 4: Percentage of social units in Study 1 that were ethnically heterogenous (White-Asian) across all time intervals in each wave – by total social units, and broken down by gender composition.....	52
Table 5: <i>D</i> indices calculated for each time interval in the main cafeteria in Study 1. Dashes indicate a time interval when no Asian students were present.	54
Table 6: Summary results of exposure <i>P</i> for ethnicity and gender, dissimilarity <i>D</i> , and aggregation <i>I</i> from Study 1.....	54
Table 7: <i>I</i> values for White-Asian adjacencies in Study 2.....	65
Table 8: Study 2 indices for exposure by ethnicity (shaded) and gender (unshaded).	66
Table 9: Percentage of social units in Study 2 that were ethnically heterogenous across all time intervals in each wave – by total social units, and broken down by gender composition.	68
Table 10: <i>D</i> indices calculated for each time interval in Study 2.	69
Table 11: Summary results of exposure <i>P</i> for ethnicity and gender, dissimilarity <i>D</i> , and aggregation <i>I</i> from Study 1 and 2.	70
Table 12: Exposure <i>P</i> indices for ethnicity and gender in Study 3.	78
Table 13: Percentage of ethnically-mixed social units in Study 3, including by gender breakdown.	80
Table 14: Summary results of exposure <i>P</i> values in Studies 1-3.....	81
Table 15: Means and standard deviations for the number of friends reported, percentage of students with at least one outgroup friend, and proportion (0-1) own-ethnicity and own-gender preference in Study 4.	98
Table 16: Means and standard deviations for reciprocal nominations in Study 4: number of reciprocal friends, percent with at least one outgroup friend, and proportion (0-1) own-ethnicity and own-gender preference.	101
Table 17: Means and standard deviations for nominations by participants from all three waves in Study 4: number of nominations, percent with more than one outgroup friend, and proportion (0-1) own-ethnicity and own gender preference.	103
Table 18: Means and standard deviations for likelihood to sit with ingroup/outgroup students.	120

LIST OF FIGURES

Figure 1: Diagram plotting housing in Detroit, based on the 2010 census data. Each dot represents a household - White (blue), Black (green), Asian (red), Latino (orange) or other (brown).	13
Figure 2: Diagram plotting housing in Birmingham, Alabama, based on the 2010 census data. Each dot represents a household - White (blue), Black (green), Asian (red), Latino (orange) or other (brown). www.wired.com/design/2013/08/how-segregated-is-your-city-this-eye-opening-map-shows-you/?viewall=true	14
Figure 3: Diagram showing a bird's-eye view of the main cafeteria.	41
Figure 4: Example of short-hand coding of the seating positions of students. Here each student is represented by two letters, the first denoting ethnicity (W for White; A for Asian; B for Black; O for other).	42
Figure 5: Example of a visually coded table, denoting gender, ethnicity and presence of single-ethnicity and ethnically-mixed social units.	44
Figure 6: Graphs showing exposure P values for ethnicity and gender in Study 1.	51
Figure 7: Map showing small cafeteria area, observed in Study 2.	63
Figure 8: Graphs showing exposure P values for ethnicity and gender in Study 2.	67
Figure 9: Map showing the merger school cafeteria, where grey boxes are tables (benches not shown).	77
Figure 10: Graphs showing exposure P values for ethnicity and gender in Study 3.	79
Figure 11: Graph showing changes in ethnicity exposure by year group.	80
Figure 12: Diagram showing a network of nodes and nominated links which are either unidirectional or bidirectional.	90
Figure 13: Diagram showing a network where node shape (square or circle) denotes group membership (e.g. gender). Other visualisation options include different sizes of nodes, or different colours.	90
Figure 14: Visualisation maps showing all ties in social networks from Study 4: Wave 1 (top), Wave 2 (middle) and Wave 3 (bottom). Characteristics are represented by colour for ethnicity and shape for gender. Numbers indicate anonymised participant identifiers.	97
Figure 15: Graphs comparing own-gender preference when all ties are included.	99
Figure 16: Graphs showing 2-way interaction effect between student ethnicity and preference type in Study 4.	100
Figure 17: Graphs comparing own-ethnicity preference when all ties are included (left) or only reciprocal ties (right) in Study 4.	101
Figure 18: Graphs showing trend changes in ethnicity preferences over time.	103
Figure 19: Study 5 table gender effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table ethnicity (x-axis) and table gender (separate bars).	123
Figure 19: Study 5 table gender effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table ethnicity (x-axis) and table gender (separate bars).	123

Figure 19: Study 5 table gender effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table ethnicity (x-axis) and table gender (separate bars).	123
Figure 20: Study 5 table ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table gender (x-axis) and table ethnicity (separate bars).	126
Figure 20: Study 5 table ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table gender (x-axis) and table ethnicity (separate bars).	126
Figure 20: Study 5 table ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table gender (x-axis) and table ethnicity (separate bars).	126
Figure 21: Study 5 participant gender effects - Graphs showing significant 4-way interaction between own ethnicity (x-axis), own gender (separate bars), table gender (top, bold) and table ethnicity (left, bold).	128
Figure 21: Study 5 participant gender effects - Graphs showing significant 4-way interaction between own ethnicity (x-axis), own gender (separate bars), table gender (top, bold) and table ethnicity (left, bold).	128
Figure 21: Study 5 participant gender effects - Graphs showing significant 4-way interaction between own ethnicity (x-axis), own gender (separate bars), table gender (top, bold) and table ethnicity (left, bold).	128
Figure 22: Study 5 participant ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (separate bars), own gender (x-axis), table gender (top, bold) and table ethnicity (left, bold).	130
Figure 22: Study 5 participant ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (separate bars), own gender (x-axis), table gender (top, bold) and table ethnicity (left, bold).	130
Figure 22: Study 5 participant ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (separate bars), own gender (x-axis), table gender (top, bold) and table ethnicity (left, bold).	130

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ABSTRACT

This thesis investigates ‘self-segregation,’ the voluntary separation and clustering of ethnic groups within a diverse environment that ostensibly provides opportunities for intergroup contact. While previous research has demonstrated self-segregation within such settings, using either self-reports, observations of behaviour, or social network analysis (SNA), such studies tend to be mono-methodological and cross-sectional. I review this literature in Chapter 1.

I then present three empirical chapters which provide both longitudinal data and comparisons between observations, surveys, and SNA: Chapter 2, with two observational studies of seating patterns in a diverse sixth form cafeteria (Studies 1 and 2), and a third observational study in a diverse secondary school (Study 3); Chapter 3, where I report an SNA study collected from the first-year students at the same secondary school (Study 4); and Chapter 4, where I report the results from a self-report survey in the sixth form college, where students indicate their cafeteria seating preferences (Study 5).

In Chapter 5, I discuss these findings, summarising 1) the strong self-segregation, and inclination towards self-segregation, found in all studies; 2) the comparisons between the two educational settings, where younger students were both more likely to be gender segregated, and to increase in ethnic integration over time; 3) the greater inclination of Asian British students than White British students to ethnically integrate; and 4) the need for further research triangulating multiple methods. From these conclusions, I suggest implications for targeted interventions, and argue the continued (and indeed, heightened) need for the contributions of social psychologists in public and policy discourse on ethnic integration.

DETAILED ABSTRACT

This thesis investigates the phenomenon of self-segregation within diverse educational settings, based on the crucial difference between *opportunity* for intergroup contact, and *actual* intergroup contact. Although intergroup contact is an effective means of reducing intergroup prejudice (Allport, 1954; Pettigrew & Tropp, 2006), ‘micro-ecological’ studies of intergroup interactions have documented ‘self-segregation’ – the behavioural tendency for groups to remain separate, even in spaces which are ‘desegregated’ (i.e., where ethnic mixing is institutionally permitted, and both groups are now present) (e.g., Al-Ramiah, Schmid, Hewstone & Floe, 2014; Campbell, Kruskall & Wallace, 1966; Dixon & Durrheim, 2003; Schofield & Sagar, 1977). The value of such studies has been in demonstrating that self-segregation is a pervasive phenomenon that can be found in a variety of settings, and that one cannot assume intergroup contact is happening by virtue of the large-scale context being diverse.

Research on self-segregation is, however, still a field with room for improvement, and benefits from the research presented here in three principal ways: triangulated methodologies, which examine not only behavioural observations of integration, but also social network analysis of intergroup friendships and self-report behavioural preferences; longitudinal design, which tracks the same students over time to examine the *dynamic* nature of integration; and the unique opportunity to conduct these studies in educational settings where students are provided with opportunities for large-scale intergroup contact for the first time. To date, self-segregation research has largely studied single time-points, and has not complemented observational studies with other methods that provide individual-level data on intergroup friendships – as such, previous research has provided a narrower perspective on integration than I am presenting here.

In Chapter 1, I review the literature on intergroup contact theory, which first established the premise that meaningful interpersonal interactions between different groups reduce prejudice (Allport, 1954), and has been empirically supported in a great deal of subsequent research (for a meta-analysis, see Pettigrew & Tropp, 2006). The value of intergroup contact in intergroup relations is important to establish when researching integration, as it underscores why self-segregation is detrimental in diverse settings.

Subsequently, I outline previous research documenting self-segregation. After the desegregation of the United States, and after the end of Apartheid in South Africa, the majority of research on integration has focussed on residential self-segregation; however, I present examples of research on interpersonal-level self-segregation, and the methods used to quantify the extent to which this is occurring, highlighting the importance (and rarity) of quantifiable behavioural measures when studying intergroup relations. I argue however that such methods are best complemented by participant-level data, which can help identify whether intergroup friendships are being made in contexts outside those observed, and allow comparisons between the formation of outgroup friends, and the seating preferences of social groups in public settings. Ultimately, this chapter concludes that while previous research has demonstrated the key distinction between opportunity for contact, and actual contact, the present research would be able to contribute to this literature by conducting longitudinal studies with multiple methodologies to provide a more in-depth understanding of patterns and preferences underlying self-segregation.

I then describe the context of Oldham, a town in northern England with a large Asian British minority population, in whose schools I conducted my research. Both educational settings I studied had similar White British and Asian British student bodies, and were likely the first ethnically diverse setting students had been in: a ‘merger’ school, an academy formed from a previously majority-White, and a previously majority-Asian, school; and a

sixth form college, many of whose students had previously been in ethnically homogenous schools. In a town that is residentially segregated by ethnic groups, such educational settings provide rare and valuable opportunities for intergroup contact.

Chapter 2 is the first of three empirical chapters. In this chapter I outline and discuss the observational studies of self-segregation in two educational settings in Oldham. In Study 1, I conducted two waves of observational studies in the cafeteria of the sixth form college (students aged 16-18), and found strong self-segregation by ethnicity, replicating and extending previous research (Al-Ramiah et al., 2014). However, since the main cafeteria observed in Study 1 is not the only area available for students, in Study 2 I conducted two more waves of observations that included the smaller, second cafeteria area. Here results showed not only self-segregation at the table level, but segregation between cafeterias such that Asian British students were clustering in the smaller cafeteria. Previous research observing mixing in cafeterias have not observed additional cafeterias outside the main cafeteria, and these findings highlighted the importance of doing so, in order to measure larger-scale self-segregation. In both studies, ethnic self-segregation remained high across all waves. In Study 3, I conducted two further waves of observational studies in the merger school (students aged 11-15), where I found not only significant self-segregation by ethnicity but also by gender. In this setting, I also found that self-segregation by ethnicity decreased between the two waves, which I suggest is linked to the positive effects of contact being optimal in this developmental window.

Studies 4 and 5 were conducted in the merger school and sixth form college respectively, and aimed to supplement the observational evidence of self-segregation with complementary data from other methodologies. Study 4 used social network analysis (SNA) conducted at the same time as Study 3 in the merger school. This study comprised of three waves of network data collected from students who were in the first year of the merger school

at the time of Wave 1, with the final wave collected a year later. These analyses, which documented students' self-reported friendships by ingroup and outgroup ethnicity, replicated high ethnic homogeneity in students' social networks (McPherson, Smith-Lovin & Cook, 2001), and showed some evidence of a decrease over time (i.e., students' networks were more ethnically integrated in later timepoints).

In Study 5 I administered a survey to the sixth form students, asking about their cafeteria seating habits and presenting them with fictitious cafeteria 'vignettes,' in which there is a table in the cafeteria that they could join. These tables depicted in the vignettes already had a group of students sat there, which varied in a within-subject design by group size, gender composition, and ethnic composition. Results showed that participants reported the highest likelihood of joining a double-ingroup table, and the lowest likelihood for a double-outgroup table. Between participants, however, Asian British students reported greater likelihood than White British students of sitting at an other-ethnicity table, thus demonstrating more willingness to ethnically integrate.

Each of these studies was designed to build on the previous one by providing complementary data on integration, to form an in-depth perspective, triangulated from multiple methods, on how students behave in diverse educational settings with opportunities for intergroup contact. While self-segregation by ethnicity is demonstrably strong within these settings, the increased integration in the merger school indicates that young adolescents (aged 11-15) make more use of intergroup contact opportunities than students of sixth form age (16-18). All of the studies moreover have evidence which points towards Asian British students making better use of contact opportunities than White British students, a finding which challenges the current stereotype of 'insular' Asian immigrants (for discussion, see Phillips, 2004). Overall, I point to the strong case made for the importance of

interdisciplinary, multi-method approaches for studying a complex topic like intergroup relations.

CHAPTER ONE: CONTACT AND SELF-SEGREGATION

Abstract

In this chapter I outline the past research in the field of intergroup relations which led to the premise of my DPhil research. The common foundation of each of the fields I discuss is the ‘contact hypothesis’ (Allport, 1954). As such, I first outline relevant background literature on ‘acculturation,’ models for mixing multiple cultures, and the relation that acculturation has to attitudes towards integration. I then discuss the context and conditions of the theory, before discussing both the subsequent evidence that supported it, and the critiques this theory faced from those questioning its real-world applicability. Most notably, I outline the key distinction in diverse environments between *opportunities for* and *actual* intergroup contact, and the key role of self-segregation research in demonstrating this discrepancy. Ultimately however I argue that observational studies of behavioural self-segregation should be complemented by participant-level information from both social network analysis and integration surveys. Finally, I outline how my research was designed to fill this gap in the literature, and provide a triangulated methodology with a rich perspective on the patterns underlying self-segregation.

Acculturation and Integration

Immigration and integration have been particularly topical areas for research in the last century, with increasing focus on the cultural implications of immigration. The essential nature of debate in this field pertains to whether it is advantageous for immigrants to maintain their former nationality’s culture, or embrace the culture of their new country; the merits can relate either to the wellbeing of the immigrants themselves, or to that of the country as a

whole. *Acculturation* refers to the process whereby immigrants adapt to their host country's culture, and integrate it into their own lives. Early research into this phenomenon was conducted by Berry (1980), whose model proposed that acculturation could be divided into four possible outcomes: assimilation, whereby the host's culture and identity is entirely adopted; separation, where in contrast, the host's culture and identity is entirely rejected; marginalisation, whereby both the host and original cultures are rejected; or integration, whereby the host and original cultures and identities are both adopted. A society where immigrants integrate the host's culture while maintaining their original cultural identity, and where such a balance of cultures is celebrated, is referred to as 'multicultural' (e.g., Modood, 2013). Research investigating the optimal strategy for acculturation has suggested, unsurprisingly, that marginalisation has particularly negative outcomes, not only in reducing social cohesion (e.g., Burke & Shields, 1999; Putnam, 1995), but also for the health and acculturative stress of immigrants (e.g., Berry, Phinney, Sam & Vedder, 2006; Castillo, Cano, Chen, Blucker & Olds, 2008; Kim, Gonzales, Stroh & Jiun-Ling Wang, 2006). More controversial, perhaps, is whether assimilation or multiculturalism is optimal. While multiculturalism has become increasingly unpopular in Europe, and the approach largely discarded (e.g., Vertovec & Wessendorf, 2010), a large body of research has advocated the merits of multiculturalism, or the integration model of acculturation. Results have shown for example that multicultural perspectives produce less implicit and explicit racial attitude bias than colour-blind perspectives (Neville, Lilly, Duran, Lee & Browne, 2000; Richeson & Nussbaum, 2004; Verkuyten, 2005), and is positively associated with psychological health (e.g., Berry, 1997; Berry, Kim, Minde & Mok, 1987). Assimilation, on the other hand, has been argued to mask group inequalities and reduce opportunities for inclusion (Markus, Steele & Steele, 2000), is associated with discriminatory behaviour (Zick, Wagner, van Dick

& Petzel, 2001), and in fact reduces focus on the importance of interethnic mixing (Revilla, Wells & Holme, 2004).

More pertinent for the purposes of this thesis, however, is how *expectations* of assimilation versus integration can shape intergroup relations, and inclination towards interethnic contact. For majority members, perceptions of the minority group's acculturation can affect their threat responses, whereby the more that minority members are perceived to maintain their original cultural identity, the more threatening they seem (Stephan, Ybarra, Martinez, Schwarzwald & Tur-Caspa, 1998; Snauwert, 2002; Verkuyten & Thijs, 2002). Furthermore, perceived cultural maintenance in immigrants is associated with negative affect in majority members, which in turn is negatively associated with majority members' support for this cultural maintenance (Van Acker & Vanbeselaere, 2011; but, see Zagefka, Brown, Broquard & Martin, 2007). Countries with a pro-diversity policy, on the other hand, show reduced anti-Muslim prejudice (Guimond, Crisp, De Oliveira et al., 2013), and perceptions that the minority group seeks out interethnic contact predicts positive affect in majority members (Zagefka et al., 2007).

Overall, therefore, while some degree of cultural maintenance – integrated with adoption of the majority culture – is beneficial to minority members and society, majority members tend to have a negative view of cultural maintenance, which negatively impacts their attitudes towards immigrants. Negative attitudes have been shown in turn to be negatively associated with likelihood of intergroup contact, which is a key process in the improvement of intergroup relations, as discussed further below. Intergroup relations, therefore, have strong ties not only with the actual acculturation processes of immigrants, but are positively impacted by majority group members perceiving that the immigrants at least partially adopt their culture, and are willing to integrate.

Intergroup Contact Theory

Global Context: Segregation

The 20th century saw great changes in national segregation policies around the world, most prominently in the United States of America, and South Africa. Both countries had previously had legalised policies separating White citizens from Black citizens, and maintaining a position of superiority for the White population. While both would come to repeal segregation laws and institute government policies to increase integration, both still serve as examples of the difficulty in practically dismantling residential and educational segregation.

Segregation in the United States of America. In the USA, segregation laws such as the Jim Crow laws of the southern states enforced ethnic segregation of African Americans from White Americans in education, public transport, employment, residential housing, and the use of public facilities. While such segregation was *de jure* (overt and legally implemented) only in the southern states, the northern states had similar *de facto* (consequential) segregation through the actions of public educational authorities (Maslow, 1961), unequal housing provisions, tax rates, and state aid formulae (Orfield, 1974), and employment bias (Jenkins, 1968). While schools were legally desegregated by the Supreme Court in *Brown v. Board of Education* in 1954, and the Jim Crow laws were repealed in the Civil Rights Act of 1964, the United States maintained a high level of *de facto* segregation even in the absence of such laws, much like had always been the case in their absence in the northern states. Schools remained largely ethnically homogenous in the ensuing years (e.g., Bankston & Caldas, 1996; Goodman, 1972), with only a slight decline in residential segregation (Iceland, 2004). As a result, the country faced an ongoing struggle to implement policies which would remove the entrenched biases that maintained segregation (e.g., Jenkins, 1968; Maslow, 1961; Orfield, 1974).

Apartheid in South Africa. South Africa similarly had a history of maintaining White superiority and power, this time from the position of being the numerical minority but socially elite group. While the White population was largely derived from European settlers from Portugal, The Netherlands and Great Britain from the 15th century onwards, there remained a large native population of Black Africans of Sub-Saharan ancestry. Ethnic segregation had been in place since the time of European settlers and British colonialism, and was further enforced under ‘apartheid’ (from the Afrikaans, ‘apartness’), as introduced after the general election in 1948. Under apartheid, South Africans were classified as either White, Black, Indian (of Asian descent), or Coloured (of mixed descent), and non-White families were forcibly relocated in order to establish full segregation under the Group Areas Act of 1950 (Besteman, 2008). Subsequently, the Bantu Education Act of 1953 segregated schools and universities, while the Reservation of Separate Amenities Act in the same year segregated transport facilities, public recreational areas, and hospitals. Although the laws upholding apartheid were repealed in the late 1980s and early 1990s, residential segregation remains very high, particularly between White and Black South Africans (Christopher, 2000).

Intergroup Contact Theory: Gordon Allport

Amidst the backdrop of segregation and apartheid, Allport (1954) proposed the seminal ‘contact hypothesis.’ Contrary to the doctrines underlying segregation and apartheid, which promoted the strength and harmony to be found in separation (“separate but equal,” as commonly referred to in the USA), Allport proposed that groups benefit from having intergroup contact. In this theory, interpersonal contact resulted in improved outgroup attitudes and reduced outgroup prejudice when conducted under optimal conditions (equal status, opportunity to have meaningful interactions and disconfirm stereotypes, a context requiring cooperation, and norms from authority that support such interactions).

Within the literature, this comes into contrast with the ‘Realistic Group Conflict Theory’ (Sherif, 1966), which posits that the presence of groups creates realistic resource threats (e.g., employment, land, etc.) which result in outgroup prejudice; ‘threat theory’ (Stephan & Stephan, 2000) expands upon this material threat to also include symbolic threats as determinants of outgroup prejudice (e.g., status, values, etc.).

Social Identity Theory (Tajfel & Turner, 1979) goes even further, in suggesting the presence of intergroup bias even in absence of threats (real or symbolic). Previous evidence had confirmed, using a Minimal Group Paradigm (Tajfel, 1970), that mere categorisation into artificial groups with no competition for resources resulted in intergroup bias (Tajfel, Billig, Bundy & Flament, 1971). Following on from this, Social Identity Theory (SIT) posited that the mere presence of existing groups is enough to elicit ingroup favouritism and outgroup discrimination, in order to maintain positive self-esteem from one’s group membership. The merit of such perspectives can be seen in many real-world examples where daily contact with a coexisting outgroup does not result in positive attitudes, for example in European anti-Semitism, attitudes towards African Americans in the USA, and in many cases of civil war. Overall such theories emphasise the pervasive nature of intergroup prejudice, and can be seen to be countered by Allport’s suggestion that (only) under particular *conditions* of contact, such bias can be reduced. After all, conditions such as those he outlined are not generally found in typical conditions of intergroup contact (and this point as a criticism will be discussed further below).

Intergroup Contact Theory: Supporting Evidence

Early evidence that led to Allport’s ‘contact theory’ came from studies of *de facto* desegregation during the Second World War, where necessity created military opportunities

for cross-ethnic mixing. Mannheimer and Williams (1949), for example, compared changes in the attitudes of White American soldiers towards Black American soldiers, based on the units they were based in. Those White soldiers who had been in desegregated units with Black soldiers showed improved outgroup attitudes and greater support of desegregation of the army than those who had fought in segregated units.

Similarly, findings in the merchant navy showed that White seamen on ships with Black seamen during World War II had reduced prejudice over time: there was a significant negative correlation between the number of voyages a seaman had shipped with Black sailors, and the prejudice they held towards Black people (Brophy, 1945). Interestingly, there were two other factors contributing to likelihood to hold prejudice, which may be taken as support for Allport's optimal conditions.

Firstly, there was a significant difference between the prejudice scores of seamen based on their union membership, such that seamen belonging to the union with active anti-discriminatory measures (National Maritime Union) had significantly lower prejudice scores than those belonging to other unions (with no such policies, and which in fact often did not admit Black members). The pro-racial equality policies of the National Maritime Union can be interpreted as fulfilling Allport's optimal criterion of institutional support and norms supporting intergroup cooperation; furthermore, the White-only admission in other unions would have resulted in these seamen having had less *previous* intergroup contact, partially explaining their higher prejudice scores (though this factor was not controlled for specifically in this study).

Secondly, seamen who had experienced combat fire during their voyages had significantly lower prejudice than those who had not. While Brophy speculated that conditions of mutually endured threat and anxiety may foster positive attitudes, I would also suggest (in my limited experience of naval warfare) that such battle conditions must surely

require even greater cooperation towards a common goal than the normal running of a ship, and thus support this further optimal condition from Allport.

Evidence from other domains also provided early evidence for the effect of contact on prejudice. Wilner, Walkley and Cook (1952) conducted a study in housing projects in post-war New York City which found that White women in mixed-ethnicity public housing projects were more likely to develop positive attitudes towards Black people if their building had Black tenants than those whose building had no Black tenants. In the workplace, MacKenzie (1948) demonstrated that White students and professionals who had previous contact with Black professionals had significantly higher attitude scores, and were more willing to interact with or live near Black people than those with no previous professional contact.

A great deal of research has subsequently tested the effects of intergroup contact in a variety of contexts and geographical locations, both experimentally and (for the most part) using cross sectional surveys. These results are best viewed through the power afforded by the meta-analysis of Pettigrew and Tropp (2006) who aggregated more than 500 of these studies and experiments from the 20th century, under selection criteria that the studies had direct contact as the independent variable, prejudice as the dependent variable, and with individual-level data on participants from clearly distinct groups. From these criteria, results of the meta-analysis showed a significant effect of contact on reduced intergroup prejudice, thus firmly establishing the positive effect of intergroup contact. Furthermore, while the optimal conditions proposed by Allport were not found to be necessary (studies where these were not applicable still had this significant effect), studies which included these optimal conditions had greater overall effect sizes than those which had not. While intergroup contact in and of itself is therefore an effective means of reducing intergroup prejudice, supporting the contact hypothesis, the greatest effects can be seen when these criteria are met.

Concerns in Real-World Settings

So far I have made the case for the efficacy of intergroup contact *if and when* it occurs. While such a claim can be confidently made in light of Pettigrew and Tropp's (2006) meta-analysis, the fact remains that conflict and prejudice exist around the world in areas where different groups coexist. Amir (1976) suggested in fact (without much substantiation) that there is an unconscious bias in the context that researchers choose to study, such that they were prone to examining contexts that were most likely to show a positive effect. On the other hand, he argued, studies in more everyday life settings were less likely to find a significant effect of contact.

Putnam (2007) similarly argued that intergroup contact was optimistic in the context of real-world diversity. In his paper, however, 'diversity' is frequently and incorrectly conflated with 'contact,' with serious ramifications. For example, in saying that "... according to [contact] theory, diversity reduces ethnocentric attitudes and fosters outgroup trust and solidarity" (Putnam, 2007, p.141-142), or that "contact theory suggests that diversity ... enhances out-group solidarity" (Putnam, 2007, p.144) Putnam is then able to discount contact theory through evidence against the relationship between *diversity* and reduced outgroup trust (e.g., Blumer, 1958; Brewer & Brown, 1998; Quillian, 1996; Taylor, 1998).

This conflation of diversity with contact similarly influenced his interpretation of his own data. Using results from a previous nationwide survey, Putnam (2007) found a negative correlation between city-wide diversity and both ingroup and outgroup trust in its residents. Based on this relationship, Putnam argued that the presence of outgroup members increases social isolation, and causes people to 'hunker down.' Furthermore, he concluded that these findings undermine the practical validity of contact theory, implying once again that city-wide diversity equates to intergroup contact. The data he was basing this conclusion on

however excluded results that in fact showed greater inter-ethnic friendship in diverse settings, which was discarded from analysis. What such lines of argument fail to take into account therefore is the marked residential segregation that is so prevalent in American cities that are diverse at the macro-level, but homogenous within neighbourhoods. As such, these data can more accurately be interpreted as representing the negative effects of the *knowledge* of the presence of the outgroup – not the negative effects of intergroup contact.

In fact, Putnam demonstrates his dissociation between contact theory and meaningful interpersonal interactions in the discussion of implications for diversity, where he follows his rejection of contact theory with the suggestion that “we need more opportunities for meaningful interaction across ethnic lines” (Putnam, 2007, p. 164). This dissociation however ignores the clear emphasis on the founding principles of contact theory as outlined in Allport’s conditions for contact, not to mention the inclusion criterion of “direct intergroup interaction” in Pettigrew and Tropp’s (2006) meta-analysis. Ironically of course, Putnam’s own suggestion that more interpersonal contact is needed echoes that of contact theorists who argue that *if and when* such contact does occur, the positive effects of the contact hypothesis ensue.

Schmid, Al-Ramiah and Hewstone (2014) for example countered Putnam’s (2007) evidence and conclusions with a more comprehensive study in England, where intergroup contact *was* measured alongside neighbourhood diversity and measures of trust, and both majority and minority respondents were purposively sampled from areas varying in both diversity and disadvantage . From these more rigorous data it was demonstrated that although high diversity had a direct negative effect on trust, albeit for majority respondents only (replicating Putnam, 2007), there was an indirect relationship whereby high diversity was associated with greater trust via positive intergroup contact. As such, it seems that while on the one hand the presence of the outgroup in your city or neighbourhood can have negative

effects on intergroup relations, the (limited) contact that actually occurs on the other hand has positive effects on intergroup relations. The problem therefore does not lie within the validity of the contact hypothesis – that interpersonal contact results in reduced intergroup prejudice – but in its practical implementation: intergroup contact has positive effects, but is not occurring often enough in natural environments.

Dixon has been a particular proponent of this point, suggesting that psychologists have been too quick to assume that intergroup contact is happening in diverse settings, and therefore being overly optimistic in expecting improved relations (Dixon & Durrheim, 2003; Dixon, Durrheim & Tredoux, 2005). While Dixon and colleagues place too much emphasis on the use of “rarefied” (Dixon et al., 2005, p.700) experimental methods in intergroup contact research (the majority of studies in fact being cross-sectional surveys in field settings), they make useful suggestions regarding the importance of ‘micro-ecological’ (interpersonal-level) research (e.g., Dixon, Tredoux & Clack, 2005).

Overall, he and colleagues argue that while contact can be created and the effects measured in an experimental setting, it would be dangerous to extrapolate from this that similar events are occurring in real-world diverse environments (and thus that such experiments have ecological validity). Instead he argues that people are often disinclined to take up opportunities for contact, and that behavioural observations of how groups cluster and interact in shared spaces is necessary. In short, the field should move towards studying contact in the context of self-segregation.

Diversity and Contact: Conclusion

It is clear both that intergroup contact is effective in improving intergroup relations, and that it is often too lacking in diverse environments where one would want such improvements to occur. In order to better understand the processes at work in real-world environments, one

must understand the nature and extent of intergroup contact that is happening (or not happening, as the case may be), through mapping and tracking patterns of self-segregation.

Self-Segregation

Macro-Level: Residential Self-Segregation

Geographers and political scientists have documented residential self-segregation for many years, particularly since the desegregation of America and South Africa drew attention to *de facto* segregation that remained. In America, early evidence post-desegregation showed that dramatic residential segregation remained in its cities (Orfield, 1974); this is still largely the case today, with census data from 2010 revealing similarly dramatic patterns (see Figure 1 and Figure 2).

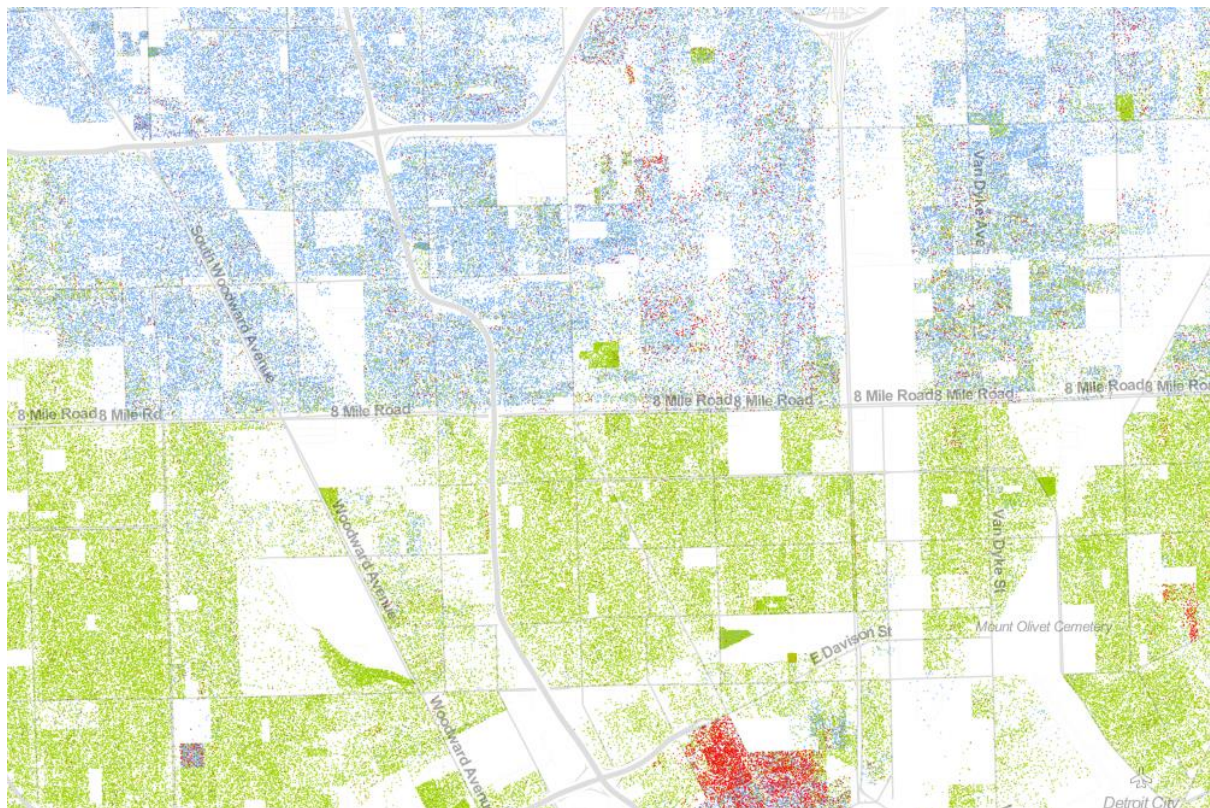


Figure 1: Diagram plotting housing in Detroit, based on the 2010 census data. Each dot represents a household - White (blue), Black (green), Asian (red), Latino (orange) or other (brown).

www.wired.com/design/2013/08/how-segregated-is-your-city-this-eye-opening-map-shows-you/?viewall=true

Iceland (2004) similarly documented residential segregation across America, finding in particular that White segregation actually *increased* between 1980-2000, while Black segregation decreased. In South Africa, residential segregation is very pronounced post-apartheid and similarly showed that White segregation was particularly marked from other ethnic groups (Christopher, 2000). In the UK, ethnic segregation is lower than in the US but still prevalent (Peach, 1996); the ethnic minority population has exponentially increased, particularly increasing in South Asian immigrants due to the labour shortage in the decades following the Second World War, with Pakistani-heritage populations in particular emerging in the northern textile towns of Greater Manchester (Peach, 2001).

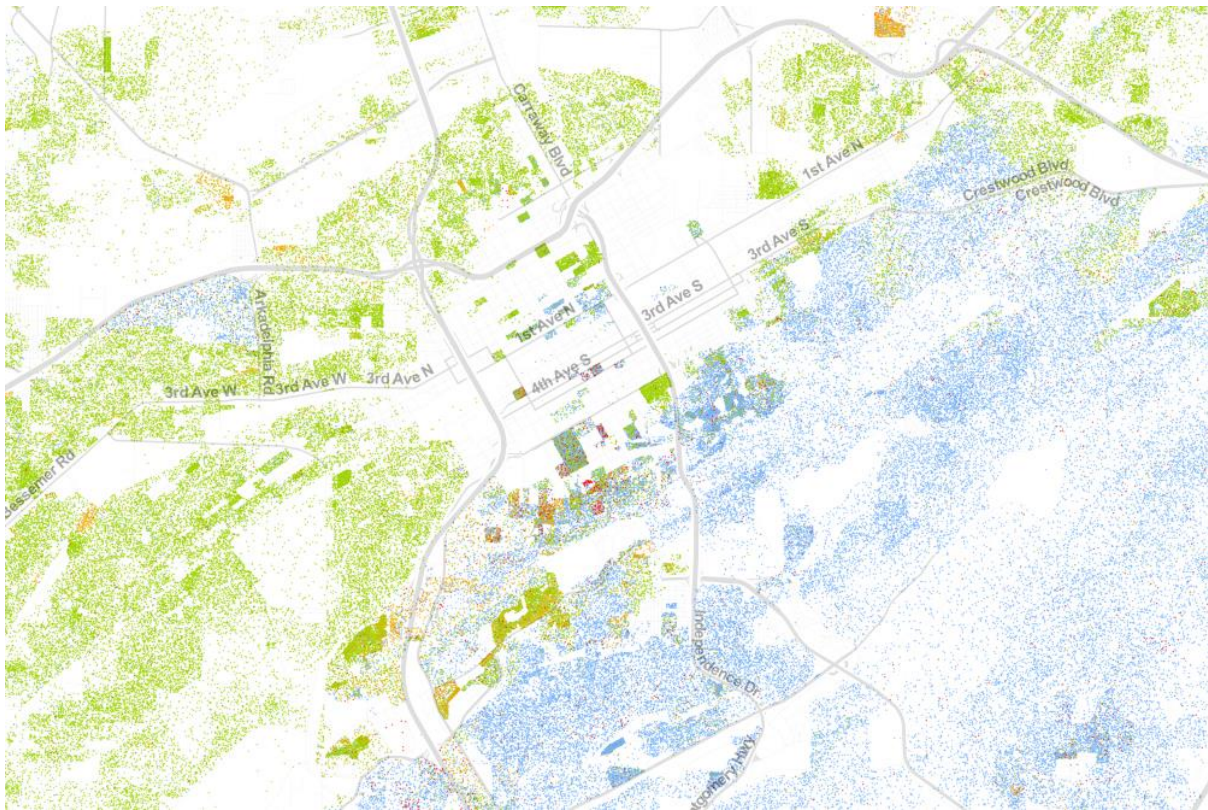


Figure 2: Diagram plotting housing in Birmingham, Alabama, based on the 2010 census data. Each dot represents a household - White (blue), Black (green), Asian (red), Latino (orange) or other (brown).
www.wired.com/design/2013/08/how-segregated-is-your-city-this-eye-opening-map-shows-you/?viewall=true

Micro-Level: Interpersonal Self-segregation

While the informational value of macro-level residential segregation is unquestionable, it cannot provide a direct indication of intergroup contact – although it is reasonable to suggest that macro-level segregation corresponds with limited (or no) intergroup contact, the inverse is less clear. In other words, as discussed in the contact literature, it is less clear whether neighbourhoods, buildings etc. which *are* ethnically heterogenous should be interpreted as sites of actual intergroup contact. Micro-level (interpersonal) studies of behavioural

integration therefore provide a necessary perspective within settings that are diverse in their population content.

One of the earliest examples of such research was conducted by Campbell, Kruskall and Wallace (1966). This study examined universities in desegregated America, mapping the actual ethnic integration occurring in classrooms of diverse colleges. For the context of this paper, Campbell et al. (1966) used the term ‘aggregation’ to mean the voluntary self-segregation of students, resulting in ethnic clustering; this is therefore distinct from ‘segregation,’ which refers to institutional and/or legalised separation of ethnic groups. For this purpose, Campbell et al. created the ‘aggregation index,’ a quantitative measure of ethnic clustering within classrooms. Students were unobtrusively observed within these classes, and their seated positions on rows of seating noted. From this, Campbell et al. were able to compare the number of cross-ethnic adjacencies (Black students sat next to White students) with the calculated number expected under the random distribution of the students present. From these observations and calculations, Campbell et al. demonstrated a high level of ‘aggregation,’ i.e., fewer cross-ethnic adjacencies than expected under random mixing.

Schofield and Sagar (1977) adapted this method to study a newly desegregated school in America. This research was novel in studying a school which had opened that year, and conducting further observations over the year to track any changes in behavioural patterns. Using Campbell et al.’s (1966) aggregation index, divided into face-to-face and side-by-side adjacencies, results showed strong self-segregation by ethnicity, though yet-stronger self-segregation by gender. Within gender groups, females were more ethnically self-segregated than males. Moreover, self-segregation by ethnicity decreased over the academic year (i.e., ethnic integration increased, though self-segregation was still high), albeit only in the seventh grade (students aged 12-13) which did not separate students into separate academic streams. The authors suggested that while the increased integration in seventh grade reflected the

positive effects of intergroup contact, that the academic streaming in eighth grade violated Allport's optimal condition of equal status, and highlighted the academic disparities between White and Black students. Such disparities were prevalent given the disadvantaged background more commonly found in the Black students, and Schofield and Sagar suggest in fact that this socioeconomic difference between ethnic groups may have been partially responsible for the self-segregation (i.e., as a reason beyond or even instead of ethnicity).

This method of micro-ecological observations emerged again some decades later in a variety of different desegregated contexts. In South Africa for example, Dixon and Durrheim (2003) studied a post-apartheid, formerly Whites-only beach. In this setting interactions are less limited than side-by-side seating, and so instead beachgoers were marked on a map with their ethnicity and the 'umbrella spaces' (spatial groups) that they occupied. Results showed marked self-segregation, such that the umbrella spaces were significantly more ethnically-homogenous than would be expected by random mixing. Furthermore, on a larger scale within the beach, White and Black beachgoers were more homogeneously clustered between discrete areas of the beach than would be expected by chance – i.e., White and Black beachgoers not only do not interact personally, but also keep to separate and unofficially demarcated areas of the beach (as confirmed in subsequent interviews).

Furthermore, Tredoux and Dixon (2009) used a similar methodology to map self-segregation within nightclubs in Cape Town. Once again, although these spaces were diverse in their population content, people within the nightclub were found to self-segregate – between sub-areas within the nightclubs, in their seating patterns at tables, and in interpersonal interactions. This was a valuable piece of research in demonstrating several levels of self-segregation simultaneously, and highlighting the importance of examining several dimensions of scale when studying the extent of self-segregation. However, it is unclear how measures of 'interpersonal interactions' were collected, and self-segregation

indices used to look at seating patterns treated whole tables as either homogenous or heterogenous – this does not reflect any *degree* of ethnic heterogeneity of tables (as the authors point out), and furthermore risks the assumption that people at these large tables all have ‘exposure’ to each other, as opposed to comprising several separate social groups.

Within cafeteria settings, however, this same index has been used to more specifically reflect groups of people who are in interactive ‘social units.’ Clack, Dixon and Tredoux (2005) observed a university cafeteria in the UK, mapping students’ seating positions by their ethnicity. Furthermore, the ‘social units’ – groups who were deemed to be interacting with each other – were marked, and the ethnic composition of all social units used in the *P* index of exposure. This index used the level of ethnic homogeneity/heterogeneity of these social groups, compared with the presence of each ethnicity in the whole space, to calculate a summed overall value between 0-1 (where 1 denotes integration - that groups are as heterogenous as they can be with the people present – and 0 denotes complete segregation – that all social units are ethnically homogenous). This then provided a specific measure of ethnic mixing within groups who are having *actual* interpersonal contact, and demonstrated similarly to previous research that self-segregation levels were high. Moreover, *D* indices measuring self-segregation between cafeteria areas showed significant clustering by ethnicity.

Al-Ramiah, Schmid, Hewstone and Floe (2014) conducted a further study of self-segregation in the UK, in a sixth form college. This college was located in a northern town with a large Southeast Asian minority group, where there was strong residential self-segregation; as such, the majority of primary and secondary education was *de facto* ethnically segregated. The sixth form college, in drawing academic students from across the town, and indeed from neighbouring towns, was therefore a rare exception as an ethnically diverse educational setting. Al-Ramiah et al. (2014) conducted observations in the sixth form

college's cafeteria, and determined, using Campbell et al.'s (1966) aggregation index, that there was strong self-segregation in face-to-face and side-by-side adjacencies.

Self-Segregation: Conclusion

Studies of self-segregation have highlighted the importance of scale when studying integration. Macro-scale residential mapping is extremely valuable in demonstrating neighbourhood-based self-segregation within a diverse city, and used for example to highlight the fallacy of assuming that city-wide diversity equates to intergroup contact (as in Putnam, 2007). City diversity should not therefore be taken to mean residential diversity within neighbourhoods. In turn, residential-scale studies cannot be reliably used to infer *actual* intergroup contact – more accurately, such diversity represents *opportunities* for intergroup contact. Residential self-segregation limits opportunities for intergroup contact; residential or building-wide diversity provides opportunities for intergroup contact. As we have seen in the micro-ecological observations of self-segregation however, such opportunities for contact are resulting in considerably lower actual contact than would be expected, within schools, beaches, nightclubs, etc.

The main strength of observational studies is that they provide real behavioural measures of actual intergroup contact (within a given setting, within a given time period). As such, they do not rely on self-report measures of intergroup contact which are vulnerable to the influence of social desirability bias. The majority of research in intergroup contact uses such self-report measures of contact (e.g., Al Ramiah, Hewstone, Voci, Cairns & Hughes, 2011; Al Ramiah et al., 2014; Shelton & Richeson, 2005). Such studies have been instrumental in examining the mechanisms behind intergroup relations. The main limitation however is that self-report questions are development about outgroup trust or attitudes by their

nature evoke awareness of intergroup relations, and may prompt biases in answering in a way that is considered socially desirable (although, for some evidence supporting the validity of self-report methods, see Hewstone, Judd & Sharp, 2014). In desegregated contexts, ‘old-fashioned racism’ (i.e., overtly expressed prejudice) became less and less socially acceptable, such that people with prejudice and negative stereotypes became less likely to express such views (McConahay, 1983). Questions asking about intergroup friendship, or attitudes and intentions towards integration may therefore yield results that are overly optimistic (i.e., more reported outgroup friends and positive integration attitudes than in actuality). Observations however circumvent such social desirability factors, and are a more direct measure of actual interactions. Furthermore, longitudinal observational studies (e.g., Koen & Durrheim, 2009; Schofield & Sagar, 1977) provide the richest perspective of integration/self-segregation, with a testable hypothesis of whether integration increases over time. However, there are still very few studies of behavioural self-segregation in the contact literature, and considerably fewer which are longitudinal. Nevertheless however the studies which have been conducted demonstrated pervasive self-segregation, on several scales, and persisting over time.

An optimistic possibility which remains in light of such results is that within the studied environment, members of different groups *are* having interpersonal interactions – just not in the studied space. Within schools and universities for example, it may be that students form some outgroup friends or friendly acquaintances based on the opportunities afforded by the diverse environment, but that each person nonetheless continues to sit with the friendship group they have always sat with at lunch. Positive contact, in this hypothetical situation, has occurred; cafeteria seating norms however remain little changed, and remain self-segregated. For researchers to measure the full extent of intergroup contact therefore would require an additional methodology asking students about their friends, but without evoking social

desirability through awareness of the researcher's intergroup focus. Such research criteria would be best met through social network analysis.

Social Network Analysis

Social network analysis (SNA) is the empirical study of the characteristics of a network of social ties between people (whether professional, marital, or friendship-based). It has largely been used to research the presence or absence of homogeneity within social networks, where homogeneity along any of a variety of criteria is referred to as 'homophily,' the preference for similar others (McPherson, Smith-Lovin & Cook, 2001). Social network studies can be broadly divided into those which sample from a national population, and those which sample an entire (discrete) network. When sampling from a national population, researchers can gather information on, for example, the prevalence of cross-ethnic marriage – Blau, Blum and Schwarz (1982) for example found that while cross-ethnic marriage was uncommon in American cities, cross-ethnic marriage rates are positively correlated with the city's heterogeneity in income, occupation, and birth region. In another example, Marsden (1987) used a representative sample from the 1985 General Social Survey in America to determine that less than 8% of adults discussed "important matters" with someone of another ethnicity. Such studies do not need to sample *everyone* within the national population, simply enough to be representative, since the reciprocity of these ties is either beyond question (in the case of marriage) or not necessary (people in whom you confide).

For studies of friendship however, population sampling without reciprocity checks is a limitation, since friendship (as opposed to someone in whom to confide) by common definition must be reciprocal to be valid. Briggs (2007) for example used phone survey methodology to ask participants in America whether they had ethnic minority friends (if

White) or White friends (if an ethnic minority). Results showed that around three quarters of participants (of any ethnicity) reported having at least one outgroup friend, where across the country the ethnic diversity of the respondent's area was positively correlated with their likelihood to have an outgroup friend (though the relationship is not as linear as if opportunity through diversity directly resulted in outgroup friends). Moreover, likelihood of having an outgroup friend was associated with the "joining" tendencies of respondents – participating in non-religious groups, involvement in workplace social life, and having a large circle of friends. A research question which cannot be directly tested from these results however is whether the outgroup friendships reported by the majority of respondents are reciprocated. There are two principal reasons why reciprocity information is important in such a context, based on the reasons *why* such a reported friendship may not be reciprocated: firstly, respondents may report, or claim, that they have an outgroup friend for reasons of social desirability, and thus we cannot be fully confident that around three quarters of Americans really *do* have outgroup friends; secondly, even if a respondent does report having an outgroup friend in good faith, if the 'friend' they have in mind would not reciprocate such a sentiment, we cannot consider this a true or meaningful friendship.

The issue of reciprocity is however addressed when the entire population of interest is studied – entire countries or even cities are too large in scope, but such studies are more possible for example within companies, schools or other organisations. Hallinan and Smith (1985) for example studied the social networks of 8-11 year old students in ethnically diverse schools in northern California. These students were asked to indicate (from a list) which of their classmates were their friend or best friend, and these nominations were matched with the ethnicity information provided separately to the researchers (i.e., limiting how aware participating students were of the researchers' interest in ethnic integration). Results showed that just over a fifth of students' friends were other-ethnicity, regardless of whether the

student was White or Black; furthermore, friendship reciprocity was just as likely for cross-ethnic as same-ethnic friendship nominations.

In a further example, Shrum, Cheek and Hunter (1988) investigated the ethnic friendship preferences of 9-18 year old students in schools in southern United States. This study compared the gender and ethnicity preferences of students in each year group to propose changes in homophily preferences over students' development (it was not, therefore, a longitudinal study tracking each student's change in preferences over time, but rather a cross-sectional comparison of age groups from which developmental changes were interpreted). Cross-ethnic friendships were overall fewer than would be expected given the diversity of these schools, but more prevalent in students aged 9-12, such that preference for own-ethnicity friends is greater each year; White females were overall the most ethnically segregated group, and Black males the least.

Social Network Analysis: Conclusion

Social network analysis within a limited population such as a school can complement behavioural measures of self-segregation in three important regards. Firstly, it is another measure of self-segregation that does not need to make the intergroup research focus salient – i.e., participants do not need to be asked about the group membership of their friends (if that information is otherwise available), and thus are less likely to be influenced by social desirability in their answers. Secondly, the validity of friendship nominations can be tested by reciprocity in the friendship nominations of others; beyond validity, such reciprocity information is useful in its own regard to compare the strength of two or more groups' nominations (e.g., do Asian students make more, and less reciprocated, friendship nominations than White students). Finally, the most important comparison with observational

studies is that SNA provides *individual*-level data on homophily preferences – while observational studies measure the overall behavioural norms of self-segregation, longitudinal SNA studies can track the development of each individual's intergroup friendships over time.

Conducting both methodologies in a diverse setting would provide a richer and more reliable perspective on integration than either in isolation. While it is often not possible to match individual SNA data to the corresponding seating preferences in e.g., cafeterias, changes in overall social networks could be compared with changes in overall behavioural integration over time. However, use of SNA in the intergroup contact literature has thus far been minimal, longitudinal studies even more so, and to date no study has made use of both SNA and observational methodologies.

Developmental Considerations

While increases in ethnic friendship homophily over time in adolescence are discouraging, positive contact with outgroup members and experience of having had outgroup friends will have had positive effects which increase the likelihood of forming outgroup friends in the future. Positive intergroup contact has been shown, given sufficient perceived typicality of the outgroup member and/or salience of group membership during the contact situation, to generalise beyond the individual encountered to their ethnic outgroup as a whole (Hewstone & Brown, 1986), and to reduce intergroup bias and anxiety related to meeting outgroup members (Pettigrew, 1998). Moreover, evidence has shown that adolescence may be a particularly impactful age for the effects of contact. In research on intergroup relations in sexuality, adolescence has been highlighted as a particularly important time for heterosexual students to have contact with gay or lesbian peers, in order to reduce prejudice (Heinze &

Horn, 2009); this age of critical influence corresponds with increasing sexual prejudice in adolescence (van de Ven, 1994).

This suggests a perspective that the age at which homophily starts to show the greatest increase is also the age at which contact interventions may be the most effective. In research on antisocial behaviour, Granic and Patterson's (2006) review concluded that the age at which interventions are the most effective is early adolescence, when children are correspondingly transitioning into greater risk of antisocial behaviour; this view has been supported in the review by Masten, Long, Kuo, McCormick, & Desjardins (2009). Meanwhile in interethnic research, the findings of Shrum et al. (1988) that adolescents 'cleave' by ethnicity between ages 9-12, and the suggestion of Devine (1989) that childhood is a formative time in implicit intergroup prejudice, can be compared with the findings of Wölfer, Schmid, Hewstone and Van Zalk (2016) that contact effects are greatest in adolescence compared with early adulthood. While Raabe and Beelmann (2011) had found in their meta-analysis evidence for increases in prejudice in childhood, but none over adolescence, the great majority of studies included used explicit measures of prejudice, and the authors suggest that age may come with a shift from explicit to implicit prejudice, where implicit prejudice continues to increase over adolescence. This has profound implications for contact theory, and the practical considerations of interethnic interventions. If intergroup contact has the greatest efficacy in adolescence, then the most important time to provide opportunities for and encourage such contact is at school.

Fortunately, the school environment can also be highly conducive to the 'optimal conditions' of contact (Allport, 1954; Pettigrew & Tropp, 2006). A diverse school which makes an effort to promote integration within its student body provides the implicit and explicit support of intergroup contact by authority figures; parents who send their children to ethnically diverse schools may also by default have positive attitudes towards integration

(although, important exceptions exist in the case of educational zoning restrictions). Within classroom activities, students are broadly of equal status, except where academic streaming is used and one ethnic group achieves more academically than the other (as in the case of Schofield & Sagar, 1977; see also Epstein, 1985; Longshore & Prager, 1985; Schofield, 1991). There is also great potential within both classroom and extracurricular projects for cooperative tasks, which would provide the opportunity for meaningful interactions.

Each of these conditions can be more or less applicable in different educational settings, depending on the ethnic and academic policies of the school. There is however, as discussed, strong evidence from the literature that simply creating diverse educational environments does not result in meaningful integration, despite what may be the best intentions of the school. A more active approach therefore needs to be taken to encourage and foster interpersonal contact between ethnic groups, whether assigning (ethnically mixed) students in groups to complete cooperative projects, or developing alternatives to academic streaming; such equal-status activities have in fact been shown to reduce academic disadvantages to minority students (Epstein, 1985).

In previous research, it has been highlighted that it is difficult to separate ethnic divides from those relating to academic ability or socioeconomic status (e.g., Schofield & Sagar, 1977). For the purposes of interethnic contact theory, it would be useful for further research to investigate diverse settings where the ethnic minority is of an equivalent socioeconomic background and academic attainment level, and track the self-segregation of adolescents in schools, and how this may develop over time. Such research is presented here.

Present Research

Context: Oldham, Greater Manchester

Oldham is a town in Greater Manchester, UK. Like many other towns in the Northwest, it has a large ethnic minority population from Southeast Asia – primarily Pakistan – that was cultivated in the mid- to late-1900s to fill textile factory positions. Since that time the factory industry has declined, leaving a town with second- and third-generation Asian British who, along with the White British, are facing high unemployment and urban decline, and occupy “marginal spaces in today’s postindustrial economy” (Phillips, 2004, p. 26). At the time of the 2011 census, Oldham had an Asian population of 22.5% (of which 10% Pakistani British, 7% Bangladeshi British, 5.5% Other Asian British). Within the town, there is marked residential segregation between the Asian British and White British communities, such that Oldham has the highest level of Pakistani segregation in all of the UK (Peach, 1996). Meanwhile, the last half century has seen concerns grow over immigration and ethnic integration. Within the UK, there has been a rise in popular fear that England may be heading towards the ‘ghettoisation’ found in the US (Peach, 1996), where responsibility has been firmly pointed at Muslims for lack of integration (Russell, 2002) and at Asian British parents for not speaking English enough in the home (Pallister, 2002).

In 2001, Oldham and the neighbouring towns of Bradford and Burnley were the sites of prolonged race riots, which erupted in response to the arrest of young Asian British men, and involved conflict between Asian British men, counter-protesting White British men (including the involvement of the British National Party and the National Front), and the police. This eruption of hostilities has been widely suggested to reflect growing prejudice and tension in such communities, and was suggested for example to reflect “manifestations of wider tensions and distrust between the British Muslim and non-Muslim (predominantly White) population across the country” (Phillips, 2004, p.26). The conflict was so great, and

the demonstration of interethnic hostilities so shocking that it was the subject of national media (e.g., Bunyan & Sparrow, 2001; Ward & Watt, 2001). With the concerns of self-segregation and interethnic relations brought into the spotlight, the government commissioned a report from the Community Cohesion Review Team to investigate the underlying self-segregation and interethnic tensions (Cantle, 2001). This so-called ‘Cantle Report’ concluded that the Asian British and White British in the areas that had seen riots led a “series of parallel lives” where intergroup contact was minimal (Cantle, 2001, p. 9). While this report was instrumental in highlighting the entrenched residential self-segregation and its negative consequences, it has also been credited with eliciting widespread criticism of the role of the *Muslim* community in this self-segregation, and increasing discourse on the responsibility (and failure) of the Asian British community to integrate (Phillips, 2004). Such views, while popular and widely spread amongst the media coverage at the time (Kundnani, 2001), have no basis in any evidence suggesting that the Asian British population were any less resistant to ethnic integration than their White British counterparts (Phillips, 2004).

On the other hand, a positive outcome in response to this report was that there was increased focus on the importance of integrating school students, whose primary and secondary education was largely *de facto* segregated given the residential self-segregation. There were two main exceptions to this: the sixth form college, and the instigation of merger schools. Oldham Sixth Form College (OSFC) educates Year 12 and Year 13 students (aged 16-18), i.e., the last two years before university. It is the only college in the town, and therefore draws pupils from a range of secondary schools, and ethnic backgrounds – in 2015-2016 the student body was 56% White British, 40% Asian British, 1% Black British and 3% mixed ethnicity/other (this relative proportion is consistent over the years).

In the last five years, the town has also seen the foundation of three new ‘merger’ schools, where in each case two schools were merged on a new campus to form one new and

larger academy. Each new school merged officially on its new campus in 2012, the year I began my research. Oasis Academy was formed from two primarily White British schools; Newman Roman Catholic College from two Catholic schools, one primarily White British and the other ethnically mixed; and Waterhead Academy from one primarily White British school and one primarily Asian British school. As such, Waterhead Academy is the only school to have merged two segregated schools (Breeze Hill: 86% Asian British; Counthill School, 93% White British), and has a student body that is 48% White British, 46% Asian British, and 6% mixed ethnicity/other.

Research Overview

I had unique access to both Oldham Sixth Form College and Waterhead Academy for my DPhil research, given their interest in promoting cross-ethnic integration. Both of these settings had roughly equal numbers of White British and Asian British students, and provided contexts of adolescent intergroup contact – at the merger school, students had recently come from being in the ethnically homogenous schools (Breeze Hill and Counthill), and at the sixth form college, the majority of students had come from ethnically homogenous secondary schools. As such, both settings provided a rare context whereby the majority of adolescents were in an ethnically diverse educational setting for the first time, and provided with opportunities for outgroup contact for the first time.

As highlighted in the self-segregation literature however, opportunities for contact often do not translate into actual contact. Despite hopes that these educational settings would encourage integration – Cantle (2006) specifically mentions OSFC, and the great potential it has for fostering intergroup friendship and shaping attitudes – it is overly optimistic to *assume* that such phenomena are occurring. I therefore sought to investigate, first, the extent of self-segregation that may be occurring in the merger school and the sixth form college. For

this, I conducted observational studies in each school's cafeteria areas (Studies 1 – 3), and a social network study in the merger school (Study 4). To capture any changes in self-segregation over time, I collected 2-3 waves of each methodology over the course of two academic school years. Having then established the presence of self-segregation, I conducted a survey in the sixth form college on cafeteria preferences and factors influencing seating choices (Study 5).

There are two main strengths of the research presented here: the triangulation of methodologies, and the longitudinal approach. As previously discussed, self-report surveys, observational studies of self-segregation, and social network analyses are informative in their own right, but limited in the scope of the integration they seek to assess. By using three methods, I was able to holistically examine and evaluate self-segregation: establish the extent of self-segregation (at the friendship level, and in recreational seating choices); whether the new opportunities for contact resulted in increased integration over time; and the characteristics of self-segregation, both initially and over time (e.g., the influence of gender). Results from each of these studies, and combined together, are strongly placed to advocate the merits of diverse schools, while highlighting how stagnated actual integration can be over time in the absence of aggressive interventions. Suggestions for such interventions, and further implications and research suggestions will be discussed in the General Discussion in Chapter 5.

CHAPTER 2: MICRO-ECOLOGICAL OBSERVATIONS OF INTEGRATION

Abstract

In this chapter, I present three studies of micro-ecological observational research: Study 1, two waves of observations in a sixth form cafeteria (aged 16-18); Study 2, two further waves of observations in the sixth form cafeteria, along with an additional smaller cafeteria; and Study 3, two waves of observations in a merged school (aged 11-15). Results from Studies 1 and 2 showed stable levels of ethnic self-segregation, but gender integration; Study 3 however showed a slight increase in ethnic integration over time, with stable gender self-segregation. These results are contrasted to form a discussion on the possible role of age on the development of ethnic and gender group salience.

Introduction

Contact Theory

The study of intergroup relations within psychology has derived a great deal from the 'contact hypothesis' (Allport, 1954). This theory outlines the importance of contact between groups in order to reduce prejudice. This original hypothesis stressed some 'optimal conditions' necessary for successful incidences of contact: opportunity for in-depth, stereotype-disconfirming interactions; a non-competitive setting for contact; equal status conditions; and authority figures known to support the interaction. Significantly, these conditions stress that *mere* contact, or co-occupation of an area, is not enough in itself to promote improved relations. This theory was proposed in the context of a body of then-recent research that had

investigated a new frontier in inter-ethnic relations following increased exposure during and immediately after World War II (e.g., Brophy, 1945; Mannheimer & Williams, 1949).

Evidence for the positive effects of contact was also found in mixed-ethnicity housing (Wilner et al., 1952) and in mixed-ethnicity places of work (MacKenzie, 1948).

The contact hypothesis has been rigorously tested in the years since it was proposed. A meta-analysis by Pettigrew and Tropp (2006) aggregated more than 500 studies from a variety of groups, nationalities and situational contexts, and found a significant effect of contact on improving intergroup attitudes, even in the absence of Allport's optimal conditions. Moreover, several studies have also identified underlying mechanisms behind these positive effects, through cross-sectional, longitudinal and experimental methodologies. For example, a significant body of literature focuses on the role of intergroup anxiety in intergroup behaviours, with evidence that intergroup anxiety is a mediator in the positive effect of contact on intergroup attitudes (Pettigrew & Tropp, 2008; Voci & Hewstone, 2003).

Interestingly, and somewhat problematically for those implementing contact theory, intergroup anxiety has also been shown to act as a moderator (e.g. Van Zomeren, Fischer & Spears, 2007; see also Stephan & Stephan, 1985). In this model, the process whereby intergroup contact leads to a reduction of prejudice is reduced with high levels of pre-existing intergroup anxiety, which negatively affects one's likelihood to engage in intergroup contact. This may result from an increased tendency to interpret any attempted contact as an aggressive or hostile act by the outgroup (Van Zomeren, Fischer & Spears, 2007) and polarised evaluations of the outgroup (Stephan & Stephan, 1985). In instances where there is a chronic state of tension between two groups, pervasive intergroup anxiety may decrease the likelihood of either seeking out or engaging in outgroup contact. As such, the positive effects of contact are not being employed to their full potential.

Segregation Literature

Previous research by geographers, political scientists and sociologists has documented macro-level residential segregation between Whites and Blacks in the US (e.g., Massey & Denton, 1988); between Whites and Blacks in post-apartheid South Africa (e.g., Christopher, 2001); and between Whites and Asians in parts of the UK (Peach, 1996). While these perspectives provide useful documentation of the lack of opportunities for contact even within diverse cities, we should be careful not to assume that the opposite holds true – that when macro-level spaces *are* integrated, the people within it are making use of their opportunities for contact. A setting for example which contains a diverse representation of groups would, under this reasoning, be assumed to represent inter-group contact - and question the effectiveness of such contact if attitudes do not improve as expected. This reasoning ignores however the possibility that people within such settings are not taking up opportunities for contact. While desegregation laws were designed to promote inter-personal interactions, micro-ecological research soon followed to demonstrate that this is *not* always the case: Campbell et al. (1966) found that White and Black students at a desegregated university were segregating in classrooms by ethnicity. Research that followed found similar results in a variety of settings, such as an American church (Parker, 1968), and post-apartheid South African beaches (Dixon & Durrheim, 2003) and nightclubs (Tredoux & Dixon, 2009).

If the positive effects of contact, which have been rigorously demonstrated (Pettigrew & Tropp, 2006), are to take place then opportunity for contact must translate into actual interpersonal contact. Such micro-ecological research in diverse settings is therefore essential in the study of contact theory, as a method for psychologists to determine the relative presence of opportunity for, and actual contact in the context. The distinction between these two is not only useful in allowing psychologists to control for amount of actual contact, but

as an area of study in itself: *why* do people often not use opportunities for cross-group contact?

This question has been addressed in the literature on homophily, where individuals' preference for similar others in their networks has been demonstrated along a variety of group dimensions (McPherson et al., 2001). Observational studies of behavioural segregation have essentially documented homophily by ethnicity, one of the most immediately identifiable group categories. Some of these studies have further noted the presence of segregation by gender, with Sagar, Schofield and Snyder (1983) reporting classrooms containing both Black and White students which were primarily *gender*-segregated, and secondarily *ethnicity*-segregated. Females in particular have been implicated in being less likely to have cross-ethnic interactions (Schofield & Sagar, 1977), and all-female groups being twice as likely to be ethnically homogenous than other gender combinations (Clack et al., 2005). If “comparatively little” micro-ecological research has been done (Tredoux & Dixon, 2009, p.761), then even fewer studies have gone further in examining this intersection between gender and ethnicity homophily.

Moreover, observational studies within educational settings have been predominantly based in universities, therefore examining students 18-22 years old. Increasingly however it is becoming relevant to consider developmental aspects of intergroup relations, with research by Wölfer et al. (in press) demonstrating that the effects of contact are greatest during adolescence (compared with early adulthood). As such, we would expect that diverse schools will be the most successful in promoting positive outgroup attitudes, and cross-group friendships, among students of a younger age (or with students who have been in such a diverse setting *from* a young age). As yet however, though Wölfer et al. have identified the diminishing influence of contact *after* adolescence, no research has looked at age effects of contact and integration within school-age children and adolescents themselves. Such a line of

research therefore has profound implications for integration policy, and its implementation in educational settings.

As mentioned, there has been a call led by Dixon for more micro-ecological perspectives in mapping integration (Dixon & Durrheim, 2003; Dixon, Tredoux & Clack, 2005; Dixon, Tredoux, Durrheim, Finchilescu & Clack, 2008; etc.) As Dixon has himself said though, research mapping single shots of segregation “‘freezes’ what is an essentially dynamic process” (Dixon et al., 2005, p. 402). The majority of observational research has however recorded segregation at one point in time – that is to say, although researchers may take recordings at several times in the day, or even several days in the week, they do not cover a timeframe in which we would be able to examine *changes* in the same population’s integration behaviours (but, see Koen & Durrheim, 2009; Schofield & Sagar, 1977). Such static research raises more questions than it answers; this is a useful process in the early stages of a field of research, by initially demonstrating stark contrasts between macro-level diversity and micro-level segregation, but can only confirm that there *is* segregation. When the question becomes not *whether* segregation is pervasive, but *how* it happens and can change, subsequent one-off observational studies yield diminishing information. If and when these studies replicate the presence of segregation within diverse spaces, this is increasingly unsurprising; if instead a diverse setting were found *not* to show segregation, it could suggest that the factors unique to this context somehow promote more integrative behaviour. However, the number of known and unknown factors that vary between different contexts of segregation research (groups involved, gender proportions, activities observed, nationality and cultural background, etc.) make it nearly impossible to compare settings by a single variable. Far better would be to compare a single setting’s segregation behaviours over months or years, for a true reflection of dynamic behavioural patterns.

Such research is also of particular importance to psychologists researching intergroup contact, since as previously noted, one-off observations showing micro-ecological segregation demonstrate the *absence* of interpersonal contact. A longitudinal methodology would however allow us to identify when/whether segregation decreases and contact increases. Segregation itself cannot reliably indicate the cognitive or affective processes present in the people involved, and has in fact be shown to have no link with negative attitudes (McKeown, Cairns, Stringer, & Rae, 2012; Al-Ramiah et al., 2014) but in fact with apathy towards the outgroup (Al-Ramiah et al., 2014). These multi-method approaches tying observational studies with attitudes, as promoted and encouraged by McKeown et al. (2012), can in a longitudinal design tie changes in integration behaviour with changes in other variables of interest. To the best of my knowledge, no study has so far taken a multi-method approach using both longitudinal observations and longitudinal measures of other factors.

Research Setting: Oldham

Many schools in the town of Oldham, Greater Manchester, have been trying to promote cross-group interaction and friendships between White British and Asian British students. This town has an unusually large ethnic minority population of around 22.5% (ONS Census 2011), mostly of Pakistani origin, and has historically had troubled relations between its minority Asian British and majority White British residents. The town is markedly residentially segregated (Phillips, 2004), and suffered prolonged race riots in 2001 involving conflict between White British men, Asian British men and the police force. Since that time, policy makers have been committed to improving intergroup relations, with focus given to targeting attitudes of young people. Cantle (2006), in his policy report written in the riot aftermath, expressed hope that institutions such as Oldham Sixth Form College (OSFC), with their ethnically diverse academic pupils, would provide an opportunity for the young

generation to establish bonds with one another and form the start of an improvement in relations going forwards. Currently, OSFC has a population of 57% White British, 40% Asian British, and 3% Mixed/Other.

Such concerns and motivations are likewise present in other Oldham schools, perhaps most notably in those who have recently merged campuses. In these cases, two schools which were previously situated in predominantly-White British and predominantly-Asian British locations, respectively, and had resulting homogenous pupil populations merged into a new campus, where the students were mixed to form the new student body. One such example was when the majority-Asian British Breezehill School and the majority-White British Counthill School merged on a new campus to form the Waterhead Academy, which is currently 48% White British, 46% Asian British, and 6% mixed/other. The hope in such instances is that the students will benefit from the exposure to the other group, make use of their intergroup contact opportunities, and that positive interethnic relations will become normalised.

The Present Research

This chapter will discuss the longitudinal observational research I conducted in two educational settings: OSFC, with 16-18 year old students, and the Waterhead Academy merger school, with 11-16 year old students. As previously discussed, both settings have comparably high levels of diversity; though they have come by this diversity through different routes (merging two schools, versus attracting high academic achievers), students in both settings are almost unanimously in a diverse educational setting for the first time. As such, one major difference between the two settings is, relatedly, both the age of students and the age at which students have had first inter-ethnic contact. These two educational settings

therefore allow comparison *between* adolescents of different ages, to add further detail on developmental perspectives on contact.

Overall therefore this chapter comprises three studies I undertook looking at micro-ecological measures of behavioural integration. In Study 1 I conducted 2 waves of observational studies in the sixth form college, where in each wave a whole day's observations were recorded from the college's main cafeteria, over a period of 6 months. In Study 2 I conducted two further waves in the sixth form college over a period of 3 months, where I collected observational data from an additional café seating area outside the main cafeteria, to test whether students were not only segregating themselves at the table level, but also in what larger dining rooms they choose to sit in. I was able to measure segregation then at two levels: whom students chose to sit next to, and whether students clustered by ethnicity in the larger cafes or café areas. In Study 3, I conducted two waves of observational studies in the merger school, over a period of 6 months. These observations took place in the school cafeteria during lunchtime, when students' lunches were staggered by year group, allowing separate observations for students of different age brackets.

For these studies, I had four main hypotheses. Firstly, given the self-segregation and homophily found in previous literature (e.g., Al-Ramiah et al., 2014; Clack et al., 2005; Dixon & Durrheim, 2003; Schofield & Sagar, 1987; Tredoux & Dixon, 2008), I predicted that students would be self-segregating by ethnicity within these cafeteria settings – both at an interpersonal level, and in their choice of where to sit in the wider spaces (i.e., self-segregation would also be present at the area or café level) (Hypothesis 1). I further predicted that all-female groups may be more likely to be ethnically segregated than either all-male or mixed-gender groups, given the precedent in the literature (e.g., Clack et al., 2005; Sagar et al., 1983) (Hypothesis 2). In light of Wölfer et al.'s (in press) developmental findings, I predicted that the (older) students in the sixth form college would be less integrated, and

show lesser integration over time, than the (younger) merger school students (Hypothesis 3). Similarly, within the merger school where observations would be divided by year groups, I predicted that the older year groups would show less improvement in integration over time (Hypothesis 4).

Study 1: Sixth Form College Main Cafeteria Observations

Method

Sample and context. I conducted observational studies in a sixth form college for 16-18 year olds in Oldham, whose population of students is 56% White British, 40% Asian British, 1% Black British and 3% mixed ethnicity/other; 54% female and 46% male. Two observational studies were conducted during different terms in the school year, in the college's main cafeteria. Four undergraduate Research Assistants were recruited to assist with data collection, and received training on full coding procedure from an extensive personal briefing, and a practice run (without students present) in the café areas the day before the studies commenced. Each observation took place over two school days, in order to collect a large number of observations. Each day contained 12 intervals in which observations were taken, every half an hour.

At the time of Wave 1, Spring Term 2013, between 3-284 students were recorded in the main cafeteria at different time points, in which the proportion of Asian students ranged from 8-58%, and the proportion of female students ranged from 29-76%. Both of the college's year groups – Year 12 and Year 13 – were present at school at that time. At the time of Wave 2, Summer Term 2013, between 1-132 students were recorded in the cafeteria at different time points, in which the proportion of Asian students ranged from 0-46%, and the proportion of female students ranged from 0-92%. Crucially, at this latter time the Year 13 students were away on study leave, so that only Year 12 students were present during these observations.

Materials. The Research Assistants and I each had 12 maps of our individual cafeteria area to be coded, one for each half hour time period to be recorded, per day (a total of 24 maps each).

Procedure. Parents of all college students were sent letters with information on the planned research, not highlighting any particular interest in ethnicity but more generally our interest in seating patterns and cohesion. These letters included an opt-out form, which was deemed by the school to be more practical and representative of parent attitudes than opt-in. No opt-out forms were returned. Neither the researchers nor the college drew students' attention to these studies at the time at which they were taking place, other than being generally notified that researchers may be present in the college within the next two weeks.

Observational studies of self-segregation took place in the college's main cafeteria, in two waves. The main cafeteria layout can be seen in Figure 3. Given the size of the space under observation, the cafeteria was divided into five observation areas, determined by architectural division of the cafeteria by shape, walls or food stalls. Each area was occupied by one researcher or Research Assistant who sat in and observed that area only, except for Area 1, which was further divided in two given its size and coded by two researchers. Previous research in this setting suggests that inter-rater reliability for observing gender and ethnicity is high enough for only one person to code each area (see Al-Ramiah et al., 2014).

Researchers were, as far as possible, strictly non-interactive with the sixth form students, remaining unobtrusive in their seat with the maps and coding kept casually private. We were dressed in casual clothing, much like the students (there not being a uniform). Moreover, given that the undergraduate research assistants were between 19-20 years old, it was the school's opinion that our presence as researchers would go unnoticed in the cafeteria.

As such, the students would have been seating themselves and interacting as they normally would, without interference of being aware of observation.

In each cafeteria area, the gender and ethnicity of any student sat in the cafeteria was coded over two days, with 12 intervals in each day (9am – 3pm). Each interval corresponded with a blank map for a specific area, in which the researcher in that area would note shorthand gender and visible ethnicity details of each student on the seat on the map which they occupied (see Figure 4). As such, maps produced not only information on students' location and demographics, but also on their location relative to other students. Adjacencies, where students were seated in either side-by-side or face-to-face proximity, were thus recorded.

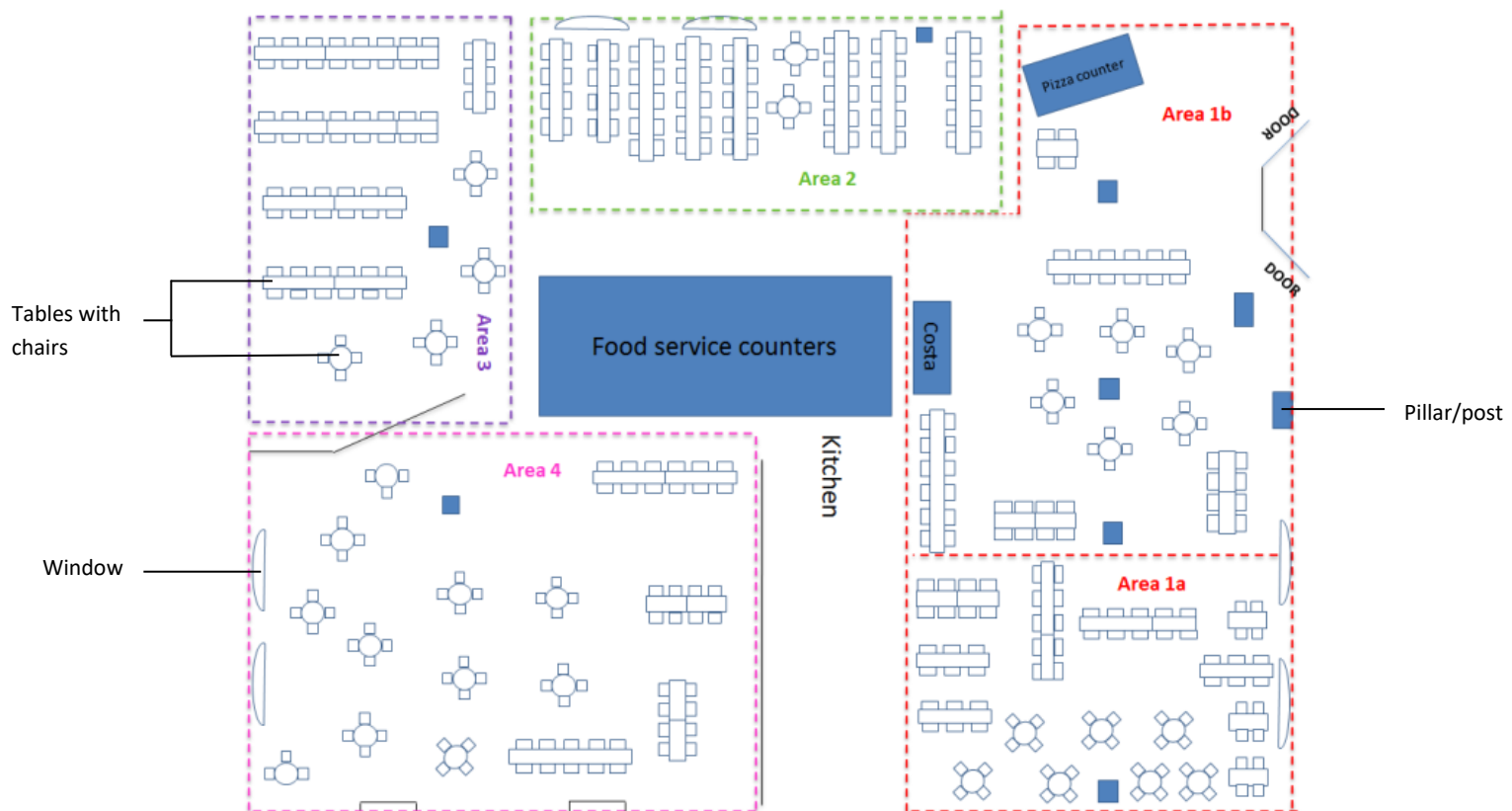


Figure 3: Diagram showing a bird's-eye view of the main cafeteria.

Each researcher made note of the social units on, within or between tables. Social units were identified as groups of people who were in conversation with each other, and/or had body positions oriented towards each other, indicating a friendship group. This information was sought to make a distinction between spatial proximity and in-depth contact: in instances where there are cross-ethnic adjacencies, it is important to have an indication of whether these students are sat together to converse, or are adjacent by chance or necessity, where the opportunity for interaction offered by proximity is not taken up. Equally, social units with interpersonal contact were sometimes spread across tables, such that interactions were in fact occurring despite students not being directly adjacent.

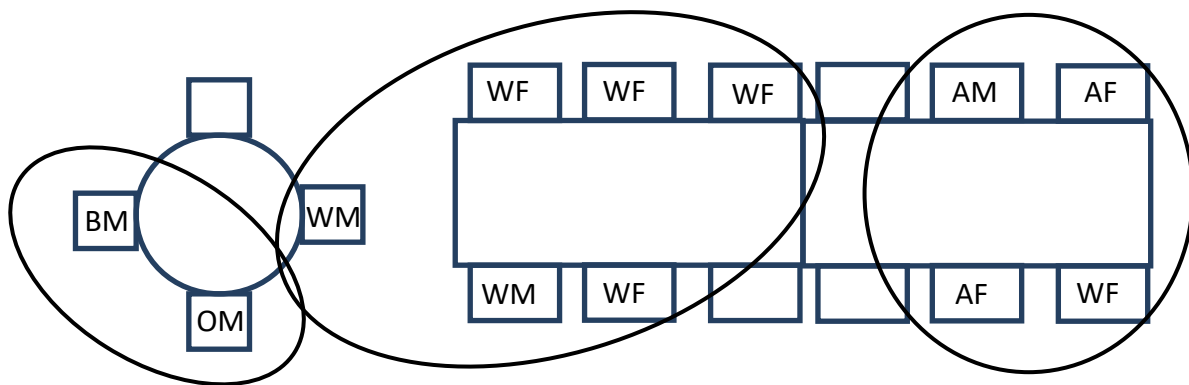


Figure 4: Example of short-hand coding of the seating positions of students. Here each student is represented by two letters, the first denoting ethnicity (W for White; A for Asian; B for Black; O for other).

In order to ensure minimal overlap with the previous time interval, an order of coding tables was established in each area such that at the start of the half hour, the same table order was observed and recorded. Once a table had been fully recorded, it could not be returned to again until its turn in the next half hour – i.e., if more students entered the cafeteria and joined a table after it had been coded, this would not be added until the next time period (presuming the students were still there). If students had moved chairs around to sit with each other, the new placement was recorded at the time of coding. If on occasion a table could not be fully

seen from their position, the researcher would take the opportunity to walk for a coffee – keeping their maps covered – and get a better glance on their way back. Subsequent to the observations, the hand-written codes from the maps were converted into a colour-coded mapping system of the whole cafeteria, from the template of Figure 3. Gender, ethnicity and social units were represented in these maps according to the key in Table 1, with example tables in Figure 5 (for an example of a fully-coded cafeteria map, see Appendix 1).

Table 1: Code for colour version of maps showing gender and ethnicity

<i>Code</i>	<i>Students</i>
	White male
	White female
	Asian male
	Asian female
	Black male
	Black female
	Other male
	Other female
	Single-ethnicity social unit
	White-Asian mixed social unit

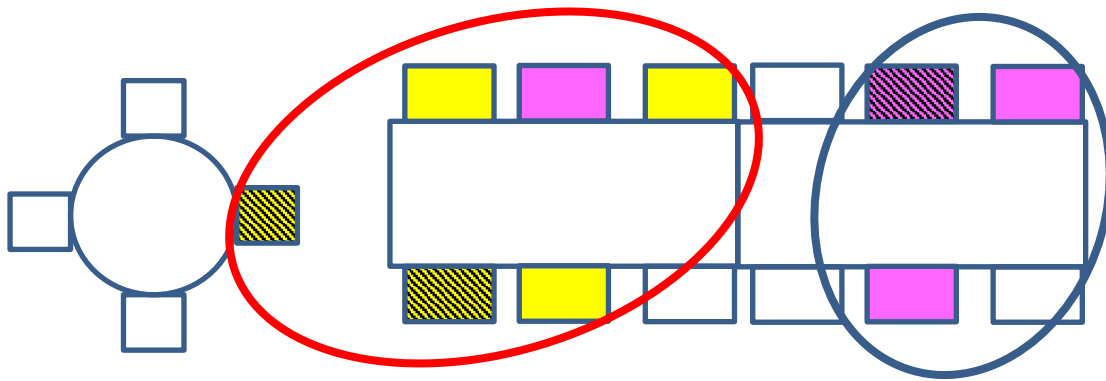


Figure 5: Example of a visually coded table, denoting gender, ethnicity and presence of single-ethnicity and ethnically-mixed social units.

Results

Three indices of segregation were calculated from the data: the aggregation *I* index (adapted from Campbell et al., 1966); and the exposure *P* and dissimilarity *D* indices (see Clack et al., 2005). Each captured different dimensions of seating choices that differ from random distribution.

Cross-ethnic adjacencies: aggregation *I*. In his 1966 paper, Campbell referred to self-segregation as ‘aggregation,’ and formulated an index for measuring this phenomenon following observational study. This aggregation *I* index was originally designed to quantify how the number of cross-ethnic adjacencies present in a classroom of rows of students differed from the number expected under randomness (see Equation 1)¹. This index has subsequently been used in other observational studies of non-row-based mixing patterns, however (e.g., Al-Ramiah et al., 2014; Clack et al., 2005; Dixon & Durrheim, 2003), and therefore was used in the present research for consistency.

$$I = \frac{A - EA}{SD} \quad \text{where } EA = 2 \frac{M(N-M)}{N(N-1)} (N - K)$$

EA = Expected number of adjacencies under randomness

A = actual number of adjacencies observed²

SD = standard deviation of EA

M = total White students in cafeteria

N = total Asian students in cafeteria

K = total groups of students in cafeteria

Equation 1: Simplified formulae for calculating Campbell et al.’s (1966) aggregation indices (*I*).

¹ The formula was used in its original format, but applied in the cafeteria setting to reflect that it was possible for students to be sat *opposite* each other as well as side-by-side. As such, White-Asian adjacencies were counted in either condition, but crucially up to a maximum of two cross-ethnic adjacencies per student, to reflect the maximum possible in Campbell et al.’s original equation. It should be noted that although this rule was held in mind, at no time was it found that any student had three or more White-Asian adjacencies, where some would have to be disregarded. That the formula is designed for a maximum of two cross-group adjacencies, i.e., for row-based seating, is a limitation which previous cafeteria research using this index has not adequately addressed (as discussed in Chapter 1).

² Within this context, White-Asian adjacencies specifically were counted, since the minority population of Black or Other students was only roughly 3%.

I values vary such that negative values indicate fewer cross-ethnic adjacencies than would be expected by random mixing of the students present – i.e., that students are showing self-segregation by ethnicity. These values were calculated for each of the time points during the day, except those where only one ethnicity was present in the cafeteria (see Table 2). *I* values in Wave 1 ranged from -21.92 to -2.71, and were more negative than values expected under random mixing, supporting Hypothesis 1. In Wave 2 values were also consistently negative, ranging from -6.02 to -0.34, and thus deviated from values expected under random mixing, showing self-segregation (again supporting Hypothesis 1). Values were not significantly different between days ($p>.05$).

Table 2: *t* values for White-Asian adjacencies in Study 1. Dashes indicate time intervals where no Asian students were present in the main cafeteria

Interval	Wave 1		Wave 2	
	Day 1	Day 2	Day 1	Day 2
1	-3.85	-2.71	-	-
2	-1.73	-4.09	-1.33	-
3	-4.40	-5.19	-	-
4	-4.06	-12.68	-2.46	-2.96
5	-6.16	-13.75	-3.61	-3.00
6	-14.21	-13.09	-1.95	-4.89
7	-7.70	-5.41	-3.97	-
8	-9.45	-8.21	-2.97	-
9	-12.36	-9.26	-0.34	-5.13
10	-21.92	-11.94	-4.57	-6.02
11	-3.34	-	-2.41	-3.02
12	-4.73	-3.36	-	-2.59
Mean	-7.98		-3.20	

Social units: exposure *P*. Opportunities for cross-ethnic contact become more flexible outside the classroom, for example spatially – one can be integrated beyond those sat immediately next to you. To better reflect the exposure that a person may be getting to outgroup members around them in an observational context, Clack et al. (2005) adapted an exposure index from McCauley, Plummer, Moskalenko and Mordkoff (2001) to calculate the exposure that each ethnicity is receiving to the other compared to the amount theoretically available in the setting. This yields therefore two separate values: *aP_w*, Asian British students' exposure to White British students given the White British population present; and

wPa , White British students' exposure to Asian British students given the Asian British population present. The index therefore indicates how much each ethnic group as a whole has exposure to the other ethnic group, compared to what they could be having under random mixing, given the proportion of ethnic groups present.

Students' exposure levels are measured by observing 'social units' – a cluster of students who form an interacting group in the observation. The ethnic heterogeneity of these units is given a value from 0-1, whereby 0 indicates an ethnically homogenous social unit, and a value above 0 indicates a heterogenous social unit. The overall exposure index for each ethnicity in each time interval is the sum of every unit's value (see Equation 2).

$$wPa = \sum_i^n (W_s/W)(A_s/T_s) \quad \text{and} \quad aPw = \sum_i^n (A_s/A)(W_s/T_s)$$

W_s : White students within the social unit
 W : White students in main cafeteria
 A_s : Asian students within the social unit
 A : Asian students in main cafeteria
 T_s : Total students within the social unit

Equation 2: Exposure indices for White and Asian students to each other respectively.

As such, P values for each time interval vary from 0 (all social units are ethnically homogenous) to 1 (social units are as heterogenous as would be expected by random mixing).

I calculated these wPa and aPw indices for each time interval and day of Wave 1 and Wave 2, using the data on social units coded during observations (see Table 3). Values in Wave 1 ranged from 0 to 0.2 (out of a maximum of 1) for ethnic exposure, showing strong self-segregation, supporting Hypothesis 1. Moreover, I also calculated identical exposure indices for exposure by gender - mPf and fPm – to create a comparative measure of gender segregation within the same setting. These values ranged from 0-0.43, with a mean value of

0.3, showing no overall self-segregation by gender. Neither ethnicity nor gender exposure values were significantly different between days ($p > .05$).

Table 3: Study 1 exposure indices for exposure by ethnicity (shaded) and gender (unshaded). Dashes indicate time intervals when no Asian students were present in the main cafeteria.

Interval	Wave 1				Wave 2			
	<i>wPa</i>	<i>aPw</i>	<i>mPf</i>	<i>fPm</i>	<i>wPa</i>	<i>aPw</i>	<i>mPf</i>	<i>fPm</i>
1	0	0	0	0	-	-	0	0
2	0.03	0.04	0.27	0.27	0	0	0	0
3	0.03	0.11	0.27	0.20	-	-	0.35	0.17
4	0.02	0.19	0.36	0.13	0.02	0.08	0.19	0.16
5	0	0.02	0.43	0.18	0.01	0.05	0.22	0.12
6	0.02	0.10	0.27	0.13	0.02	0.14	0.23	0.09
7	0.02	0.14	0.29	0.15	0	0	0.09	0.06
8	0.03	0.14	0.34	0.12	0.01	0.08	0.37	0.09
9	0.03	0.16	0.37	0.13	0.02	0.31	0.64	0.42
10	0.04	0.15	0.40	0.12	0.03	0.21	0.26	0.08
11	0.02	0.20	0.19	0.11	0	0	0	0
12	0.03	0.20	0.46	0.25	0	0	0.01	0.01
Mean	0.02	0.12	0.30	0.15	0.01	0.09	0.20	0.10

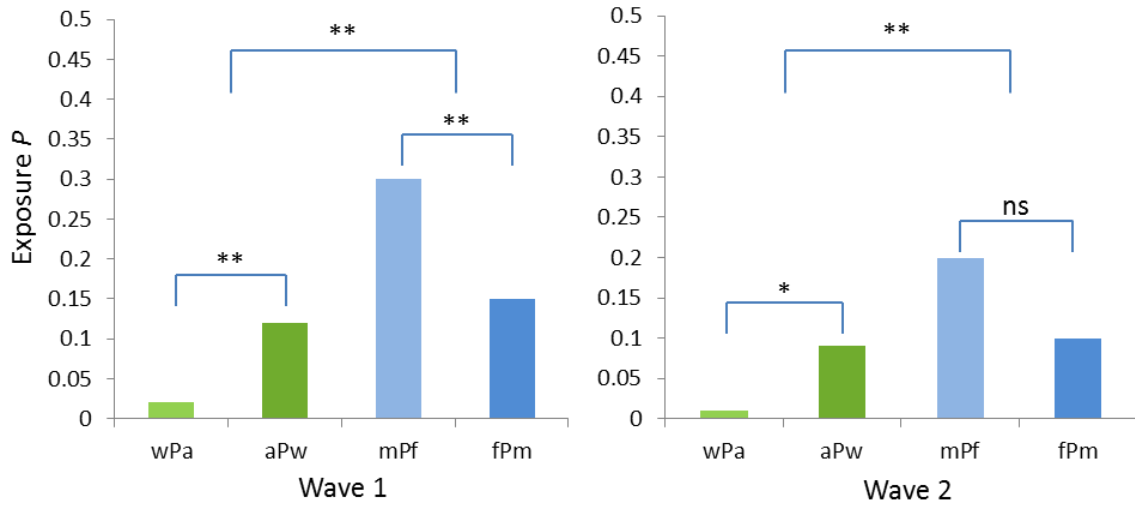


Figure 6: Graphs showing exposure P values for ethnicity and gender in Study 1.

I conducted paired-samples t -tests to compare P values in both waves (see Figure 6). In Wave 1, gender integration was higher than ethnic integration, where values for gender exposure ($M = 0.23$, $SD = 0.13$) were significantly higher than values for ethnicity exposure ($M = 0.08$, $SD = 0.01$), $t(23) = 4.58$, $p < .001$, $d = 1.63$; the same was the case in Wave 2 ($M_{ethnicity} = 0.06$, $SD_{ethnicity} = 0.12$; $M_{gender} = 0.17$, $SD_{gender} = 0.21$), $t(23) = 2.77$, $p = .01$, $d = 0.64$.

Within ethnicity, Asian British students' relative exposure to White British students was greater than vice versa, i.e. Asian British students were making better use of the outgroup students available: values for aPw were significantly higher than wPa in both Wave 1 ($M_{aPw} = 0.13$, $SD_{aPw} = 0.18$; $M_{wPa} = 0.026$, $SD_{wPa} = 0.02$), $t(11) = 5.45$, $p < .001$, $d = 1.16$, and in Wave 2 ($M_{aPw} = 0.11$, $SD_{aPw} = 0.15$; $M_{wPa} = 0.01$, $SD_{wPa} = 0.01$), $t(9) = 2.50$, $p = .003$, $d = 0.9$. Within gender, there was only a significant difference in Wave 1, where males had higher relative exposure to females than vice versa, and values for mPf ($M = 0.30$) were higher than for fPm ($M = 0.15$), $t(11) = 5.47$, $p < .001$, $d = 1.47$.

Between waves, White British students' relative exposure to Asian British students decreased, where values for wPa were significantly lower in Wave 2 ($M = 0.01$; $SD = 0.004$) than Wave 1 ($M = 0.03$, $SD = 0.004$), $t(36) = 2.28$, $p = .03$, $d = 0.77$. No other P values for ethnicity or gender changed significantly between Wave 1 and Wave 2.

To test Hypothesis 2, I investigated descriptive statistics of the features of ethnically-mixed social units, particularly relating to gender. I therefore grouped all social units from across all time points of each wave by their gender composition (all-female, all-male or mixed gender), and calculated the percentage that were ethnically-mixed for each gender grouping (see Table 4). These results do not support Hypothesis 2, in that all-female social groups are no less likely to be ethnically-mixed; in fact, they are somewhat more likely to be ethnically-mixed than either all-male or mixed-gender social groups.

Table 4: Percentage of social units in Study 1 that were ethnically heterogenous (White-Asian) across all time intervals in each wave – by total social units, and broken down by gender composition.

Wave	All-female	All-male	Mixed-gender	All social units
1	14%	5%	11%	11%
2	10%	2%	5%	7%

Dissimilarity D . The D dissimilarity index (Clack et al., 2005) indicates the unevenness of the spread of group members across a wider space. It does this by producing a D value between 0-1 to indicate the proportion of the minority group that would have to be redistributed between different areas of the wider space in order to match random distribution – here a value of 0 indicates that no redistribution is necessary, and the groups are already evenly spread, but a value for example of 0.75 suggests that 75% of the minority group would need to be redistributed in order to match random distribution in the whole space (see

Equation 3). Overall therefore it indicates whether there is area-level segregation, where groups (e.g., ethnicity) cluster in particular areas.

$$D = 0.5 \times \sum_i \left| \frac{W_i}{W} - \frac{A_i}{A} \right|$$

W_i : White students in one sub-area

W : White students in whole space

A_i : Asian students in one sub-area

A : Asian students in whole space

Equation 3: Dissimilarity D index for evenness of ethnicity distribution.

There are, as previously noted, quite distinct sections within the main cafeteria, and I calculated D indices for each of the time intervals in each wave, using Areas 1-4 as indicated on Figure 3 (see Table 5). Values from Wave 1 and Wave 2 were not significantly different, and values from both ranged from 0.15 to 0.82, with mean values of 0.48 and 0.36 indicating that 48% and 36% of Asian British students respectively would need to be redistributed around the cafeteria areas in order to achieve random spread by ethnicity; this therefore shows self-segregation by café area, supporting Hypothesis 1. Again, values were not significantly different between days ($p > .05$).

Table 5: *D* indices calculated for each time interval in the main cafeteria in Study 1. Dashes indicate a time interval when no Asian students were present.

Interval	Wave 1		Wave 2	
	Day 1	Day 2	Day 1	Day 2
1	0.29	0.50	-	-
2	0.82	0.65	0.25	-
3	0.53	0.75	-	-
4	0.67	0.40	0.54	0.20
5	0.72	0.45	0.48	0.19
6	0.33	0.41	0.59	0.15
7	0.26	0.53	0.48	-
8	0.24	0.42	0.70	-
9	0.30	0.42	0.70	0.18
10	0.25	0.28	0.72	0.23
11	0.60	-	0.37	0.15
12	0.41	0.83	-	0.25
Mean	0.48		0.36	

Summary results. Mean results across time intervals and days can be seen for each index calculation in **Table 6**. There is strong self-segregation by ethnicity, both at the interpersonal level of exposure and adjacencies, and between café areas.

Table 6: Summary results of exposure *P* for ethnicity and gender, dissimilarity *D*, and aggregation *I* from Study 1.

Wave	<i>wPa</i>	<i>aPw</i>	<i>mPf</i>	<i>fPm</i>	<i>D</i>	<i>I</i>
1	0.02	0.12	0.30	0.15	0.48	-7.98
2	0.01	0.09	0.20	0.10	0.36	-3.20

Discussion

Ethnicity exposure. Exposure levels between White British and Asian British students were low at all time points in both waves, and show strong segregation by ethnicity occurring in this cafeteria setting (supporting Hypothesis 1). That the exposure indices do not increase for either ethnicity between Wave 1 and Wave 2 indicates that ethnic integration has not increased across this time period of 3 months, and in fact, White British students are significantly less exposed to Asian British students in Wave 2 than they were at Wave 1, showing less integration given the Asian British students present. While this initially seems a disappointing finding from the perspective of contact theory, it bears remembering that the population of students changed considerably between waves, with Year 13 leaving. As such there is a possibility that the Year 13 students are in fact more integrated than the Year 12 students, having had an additional year of contact with the outgroup – as such, this is a possible explanation for why the cafeteria is in fact slightly more segregated once the Year 13 students had left. To test this idea, I would need to be able to distinguish Year 12 from Year 13 students in Wave 1 to determine whether year group has a relationship with outgroup exposure; unfortunately this is not possible, and remains an untested theory.

A striking difference is that the exposure of Asian British students to White British students is significantly greater than vice versa – in other words, Asian students have greater relative exposure to White students, and are more likely to be in the minority in mixed-ethnicity groups, with greater resulting intergroup contact. This is particularly important to note, given that discussion around diverse regions tends to focus on the issue of whether ethnic minorities are failing to take up opportunities to integrate, and are isolating themselves to the detriment of better community-wide intergroup relations. What is less discussed is whether the White British population are taking up opportunities to integrate with ethnic minorities in their community – this comparison, and the question of relative

responsibility to integrate, becomes more relevant the longer the ethnic minorities have been present in the community (and arguably, the more “British” they can therefore be seen to be).

While the present results do not indicate a very substantial amount of integration on the part of Asian British students, the finding that their relative exposure levels are higher than those of White British students suggests in fact that they are more willing to ethnically mix than their White British counterparts, in a setting where they are in almost equal numbers – this holds true across both waves. More specifically, this means that ethnically mixed social units were for the most part majority-White British, i.e., where the Asian British students in this group were getting more exposure to them than vice versa. Asian British students can therefore be seen as more willing to be in the minority within a social group than White British students are.

The breakdown of the ethnically-mixed social units by their gender composition yielded results that cannot support Hypothesis 2, and the proposition from previous research, that females and female-only groups show the greatest level of ethnic segregation compared with either male-only or gender-mixed groups (Clack et al., 2005). In fact, even when taking into account that all-female units made up the largest gender category in the main cafeteria, these groups showed the highest proportion of ethnically-mixed units – i.e., all-female groups are showing greater ethnic integration. Conversely, all-male social units have the lowest proportion of ethnically-segregated groups, and are showing the least ethnic integration.

Schofield and Sagar (1977), having found greater inter-ethnic interaction in males than females in their study, suggested that females at this age are perhaps more preoccupied with attracting a boyfriend than engaging in interactions with cross-ethnic students of their own gender. In this study, however, while there was evidence of such interest in cross-gender interactions (both through gender exposure indices, and observation of not infrequent sitting

on each other's laps), it did not come with fewer cross-ethnic interactions in females. Perhaps then it is over-simplistic to assign romantic interest (at the expense of cross-ethnic interactions) largely to females of this age – in the current setting, following Schofield and Sagar's logic, it seems that the males are the most preoccupied with interacting with the other sex; this is supported by the fact that all-male social units were by far the smallest category within the cafeteria (as opposed to mixed-gender).

One explanation for the female-male switch in other-gender interest between Schofield and Sagar's study and my own, is that the students in their observations were of American middle school age, i.e. aged 12-14, compared with aged 16-18 in the present study. From a developmental perspective, female adolescents reach puberty faster than boys, and may be interested in dating earlier than the average boy. By late adolescence however males have caught up, and entirely possibly become the ones who are most preoccupied with cross-gender interactions. Since Schofield and Sagar had posited some degree of zero-sum interplay between gender integration and ethnic integration, a developmental perspective would build on this to suggest that girls are initially more interested in gender integration and less motivated than boys to integrate cross-ethnically, but at an older age this pattern is reversed.

It is important to note that the present findings can only tangentially support such hypotheses involving a dynamic developmental process of relative gender/ethnic focus and interactions, and it can be hazardous to apply patterns found within individual studies to entire gender groups. That being said, a gender-developmental process such as previously suggested and built upon here is an intriguing one, with implications for optimal developmental windows for cross-ethnic integration that are different for boys and girls.

Gender exposure. Comparative exposure indices for gender allowed me to test whether students in this setting had particularly strong ethnic segregation, or whether other salient group memberships such as gender may also dictate mixing amongst students. If gender exposure were found to be equivalently low to ethnicity exposure, this would suggest that rather than students being particularly conscious of ethnicity and unwilling to mix with the ethnic outgroup, students may be clustering along a multitude of homogenous categories, of which ethnicity has no particular importance. The finding however that gender exposure is significantly higher than ethnicity exposure does not support this hypothesis, but suggests rather that ethnicity in particular *is* the primary factor influencing the composition of students' social groups.

Aggregation. Results overall showed fewer cross-ethnic adjacencies than would be expected under random mixing, supporting Hypothesis 1. Although *I* values were more negative at Wave 1 than Wave 2, this can be explained by the greater number of students present at the time of Wave 1 – the formula compares the expected number of adjacencies against the actual observed number of adjacencies, and the differences between these two values can be greater when more students are present (increasing the expected number of adjacencies); the difficulty comparing values when different totals (and ethnic proportions) are present is a limitation of this index.

The primary reason for including this index was because it has been used in similar observational settings before, such as Schofield and Sagar (1977), and in this exact setting in Al-Ramiah et al. (2014); results here therefore provided consistency with previous literature, and provide a useful comparison for levels of segregation found in each study, particularly in the case of Wave 1 when the total number of students (and ethnic proportions) were similar to that of Al-Ramiah et al. (2014). The count of side-by-side and/or face-to-face adjacencies (up to maximum 2) was an improvement upon these previous studies, in that it does not produce

two indices each of which may be representing up to half the interactions really present, and therefore misrepresenting the context as being more self-segregated than it really is.

As mentioned, the equation is reliant on the total number of White British and Asian British students present within the area, in order to determine for example how unlikely it is for a White British student to have no Asian British adjacencies given the relative availability of White British and Asian British students in the spatial population. This is, in fact, very useful – it is important to distinguish between a setting with two cross-ethnic adjacencies in a population of 10% Asian British students (less surprising), and a setting with two cross-ethnic adjacencies in a population of 40% Asian British students (more surprising). It does however rely on the crucial assumption that the whole studied population are present in the observed space, and that the students present reflect the true range of possible students and ethnicities to sit with. The possibility not accounted for however is that not all of the college's students are sitting in the main cafeteria, and moreover that ethnicity may be a factor in determining which students even choose to eat there, or not. At no point during observations did the number of students in the setting equal the number attending the college – this is true both here and in all educational observation studies that I am aware of.

This would not matter if we could be confident that the students within the studied space are representative of the college population, both demographically and in their attitudes and behaviours relating to ethnicity. A critical possibility however is that this is not the case, and that one ethnic group may be less likely than the other to sit in the main cafeteria; if this is the case, what is further unclear is whether the reasons for this relate to ethnicity and integration. What would be most unfortunate for the present study would be if White British and Asian British students were in fact segregating at the level of the whole cafeteria, with Asian British students less likely to sit in the main cafeteria observed. The *I* index is designed to compare the expected number of cross-ethnic adjacencies with the number actually

observed, but a large proportion of Asian British students outside the main cafeteria would mean that the index would estimate too few expected cross-ethnic adjacencies, and thus produce a value that indicates less segregation than there actually is. To summarise – since the present study did not observe all possible eating areas for students, it is possible that this index indicates less segregation than there actually is at the level of the wider college eating areas.

Segregation by cafeteria area. *D* values indicated whether students were clustering in different areas of the cafeteria – in other words, whether they were segregated not only at the interpersonal level of seating but in the wider scale of space. While results showed that students were *not* randomly spread around the areas regardless of ethnicity, and closer examination showed White British students particularly present in Area 2, the values only showed that a moderate number of students would need to be redistributed in order to create an even spread by ethnicity. Taken at face value, this would suggest that while students are segregating at the micro-level of immediate seating proximities, students are more relaxed about sharing broader-scale sub-areas within the cafeteria. Much like the aggregation index however, these calculations could be misleading if students *are* in fact clustering by area, outside the main cafeteria – treating, hypothetically, the main cafeteria itself as an area that one ethnicity is less likely to enter. For *D* values to be reliable, the entire scope of possible eating spaces must be observed.

Study summary. Study 1 provided a picture of ethnic segregation (in absence of gender segregation), mainly at the interpersonal level and with more integration seen in Asian British students. While the aggregation measure supports the evidence of ethnic segregation, it and the evenness *D* index are designed to be used on a sample of the whole student population, which was not possible at the time of this study. Although each index for measuring self-segregation has its limitations as previously highlighted, the combined use of

all three measures allowed me to evaluate self-segregation levels more richly than previous research, by demonstrating not only that they provide complementary and robust indication of different levels of self-segregation, but that they all support that there is self-segregation present, and that it got worse at the interpersonal level between waves. Although I was only aware of the existence of the main cafeteria at the time of Study 1, the college then brought to my attention that there was an additional smaller cafeteria, which I then also observed in my next study in order to increase the representation of students observed.

Study 2: Sixth Form College Spatially-Extended Cafeteria Observations

Method

Sample and context. Further observations were conducted in the same sixth form college as in Study 1. While the previous study observed the integration of students present in the main cafeteria, it is important to note that another smaller cafeteria exists separately from the main cafeteria, and was brought to our attention by the college after Study 1 had started (for a photo, see Appendix 2). While observing the main café in Study 1 yielded segregation indices for ethnic clustering by spatial areas within the cafeteria, there is a yet larger scale of segregation possible, where students may choose which cafeteria (and observation setting) to enter based on preferences relating to ethnicity, i.e., inter-cafeteria segregation. This larger scale of segregation will always be lost unless all possible venues for the observation type are observed: in this case, all possible seating areas provided for free time and lunch.

I wanted therefore to conduct further observation studies, which mapped students' seating across both cafeterias, simultaneously. This would therefore produce maps which allow for analysis of integration at this inter-cafeteria scale, as well as on the smaller scales previously conducted. Cafeteria eating areas I observed were therefore the main cafeteria, and this smaller cafeteria (see Figure 7). Two further undergraduate research assistants were recruited and trained to help take on the additional observation areas.

Observations for Study 2 took place over one day, since the previous studies found that the numbers of students and segregation patterns were not significantly different between the two days of observations. There were two waves of observations, in the autumn and spring term of the academic year following Study 1. In Wave 1, between 40-385 students were present in all eating areas, of which the proportion of female students ranged from 49-

68%, and the proportion of Asian students ranged from 24-50%. In Wave 2, between 21-328 students were present in all eating areas, of which the proportion of female students ranged from 53-67%, and the proportion of Asian students ranged from 22-42%.

Recruitment, materials and procedure were the same as in Study 1. For an example of a fully coded map, see Appendix 3.

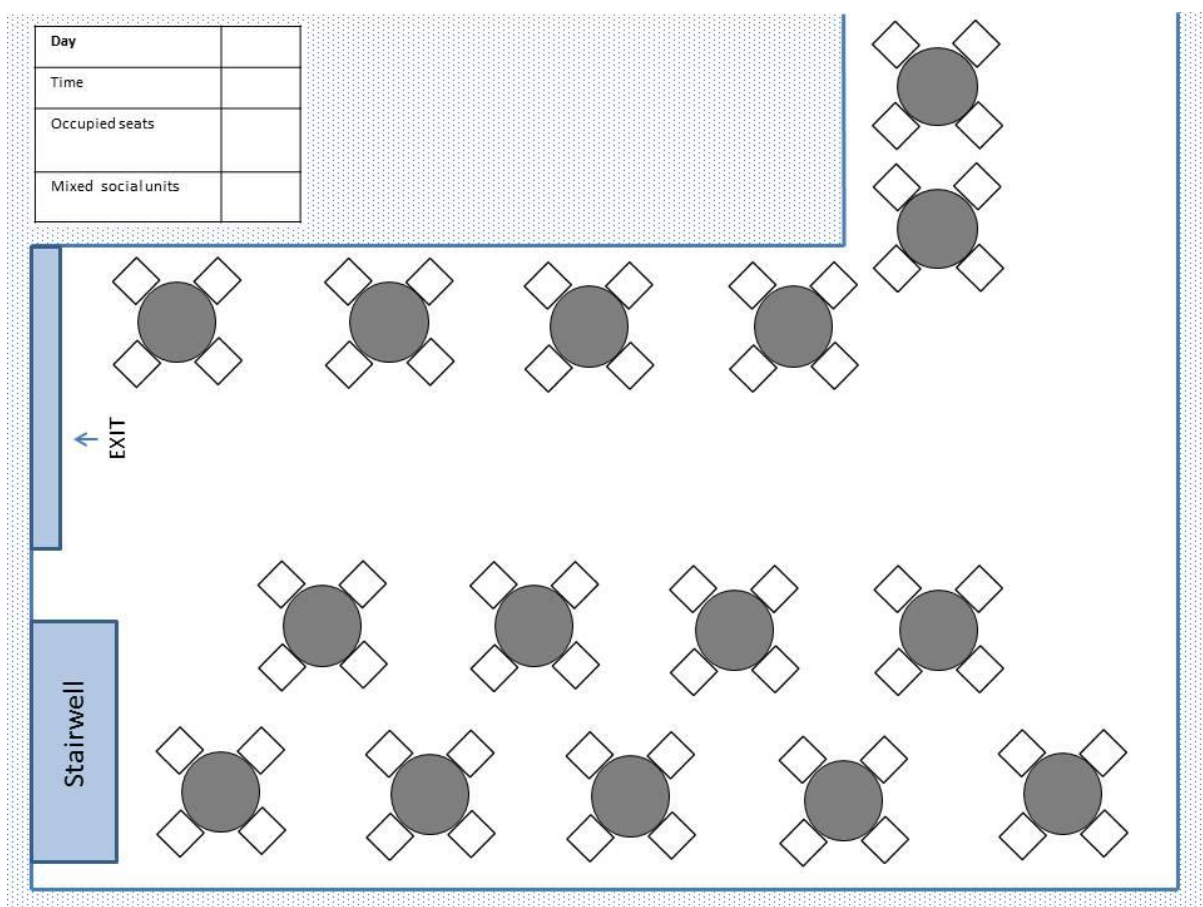


Figure 7: Map showing small cafeteria area, observed in Study 2.

Results

Once again I used calculations of exposure, aggregation and evenness of distribution for analysis of Study 2.

Aggregation *I*. As in Study 1, I calculated aggregation *I* values for each time interval (see **Table 7**). These values were calculated from adjacencies in both the main cafeteria and smaller cafeteria, and ranged from -6.94 to -15.13 in Wave 1, and from -3.26 to -13.15 in Wave 2, with very negative values overall that deviate from values expected under random mixing, indicating fewer cross-ethnic adjacencies than expected and significant self-segregation by ethnicity (supporting Hypothesis 1). Values did not differ significantly between Wave 1 and Wave 2.

Exposure *P*. I calculated exposure *P* values as in Study 1 for each time interval. These were calculated from social units in both the main cafeteria and smaller cafeteria, for ethnicity and gender exposure (see Table 8). Values for ethnicity exposure were close to 0 across both waves, i.e., showed self-segregation (again supporting Hypothesis 1). Values for gender exposure were higher (mean of 0.25), i.e., did not indicate greater self-segregation by gender than would be expected from random mixing.

Table 7: *I* values for White-Asian adjacencies in Study 2.

Interval	Wave 1	Wave 2
	<i>I</i>	<i>I</i>
1	-5.11	-3.26
2	-4.94	-5.06
3	-5.52	-7.51
4	-6.32	-8.28
5	-6.38	-8.82
6	-10.05	-12.43
7	-7.94	-7.77
8	-7.58	-7.20
9	-9.68	-10.12
10	-13.17	-13.15
11	-5.13	-6.78
Mean	-7.29	-8.22

Table 8: Study 2 indices for exposure by ethnicity (shaded) and gender (unshaded).

Interval	Wave 1				Wave 2			
	<i>wPa</i>	<i>aPw</i>	<i>mPf</i>	<i>fPm</i>	<i>wPa</i>	<i>aPw</i>	<i>mPf</i>	<i>fPm</i>
1	0	0	0.58	0.25	0	0	0.38	0.16
2	0.04	0.04	0.45	0.30	0	0	0.59	0.19
3	0.04	0.09	0.36	0.20	0.02	0.04	0.31	0.29
4	0.05	0.05	0.29	0.28	0	0	0.19	0.21
5	0.06	0.04	0.25	0.23	0.03	0.05	0.19	0.14
6	0.04	0.09	0.19	0.15	0.01	0.04	0.19	0.17
7	0.03	0.04	0.25	0.17	0.01	0.03	0.19	0.16
8	0.03	0.07	0.23	0.23	0.03	0.09	0.25	0.20
9	0.04	0.09	0.19	0.15	0.02	0.09	0.27	0.17
10	0.01	0.04	0.18	0.11	0.02	0.07	0.31	0.16
11	0.03	0.05	0.24	0.18	0.02	0.03	0.27	0.21
Mean	0.03	0.05	0.29	0.21	0.01	0.04	0.29	0.19

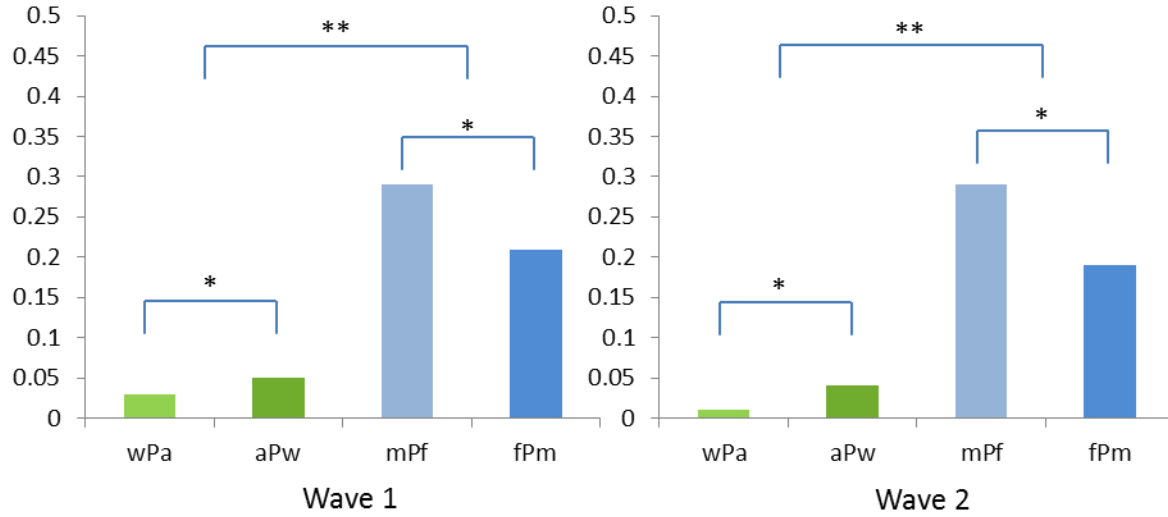


Figure 8: Graphs showing exposure P values for ethnicity and gender in Study 2.

I conducted paired-samples t-tests to compare P values in both waves (see Figure 8). In Wave 1, values for ethnicity exposure ($M = 0.04$, $SD = 0.02$) were significantly lower than for gender exposure ($M = 0.25$, $SD = 0.11$), showing greater ethnic segregation than gender segregation, $t(21) = 8.14$, $p < .001$, $d = 2.91$; the same was the case at Wave 2 ($M_{ethnicity} = 0.03$, $SD_{ethnicity} = 0.03$; $M_{gender} = 0.24$, $SD_{gender} = 0.10$), $t(21) = 8.60$, $p < .001$, $d = 2.91$.

Within ethnicity, values for aPw were significantly higher than wPa , with Asian British students having more relative exposure to White British students than vice versa, at both Wave 1 ($M_{aPw} = 0.05$, $SD_{aPw} = 0.03$; $M_{wPa} = 0.03$, $SD_{wPa} = 0.02$), $t(10) = 2.81$, $p = .02$, $d = 0.91$, and at Wave 2 ($M_{aPw} = 0.04$, $SD_{aPw} = 0.03$; $M_{wPa} = 0.02$, $SD_{wPa} = 0.01$), $t(10) = 3.43$, $p = .006$, $d = 1.03$. Within gender, values for mPf were significantly higher than fPm , with males having more relative exposure to females than vice versa, at both Wave 1 ($M_{mPf} = 0.29$, $SD_{mPf} = 0.12$; $M_{fPm} = 0.21$, $SD_{fPm} = 0.059$), $t(10) = 3.12$, $p = .01$, $d = 0.89$, and in Wave 2 ($M_{mPf} = 0.29$, $SD_{mPf} = 0.12$; $M_{fPm} = 0.19$, $SD_{fPm} = 0.041$), $t(10) = 2.70$, $p = .02$, $d = 1.11$. Each of these significant findings replicates the corresponding effects found in Study 1.

Between waves, the only significant change was that values for wPa were significantly lower at Wave 2 ($M = 0.015$, $SD = 0.01$) than in Wave 1 ($M = 0.03$, $SD = 0.02$),

$t(10) = 2.81, p = .02, d = 1.33$, showing significantly less relative exposure of White British students to Asian British students in Wave 2, again replicating the finding from Study 1.

To test Hypothesis 2 again, I calculated descriptive statistics on the social units from both cafeterias, having grouped them all across time intervals by their gender composition (all-male, all-female or mixed gender) to find the percentage of all social units that were ethnically mixed and how this proportion varied by gender composition (see Table 9). As in Study 1, all-female units are no less likely to be ethnically homogenous than either all-male or mixed-gender groups, which does not support Hypothesis 2.

Table 9: Percentage of social units in Study 2 that were ethnically heterogenous across all time intervals in each wave – by total social units, and broken down by gender composition.

Wave	All-female	All-male	Mixed-gender	All social units
1	14%	13%	8%	11%
2	8%	10%	5%	7%

Dissimilarity D . I calculated D indices for evenness of ethnicity spread as in Study 1, with sub-areas 1-4 within the main cafeteria, with the addition of the smaller café as a fifth sub-area. Values were not significantly different between waves, and both ranged from 0.56 to 0.82, with mean D values of 0.73 and 0.72 indicating that 73% and 72% of the Asian British population in Waves 1 and 2 respectively would need to be redistributed around the cafeteria areas in order to achieve random distribution by ethnicity (see Table 10). Comparatively, when the smaller cafeteria is *not* included in these same calculations for Study 2, values across both waves range from 0.23 to 0.66, and are significantly lower than when the smaller cafeteria is included, $t(38) = 10.15, p < .001, d = 2.94$.

Table 10: *D* indices calculated for each time interval in Study 2.

Interval	Wave 1	Wave 2
	<i>D</i>	<i>D</i>
1	0.69	0.80
2	0.69	0.82
3	0.68	0.71
4	0.77	0.58
5	0.60	0.68
6	0.65	0.71
7	0.70	0.69
8	0.67	0.66
9	0.53	0.68
10	0.67	0.65
11	0.53	0.93
Mean	0.66	0.72
Mean without smaller cafeteria	0.31	0.45

Summary results. Mean values from each of these index results for Study 2, compared with results from Study 1, can be seen in Table 11. *D* values are significantly higher in Study 2 ($M = 0.73$, $SD = 0.09$) than in Study 1 ($M = 0.43$, $SD = 0.19$), $t(59) = -8.30$, $p < .001$, $d = 2.42$, showing greater self-segregation by area in Study 2 than in Study 1. Ethnicity *P* values are significantly lower in Study 2 ($M = 0.035$, $SD = 0.027$) than in Study 1 ($M = 0.079$, $SD = 0.11$), $t(49) = 2.70$, $p = .009$, $d = 0.55$, showing more group-based self-segregation in Study 2 than in Study 1; closer analysis shows that *aPw* values are significantly lower in Study 2 ($M = 0.047$, $SD = 0.03$) than in Study 1 ($M = 0.12$, $SD = 0.14$),

$t(43) = 3.28, p = .002, d = 0.72$, whereas wPa does not significantly change between studies ($p > .05$). Gender P values are also non-significantly different between studies ($p > .05$). I did not differ significantly between Study 1 and Study 2 ($p > .05$).

Table 11: Summary results of exposure P for ethnicity and gender, dissimilarity D , and aggregation I from Study 1 and 2.

Study	Wave	wPa	aPw	mPf	fPm	D	I
1	1	0.02	0.12	0.30	0.15	0.48	-7.98
	2	0.01	0.09	0.20	0.10	0.36	-3.20
2	1	0.03	0.05	0.29	0.21	0.73	-7.29
	2	0.01	0.04	0.29	0.19	0.72	-8.22

Discussion

While the context for Study 2 was similar to Study 1 in many respects, it differed in three principal ways. Firstly, it took place the following academic year, and thus had around 50% changed student population. Secondly, the scope of observations was expanded to include the smaller cafeteria, which gave a more accurate representation of the student population present, and where they were choosing to sit – both at the small scale of chairs and tables, and between sub-areas they could sit in. Finally, both year groups were present in both waves of this study, unlike in Study 1, making the observed population more stable in characteristics and removing the possibility that any differences between waves may be due to the absence of a year group. Differences in results found between Study 1 and Study 2 can therefore be interpreted with these factors in mind.

Ethnicity and gender exposure. Ethnicity and gender exposure levels showed strong ethnic segregation in Studies 1 and 2, supporting Hypothesis 1. That the ethnicity exposure

levels not only remain low but significantly decrease between the time of Study 1 and Study 2 demonstrates the pervasive nature of inter-ethnic seating patterns. The significant decrease itself however can be attributed to the inclusion of the smaller cafeteria, rather than a change in the behaviour of the students themselves – since the smaller cafeteria was predominantly occupied by Asian British students at all time points, it increased the total Asian British students present within the overall sample of Study 2, meaning that the level of exposure Asian British students *overall* were getting to White British students was revealed to be less than had been measured in Study 1. It is possible from these results that similar integration behaviours could have been present at Study 1, but masked by the absence of the smaller cafeteria (and the larger proportion of Asian British students resulting).

It is possible that Asian British students who sit in the main cafeteria do so because they are more willing to ethnically integrate, whereas those who are less comfortable sitting with White British students choose to cluster in the small cafeteria. Since this clustering was consistent across both waves, and matched the college's own description of the area, this suggests a pervasive and self-perpetuating norm – Asian British students who wish to be around Asian British students choose to go to the small cafeteria, and White British students may feel dissuaded from sitting there themselves.

The breakdown of ethnically-mixed social units by gender composition shows no clear difference between levels of cross-ethnic interactions in all-male and all-female groups in either study. This does not then support Hypothesis 2, and fails to replicate the findings from previous research (e.g., Clack et al., 2005; Sagar et al., 1983), that females are *less* likely to be ethnically integrated.

Segregation by café area. Overall, *D* values indicated significant self-segregation by café area (and café), supporting the self-segregation predicted in Hypothesis 1. Furthermore,

the addition of the small cafeteria as an observed area to sit in made a large impact on D values in Study 2. Much like the exposure calculations, the high proportion of Asian British students in the small cafeteria affected calculations of area-level self-segregation, such that the D values were significantly greater in Study 2 than in Study 1, driven by this area of Asian British clustering – this is conclusively demonstrated in that this same context in Study 2 has significantly lower calculated D values when the smaller cafeteria is excluded from the calculations.

This is important to note, as it further reinforces how crucial it is to include every possible eating area when conducting observational studies such as this. Calculated D values may then be artificially low if only one cafeteria is observed, as in Clack et al. (2005) – here only a maximum of 155 students were observed in the cafeteria at any time over the course of the observed week, in a university of more than 31,000 students. While such observations can indicate the integration levels of those students present, interpreting the findings any more broadly is riddled with problems. Without observing all possible areas, researchers can never be sure that the students within their sample are representative – it may be that the observed cafeteria is where the more integration-prone (or indeed, less integration-prone) students go; or that outside that space, students cluster in other cafeteria choices by ethnic group, which makes the true mean integration level substantially lower than would be thought from looking at a single cafeteria.

Aggregation. As noted in the previous study, aggregation I is sensitive to having a stable total number of students present, which was provided in Study 2 with the added inclusion of the smaller cafeteria, and both waves taking place at times when both year groups are present at college. Unlike in Study 1, aggregation values were stable across waves, given the similar total number of students present, and confirmed that students are strongly self-segregated in their seating adjacencies, supporting Hypothesis 1. The addition of the

smaller cafeteria did not have a large effect on the indices, such that values for I were non-significantly different between Study 1 and Study 2.

Study summary. The results from Study 2 replicated the results from Study 1 in three important regards: that students are self-segregating by ethnicity, both interpersonally and between café areas (supporting Hypothesis 1); that this self-segregation is significantly higher for ethnicity than for gender; and that self-segregation is not reducing over time; and that females are no less likely to be ethnically self-segregated than males (evidence against Hypothesis 2).

The inclusion of the smaller cafeteria had meaningful impacts on both the P and D values, where the lower relative interethnic exposure of Asian British students to White British students, and the greater self-segregation by area, in Study 2 compared with Study 1 are likely the result of the smaller café not being observed at Study 1. That indices for segregation can change so dramatically with the inclusion of additional cafeterias is extremely important for the field. The study of micro-ecological segregation is increasing in popularity, particularly given encouragement from researchers like Dixon, but to date no studies observing cafeterias in educational settings have observed more than a single cafeteria; as such, the representativeness of their samples is called into serious question, with the strong possibility that self-segregation at the broader spatial level may be greater than reported.

It must be noted that the inclusion of the smaller cafeteria did not by any stretch assess the lunch-time seating preferences of the entire college population for the observed sample in Study 2. On the one hand, during many of the time intervals only some students had free periods, and it is possible that all of those who wanted to sit with other students during this time were observed in the main and smaller cafeterias. On the other hand, all students are given a lunchbreak, and even if we assume that non-overlapping students were

eating lunch in the intervals between 1-2pm, the total sample is still only around half of the college population. In theory, if all students not observed had left the college campus to buy and eat lunch (which they are allowed to), then the current study can at least be said to represent the self-segregation levels in students present in the college³. The more worrying alternative is that many students not observed in either the main cafeteria or the smaller cafeteria are gathering in clusters in less official eating areas in the college, such as empty classrooms. This would mean that the same problem from Study 1 would, to a lesser extent, still be present in Study 2 – that the observed sample does not represent the college population for whom we are drawing conclusions.

A further possibility, as previously mentioned, is that students gathering in the main cafeteria area of any educational setting may be more inclined towards ethnic integration than those who go to smaller cafeteria options, where ethnic clustering may occur. As such, integration levels in the main cafeteria would reflect the highest point of integration in the educational setting, rather than a representative sampling of the student body; meanwhile, the research objective of most studies is to identify and understand those who are inclined to self-segregation, and is not being fully met. At present, I cannot conclude with certainty the integration levels of the entire college, but can say with confidence that students interacting in the cafeterias showed strong and persistent self-segregation by ethnicity, both in terms of who students were interacting with, and in which areas (or cafeterias) they chose to sit.

³ The assumption in this case would be that no characteristics relating to segregation distinguish students who eat lunch out from those who stay in the cafeterias (e.g., that one ethnicity is more likely to eat out, or that students less comfortable with ethnic integration choose to leave campus, etc.)

Study 3: Merger School Cafeteria Observations

Method

Sample and context. I conducted observational studies in Waterhead Academy, a school which merged on its new campus in autumn 2012. This school has students from Year 7 to Year 11, i.e. aged 11-16, and has roughly equal numbers of Asian British and White British students (in academic year 2014-2015, the student population was 48% White British and 46% Asian British). Two observational studies were conducted in the school's cafeteria at lunchtime, when the students are admitted to the cafeteria in staggered slots by year group: Year 7-8, 9-10, and Year 11 (without overlap). Wave 1 took place in the Spring Term of 2014, with between 53-71% Asian British proportion and 38-63% female proportion in the cafeteria. Wave 2 took place in Summer Term 2014, with between 32-52% Asian British proportion and 46-74% female proportion in the cafeteria. No Research Assistants were necessary for this study.

Materials. During each wave, I had three copies of a map of the cafeteria that I had made based on photographs (see Figure 9). I also had copies of a food satisfaction survey designed by the school (which the school requested me to have the students complete, but was not used in my research), and a clipboard to contain these items.

Procedure. Opt-out forms were sent to parents as in Studies 1 and 2. While in Studies 1 and 2 the strategy was to blend in with the students sat in the cafeterias, this was not possible in the merger school given the younger students and my own increasing years. Instead the school requested that I adopt a cover story of handing out food satisfaction surveys, to explain my presence in an official capacity and allow me to privately document seating patterns while moving around. As such, I had a clipboard with three maps of the

cafeteria at the bottom layer, one for each lunch period. On top of these were many copies of the school's food surveys, hiding the maps. I walked around the tables systematically, offering the students the opportunity to give feedback in the food satisfaction survey (participation was voluntary). I would then make brief notes of the gender and ethnicity of students and where they were positioned, on the maps at the bottom of the clipboard. Unlike in previous studies, the seating here was not on chairs but on benches that stretched the length of the tables on both sides, so I freely wrote the shorthand for each student on positions around the map tables. Similarly to previous studies, I did not return to a table to re-code it if a later-arriving student joined it after I had mapped the table already.

In theory, if students were to ask what I was noting while they filled in surveys, the prepared answer was that I was noting whom I had given surveys to so that I wouldn't bother them again (this was not necessary in the end, as no one asked). I then collected back the food satisfaction surveys, and ultimately returned them to the school at the end of the day for their own uses. This process was repeated for each lunch period. For an example of a fully-coded map, see Appendix 4.

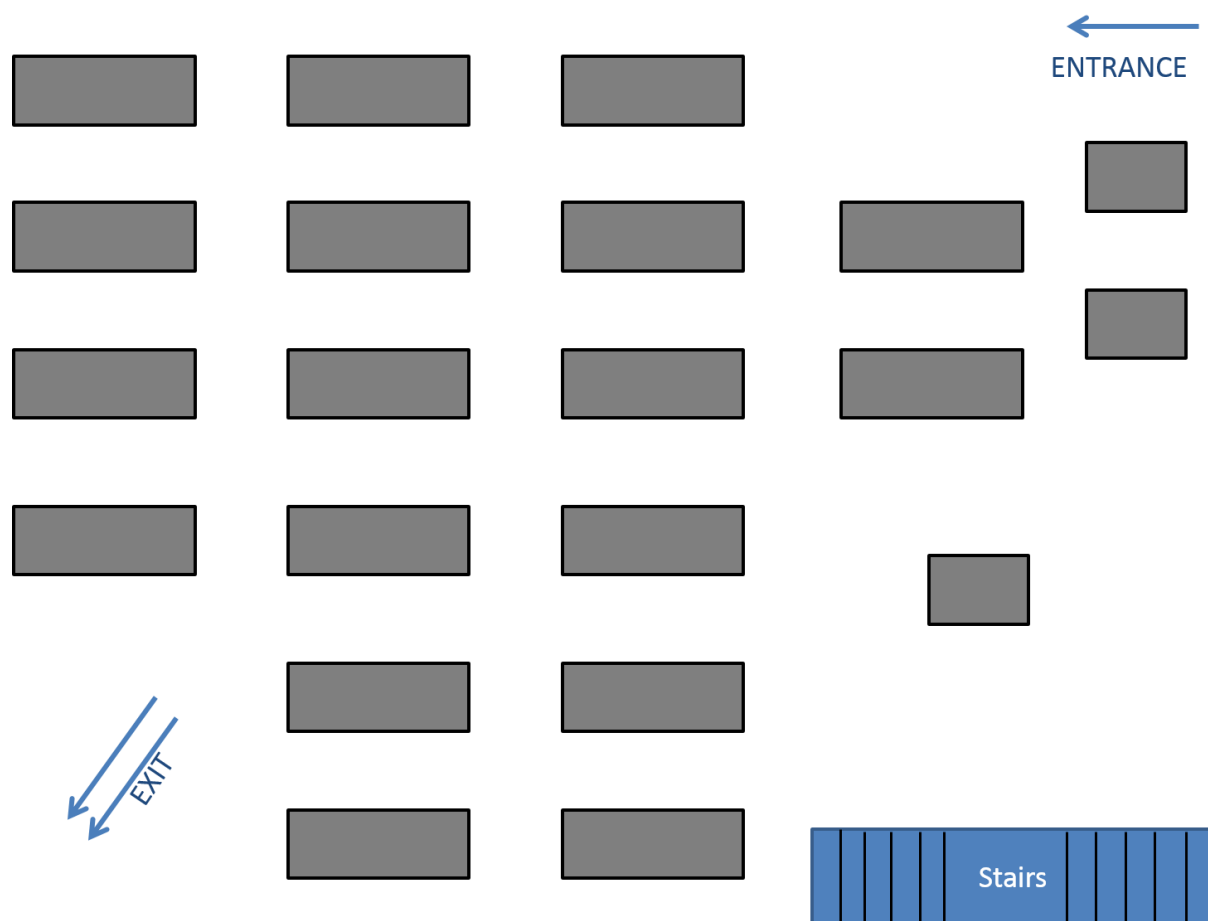


Figure 9: Map showing the merger school cafeteria, where grey boxes are tables (benches not shown).

Results

It was necessary to use the aggregation I index in Study 1 and Study 2 for continuity with previous research. In Study 3 however I once again had varying total numbers of students present in each wave, so having concluded the weakness of I values in these circumstances from Studies 1 and 2, I discarded the I index as an analysis for this study. Similarly, since the school cafeteria is reasonably small and not clearly divided into sub-areas, the D indices were not applicable.

Ethnicity and gender exposure. I calculated wPa and aPw indices as in Studies 1 and 2 for each of the lunch intervals, as well as mPf and fPm for comparison (see Table 12). This provided me with separate segregation indices for different year groups.

Table 12: Exposure P indices for ethnicity and gender in Study 3.

Year(s)	Wave 1				Wave 2			
	aPw	wPa	mPf	fPm	aPw	wPa	mPf	fPm
7-8	0.007	0.02	0.05	0.03	0.04	0.04	0.15	0.08
9-10	0.01	0.02	0.02	0.03	0.09	0.04	0.07	0.06
11	0.02	0.03	0.04	0.05	0.18	0.08	0.03	0.04
Mean	0.01	0.02	0.04	0.04	0.1	0.05	0.08	0.06

I conducted a one-way analysis of variance (ANOVA) which showed no significant difference between any category of exposure P values by year group; values from each year group were subsequently grouped together for all P calculations, with which I conducted independent-samples t-tests to determine differences in and between Waves 1 and 2 (see Figure 10).

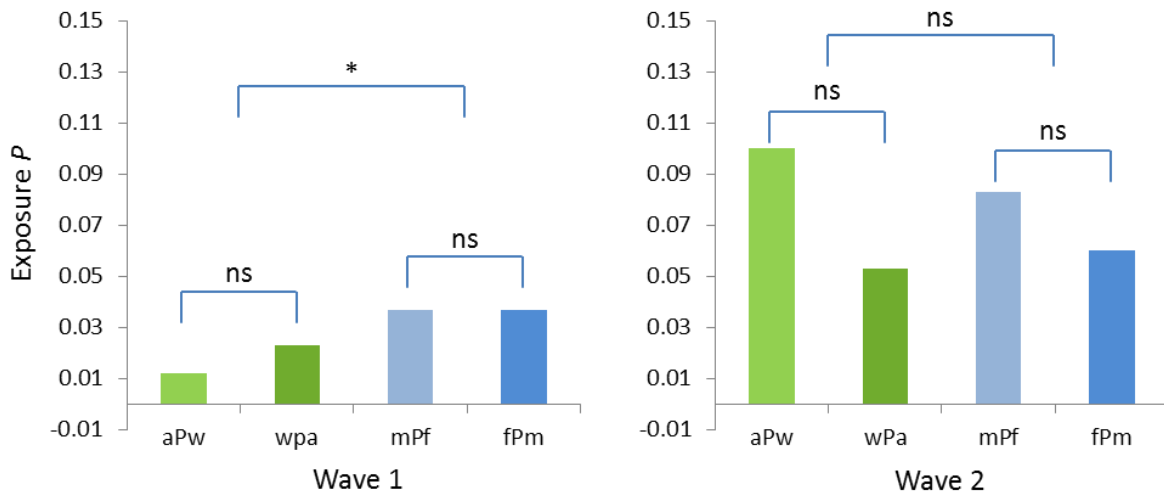


Figure 10: Graphs showing exposure P values for ethnicity and gender in Study 3.

At Wave 1, values for ethnicity ($M = 0.02$, $SD = 0.007$) were significantly lower than for gender ($M = 0.04$, $SD = 0.01$), $t(5) = 3.60$, $p = .02$, $d = -2.19$. Unlike in Studies 1 and 2 however, ethnicity values denoting ethnic integration increased significantly from Wave 1 ($M = 0.02$, $SD = 0.007$) to Wave 2 ($M = 0.08$, $SD = 0.06$), $t(5.) = 2.60$, $p = .05$, $d = 1.56$. No other comparisons between or within gender, ethnicity, or wave were significant.

Separating results by year group again, I conducted a 2 (wave: 1 or 2) by 3 (Year group of student: 7-8, 9-10, or 11) ANOVA, which showed a non-significant trend where the difference between exposure values at Wave 1 and 2 was greater for the older year group than the younger year groups (see Figure 11). This in fact is the opposite trend to what I predicted in Hypothesis 4, where I had expected the older students to show less increase in integration between waves than the younger year groups.

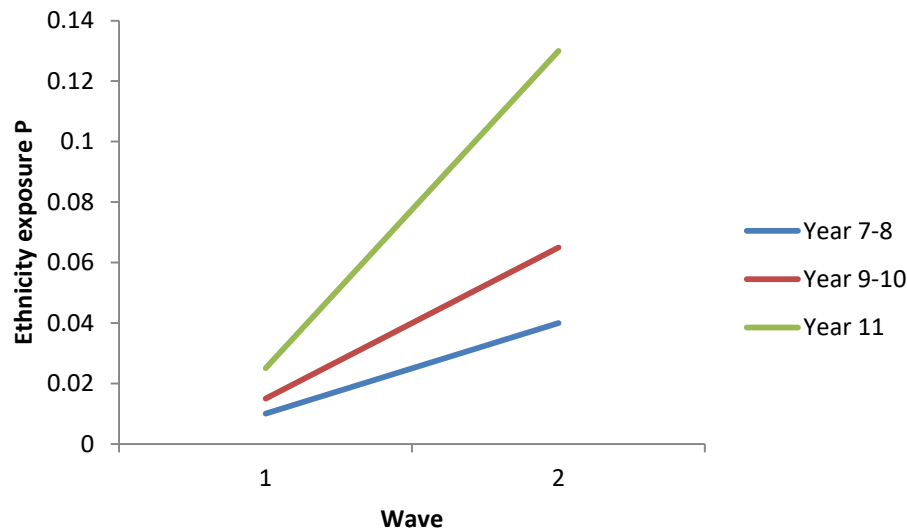


Figure 11: Graph showing changes in ethnicity exposure by year group.

I also grouped social units by gender composition to see any differences in incidence of ethnic heterogeneity (see Table 13). The proportion of all-female social groups that were ethnically-mixed is non-significantly lower than that of all-male or mixed-gender groups, which provides further evidence against Hypothesis 2.

Table 13: Percentage of ethnically-mixed social units in Study 3, including by gender breakdown.

Wave	All-female	All-male	Mixed-gender	All social units
1	8.6%	0%	12.5%	5.8%
2	14.3%	17.6%	22.2%	17%

Summary results. Results from all three studies can be seen in Table 14. Values for ethnicity exposure are non-significantly different between the sixth form college (Studies 1 and 2) and the merger school (Study 3). These results therefore cannot support the prediction of Hypothesis 3 that the students at the sixth form college would be more ethnically self-

segregated than the students at the merger school. Values for gender exposure however do differ between studies: I conducted a one-way between-subjects ANOVA to compare values of gender exposure P between Studies 1, 2, and 3, which found a significant effect of Study on gender exposure, $F(2, 121) = 10.86, p < .001, \eta^2 = .152$. Post-hoc comparisons showed that gender exposure in Study 3 ($M = 0.05, SD = 0.03$) was significantly lower than in Study 1 ($M = 0.19, SD = 0.15$), $p = .003, d = 1.29$, or in Study 2 ($M = 0.24, SD = 0.10$), $p < .001, d = 2.57$.

Table 14: Summary results of exposure P values in Studies 1-3.

Study	Wave	wPa	aPw	mPf	fPm	D	I
1	1	0.02	0.12	0.30	0.15	0.48	-7.98
	2	0.01	0.09	0.20	0.10	0.36	-3.20
2	1	0.03	0.05	0.29	0.21	0.73	-7.29
	2	0.01	0.04	0.29	0.19	0.72	-8.22
3	1	0.02	0.01	0.04	0.04	-	-
	2	0.05	0.10	0.08	0.06	-	-

Discussion

P values in Study 3 were low at both waves, showing low cross-ethnic integration, supporting Hypothesis 1 - though ethnicity integration improved significantly between Waves 1 and 2. In instances of White-Asian social units, it was in fact common for these groups to be formed of multiple students from each ethnicity, rather than one Asian British student sitting with a group of White British students as was so common in the sixth form college; this explains, in part, why differences between aPw and wPa were non-significant in this

study. While the high self-segregation again replicates the findings of previous literature (Al-Ramiah et al., 2014; Campbell et al., 1966; Clack et al., 2005; Dixon & Durrheim, 2003; Tredoux & Dixon, 2009), the decrease in self-segregation over time does not match the findings of Koen and Durrheim (2009), who had found *increased* self-segregation over the course of a university semester. That study however had observed older students (aged 18-22) than those observed here, which could account for the difference (further age considerations will be discussed below).

In this study again there is no compelling evidence to suggest that all-female social units are less ethnically integrated than either all-male or mixed-gender, and thus cannot support Hypothesis 2. In two educational settings, and across a total of 6 waves, I have not replicated the finding that females are more likely than males to self-segregate (Clack et al., 2005; Schofield & Sagar, 1977; Shrum et al., 1988). Interestingly however, in this study the all-female groups do not show as high an increase in percentage ethnically-mixed as the other group types. In theory, this could be taken to support the idea that female students of secondary school age are least likely to take up opportunities to interact with students of another ethnicity (which was conclusively not found in my studies with older sixth form students). However, such a conclusion would need to be made with caution given that this trend is based on a change between only two waves.

For Hypothesis 3, I had predicted that ethnic self-segregation levels would be greater in the sixth form college than in the merger school, given the developmental hypothesis that younger adolescents make better use of contact opportunities. However, values for ethnicity exposure were non-significantly different between Studies 1 and 2 (sixth form college), and Study 3 (merger school), and thus Hypothesis 3 is not supported. Hypothesis 4 had also taken the developmental perspective that younger students may be more receptive to the opportunity for contact, and predicted that the younger year groups at the merger school

would show greater integration, and improvement in integration over time, than the older year groups. Not only was this not found from these data, but a trend in the opposite direction showed that students in Year 11 (aged 16) had greater increase in integration between Wave 1 and Wave 2 than Year 9-10 (aged 14-15) or Year 7-8 (aged 12-13).

Interestingly however, there was significantly greater gender self-segregation in the merger school than in either study at the sixth form college. Furthermore, though there was a highly significant difference between exposure scores for gender versus ethnicity at both waves of Studies 1 and 2, this is considerably less pronounced here in Study 3, with smaller mean differences and a significant difference only found in Wave 1⁴. In other words, though there is ethnicity *segregation* but gender *integration* in the sixth form college, students are segregating in terms of both ethnicity *and* gender while in secondary school. This suggests that these younger age groups are at a socio-developmental stage where gender is still a strong dividing factor, compared with older sixth form students who may be less cautiously exploring relationships with the other gender.

An intriguing possibility (though here still a tenuous one) is that a mechanism behind these differences between educational settings is that students in this secondary school sample improve in integration over time *because* they are gender segregated – that is to say, if one's social group is limited by gender, it may be more flexible in the case of same-gender other-ethnicity. This would in theory support developmental perspectives on intergroup relations which suggest that adolescents make better use of opportunities for intergroup contact than young adults (e.g., Wölfer et al., in press), and my own hypothesis that gender and ethnicity integration may have an interactive relationship.

⁴ It should be noted that in this study, only three intervals were recorded in each wave given the duration of lunchtime, and it is possible that some of these differences would have reached significance given greater statistical power.

If it is indeed the case that younger, school-aged children are more prone to ethnically integrate over time given their relative lack of interest in the other gender, then this has critical implications for future interventions – in theory, it may for example be beneficial for the town to move to integrating primary schools as well as secondary schools, and tailor some school activities to be separated by gender. While I would be among the last to suggest that gender stereotypes be enforced, some emphasis on the similarities between-gender, regardless of ethnicity, may be helpful in encouraging cross-group friendships. For a more in-depth perspective on actual friendships between students however, a social network approach must be taken.

CHAPTER 3: HOMOPHILY AND SOCIAL NETWORKS IN THE MERGER SCHOOL

Abstract

In this chapter I present Study 4, three waves of social network analysis (SNA) of the interethnic friendships tracking students starting the merger school in Year 7 (aged 11). Results show a strong own-ethnicity preference in friends (between 86-98% across all waves), with an increase in other-ethnicity friends seen in White British within-subject participants over time. The disappointing lack of significant friendship integration over time is discussed with reference to the importance of active focus on interethnic mixing, while it is also pointed out that the merger school has provided a valuable context for students to make even the small number of other-ethnicity friends that they have.

Introduction

While observations of self-segregation are useful in providing a direct behavioural measure of integration attitudes, this method leaves unclear the extent of cross-ethnic contact that students may be getting in other settings, and the extent to which this homophily pervades. Social network analysis however allows students to report friends who may not necessarily be those they are in the habit of sitting with at lunch. As such, even when ethnic integration is low in the cafeteria, we can identify whether outgroup friends nevertheless exist, to provide a more promising (and accurate) picture of outgroup contact. Moreover, the composition of friendship networks can provide a complementary picture of gender versus ethnicity groupings to those seen in seated cafeteria groups. Furthermore, this approach allows us, in contrast to the behavioural observations, to link individuals longitudinally over time, so that we can study the intra-individual change in terms of cross-group contact.

This chapter outlines the social network analysis (SNA) data I collected from the merger school. First I outline the literature on homophily, the broad principle of homogeneity and "likeness" preference that has been demonstrated in a variety of fields. I then review the SNA research that has followed from this principle, including (limited) examples of its use in the study of interethnic relations. Overall however I conclude that given the strength of the SNA methodology, it is currently under-used in the intergroup contact field, and there is particular need for longitudinal SNA research to demonstrate the effects of contact over time. With this context, I then present the methodology and findings of such research (Study 4), and discuss how these longitudinal results contribute to our understanding of self-segregation, and the possible role of gender in developmental perspectives of contact.

Homophily

Research into homophily, the strong presence of homogenous networks, has shown preference for ingroup members along a variety of group dimensions (Loomis, 1946; McPherson et al., 2001; more recent examples include MacKinnon, Jordan & Wilson, 2011), as well as for less intuitively important outer characteristics such as hair style and wearing glasses (MacKinnon et al., 2011). Such research would suggest that students in the current setting would prefer to interact with those who are both the same gender and same ethnicity, but does not necessarily provide a hypothesis for how this may change over time, although it may be assumed to not change at all. By its nature, homophily is self-reinforcing – as McPherson et al. (2001) have commented, homophily in your networks solidifies stereotypes about your own group and others’.

Though they do not specifically reference contact theory, there is a large body of research in this field that supports their claim: i.e., that people are biased towards perceiving greater similarity *within* people of the same group than there really is - ‘attenuation’ - and that the difference *between* groups is perceived as greater than it really is - ‘accentuation’ (Tajfel,

1959, 1978). Moreover, contact has been shown to reduce biases in perceived homogeneity of groups (e.g., Brewer & Miller, 1984, 1988; Miller, 2002; Richards & Hewstone, 2001), which means that the continued existence of biases in perceived homogeneity and outgroup stereotypes can be seen as linked to the absence of intergroup contact. Furthermore, intergroup friendship is a particularly effective means of contact in reducing intergroup anxiety (Page-Gould, Mendoza-Denton & Tropp, 2008) and reducing prejudice (Paolini, Hewstone, Cairns & Voci, 2004); having an outgroup friend also means that your other ingroup friends will also feel such benefits, in what is termed the ‘extended contact’ effect (Wright, Aron, McLaughlin-Volpe & Ropp, 1997).

Homophily preferences, meanwhile, by definition preclude intergroup contact and ensure that social contacts are still selected according to overlapping group memberships, limiting the positive ripple effect that follows intergroup contact. Overall, this provides a picture wherein people *could* form outgroup friends, and be willing to interact with further outgroup members, if they had experienced interpersonal outgroup contact. However, much like in the self-segregation literature, opportunity for such contact – already limited by the self-selection of homophilous environments – is also not readily translated into actual contact. Dixon, Durrheim and Tredoux (2005) have in fact criticised the contact theory literature for focusing too greatly on ‘rarefied’ situations of contact, such as “short-lived laboratory analogues or highly localised interventions in the field”⁵ (Dixon, Durrheim et al., 2005, pp 700), whereas real-life scenarios are suggested to not adhere to such superficial conditions of enforced and optimised contact, but to be more commonly “occasional, fleeting and superficial” (Dixon, Durrheim et al., 2005, p. 699).

⁵ It is worth noting however that this criticism is likely to be overly harsh; in Pettigrew and Tropp's (2006) meta-analysis, where there is a significant effect of contact on prejudice, around 80% of the studies included were cross-sectional surveys (and thus neither laboratory experiments nor localised interventions).

While Dixon, Durrheim et al. (2005) were making the point that meaningful interpersonal contact does not occur as frequently in real-world settings as psychologists may think or portray them to be, it is undeniable that interpersonal contact *if and when* it occurs has positive benefits on intergroup relations. Overall however, the literature suggests that it is optimistic to assume that such interpersonal contact is automatically happening in diverse educational settings, including in my own observational studies which showed consistent ethnic self-segregation over time. Ethnic homophily, from my previous results, seems then to be consistent over time and suggests that fewer interpersonal cross-ethnic interactions are occurring compared to what would be expected from a diverse environment. Analysis of social network data, which takes into account friends from a broader range of settings, can show however what cross-ethnic friends exist in less specific settings, and whether *these* increase over time, even without an increase in outgroup friends being sat with in the cafeteria.

The vast majority of SNA research into gender and ethnic homophily in childhood and adolescence has found greater homophily for gender than for ethnicity (e.g., Hallinan & Smith, 1985; Sagar et al., 1983; Shrum, Cheek & Hunter, 1988). On the other hand, while there is some evidence that gender homophily preferences decrease during later adolescence (Crockett, Losoff & Petersen, 1984), when ethnic and gender homophily are compared there is evidence to suggest that ethnicity homophily increases between 9-12 years old, and then remains stable even while interest in other-gender friends increases with age, particularly between 15-18 years old (Shrum et al., 1988). Among adults, results from an American national survey indicated that homogeneity was strongest by ethnicity, with only 8% of respondents having other-ethnicity ties within their networks; from the same sample, however, 78% of respondents had both male and female ties within their networks (Marsden, 1987). While there is a window in childhood and early adolescence where both gender and

ethnic homophily is strong, evidence suggests therefore that gender homophily drops off in late adolescence, such that eventually networks stabilise as (moderately) gender integrated but strongly ethnically homogenous.

Social Network Data

Background. Quantitative analysis of social ties or networks is a key methodology in the study of homophily. Some studies, particularly in the 20th century, used census data to determine cross-group ties such as interracial marriage (Blau, Blum & Schwartz, 1982), people with whom respondents discuss “important matters,” (Marsden, 1987), or friendship (Briggs, 2007). This provided information on individual respondents’ network homogeneity, to create an overall national mean for each ethnic group. To study a specified population of network ties, such as within an organisation or school, one can also use social network surveys where participants have the opportunity to nominate others within their network as a tie, which may or may not then be reciprocated by these participating friends. These nominations form visualisable networks which show connections between ‘nodes’ of individuals (see Figure 12). Demographic information of interest can also be visualised and analysed in these networks (see Figure 13).

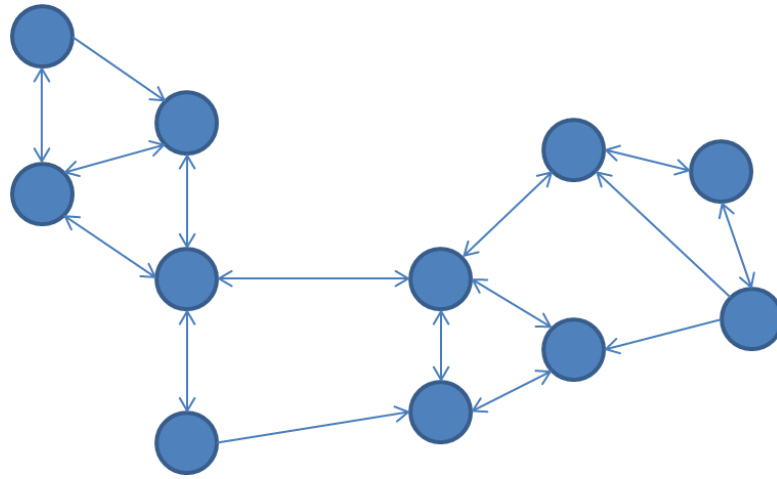


Figure 12: Diagram showing a network of nodes and nominated links which are either unidirectional or bidirectional.

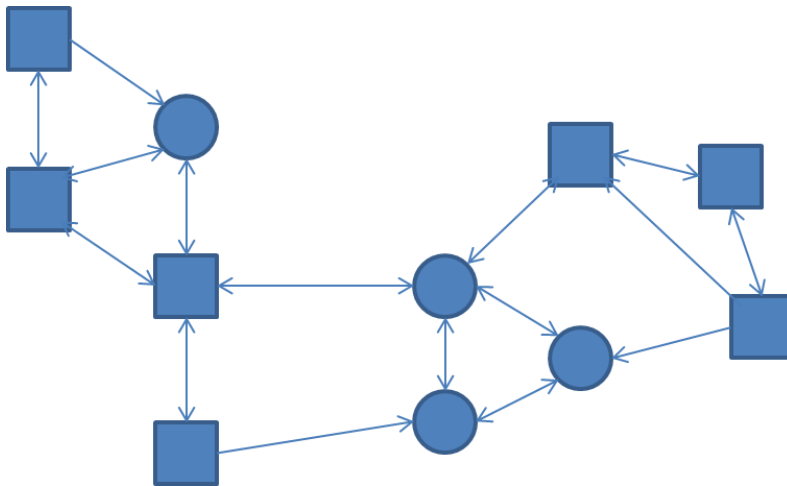


Figure 13: Diagram showing a network where node shape (square or circle) denotes group membership (e.g. gender). Other visualisation options include different sizes of nodes, or different colours.

Analysis. The social network approach provides information beyond an individual's own network homogeneity, to more complex networks that contain *interlinking* reciprocal and non-reciprocal ties which provide information on clusters of ties, individuals' centrality within networks, and social distance between individuals – i.e., the dynamic ties between members of an interlinking network, rather than a static portrayal of a series of individuals. Here 'centrality' can be calculated in several ways, whether counting the number of direct

ties an individual has (degree centrality), the number of direct *and* extended ties an individual has (Bonacich's centrality measure), how many degrees of separation an individual has from all other network members (closeness centrality), or how much an individual links separate clusters of the network (betweenness centrality) (e.g., Borgatti, Mehra, Brass, & Labianca, 2009; Burt, Kilduff, & Tasselli, 2013; Freeman, 1979; Wölfer, Faber & Hewstone, 2015).

Inclusion of demographic information, as visualised in Figure 13, allows firstly for the demographic composition of each node's ties – or 'ego network' – to be calculated (e.g., in determining homogeneity of individuals' ties), and secondly for comparison of each demographic group's network characteristics (e.g., comparing how central different groups are to the network). Moreover, longitudinal study of social networks within contained populations provides a dynamic picture of changing ties between the same nodes, and the comparative network structure changes for each group.

Social Networks in Self-Segregation Research

So far I have outlined the use of social network analysis in demonstrating the quantifying the presence of homophily in people's professional, marital, or friendship ties. Social network analysis is therefore relevant in the study of self-segregation, where network homophily, even in a diverse environment that provides the opportunity for outgroup ties, implies that self-segregation is occurring. Despite the advantages of this approach, little research to date has made use of this methodology in the study of intergroup contact, with a few exceptions. Munniksma et al. (2013) were interested in the application of social network analysis to the study of 'extended contact' – the indirect beneficial effects of knowing an ingroup member with an outgroup friend (Wright et al., 1997). In their longitudinal study Munniksma and colleagues demonstrated that extended ties with an outgroup member within the network was

associated with improvements in outgroup attitudes (even when controlling for direct outgroup ties), if participants had initially had poor attitudes toward outgroup members.

Furthermore, Wölfer et al. (in press) used social network analysis to establish this technique as a complementary method of measuring direct and extended contact, and demonstrated that direct and extended contact within the network predicted improving positive attitudes towards the outgroup (with a developmental interaction, such that the effect of either form of contact was greatest during adolescence compared with early adulthood). The application of social network analysis to intergroup contact seems poised to be an increasingly important dimension of the field, with a perspective that will enrich our understanding of intergroup contact and integration.

Present Research

Context. For Study 4, I conducted three waves of social network surveys over 15 months in the merger school in Oldham. This educational setting was chosen above the sixth form college given the more manageable size of a year group network (roughly 200 students as opposed to 1,000 per year in the college). I chose to collect these waves from the year group that was starting at the school that year, i.e. Year 7s (aged 11-12), who had almost unanimously previously been at ethnically-homogenous primary schools, and thus were experiencing a diverse educational environment for the first time⁶. The three waves of data collection therefore followed these students through to the end of Year 8 (aged 12-13).

Hypotheses. I had four main hypotheses for Study 4. Firstly, that students' social networks would be ethnically homogenous, given consistent previous evidence for homophily (e.g., Briggs et al., 2005; Hallinan & Smith, 1985; McPherson et al., 2001; Shrum

⁶ This assumption is based on the prevalence of *de facto* segregated primary schools in Oldham, as a result of residential self-segregation, and on the school's informal communications with me.

et al., 1988), as well as the level of self-segregation observed in Study 3 (Hypothesis 1). I did however secondly predict that own-ethnicity preference would decrease over time – although I would expect networks to remain primarily homogenous as in Hypothesis 1, I nevertheless expected opportunity to create a small number of new outgroup ties over time, as found in the increased ethnic integration in the cafeteria (Hypothesis 2). On the other hand, while I expected own-gender preference to be high I predicted that it would be stable over time, given that (cross-sectional) research has shown gender homophily to be high and stable in early adolescence (Shrum et al., 1988) (Hypothesis 3).

Study 4: Social Network Analysis in a Merger School

Method

Sample and context. I conducted Study 4 in Waterhead Academy, the merger school observed in Study 3. Participants were students in Year 7 (aged 11-12) at the time of the first wave (203 students: 54% Asian British, 44% White British, 2% Black/Other; 60% male, 40% female). Wave 1 took place in March 2014, at the end of students' second term at the school, in order for them to have had the opportunity to establish preliminary ties within their year group (and particularly, to establish ties beyond any friends they already knew from primary school). Response rate was moderately high, with 87 White British (43%) or Asian British (57%) respondents (4 students of other ethnicities were discarded). Wave 2 took place in July 2014, at the end of the academic year, and had 87 White British (39%) and Asian British (61%) respondents. Wave 3 took place in July 2015, at the end of their second academic year when students were 12-13 years old, and had 152 White British (40%) and Asian British

(60%) participants⁷. For all three waves, one-sample t-tests comparing the proportion of Asian students in the sample with their proportion in the year group found no significant difference, i.e., there was no significant selective ethnic attrition.

Materials and procedure. Parents were sent opt-out forms two weeks prior to the survey being administered, when they had the option of withdrawing consent for their child to take part. The survey was summarised as relating to how children form friendship groups at a new school and how these groups change over time. No opt-out requests were returned. Teachers therefore gave out the paper surveys during form time to all students in the studied year group. Participants were additionally asked for their consent at the start of the survey, where it was made clear that participation was voluntary, and participants could stop at any time if they wished to. I discarded the surveys of any students who did not give consent. Participants were asked to give their full name on the front of the survey, where it clearly stated that their names would be used to match their answers over time and would be removed and anonymised once data collection was complete.

Measures. Students were first asked to provide basic information on their gender, date of birth, religion, ethnicity, primary school and residential area. Subsequently, I asked students to name up to 10 students in their year at their school who they were “most friendly” with (see Appendix 5). Given the sensitive nature of the question, the survey reminded participants here that answers would not be shown to other students, or anyone at the school. Moreover, no aspect of these questions related to ethnicity, as I did not want students to answer in any way differently because they knew I was interested in cross-ethnic friendships. For the same reason, no items were included on outgroup attitudes, trust etc. Instead, students were simply asked to give both the first and last name of these friends, and tick a box next to

⁷ The school unfortunately mislaid some form groups’ surveys in both Waves 1 and 2. Boosted numbers for Wave 3 were likely due to our presence at the school to distribute and immediately collect surveys.

their names if they agreed “I often sit next to this person at lunch.” This same survey was given in both Wave 1 and 2.

In an attempt to increase the sample in the first two waves, I attempted to collect retrospective friendship nominations from all students in Wave 3. Students in Wave 3 were asked in the survey to think back to the end of Year 7 Spring Term (Wave 1) and list up to 10 friends that they had *at that time* (see Appendix 6). They were then asked to do the same for up to 10 friends they had at the end of the Summer Term of Year 7 (Wave 2), and finally to do the same for up to 10 friends that they have *now* (non-retrospectively, to provide a new wave of data). Those who had completed the previous waves provided a reliability check when their answers then and now were matched, and those who had not completed the previous waves were given a new opportunity to do so.

Analyses. SNA were performed using UCINET software, where students’ friendship nominations were computed into a network of interlinking “nodes.” Some participants, who had listed their own friends, had not been nominated by any other participant in the sample but were included with their outwards links in the network.

Results

Social networks were created and analysed along three separate divisions of the data: 1. All participants and all their nominated ties; 2. All participants including only reciprocal ties; 3. Only participants who completed all 3 waves, and all their nominated ties (see below for more information). The retrospective networks of Waves 1 and 2, collected at the time of Wave 3, were not used since nominations from participants who *had* completed all 3 waves were significantly different between their retrospective nominations and those they made at the time (i.e., participants were listing different friends retrospectively than they had listed

when asked at the time). Thus, the retrospective nominations of those who had not completed Waves 1 and 2 could not be judged reliable enough to fill in these waves.

The visualisation of the full nominated network can be seen in Figure 14.

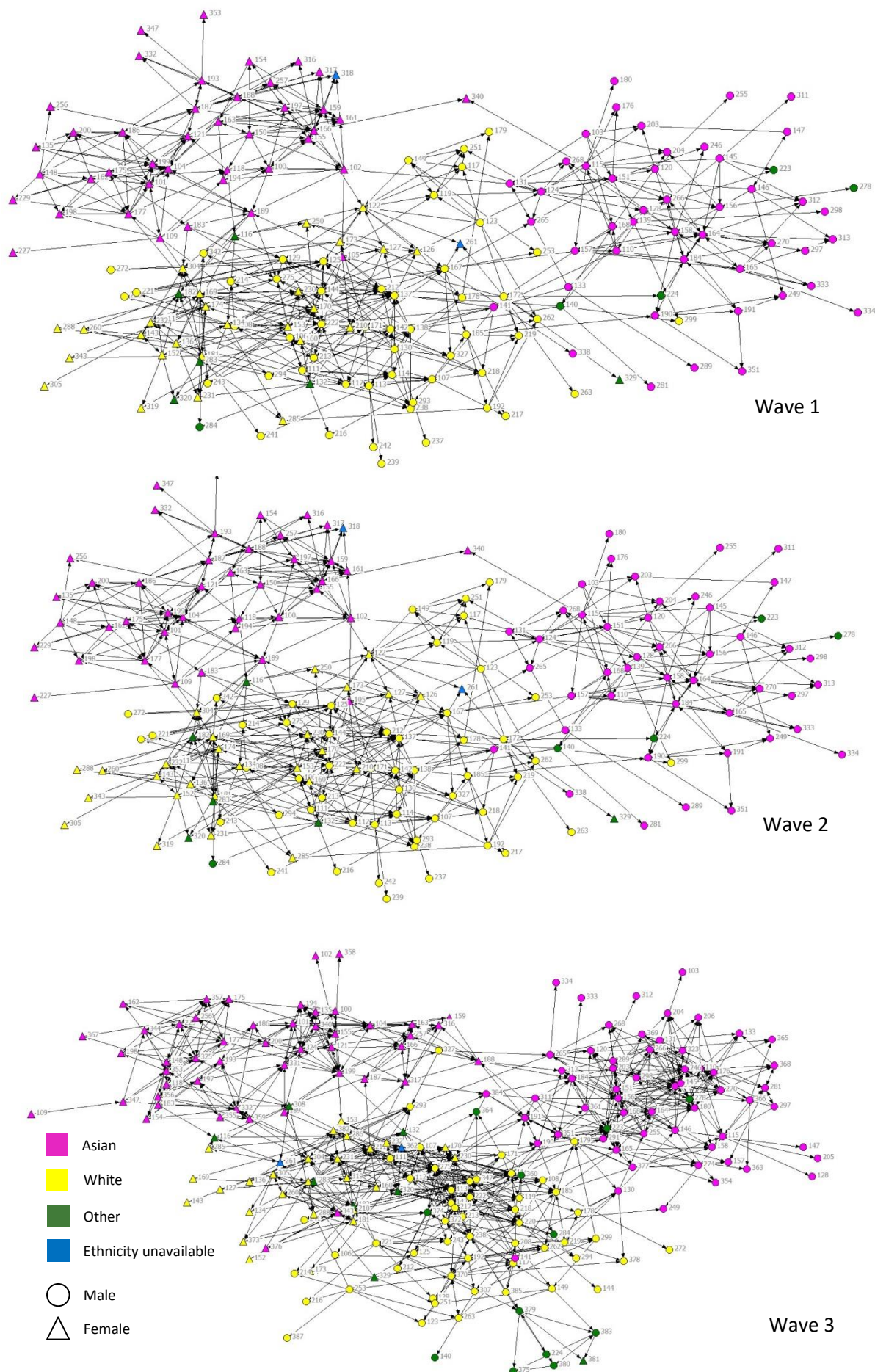


Figure 14: Visualisation maps showing all ties in social networks from Study 4: Wave 1 (top), Wave 2 (middle) and Wave 3 (bottom). Characteristics are represented by colour for ethnicity and shape for gender. Numbers indicate anonymised participant identifiers.

All nominated ties. I created a baseline social network by using all of the non-retrospective data available, from all participants and all their nominated ties. Using demographic information on all students provided by the school, each nominated friend was matched with their gender and ethnicity, allowing me to calculate the proportion (0-1) of each participant's friends that belonged to their ethnic or gender outgroup, such that 0 indicates no outgroup friends and 1 indicates all friends are outgroup friends. From a slightly different perspective, I also calculated the percentage of White British and Asian British students who had at least one other-ethnicity friend. These descriptive statistics can be seen in Table 15, and the visualisations of the full networks in each wave in Figure 14. The proportions of White British and Asian British students in each wave were non-significantly different ($p > .05$).

Ethnicity preferences. In all waves, students have on average between 7-8 friends altogether, and an average own-ethnicity preference of 91.2%. This supports Hypothesis 1, in that there is high ethnic homophily in these networks. However, this ethnic homophily does not significantly decrease over time for either ethnic group, and thus cannot support Hypothesis 2. Own-ethnicity preference is not significantly different between males ($M = 0.94$, $SD = 0.13$) and females ($M = 0.89$, $SD = 0.18$), $p > .05$.

Table 15: Means and standard deviations for the number of friends reported, percentage of students with at least one outgroup friend, and proportion (0-1) own-ethnicity and own-gender preference in Study 4.

	Participant ethnicity					
	Asian British			White British		
	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Number of nominations	7.1 (2.1)	7.7 (2.4)	7.4 (2.0)	7.7 (2.5)	8.5 (2.0)	8.0 (2.7)
Percent with outgroup friends	40.0%	31.5%	43.2%	18.9%	33.3%	28.6%
Own-ethnicity preference	0.86 (0.46)	0.92 (0.45)	0.87 (0.45)	0.98 (0.49)	0.93(0.46)	0.93 (0.47)
Own-gender preference	0.92 (0.47)	0.99 (0.50)	0.98 (0.46)	0.80 (0.43)	0.86(0.44)	0.84 (0.44)

Gender preferences. Asian British students had significantly greater own-gender preference than White British students in Wave 1, $t(89) = 2.67, p = .009, d = 0.56$, Wave 2, $t(86) = 4.89, p < .001, d = 0.93$, and Wave 3, $t(123) = 5.41, p < .001, d = 0.91$ (see Figure 15). Across all students, own-gender preference was high, with mean preference of 89.9%, and does not decrease over time, both supporting Hypothesis 3.

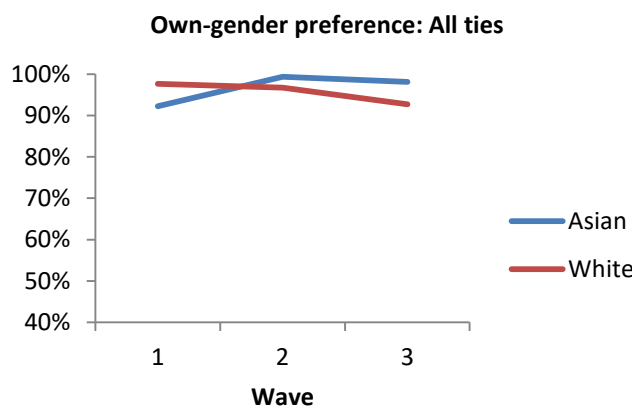


Figure 15: Graphs comparing own-gender preference when all ties are included.

Comparing gender preferences and ethnicity preferences. I conducted a 2 (ethnicity of student: White British or Asian British) x 2 (preference: own-ethnicity or own-gender) x 3 (wave) mixed design ANOVA, with repeated measures on the last two factors. Results revealed a significant 2-way interaction between student ethnicity and preference type, $F(2, 27) = 4.17, p = .027, \eta^2 = .236$ (see Figure 16). Estimates of marginal means show that while Asian British students have higher own-gender preference ($M = 98.7, SD = 3.5$) than own-ethnicity preference ($M = 87.2, SD = 23.9$), $t(34) = 2.03, p = .005, d = 0.68$, White British students have the opposite pattern with higher own-ethnicity preference ($M = 97.9, SD = 4.0$) than own-gender preference ($M = 86.3, SD = 13.6$), $t(20) = 2.71, p = .001, d = 1.16$.

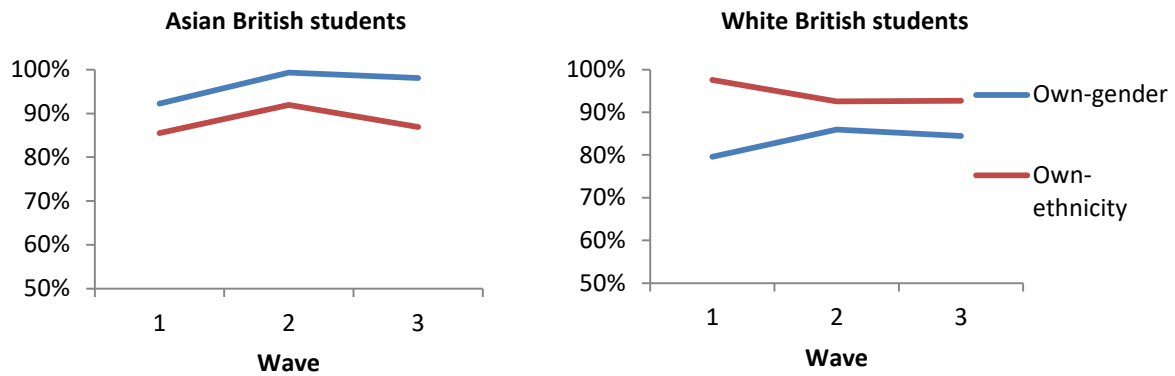


Figure 16: Graphs showing 2-way interaction effect between student ethnicity and preference type in Study 4.

Reciprocal ties. I then removed all nominated ties that were not reciprocated, to create a reciprocal network. In some cases, these ties were truly non-reciprocated, in that the friend failed to nominate them back; in other cases however these removed ties were due to the nominated friend not having completed a survey, particularly in Waves 1 and 2. Regardless, inclusion of reciprocated ties only allows a reliable perspective of ‘true’ friendship, i.e., removing the possibility that students are being nominated as friends for reasons of social desirability (particularly in the case of ethnicity, and the desire to appear integrated).

Students had significantly fewer reciprocal friends ($M = 3.0$, $SD = 1.8$) than nominated friends ($M = 7.5$, $SD = 2.4$), $t(183) = 17.2$, $p < .001$, $d = 2.52$. Descriptive statistics for these data can be seen in Table 16. Comparisons between reciprocal network ethnicity characteristics with that of all nominations can be seen in Figure 17.

Table 16: Means and standard deviations for reciprocal nominations in Study 4: number of reciprocal friends, percent with at least one outgroup friend, and proportion (0-1) own-ethnicity and own-gender preference.

	Participant ethnicity					
	Asian British			White British		
	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Reciprocal friends	2.2 (1.7)	2.6 (1.4)	3.3 (1.7)	2.4 (1.9)	3.5 (2.1)	3.8 (2.0)
Percent with outgroup friends	9.5%	8.3%	11.8%	6.3%	12.1%	15.2%
Own-ethnicity preference	0.92 (0.27)	0.94 (0.22)	0.95 (0.19)	0.98 (0.10)	0.97 (0.09)	0.93 (0.22)
Own-gender preference	0.80 (0.40)	0.80 (0.41)	0.60 (0.49)	0.85 (0.30)	0.60 (0.47)	0.65 (0.46)

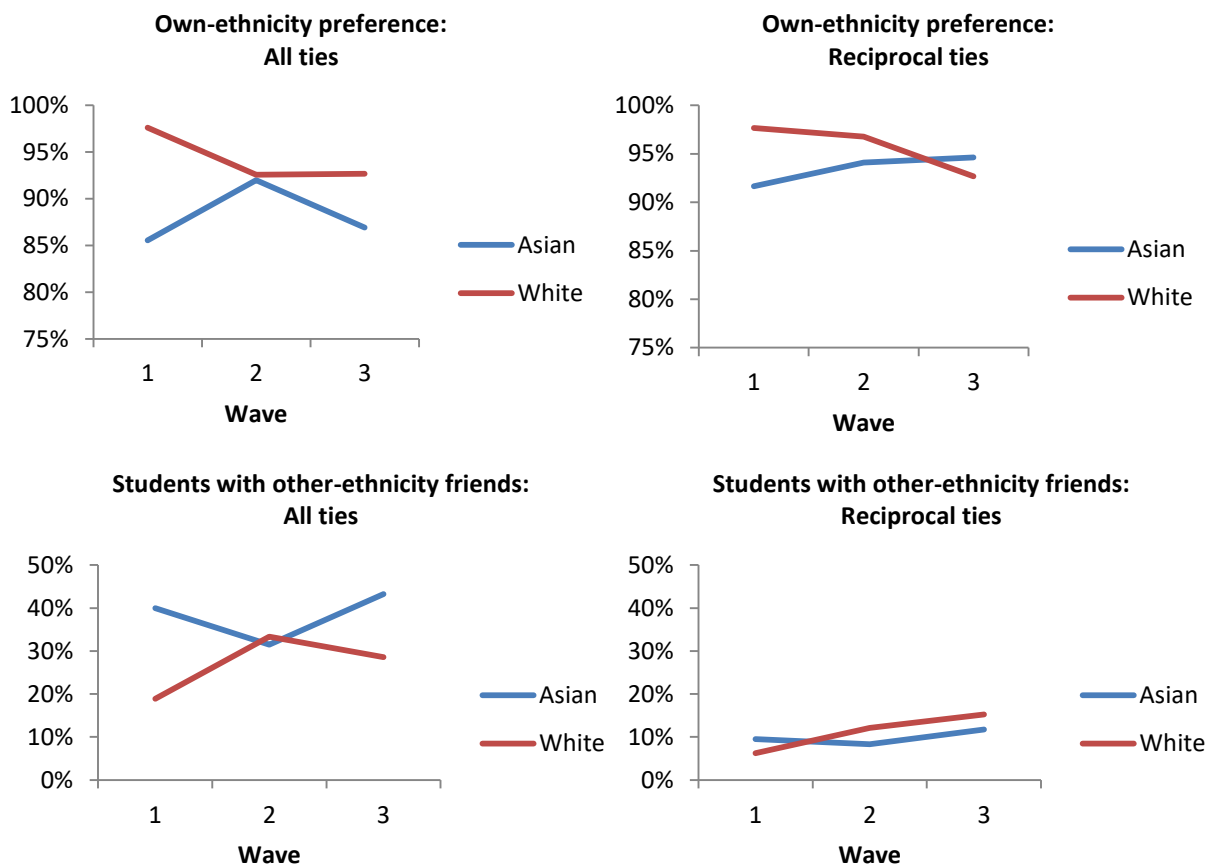


Figure 17: Graphs comparing own-ethnicity preference when all ties are included (left) or only reciprocal ties (right) in Study 4.

Figure 17 shows that when only reciprocal ties are included, the number of students with other-ethnicity friends is less than when all ties are included (from an average of 39% Asian British and 27% White British, to an average of 10% Asian British and 11% White British); in other words, between half and two thirds of the students who reported other-ethnicity friends in fact had no reciprocated other-ethnicity friends. On the other hand, the overall own-ethnicity preference is non-significantly different between all ties and reciprocal ties, indicating that just as many own-ethnicity ties were not reciprocated as other-ethnicity ties – i.e., although the number of friends drops from an average of 7.5 to an average of 3.0, just as many own-ethnicity nominations as other-ethnicity nominations failed to be reciprocated. Since ethnicity properties are similar regardless of reciprocity, but the sample size is greater in all ties, I did not conduct further statistical tests on these reciprocal data.

Participants in all waves. Having compared reciprocal ties with all ties and found similar ethnicity properties in the network, I then divided the participants by those who had completed all three waves of network analysis ($N = 30$). The proportion of White British and Asian British participants were non-significantly different from all participants who took part in each wave ($p > .05$). This meant that changes in network properties between waves reflected changes within the same population, as opposed to some variation caused by non-overlapping samples, and provided another perspective on ethnicity changes over time.

Table 17: Means and standard deviations for nominations by participants from all three waves in Study 4: number of nominations, percent with more than one outgroup friend, and proportion (0-1) own-ethnicity and own gender preference.

	Participant ethnicity					
	Asian British			White British		
	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Number of nominations	7.4 (1.7)	7.6 (2.1)	8.4(1.6)	9.2(1.3)	9.8(0.4)	8.5(3.1)
% with outgroup friends	39.0%	27.8%	33.3%	0%	8.3%	33.3%
Own-ethnicity preference	0.88 (0.25)	0.88 (0.25)	0.85 (0.30)	1.00 (0.0)	0.99 (0.03)	0.95 (0.12)
Own-gender preference	0.96 (0.11)	1.00 (0.0)	1.00 (0.0)	0.85 (0.18)	0.86 (0.23)	88.2 (0.30)

I found no significant changes in the number of students with other-ethnicity friends, or own-ethnicity preference, over time. There is however a trend whereby more White British students have Asian British friends, $F(2, 20) = 1.74$, $\eta^2 = .148$, and their own-ethnicity preference decreases over time, $F(2, 20) = 1.89$, $\eta^2 = .159$. Although these are non-significant trends, likely due to the small sample size, both have medium effect sizes, which provides some support for Hypothesis 2 (see Figure 18).

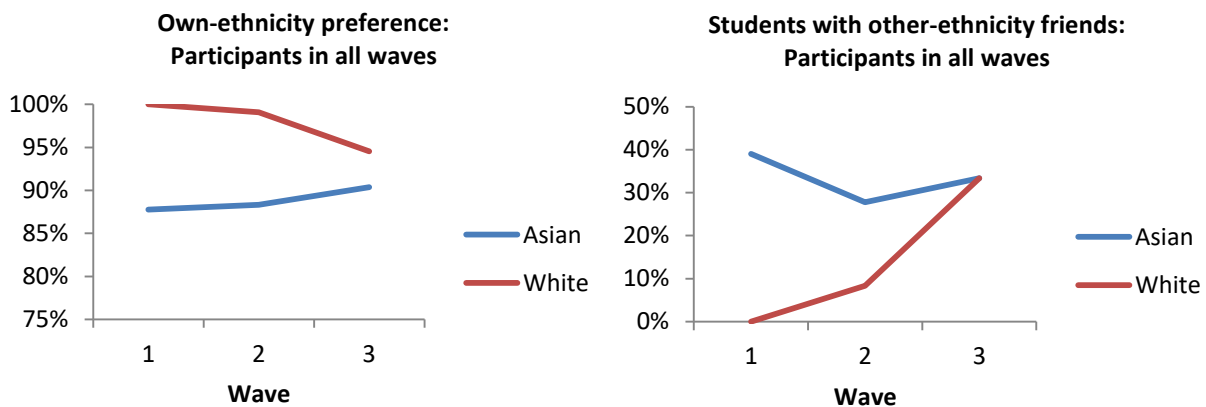


Figure 18: Graphs showing trend changes in ethnicity preferences over time.

Discussion

These social network analyses supported the majority of my hypotheses, with mixed support for previous literature on homophily. Networks are ethnically homogenous with a great proportion of own-ethnicity preference among the friends of both White British and Asian British students, supporting Hypothesis 1. This finding is in line with homophily literature which has demonstrated ingroup preferences in one's networks along a variety of dimensions (see McPherson et al., 2001).

There were no significant differences in own-ethnicity preference between White British and Asian British students, which is unsurprising given the similar properties of the full social network to those only including reciprocal ties (i.e., because the proportion of Asian British and White British students is similar in this school, cross-ethnic friendships would result in the same proportion of each having outgroup friends). Male and female students also had no significant difference in own-ethnicity preference. While there is no evidence in the network homophily literature that examines gender differences in ethnic homophily, observational research of interactions and self-segregation had previously suggested that females were less likely to have cross-ethnic interactions (e.g., Clack et al., 2005; Schofield & Sagar, 1977). Social network results here cannot however support this proposition.

While the full network with all participants and all ties did not show significant decreases in own-ethnicity preference over time as predicted by Hypothesis 2, there is a trend increase in outgroup friends, and decrease in own-ethnicity preference, in White British students when only looking at those participants who can be followed through all three waves. On the one hand, limited participation in the first two waves of SNA (as previously discussed) limited the number of students taking part in all three waves to just 30, and these changes did not reach significance. On the other hand, this selection of participants allowed

for a more accurate representation of changes over time *within participants*, and this increase in outgroup friends within this White British sample is encouraging, and can be taken as support for Hypothesis 2. This would not support the results of Shrum et al. (1988) who had found increased ethnic homophily over time; it would however support the findings of Hallinan and Smith (1985) who found that ethnically-balanced classrooms (like those in the present research) were the most likely to show ethnic integration over time.

Furthermore, it is encouraging that not only do overall levels of own-ethnicity preference in White British students appear to decrease over time, but also that the number of White British students with outgroup friends is increasing over time; i.e., instead of students who already have positive attitudes towards cross-group friendship forming more ties over time (and opportunity), but those with little inclination towards cross-group friendships remaining unaffected, we can see instead that more and more White British students are making the leap towards having Asian British friends.

It is, I would argue, more significant for students to improve from no outgroup friends to one outgroup friend, than from one outgroup friend to two, since it may indicate the difference between disinclination to have an outgroup friend, and willingness to have an outgroup friend. While anxiety moderates the effect of intergroup contact by negatively biasing information-processing (Stephan & Stephan, 1985), and amplifying threat appraisal when outgroup members initiate contact (Van Zomeren et al., 2007), intergroup contact itself also reduces intergroup anxiety (Voci & Hewstone, 2003), particularly in the case of intergroup friendship (Page-Gould, Mendoza-Denton & Tropp, 2008). While having no outgroup friends would therefore result in intergroup anxiety remaining high (and has negative effects on inclination towards, and interpretation of, intergroup contact), the existence of an outgroup friend is likely therefore to reduce intergroup anxiety, improve the

quality of intergroup contact via unbiased interpretations, and make the formation of yet more outgroup friends more likely.

The main limitation when conducting social network studies is that the network is strongest when all individuals within a contained population are sampled. If too great a proportion of the population have not completed the survey indicating their ties, then the nodes that are within the network do not show all *their* ties – nominated links who have not completed the study (i.e., as distinct from having completed it but chosen not to nominate them back) are generally not represented within the network at all. The risk in these cases is particularly that nodes which would have been in some way central to the network are not included, and thus in their absence change the representation of the network structurally. While the separate analysis of reciprocal ties confirmed that the ethnicity properties of the network are the same even when removing ties that are non-reciprocated (whether from a one-way friendship *or* missing data from that participant), greater power would be added to the network if the sample population were closer to the full network boundary of the year group.

Given that the vast majority of students had come from ethnically homogenous primary schools, it is in fact reasonable to point out that looking further back than Wave 1, an even more negligible number of students of either ethnic group will have had any outgroup friends. As such, the true baseline can effectively be seen as zero, and the levels of ethnic heterogeneity in students' networks seen as an increase from their starting networks when they joined the school. While the overall levels of other-ethnicity friends are modest in line with cafeteria observations, then, it is encouraging that students are taking up at least *some* opportunities to make outgroup friends in this new diverse environment.

Own-gender preference was also very high, and did not decrease over time, supporting Hypothesis 3. While this was true for both ethnic groups, there was a difference

between the *relative* preference for ethnicity versus gender for White British versus Asian British students. Asian British students had significantly greater own-gender preference than own-ethnicity preference, similar to the findings in previous research that gender homophily was stronger than ethnic homophily in school-aged children (Hallinan & Smith, 1985; Sagar et al., 1983; Shrum et al., 1988). White British students however did not support this pattern, and instead had significantly higher own-ethnicity preference than own-gender preference (the comparison with Asian British students is stark in the visualisations of Figure 14 where Asian British students form clearer distinct clusters by gender than White British students do). While it is not possible from these data to extract mechanisms or processes behind these relative preferences, there may be cultural differences in attitudes towards gender integration (particularly in the lead-up to dating age) that is responsible for Asian British students being particularly averse to gender mixing.

Overall, these data show that students have taken up some small degree of opportunities for other-ethnicity friends during their first two years of integrated secondary school. While own-ethnicity preference remains high, it is important to bear in mind the comparable levels of own-gender preference, indicating high preference for homophily along more than one (ethnicity) dimension. Homophily literature, as discussed, does not take a temporal approach but implies a stable phenomenon where preferences persist over time (e.g., McPherson et al., 2001). Here we can see that homophily is in fact decreasing, and extended contact literature (e.g., Wright et al., 1997) suggests that once this outgroup contact has been made even by a few students, that the attitudes of students towards the outgroup will be improving over time even with this indirect form of contact (but, see Munniksma et al., 2013). This opportunity may in fact have the greatest effect at this age, given the developmental findings of Wölfer et al. (in press) showing greatest use of contact in adolescence. The students in this context have after all formed other-ethnicity friends even in

the presence of pervasive norms of own-ethnicity friends from their earlier years, and their peers in non-integrated schools (which make up the majority of secondary schools in the city); even if students are not immediately forming as many outgroup as ingroup friends in this new environment, it sets a hopeful precedent that further opportunities for making outgroup friends, in continued education as well as adulthood, would not be impaired by contact anxiety or friendship norms.

CHAPTER 4: SELF-REPORT LIKELIHOOD OF CAFETERIA INTEGRATION

Introduction

Context: Studies 1 and 2

Studies 1 and 2 demonstrated significant and persistent ethnic self-segregation in the sixth form college, stable across time and along both interpersonal and sub-area clustering levels of segregation. While these studies succeeded in demonstrating the *phenomenon* of self-segregation in a diverse environment that offers opportunities for cross-ethnic interactions, observations cannot themselves give any indication of *why* students self-segregate, or the decision-making processes that occur when they walk into a cafeteria. In other words, observational studies such as in Studies 1 and 2 (which by necessity had to occur without students' awareness at the time) would be enriched by subsequent input from the students themselves.

Previous Research: Integration Surveys

Previous research using survey methodology has identified factors which predict individuals' likelihood of engaging in outgroup contact. Patchen, Davidson, Hofman and Brown (1977) for example were among the earliest to highlight the importance of studying not only attitudes and attitude change as outcome variables of contact, but actual integration or avoidance behaviour. The authors therefore conducted a study in an Indianapolis high school which had a high proportion of both White and Black students, to investigate factors which correlate with likelihood for either positive or negative interactions. This study found that parental and peer negative attitudes towards the ethnic outgroup were a strong

determinant of cross-ethnic contact avoidance, particularly among White students; within ethnic groups, tendency for aggressive behaviour predicted low outgroup contact in Black students, while in White students gender had an impact in that White male students were less likely than White girls to be avoidant of contact with Black students. While Chadwick and Bahr (1971) had found in a similar school setting that Black students showed integrative behaviour more often than White students, Patchen et al. (1977) did not report any similar research question or data.

Experiments manipulating information about outgroup members' attitudes have identified factors which increase participants' subsequent willingness to interact with outgroup members; participants are for example more willing to engage in outgroup contact if they have been told that outgroup members support diversity (Tropp & Bianchi, 2006), or perceive their respective groups as sharing a common ingroup identity (Gómez, Dovidio, Huici, Gaertner & Cuadrado, 2008).

Unlike previous research, where students were asked directly about their own integrative behaviours and attitudes, Shelton and Richeson (2005) additionally asked students about their attributions of the *outgroup's* integrative behaviours and attitudes. Participants in this study were asked to imagine a scenario where they entered the cafeteria alone, and saw a table of White/Black students who live near them; subsequently, participants were asked how likely different factors were to inhibit their likelihood of sitting at that table. Comparison between attributions for ingroup and outgroup avoidance behaviour showed divergent explanations in both White and Black students, where they attributed the outgroup's lack of initiating contact to lack of interest in their ingroup, whereas their ingroup's lack of initiating contact with the outgroup was attributed to a fear of rejection on the basis of their ethnicity. Participants reported *wanting* to have more contact with the outgroup, but not expecting that the outgroup would want the same; this links neatly with their reports that the outgroup is not

interested in contact, and (perhaps consequently) that they the ingroup would be rejected should they attempt to initiate contact.

Even more pertinently, Al-Ramiah et al. (2014) conducted similar surveys to Shelton and Richeson (2005) but in this same sixth form college, albeit with a different student population at the time. Preliminary results (Study 2) showed that students rate their own likelihood of sitting with outgroup members in the cafeteria as low (which supports their self-segregated behaviour as seen in Study 1), but that Asian students rated their integrative behaviour significantly higher than White students (and this finding was replicated in the secondary schools surveyed in Al-Ramiah et al.'s Study 3). There was no evidence however of negative attitudes towards the outgroup, with students in Study 3 rating attitudes significantly above the scale midpoint.

Unlike Shelton and Richeson however, this study did not find an attributional bias wherein students attributed the ingroup's lack of contact to fear of rejection and the outgroup's lack of contact to disinterest. Instead, results showed that both White and Asian students attributed both groups' failure to initiate contact to a lack of interest more than to fear of rejection. This finding was important in establishing the lack of ingroup-outgroup bias in attribution within this UK context, but values that students gave to indicate their agreement with these attributional factors were still very low (means between 2-3 on a scale from 1-7), indicating overall that students did not rate either of these factors as playing more than a small role in motivating avoidance of contact. The intriguing possibilities are either that there are other motivational factors at play in students' interpretations of their own and outgroup members' avoidance behaviours, or that these *are* the main factors that students attribute their avoidance to, but that social desirability factors disincline participants from strongly endorsing any motivation behind avoiding outgroup contact. In either case, it is unlikely that this affects the *difference* between attributions that participants would give to the ingroup

versus the outgroup, and so the lack of attributional bias in this study remains an important comparison to that found in Shelton and Richeson (2005).

It should be noted that in situations where inter-ethnic contact is low and students are being asked their reasons for not initiating contact in a context that implies the establishment's desire for integration, that answers may be influenced by some degree of social desirability: in the example of the Shelton and Richeson (2005) paper, that students avoid indicating a lack of interest in the outgroup, instead essentially implicating the disinterest and rejection of the outgroup in their own lack of initiative. Shelton and Richeson (2005) address this limitation, suggesting in essence that the attributions given for ingroup and outgroup are equally desirable/undesirable – that it is not more self-enhancing to say you do not initiate contact with the outgroup due to fear of rejection than it is due to lack of interest. Similarly, they suggest that it is not self-enhancing to believe that members of the outgroup are not interested in getting to know *them*. While there is not yet any evidence to either support or undermine these suggestions, these arguments do not seem particularly well suited to an environment where students would be aware that they are encouraged to ethnically integrate – as such, 'self-enhancement' is not only influenced by everyday social factors (such as being unlikely to admit to fear of rejection), but by disinclination to indicate responsibility for ethnic self-segregation (and thus shifting responsibility by expressing a desire to integrate, but which is not acted upon because it is perceived as unwanted by the outgroup).

Previous research has therefore provided three main findings that are of particular relevance to my research. Results show that students in self-segregated contexts are, firstly, aware of and acknowledging ingroup and outgroup avoidance of contact; secondly, that this is in the absence of any evidence of negative attitudes, but more commonly disinterest in the

outgroup; and thirdly, that ethnic minorities tend to report higher levels of, and willingness towards, integrative behaviour.

Current Research: Cafeteria Integration Scenarios

Aims. Al-Ramiah et al. (2014) have already conducted research into attributions of avoidance of contact in the same sixth form college that I had observed in Study 1 and 2, and intended to further study for this chapter. As such, even though the student population had changed, I did not aim to replicate any data on attributions of behaviour (partly due to unnecessary overlap, and partly due to the sensitivity involved in implying a responsibility to ethnically integrate, as discussed above). Moreover, while questions in Study 3 had provided students with a scenario in which they do not sit with a table of *outgroup* members they are not friends with, an interesting comparison not provided here is how students would view approaching a table of *ingroup* members they are not friends with (i.e., separating out integration attitudes relating to ethnicity from social factors relating to approaching unfamiliar others).

For Study 5 therefore I surveyed students in Oldham Sixth Form College, where my observation research was conducted for Studies 1 and 2⁸, and aimed to address two main research questions. Firstly, I sought confirmation that seating habits within and between cafeterias were stable within students, to add reliability to the findings of my previous observational research. Secondly, I built upon the research of Shelton and Richeson (2005) and Al-Ramiah et al. (2014) by presenting students with scenarios in which a table of students who are familiar but not personal friends is available to sit at. Rather than indicating

⁸ This survey was administered after Study 2, and so more specifically was completed by students who had been present for that observational study.

that they do *not* join the table and asking why, this study addressed *how likely* students were to join this table, where a series of scenarios were presented in which tables varied in composition by gender, ethnicity, and number of students (for an example, see Appendix 7).

Hypotheses. For my first research question, I hypothesised that students' seating habits would indicate not only that they often sat in the same area, but moreover that Asian students would report more frequent seating in the smaller cafeteria, where I had observed considerably more Asian than White students.

For my second research question, I had three hypotheses about which tables students would be more or less likely to indicate they would join, based on students' own characteristics and the characteristics of the students described at the imagined table scenarios. Firstly, I predicted that the likelihood of sitting at an outgroup table would be lower than for sitting at an ingroup table, whether along gender or ethnicity dimensions, given established evidence for multi-dimensional homophily (McPherson et al., 2001) (Hypothesis 1). Specifically, students would be most likely to sit at tables which were double-ingroup, and least likely to sit at tables which were double-outgroup.

Secondly, I predicted that Asian students would make less of a distinction than White students between ethnic ingroup and outgroup tables, but more of a distinction between gender ingroup and outgroup tables, given previous research indicating that ethnic minorities have greater inclination towards ethnic integration (Al-Ramiah et al., 2014; Chadwick & Bahr, 1971) (Hypothesis 2). This would further be supported by the observational findings of Studies 1 and 2, where Asian students overall interact with White students more than vice versa, indicating less self-segregation by ethnicity, and the SNA findings of Study 4 that showed greater own-gender preference in Asian students than in White students.

On the other hand, (Hypothesis 3) I did not expect female students to be less likely to sit at ethnic outgroup tables than male students – despite previous research suggesting that females are less likely to ethnically integrate (Clack et al., 2005; Schofield & Sagar, 1977), results from Studies 1 and 2 in this setting had not indicated that all-female social groups were less likely to be ethnically integrated than other gender compositions.

Method

Sample and Context

Participants were students at the sixth form college, aged 16-18. There were a total of 1314 Year 12 students, and 1017 Year 13 students, of whom 51% were female, 49% male; 54% White British, 23% Asian Pakistani British, 17% Asian Bangladeshi British and 7% Other (Asian British: Indian; Asian British: Other; White: Other; Black; or Mixed ethnicity). Study 5 took place in July 2014, i.e. when the students at the college were the same students that had been observed in Study 2. The survey was completed by 277 students, of whom 62% were White British, 20% Asian Pakistani British, 12% Asian Bangladeshi British, and 6% Other; 62% female, 38% male; and 80% Year 12 (aged 16-17) and 20% Year 13 (aged 17-18).

Materials and Procedure

The survey was run using Qualtrics software, a reliable and frequently-used platform for such research. A link to this survey was emailed to all students, who were notified by teachers of the incoming email and reminded of their voluntary participation one week later. Since Year 13 students were on study leave at the time, the survey was kept online for one month to increase their likelihood of participation. Parents were sent opt-out forms two weeks prior to the survey being administered, where they had the option of withdrawing consent for their child to take part. No opt-out requests were returned. Participants additionally were asked for their consent at the start of the survey, and did not proceed to the survey if they declined. It was made clear that participation was voluntary, and participants could stop at any time if they wished to.

Measures

After giving consent, students were first asked to report their gender, year group, and ethnicity. Subsequently, I targeted two main research questions in this survey: habitual seating preferences, and cafeteria table vignettes.

Habitual seating preferences. Firstly, having conducted four waves of observational studies (two with this college cohort), it was important to address whether students' seating patterns as observed over one or two days each wave were likely to reflect their common seating patterns, i.e., that the high levels of ethnic self-segregation observed were not likely to be anomalies in year-round seating choices. Survey items asked students about free periods, morning break, and lunchtime separately. In these questions, students were asked to rate on a scale of 1 (strongly disagree) to 5 (strongly agree) whether they 'always sit in the same cafeteria'; 'always sit in the same section of the cafeteria'; 'always sit at the same table'; 'always sit in the same seat'; and 'always sit with the same people.'

Cafeteria table vignettes. Secondly, I aimed to address factors which would influence students' likelihood of breaking from established seating habits, and sitting with unfamiliar students. The next group of items therefore asked students to imagine that one table has a space available for them to sit at, where 'You are not friends with these students, but you recognise them from lessons. As your best guess, how likely would you be to go join them?' This question however was preceded by a brief description of the imagined students present at this table: 4 or 10 students; female, male, or both male and female; White, Asian, or both White and Asian. Students were asked to move a sliding scale from 0 ('Very unlikely') to 100 ('Very likely'), with 'Undecided' at the midpoint, where the cursor started. Given the sensitivity of the question, students could instead tick a box labelled 'No response.'

This was conducted in a within-subject design, such that each participant answered 18 questions on imagined tables, in randomised order.

Following these questions, students were thanked for their participation.

Results

Habitual Seating Preferences

I conducted one-sample *t*-tests to test whether students' self-reported frequency of sitting in each café area showed a preference, i.e. differed from the scale midpoint (scale from 1 - 'never' to 5 - 'always'). For each café, results from the different time points (during morning break, during free periods, and during lunchtime) were aggregated, since there was good internal consistency for each (main café $\alpha=.934$; smaller café $\alpha=.886$). I used a simplified ethnicity grouping of Pakistani and Bangladeshi students for Asian ($n = 85$), and White British and White Other for White ($n = 169$); all other students were excluded ($n = 12$).

I ran a 2-factor 2 (café area: main café or smaller café) x 2 (ethnicity of student: White or Asian) ANOVA with repeated measures on the first factor. There was a significant interaction between student ethnicity and café area, $F(1, 235) = 28.47, p<.001, \eta^2 = .108$. I conducted a pair-wise *t*-test of differences in all participants' frequency scores for the main cafeteria and the smaller cafeteria, which showed that the main cafeteria had significantly higher frequency scores ($M = 2.50$) than the smaller cafeteria ($M = 1.89$), $t(248) = 5.03, p<.001, d = 0.48$. When looking separately by ethnicity, White students reported significantly higher frequency of sitting in the main cafeteria ($M = 3.01$) than did Asian students ($M = 1.84$), $t(233) = -7.38, p<.001, d = 0.92$.

Cafeteria Table Vignettes

Results were initially grouped into four repeated measures "table type" variables: tables which were ethnic ingroup and gender ingroup ($E_I G_I$), ethnic ingroup and gender outgroup ($E_I G_O$), ethnic outgroup and gender ingroup ($E_O G_I$), and ethnic outgroup and gender outgroup ($E_O G_O$). Repeated measures ANOVA results showed a significant effect of table type,

$F(1,226) = 51.02, p < .001, \eta^2 = .242$. Means and standard errors are shown in Table 18. As predicted in hypothesis (1), the double ingroup ($E_I G_I$) was significantly more likely to be approached than any other table, and the double outgroup ($E_O G_O$) was significantly less likely to be approached than any other table: $E_I G_I$ tables were more likely to be joined than $E_O G_I$ tables, $p < .001, d = 0.47$, which were more likely to be joined than $E_I G_O$ tables, $p = .029, d = 0.21$, which were more likely to be joined than $E_O G_O$ tables, $p < .001, d = 0.24$.

Table 18: Means and standard deviations for likelihood to sit with ingroup/outgroup students in Study 5.

$E_I G_I$	$E_I G_O$	$E_O G_I$	$E_O G_O$
47.96 (32.01)	27.08 (28.39)	33.26 (30.02)	20.46 (25.60)

To examine more specific table condition effects, I then discarded the four “table type” variables in favour of the full 18 repeated-measures conditions. Data were analysed using a 5-factor 2 (ethnicity of student: White or Asian) $\times 2$ (gender of student: male or female) $\times 2$ (year of student: Year 12 or Year 13) $\times 2$ (size of imagined group: 4 or 10) $\times 3$ (gender of imagined group: all-male, all-female or mixed) $\times 3$ (ethnicity of imagined group: all-White, all-Asian or mixed) repeated-measures ANOVA, with repeated measures on the last three factors. I found within-subject main effects that were significant for imagined group size, $F(1, 129) = 9.21, p = .003, \eta^2 = .067$, where seating likelihood scores for imagined tables with 4 people ($M = 37.50$) were higher than imagined tables with 10 people ($M = 33.13$), $p = .003, d = 0.17$; and a trend for imagined group gender, $F(1.57, 202) = 3.08, p = .060, \eta^2 = .023$, where all-female tables were given the highest likelihood ($M = 36.35$), followed by mixed-gender tables ($M = 34.56$), and with lowest likelihood for all-male tables ($M = 30.02$); and non-significant for student ethnicity or student gender.

I found between-subject effects for own ethnicity, own gender, table ethnicity and table gender in 3-way interactions (own gender, table ethnicity and table gender, $F(2, 202) = 6.22, p < .001, \eta^2 = .046$; own gender, own ethnicity and table gender, $F(2, 202) = 9.85, p < .001, \eta^2 = .071$) that were qualified by a significant 4-way interaction between own ethnicity, own gender, table ethnicity and table gender, $F(3.58, 235.04) = 7.34, p < .001, \eta^2 = .054$. For a breakdown of means, see Appendix 8. These interactions will be represented firstly in comparing approach likelihoods for tables *within*-participants by table gender (see Figure 20: Study 5 table gender effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table ethnicity (x-axis) and table gender (separate bars).

Figure 21), and by table ethnicity (see Figure 23: Study 5 table ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table gender (x-axis) and table ethnicity (separate bars).

Figure 24); secondly, in comparing approach likelihoods for tables *between*-participants by participant gender (see Figure 26: Study 5 participant gender effects - Graphs showing significant 4-way interaction between own ethnicity (x-axis), own gender (separate bars), table gender (top, bold) and table ethnicity (left, bold).

Figure 27), and by participant ethnicity (see Figure 29: Study 5 participant ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (separate bars), own gender (x-axis), table gender (top, bold) and table ethnicity (left, bold).

Figure 30). Subsequently, I will summarise where these results fit with my three research hypotheses, and any other key findings that emerged.

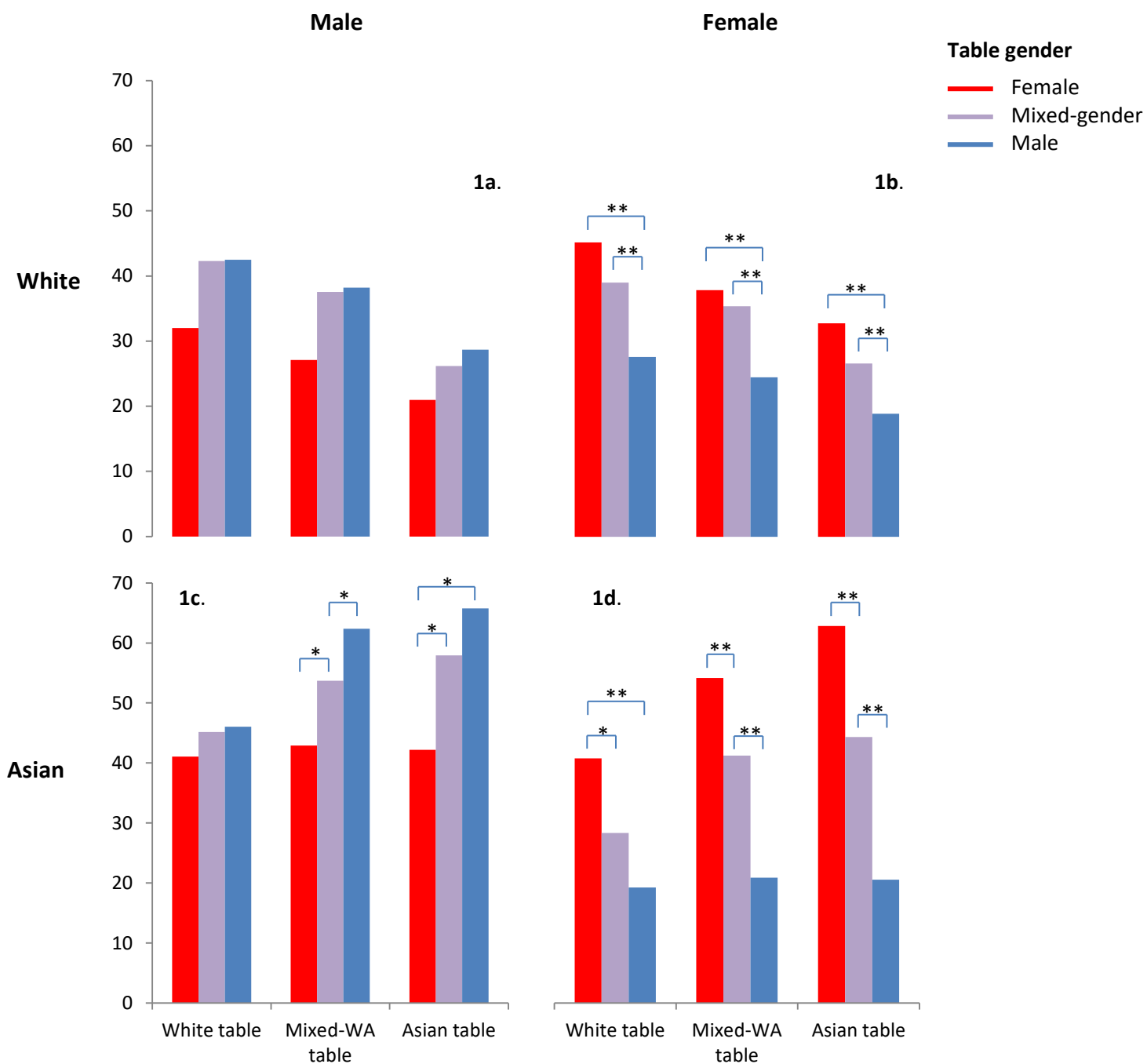


Figure 20: Study 5 table gender effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table ethnicity (x-axis) and table gender (separate bars).

Figure 21: Study 5 table gender effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table ethnicity (x-axis) and table gender (separate bars).

Table gender effects: White participants. White male participants (1a.) had no significant gender effects for table approach likelihood. White female students (1b.) had lower likelihood scores for White all-male tables than either White mixed-gender, $p = .002$, $d = 0.41$, or White all-female tables, $p = .002$, $d = 0.63$. They similarly had lower likelihood scores for Asian all-male tables than either Asian mixed-gender, $p = .008$, $d = 0.34$, or Asian all-female tables, $p = .009$, $d = 0.56$. White female students also had higher likelihood scores for mixed-ethnicity mixed-gender tables than for mixed-ethnicity all-male tables, $p < .001$, $d = 0.42$.

Table gender effects: Asian participants. Asian male participants (1c.) had lower likelihood scores for Asian all-female tables than either Asian mixed-gender tables, $p = .033$, $d = 0.47$, or Asian all-male tables $p = .002$, $d = 0.69$. They had higher likelihood scores for mixed-ethnicity all-male tables than either mixed-ethnicity mixed-gender tables, $p = .016$, $d = 0.37$, or mixed-ethnicity all-female tables, $p = .012$, $d = 0.68$.

Asian female participants (1d.) had higher likelihood scores for White all-female tables than either White mixed-gender tables, $p = .023$, $d = 0.42$, or White all-male tables, $p < .001$, $d = 0.77$. They also had higher likelihood scores for Asian all-female than Asian mixed-gender tables, $p < .001$, $d = 0.64$, which were themselves higher than for Asian all-male tables, $p < .001$, $d = 0.85$. Similarly, they had higher likelihood scores for mixed-ethnicity all-female than mixed-ethnicity mixed-gender tables, $p = .002$, $d = 0.42$, which were themselves higher than for mixed-ethnicity all-male tables, $p < .001$, $d = 0.74$.

These results show that while Asian males and females and White females distinguish significantly between tables of different genders with a preference for own-gender (no matter the table ethnicity), White males do not show this distinction or preference and report that they are equally likely to approach tables of any gender composition.

Results here somewhat support Hypothesis 2, where I had predicted that Asian students would have greater differences than White students for whether they would join a table of students based on their gender. Although White females' likelihood to sit at tables is similarly significantly impacted by the table gender as it is for Asian male or female participants, White males do not distinguish between tables based on gender. This then qualifies the hypothesis, such that White students *are* less influenced by gender of a table than Asian students, but specifically driven by White male students and their non-significant preferences by gender.

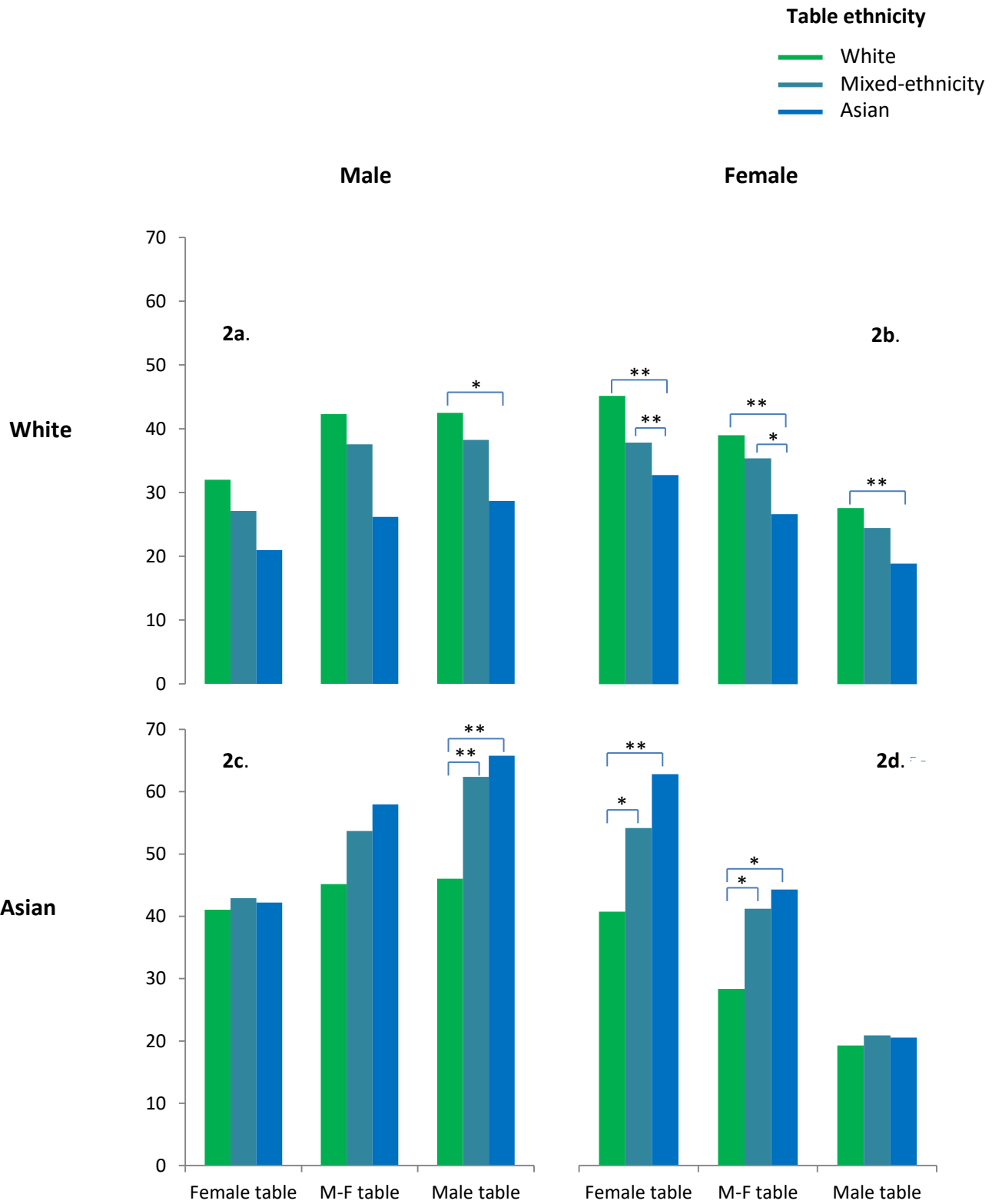


Figure 23: Study 5 table ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table gender (x-axis) and table ethnicity (separate bars).

Figure 24: Study 5 table ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table gender (x-axis) and table ethnicity (separate bars).

Table ethnicity effects: White participants. White male participants (2a.) had higher likelihood scores for White all-male tables than for Asian all-male tables, $p = .021$, $d = 0.45$, and for White mixed-gender tables than for Asian mixed-gender tables, $p = .005$, $d = 0.55$. White female participants (2b.) had lower likelihood scores for Asian all-female tables than either mixed-ethnicity all-female tables, $p = .007$, $d = 0.17$, or White all-female tables, $p = .001$, $d = 0.43$.

Table ethnicity effects: Asian participants. Asian male students (2c.) had lower likelihood scores for White all-male tables than either mixed-ethnicity all-male, $p = .001$, $d = 0.52$, or Asian all-male tables, $p = .001$, $d = 0.52$. Asian female participants (2d.) had lower likelihood scores for White all-female tables than either mixed-ethnicity all-female tables, $p = .015$, $d = 0.44$, or Asian all-female tables, $p = .001$, $d = 0.78$.

Here we can see that students particularly have an own-ethnicity preference on tables which are own-gender, where other-gender tables are less likely to be approached and may be experiencing a floor effect for ethnicity preference; White females however continue to show significant own-ethnicity preference even for tables which are other-gender. Differences in likelihood to approach tables based on their ethnicity are similar here between male and female participants, in line with Hypothesis 3.

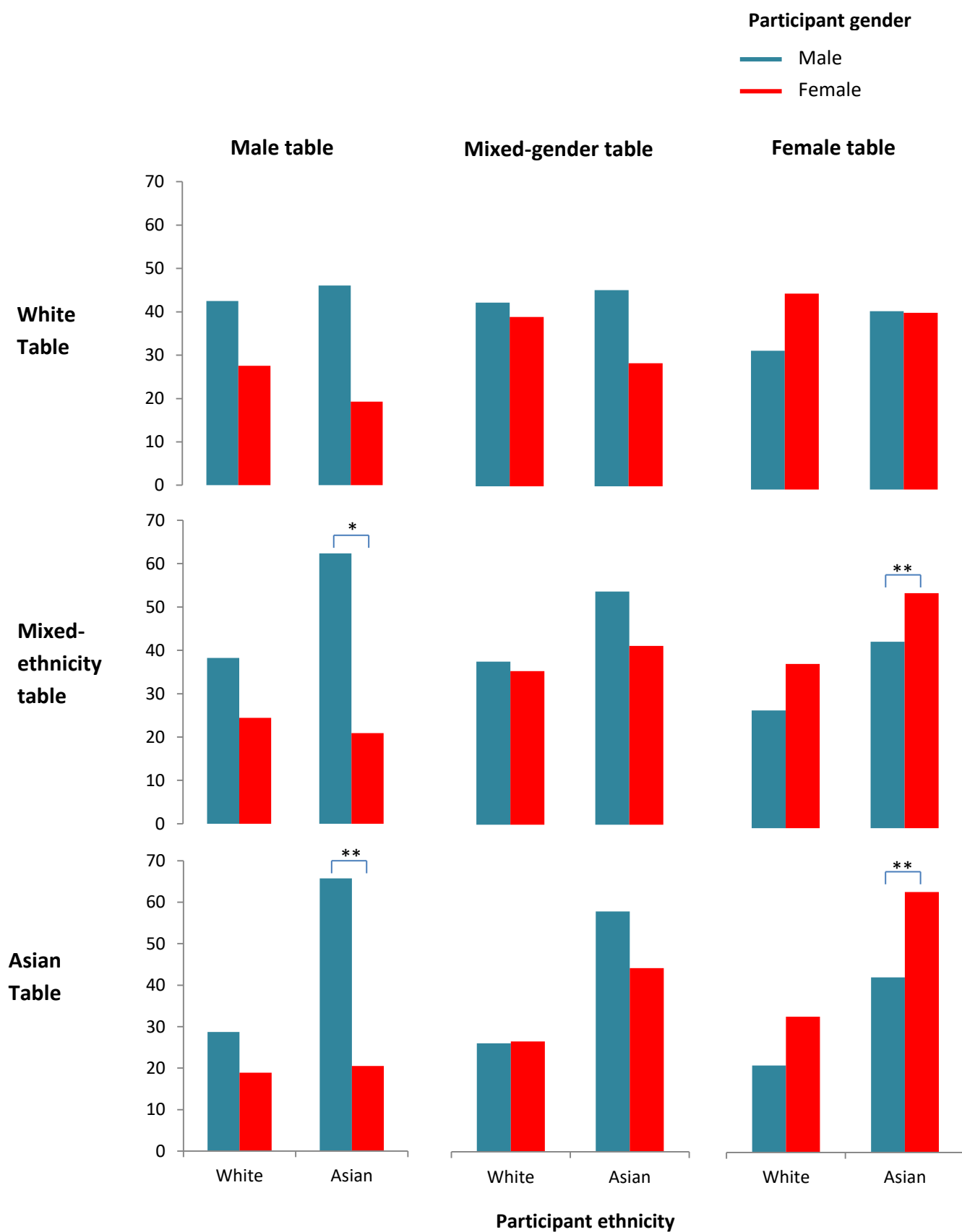


Figure 26: Study 5 participant gender effects - Graphs showing significant 4-way interaction between own ethnicity (x-axis), own gender (separate bars), table gender (top, bold) and table ethnicity (left, bold).

Figure 27: Study 5 participant gender effects - Graphs showing significant 4-way interaction between own ethnicity (x-axis), own gender (separate bars), table gender (top, bold) and table ethnicity (left, bold).

Participant gender effects: White participants. I found no significant gender effects.

Participant gender effects: Asian participants. Asian female students had higher likelihood scores than Asian male students for either Asian all-female tables, $p < .001$, $d = 0.67$, or mixed-ethnicity all-female tables, $p = .004$, $d = 0.35$. Conversely, Asian male students had higher likelihood scores than Asian female students for either Asian all-male tables, $p = .003$, $d = 1.57$, or mixed-ethnicity all-male tables, $p = .011$, $d = 1.66$.

Here results show that within Asian or mixed-ethnicity tables, Asian students but not White students show gender differences in their approach likelihood of tables of different genders. Neither ethnic group showed differences between male and female participants for approaching a White table, and White students had no significant differences in approach likelihood between male and female participants (when results were broken down by table type). This further confirms Hypothesis 2, by showing a greater own-gender preference in Asian students compared to White students.

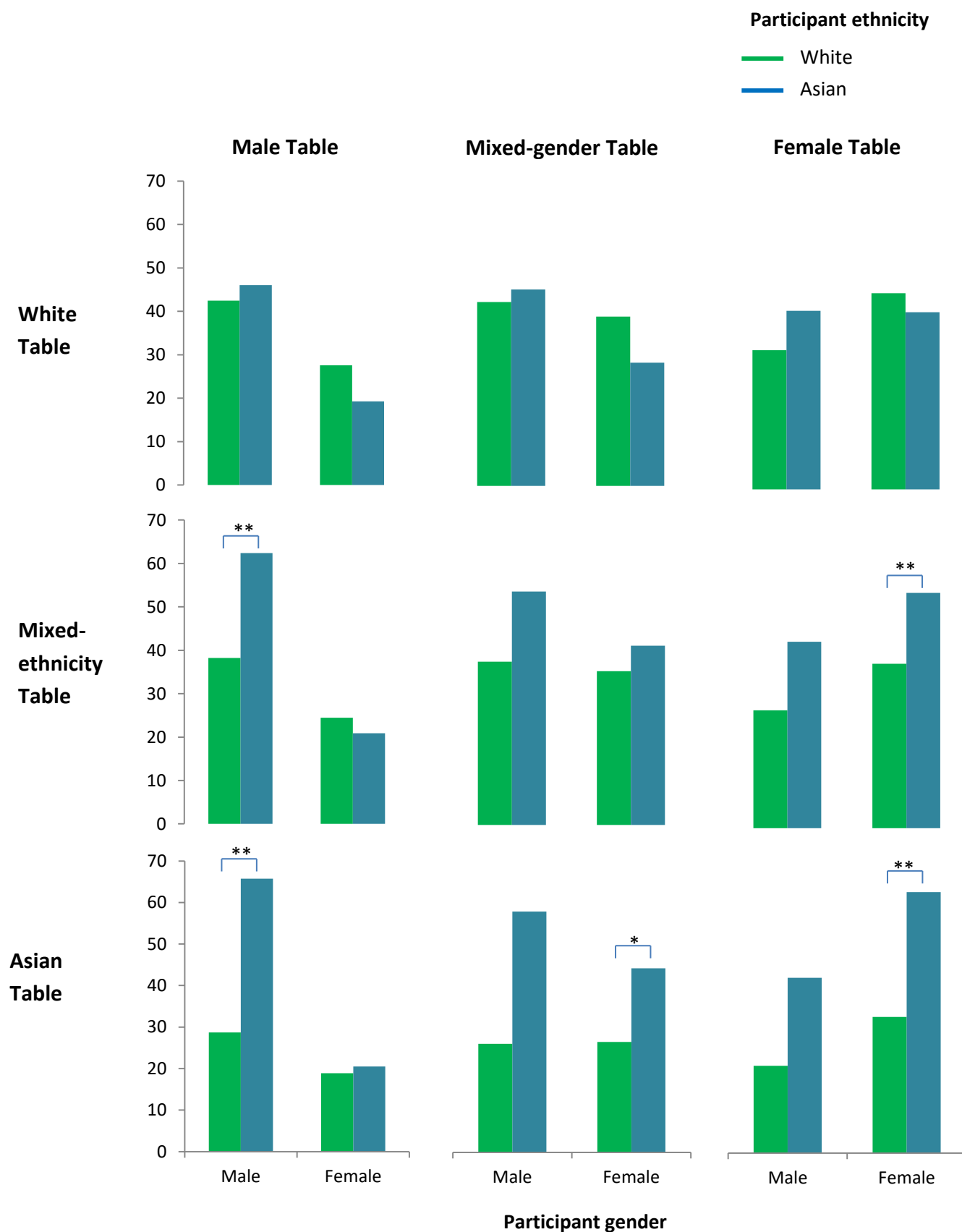


Figure 29: Study 5 participant ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (separate bars), own gender (x-axis), table gender (top, bold) and table ethnicity (left, bold).

Figure 30: Study 5 participant ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (separate bars), own gender (x-axis), table gender (top, bold) and table ethnicity (left, bold).

Participant ethnicity effects: Male participants. Asian males had higher likelihood scores than White males for Asian all-male tables, $p = .001$, $d = 1.20$, or mixed-ethnicity all-male tables, $p = .001$, $d = 0.83$.

Participant ethnicity effects: Female participants. Asian female students had higher likelihood scores than White female students for tables which were Asian all-female, $p < .001$, $d = 1.12$, Asian mixed-gender, $p = .005$, $d = 0.63$, or mixed-ethnicity all-female tables, $p = .002$, $d = 0.54$.

Here results show support for Hypothesis 2, where Asian students are significantly more likely to sit at either Asian or mixed-ethnicity tables (particularly when these tables are own-gender), but just as likely as White students to sit at White tables.

Again, differences are similar for male and female students, indicating as in Hypothesis 3 that there is no evidence for females being more prone to self-segregation by ethnicity.

Discussion

Habitual seating preferences. Results from this section confirmed my hypotheses that students have stable seating preferences by café area, and furthermore that White British students reported higher frequency of sitting in the main cafeteria than Asian British participants. This can be loosely linked with the observations of Study 2 that Asian British students were more likely to sit in the smaller cafeteria, but the results from this survey failed to show a significant difference between White British and Asian British students for sitting in the smaller cafeteria, despite these behavioural observations. Given its small size, it may be that too few students from *either* ethnic group rated it as a likely place to sit (means were, after all, around 1-2 out of 5, indicating low likelihood), and if there are particular Asian British students who typically sit there they may not have all been surveyed.

Cafeteria table vignettes. Results from these items, while statistically complex, are intuitive and in line with my hypotheses. Firstly, the significant effect of table type (denoting levels of ingroup versus outgroup in ethnicity and gender) confirmed Hypothesis 1, where students are most likely to join a double-ingroup table, and least likely to join a double-outgroup table. It is interesting that within these extremes, E_OG_I was significantly more likely to be approached than $E_I G_O$ – both of these tables are partially ingroup, partially outgroup, but preference for E_OG_I indicates that preference for own-gender is stronger than preference for own-ethnicity.

This is perhaps surprising, in that gender segregation as observed in Studies 1 and 2 was consistently lower than ethnicity segregation. One explanation for this discrepancy may derive from the fact that in the survey scenarios, tables of students are described as not being personal friends. When students *do* sit with other-gender students in the cafeterias, it is highly plausible that these other students are part of their established friendship groups, and/or

(prospective) romantic partners. From these data however it seems that the prospect of approaching an other-gender table of students they are *not* friends with is in fact more unappealing than approaching a group of other-ethnicity, same-gender students. Students of the opposite gender may be attractive as potential partners from within your social group, but not as new acquaintances from outside your social group.

The significant main effect of group size, where students are more likely to approach a group of 4 than a group of 10, suggests that smaller groups are less off-putting to approach. This could be because larger groups are more intimidating, or perceived as less welcoming of an unfamiliar person. The non-significant main effects of participant ethnicity or participant gender is not as surprising as it may first appear: what this indicates is that gender or ethnicity do not affect *general* approach likelihood towards a table of students who are not personal friends, before accounting for table gender or ethnicity information; differences in scores would therefore mean greater or lesser willingness to meet new students (extroversion, perhaps). On the other hand, as predicted in Hypothesis 3, there was no significant difference between males and females for ethnic outgroup scores, or ethnic ingroup-outgroup difference scores, and no interaction was found between own gender, own ethnicity and table ethnicity, either of which would have indicated that males or females are more or less likely to approach an outgroup ethnicity table. Once again, this cannot support previous findings (Clack et al., 2005; Schofield & Sagar, 1977) that suggest that females are less likely to integrate with the ethnic outgroup.

The 4-way interaction however demonstrates the expected preference of students for their own-gender over other-gender, own-ethnicity over other-ethnicity, and own-gender own-ethnicity most of all compared with other-gender other-ethnicity least of all. Within this finding, there are interesting comparisons to be had between White British males, White

British females, Asian British males and Asian British females, and the extent to which these preferences occur.

Results in Figure 20: Study 5 table gender effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table ethnicity (x-axis) and table gender (separate bars).

Figure 21 show overall more gender segregation in Asian British students compared with White British students, as predicted by Hypothesis 1. When broken down by student gender however, it is clear furthermore that these differences may particularly arise given White British *male* students' lack of significant preference for own-gender tables. This is an interesting qualifier, though not in itself likely to be meaningful in ethnic self-segregation.

Results from Figure 23: Study 5 table ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (left, bold), own gender (top, bold), table gender (x-axis) and table ethnicity (separate bars).

Figure 24 have shown that students make distinctions between male and female tables *if* these tables are own-ethnicity, with the exception of White British female students who retain a significant own-gender preference with Asian British tables. One possible interpretation is that White British females have a particularly negative stereotype about Asian British males, given the recent scandal in the British press over Asian British male sexual predators targeting young White British females (e.g., Norfolk, 2014; Pearson, 2016). As such, although White females are (like all students) less inclined to sit at other-ethnicity tables, they take particular exception to Asian British males over Asian British females. Overall however, ethnicity preferences appear similar between male and female students, supporting Hypothesis 3 that females are not more inclined towards ethnic self-segregation.

Results in Figure 26: Study 5 participant gender effects - Graphs showing significant 4-way interaction between own ethnicity (x-axis), own gender (separate bars), table gender (top, bold) and table ethnicity (left, bold).

Figure 27 confirmed Hypothesis 2, that Asian British students have greater own-gender preference than White British students. Here, when Asian British students are presented with vignettes of Asian or mixed-ethnicity tables, males' approach likelihood is higher for male tables than females' approach likelihood, and vice versa for female tables. Male and female White British students are both being treated more similarly in approach likelihoods, and responding more similarly in their own approach likelihoods, than Asian British male and female students. That Asian British students respond with greater own-gender preferences, particularly for Asian British tables (and mixed-ethnicity), is intriguing in light of the results of social network analysis in Study 4 (in a different educational setting), where Asian British students showed greater own-gender preference in their friends than White students. Here I similarly replicated these patterns, but from the perspective of making new interactions rather than established friends: replicated firstly in that both ethnic groups have an own-ethnicity preference, and secondly that within own-ethnicity preferences, it is only Asian British students who still have a strong own-gender preference.

Further support for Hypothesis 2 can be found from the results in Figure 29: Study 5 participant ethnicity effects - Graphs showing significant 4-way interaction between own ethnicity (separate bars), own gender (x-axis), table gender (top, bold) and table ethnicity (left, bold).

Figure 30, where White British students were significantly less likely than Asian British students to join either an Asian British or mixed-ethnicity table, showing own-ethnicity preference on the part of White British students; Asian students on the other hand were no less likely than White British students to indicate likelihood to join a White British table.

Asian British students can therefore be seen to have less own-ethnicity preference than White British students.

Overall, my three main hypotheses for imagined tables have been addressed in different aspects of the 4-way interaction data. Hypothesis 1 is supported by the significantly higher likelihood for students to approach ingroup tables than outgroup tables, with highest likelihood for the double-ingroup and lowest likelihood for the double-outgroup. Hypothesis 2, regarding Asian British students' preferences within this pattern, was supported both in that their own-ethnicity preference was lower than White s British tudents', and that their own-gender preference was greater than White British students' (though primarily, I have suggested, because of White British males' lack of gender distinctions). Hypothesis 3 was supported in that no significant effect of gender was found on likelihood to approach other-ethnicity tables, and in the similar patterns of own-ethnicity preference (or lack thereof) between males and females throughout the rest of the data.

Overall, many of these results fit neatly and interestingly with the findings of both observational Studies 1-2 and social network Study 4, as will be discussed in the Thesis Discussion.

CHAPTER 5: THESIS DISCUSSION

Abstract

This thesis has covered five studies within a merger school and sixth form college in Oldham: Study 1 and Study 2, 2-wave observational studies of the sixth form college's cafeteria(s); Study 3, a 2-wave observational study of the merger school cafeteria; Study 4, a 3-wave social network study of students starting their first year at the merger school; and Study 5, a self-report survey of imagined cafeteria vignettes in the sixth form college. Overall, the results from this thesis can be divided into three main discussion topics: the presence of self-segregation based on homophily preferences, with between-participant effects of gender, ethnicity, and age (with developmental considerations); comparisons between ethnic and gender homophily; and limitations and directions for future research, with particular emphasis on the importance of triangulating methods.

Self-Segregation and Homophily

Results from the cafeteria observations and social network analyses demonstrated strong ethnic self-segregation, and were supported by survey evidence that students are particularly disinclined to approach a table at which only ethnic outgroup members are seated. Like other studies which have found self-segregation within diverse settings (e.g., Al-Ramiah et al., 2014; Campbell et al., 1966; Clack et al., 2005; Dixon & Durrheim, 2003; McKeown et al., 2012; Schofield & Sagar, 1977; Shrum et al., 1988; Tredoux & Dixon, 2009; etc.), these results demonstrate the key difference between *opportunity* for contact, and *actual* contact.

The importance of such a distinction should not be under-estimated, as it has meaningful implications for contact theory, and its applications in real-world settings.

Since the meta-analytic demonstration of the significant effect of contact *when* it occurs (Pettigrew & Tropp, 2006), the main criticism of contact theory has been its relevance in naturally-occurring settings. Dixon, Durrheim, et al. (2005) argued that research into intergroup contact too often was detached from the real-world settings where such contact typically occurs, and Dixon, Tredoux, et al. (2005) further posited that interpersonal contact does not occur as frequently in ecological settings as is assumed by contact theorists. Evidence of self-segregation in the observational literature supports this view, though the majority of these studies have not studied self-segregation longitudinally. As such, these results are generally interpreted as reflecting the self-segregation that is pervasive despite the time spent in a diverse environment, i.e., reflects a stable phenomenon of self-segregation. However, because they only measure one ‘snapshot’ in time it remains unclear whether this snapshot could fit into a broader trend of *increasing* (though still low) integration.

Here however I have reported results from the merger school that show significantly greater levels of ethnic integration in the cafeteria over time, and there was a trend in the SNA data following the same participants over time, for ethnic homophily in friendships to be lower over time. On the one hand, at the final wave, integration in the cafeteria is still significantly lower than would be expected by chance; on the other hand, the effect size of the increase is large, providing us with grounds for optimism the trend may continue beyond the observed time period.

While these results demonstrate overall self-segregation within the school and college populations, there were also interesting comparisons *between* participants which allowed for

comparisons of self-segregation tendencies: between gender, between age groups, and between ethnic groups.

Between Gender

The majority of previous research into homophily and self-segregation has looked at either ethnic homophily or gender homophily, but not for example at gender differences *within* ethnic homophily. A few exceptions exist, and this previous literature had found females to be less likely to interact with other-ethnicity students (Clack et al., 2005; Schofield & Sagar, 1977) or have other-ethnicity friends (Shrum et al., 1988). Results here from cafeteria observations (Studies 1-3) and social networks (Study 4) however showed no difference between males and females in their likelihood to sit with an other-ethnicity student, or have an other-ethnicity friend. Similarly, the cafeteria survey (Study 5) showed no significant effect of gender on reported likelihood to sit at an ethnic outgroup table. Overall my thesis data cannot replicate the finding that females are more ethnically self-segregated than males, and future research should continue to investigate factors *within* participants which influences their likelihood of being self-segregated, to further investigate the possible effect of gender.

Between Ethnic Groups

As in the case of gender, few previous studies have looked within self-segregation to whether one ethnic group was more prone to self-segregation than the other (often, this also means a majority versus minority perspective). Within literature on residential segregation, it was found that White people were more likely to relocate to self-segregate than other ethnicities were (Christopher, 2000; Iceland, 2004). Al-Ramiah et al. (2014) have also demonstrated that Asian British students are more likely than White British students to report that they were likely to approach an outgroup table, and Sagar et al. (1983) found that Black American

students were more likely to instigate cross-ethnic interactions in a desegregated school than White Americans were.

There is also some evidence from my research to support the idea that Asian British students are more prone to integration than White British students. In Study 5, Asian British students reported lower own-ethnicity preference in their imagined cafeteria seating preferences than White British students. That White British tables in this survey are equally likely to be approached by White British or Asian British students, while Asian British tables are more likely approached by Asian British students, matches the greater level of Asian British exposure to White British students (i.e., greater relative integration of Asian British students) found in the observational studies. As discussed, this came about due to ethnically-mixed social units being mostly majority-White British, and in many cases having only one Asian British student present in the group. As such, these Asian British students were each getting more outgroup contact out of these mixed social units than were the White British students. This finding is particularly interesting in the context of political and media “isolationist discourse” (Phillips, 2004, p.25), which tend to project the view that Asian British people are secluding themselves from the rest of British society. That Asian British students in this particular context appear in fact to be *more* willing to integrate – report greater likelihood of sitting with unfamiliar outgroup tables, and are in fact more often willing to sit in groups where they are the minority – challenges this view.

It is important to note however that these results discussed (observational Studies 1 and 2, and self-report Study 5) were taken from the sixth form college, whereas similar effects were not found in the merger school. Observations did not show significant differences between Asian British and White British students’ exposure to one another, where mixed social units were roughly equally comprised of White British and Asian British students (Study 3); furthermore, social network analysis with the 11-13 year olds did not

show significant differences between Asian British and White British students' likelihood to of having outgroup friends (Study 4). Since there is an age difference between these two settings (11-15 years in the merger school, and 16-18 in the sixth form college) there could in theory be a developmental reason why younger Asian students are less prone to integration.

This does not, however, seem the most immediately plausible explanation. In the case of the observations, it is entirely possible that this lack of a statistically significant difference between ethnic groups' exposure was due to the lower power of this study compared to those in the sixth form college, since there were fewer students and fewer observed time intervals. In social networks, it is even more plausible that there are no ethnic differences in having outgroup friends, since the nominated ties were similar to reciprocal ties, and reciprocated friendships that are White-Asian by definition cannot occur more frequently to Asian British students than to White British students. In theory, what remains is the possibility that Asian British students are more *interested* in having outgroup friends, and the fact that they do not have more of them is due to the lack of reciprocated interest from White British students; whether this is the case is however beyond the scope of the current research.

What remains, overall, is the implication from the sixth form college data that Asian British students are making more use of the opportunities for outgroup contact than their White British peers are. Given the concern that prejudice towards Asian British is often rooted in the belief that they are disinclined to interact with White British, this contradictory data provides useful evidence against this view. Evidence from acculturation theory has shown that majority members viewing minority members as seeking out intergroup contact prompts positive affect (Zagefka et al., 2007). If this were the case in this context, then publicising Asian British students' interest in outgroup contact might increase White British students' own inclination towards outgroup contact. Some evidence from the minority perspective has demonstrated in fact that the ethnic *minority's* interest in outgroup contact is

predicted by their perception of how much the *majority* group values diversity (Tropp & Bianchi, 2006). Either way, an optimistic suggestion would be that highlighting Asian British students' interest in integration may prompt a positive cycle whereby White British students are more positive about diversity, Asian British students respond with further increased interest in integration, etc.

Between Age Groups: Developmental Perspective

What does seem possible however is that the overall difference in ethnic integration between the merger school and the sixth form college may be related to developmental factors. Setting aside differences between Asian British and White British students, overall ethnic self-segregation was non-significantly different between the two educational settings *but* only significantly increased over time in the merger school. While comparisons between different settings can be difficult if not impossible, it is intriguing nonetheless that this difference exists: on the one hand, students at the merger school are significantly more integrated (and with a large effect size) between two waves in one academic year; on the other hand, the sixth form students do not show any increase in ethnic integration over a total of four waves in two academic years.

From a developmental perspective, these findings are in line with previous research on the developmental effects of intergroup contact: for example, that childhood is particularly influential in the formation of stereotypes (Devine, 1989); that while explicit prejudice decreases in adolescence, implicit prejudice may be increasing (Raabe & Beelmann, 2011); that early adolescence corresponds both with a formative window for (negative) attitude change, and with the efficacy of interventions (Granic & Patterson, 2006); and that young adolescents show the greatest positive effect of opportunities for contact, compared with

young adults (Wölfer et al., in press). Overall, these findings provide a picture whereby both prejudice formation *and* the efficacy of contact may be particularly influential in adolescence. From this perspective, the (younger) students at the merger school can be interpreted as making better use of their opportunities for contact - and thus, integrating - than the (older) students at the sixth form college. A particular strength of the present research within the developmental literature is that it is the first to observe actual integration *behaviours* across a range of age groups, and compare the effect of opportunities for contact on integration over time.

Very little previous research has observed micro-ecological integration longitudinally – both Koen and Durrheim (2009) and Schofield and Sagar (1977) found some evidence for ethnic self-segregation worsening over time, but these results can be compatible with the developmental interpretation of the results found here. Koen and Durrheim's (2009) research observed classroom seating patterns at the start and end of a semester, based in a South African university, and thus observed students even older (aged 18-22) than those in the sixth form college – it would not therefore be expected to be in the optimal developmental window for the positive effects of contact. Schofield and Sagar (1977) *did* observe students of a similar age to the merger school (aged 11-13), in a middle school in the US with a large Black American minority study body. Here these authors observed classroom interactions between students, and found initial evidence of ethnic integration over the course of the seventh grade (aged 11-12); the subsequent decrease in integration over the eighth grade (aged 12-13) was attributed to the introduction of academic tracks, which had the unfortunate effect of largely ethnically segregating the class. As such, there is a strong suggestion from the developmental literature, and my own findings in a similar setting, that had the academic tracking not been introduced those students would have continued to integrate over time.

While one must be cautious when suggesting a developmental mechanism of intergroup relations based on comparisons between observational studies, such an interpretation *would* therefore be in line with the literature. Furthermore, these results add an important additional methodology for studying this developmental phenomenon, with important considerations. If childhood and adolescence are indeed the optimal window for intervention in the formation of prejudice (Granic & Patterson, 2006; Killen & McKown, 2005; Masten et al., 2009; Raabe & Beelmann, 2011; Wölfer et al., in press), then it is crucial in towns like Oldham that opportunities for intergroup contact be provided at as young an age as possible.

Comparing Ethnic and Gender Self-Segregation

The observational, social network, and survey studies all allowed comparison of self-segregation by ethnicity versus by gender. Such a comparison is useful for two reasons: in distinguishing interethnic relations and possible ethnic prejudices from a general desire for homophily; and in a possible interaction between age, and how ethnic and gender homophily relate to one another.

In the observational studies, gender self-segregation was calculated alongside ethnicity self-segregation, and produced different patterns in the two educational settings. In the merger school, gender self-segregation was high, and comparable with the levels of ethnic self-segregation, while there was no significant gender self-segregation in the sixth form college. The (younger) students at the merger school were not mixing with the other gender – the (older) students at the sixth form college were. Meanwhile, ethnic integration improved at the merger school, while it did not at the sixth form college.

While – once again – comparisons between studies and settings must be made with caution, it is interesting to compare these observational data with results from the social network study (at the merger school) and imagined cafeteria survey (at the sixth form college). Although each study uses a different methodology, they both provide a comparative measure of gender homophily which corroborates the observational findings in the respective educational settings. In the merger school, where gender self-segregation was high in the cafeteria, social network analysis also revealed strong own-gender preference for friends, particularly amongst Asian British students. In the sixth form college, where gender self-segregation was low in the cafeterias, survey participants (from the same population as those observed in Study 2) did not have a significant overall own-gender preference for own-ethnicity tables. However, levels of gender preference in the survey differed between White British and Asian British students: while White British students had no significant gender differences in their likelihood of approaching any tables, Asian British students showed own-gender preferences at Asian British tables. This shows a greater level of gender selectivity than in White British students, as also found in the merger school with social network analysis.

It is important to bear in mind that the survey in Study 5 presented participants with a hypothetical scenario in which they could join a table of students who were *not* already their friends, in order to specifically investigate factors relating to making new acquaintances, or even having proximal but non-interactive contact with outgroup members. While Asian British participants preferred to sit with students of the same gender as themselves when imagining an unfamiliar White British table, the presence of ethnic self-segregation in the cafeteria demonstrates that Asian British students do *not* often sit at a White British table, regardless of gender. Instead, members of each ethnic group are significantly more likely to

sit with members of their own ethnic group, and thus gender preferences appear to largely arise when imagining unfamiliar groups of students.

Overall, students at the merger school had high gender social network homophily but increasing behavioural ethnic integration over time; students at the sixth form college showed mixed evidence for own-gender preference when imagining sitting at a table with unknown others, and no increase in behavioural ethnic integration over time. What this pattern suggests (but cannot conclusively demonstrate) is that there is an interplay between ethnic and gender homophily, which shifts during adolescent development. During early adolescence (aged 11-15), gender salience is still high for ingroup/outgroup membership – this means both that interactions with other-gender students are low, and that same-gender students are perceived as ingroup (even when also other-ethnicity). This would mean that at this age, students are more likely to develop other-ethnicity friends, if they are own-gender. In late adolescence on the other hand, students show less reluctance to interact with the other gender, and this occurred in the present research at the same time as low ethnic integration. Students aged 16-18 may be more likely in this case to see other-ethnicity students as the outgroup, and have low interest in interacting with them, if they are more preoccupied with interacting with the other gender (especially romantically).

The suggestion that interest in the other gender may come at the expense of interethnic contact has been made in a different context by Schofield and Sagar (1977), who interpreted their finding that girls were less likely to engage in cross-ethnic contact by proposing that females' interest in "attracting boys" (p. 137) reduced opportunities for interactions with girls of other ethnicities. While Schofield and Sagar had studied students aged 11-13 (i.e., around the age of those at the merger school), I found gender integration and ethnic segregation in the 16-18 year old students at the sixth form college. On the one hand, I did not replicate either the interest in the other gender, or the greater ethnic self-segregation

of females at the merger school; on the other hand, the general principle can still apply that *if and when* adolescents become interested in gender mixing, the likelihood of using new opportunities for cross-ethnic contact diminishes.

This links neatly with the developmental literature on contact, adding a further dimension of gender homophily as a potential factor in the mechanism. While literature has already suggested that children and young adolescents may be in an optimal window for attitude change and the positive effects of contact, the suggestion from a combination of Schofield and Sagar's (1977) findings and my own data is that optimal windows for ethnic integration occur during stages of gender segregation.

Interim Summary: Self-Segregation in the Present Research

Considering the observations, survey and social network analysis, triangulation of these findings lends weight to possible patterns emerging: that when faced with the prospect of new groups to interact with, students have particularly weighted preferences for own-gender and own-ethnicity based on their own gender and ethnicity. These preferences therefore limit the heterogeneity of interactions, as predicted by survey results and observed in the cafeteria, and result in friendship networks which are homogenous (and vice versa: causality likely goes both ways, such that homogenous friendship networks also result in homogenous cafeteria interactions, and so on). However, there is some evidence from the cafeteria observations and social network analysis at the merger school that ethnic integration may have a slight but meaningful increase over time, whereas no such integration can be seen over time at the sixth form college. This suggests a developmental process whereby younger adolescents are more likely to use opportunities for cross-ethnic contact, while the added dimension of gender

homophily as measured using all three methods further hints at a developmental interplay between gender and ethnic self-segregation.

Researching Self-Segregation: Methodological Considerations

In planning and executing data collection and interpreting the results from my research, particular considerations emerged for best practice in studying self-segregation. These considerations fall into three main categories: (1) particular methodological concerns in observational studies of self-segregation, and the important contributions of (2) longitudinal and (3) triangulated-method research.

(1) Implications for Observational Research

The majority of previous research on self-segregation has examined this phenomenon through micro-ecological observational study. Such research, while instrumental in demonstrating self-segregation within diverse settings, is also dependent on the means of calculating self-segregation as well as the scope of the area observed. Adapted *I* values from Campbell et al. (1966) are not best suited for settings such as cafeterias where adjacencies can be either side-by-side or face-to-face (or, indeed, diagonal), and studies which have done so, including my own (i.e., Al-Ramiah et al., 2014; see also Schofield & Sagar, 1977) are likely to have two indices neither of which is measuring *all* cross-group interactions against all *possible* cross-group interactions. This index is also, as discussed, sensitive to the total number of students present in the whole space, and can present misleadingly low levels of self-segregation. Further adapting this index to count either side-by-side *or* face-to-face

adjacencies (up to the same maximum of two) is an improvement, though best complemented with an index that measures cross-group exposure at the level of the whole social unit (such as the *P* exposure indices).

As highlighted by my own results, each index of self-segregation – and particularly, *D* value measurements of segregation between sub-areas – is reliant on the assumption that the population under observation is representative of the whole population making choices about where to sit or interact. If this is not the case, and a disproportionate number of one group is in fact gathering in other (unobserved) areas, then the level of self-segregation present in the whole environment will in fact be greater than could be concluded from the observational results from one (e.g.) cafeteria. Tredoux and Dixon (2008) have already highlighted the importance of examining self-segregation at several levels (e.g., not just interpersonally within a nightclub, but between nightclub sub-areas or even between nightclubs themselves). So far however research in educational settings has only examined a maximum of two levels of self-segregation: interpersonal, and between sub-areas – not between the different larger areas that people have the option to sit in, such as cafeterias within a school (Al-Ramiah et al., 2014; Clack et al., 2005; Schofield & Sagar, 1977), university computer rooms (MacKinnon et al., 2011), or university classrooms (Campbell et al., 1966; Koen & Durrheim, 2009). As such, the results from the present research would suggest that each of these studies may be reporting even less self-segregation than is actually occurring in the environment they are studying, and that it is important wherever possible to observe all available spaces possible (or report tests comparing your observed sample with the population to which results will be extrapolated).

(2) The Importance of Longitudinal Research

Researchers of micro-ecological self-segregation are essentially interested in the difference between opportunities for contact, and actual interpersonal contact. Although single time point studies can demonstrate the difference between the two (if there is strong self-segregation), longitudinal research is required to test whether there is, nevertheless, any degree of integration occurring over time (i.e., the difference between opportunities for and actual contact is diminishing).

Unfortunately, the only previous examples of longitudinal observational studies (Koen & Durrheim, 2009; Schofield & Sagar, 1977) used *I* indices as their measure of self-segregation, which as previously discussed are not well suited to environments where people can interact along more than one spatial dimension – with those directly adjacent to them (sideways or across the table) or indeed those a few seats down, or at a neighbouring table. As such, the present research is the first to conduct observational studies longitudinally with the additional analysis at the level of social units (exposure *P* index based on Clack et al., 2005).

Furthermore, my observational studies were uniquely placed to begin this longitudinal research near the *start* of these opportunities for contact – particularly in the merger school, where the ethnically-homogenous previous schools had merged on this new campus only the previous year. As a result, the data provide a perspective of the integration changes over time that occur soon after the introduction of opportunities for contact.

(3) The Value of Triangulation

Each of the three methodologies used in this research made important contributions to the picture of self-segregation discussed above. Some previous research on self-segregation and homophily has used more than one methodology: for example, combining behavioural

observations with self-report surveys (Al-Ramiah et al., 2014) or interviews (Dixon & Durrheim, 2003), or social network analysis with census data (Briggs, 2007), or attitude surveys (Munniksma et al., 2013; Wölfer et al., in press). None however have combined behavioural observations with social network analysis, and the triangulation of these with the added perspective of a self-report survey in the present research provided a rich set of data with complementary strengths.

Observational studies of integration versus self-segregation provide real and direct measures of inter-ethnic behaviour, in a manner where the participants are unaware of the exact nature of the study and so are less influenced by social desirability than self-report methods. This provides researchers with a measure of actual interpersonal contact that is occurring in a diverse setting, since intergroup contact is key for reducing prejudice (Allport, 1954; Pettigrew & Tropp, 2006), yet opportunities for intergroup contact are often avoided in favour of self-segregation (Al-Ramiah et al., 2014; Campbell et al., 1966; Clack et al., 2005; Dixon & Durrheim, 2003; MacKinnon et al., 2011; McKeown et al., 2012; Schofield & Sagar, 1977; Tredoux & Dixon, 2008). Observational studies not only document whether self-segregation is occurring (and to what extent), but allow psychologists to test whether behavioural integration increases over time (e.g., Koen & Durrheim, 2009; Schofield & Sagar, 1977).

As discussed, there is a need for more *longitudinal* observational studies, to track dynamic changes in integration in response to opportunities for contact. Furthermore, even longitudinal observational studies should ideally be paired with other methodologies, given the limitations of observational research. Principally, analyses of behavioural integration only provide an overall perspective of the level of self-segregation in the *whole population*, but do not provide meaningful individual-level data. As such, observational studies cannot themselves provide insight into the mechanisms or motivations behind ethnic integration or

self-segregation. Data from individual participants, such as from social networks or attitude surveys, can however provide a meaningful context to behavioural data.

Social network data is a particularly complementary method to observational studies. On the one hand, if one finds ethnic self-segregation in spaces such as the cafeteria, or even classrooms or beaches, this is discouraging as evidence of limited interpersonal contact. On the other hand, interpersonal contact *may* still be happening in other (unobserved) settings, and it is important to have a direct measure of any outgroup friends people may have but not be interacting with in the researcher's observed setting. Students for example may form one or two outgroup friends based on their contact opportunities in their setting (commute to school, extracurricular activities, etc.), but still sit with their respective own-ethnicity friendship groups at lunchtime. If this were the case, then conducting observational studies of integration in isolation would find strong self-segregation – valid in and of itself as a meaningful aspect of the context's inter-ethnic relations, but not reflecting the other more positive aspects of inter-ethnic relations that are at play.

Other survey data can also provide useful understanding of the attitudes and preferences of the observed population. Some, such as those conducted here and by Al-Ramiah et al. (2014), can ask participants about their preferences relating to cross-ethnic interactions in the observed setting. Such data can confirm participants' own-ethnicity preferences (or, show a discrepancy between participants' self-reported preferences and their actual behaviours), or investigate self-reported motivations behind these preferences, and any attributional bias or correspondence in participants' own motivations and those they attribute to the other ethnic group. Survey items on intergroup attitudes can, furthermore, allow comparison of levels of behavioural self-segregation with outgroup attitudes (and, if longitudinal, with whether changes in one predict changes in the other). This can either be achieved at the population level (i.e., overall self-segregation is compared with overall

outgroup attitudes), or at the participant level (if it is possible to match individuals within the observations to their survey answers, such as in McKeown et al., 2012).

Individually, any one of these methods provides a valuable but ultimately limited perspective on dynamic and multifaceted aspects of integration in an ethnically diverse setting. Through triangulation, such as in the present research, researchers are able to consider how data from behaviour, self-report integration preferences, and friendship ties interlink to form a holistic view of integration in one or more environments. In the current case, it has also allowed me to propose a developmental mechanism whereby gender relations in adolescence shape interest in other-ethnicity contact, creating an optimal window for cross-ethnic relations in early adolescence.

Limitations and Suggestions for Future Research

So far I have highlighted the strengths of the present research, in that it makes an important contribution to the field in being longitudinal, and triangulating several key methodologies to provide a rich dataset. There are however limitations associated both with research in educational settings, and the time period of a DPhil (not to mention one or two other unrelated surprises), that I will now discuss with reference to future research.

Ideally, triangulation of the three methodologies (behavioural observation, social network analysis, and self-report survey) would have occurred in both educational settings (merger school and sixth form college) – instead, there was overlap in the observational studies in each location, but separation of the SNA study in the merger school and the survey in the sixth form college. Had SNA also been conducted in the sixth form college, and the self-report survey in the merger school, I could have compared results in each setting to further test my developmental hypothesis of interethnic relations. However, the merger

school was (understandably) reluctant to conduct another study with the same students, with the added possibility that they were too young to complete a (long) online survey on imagined cafeteria vignettes. At the sixth form college meanwhile it would have been difficult to conduct a SNA study on such a large scale within the time frame I had, since individual data preparation is largely manual (the sample from both sixth form year groups would have been roughly ten times that studied in the merger school). That being said, future research could improve upon that reported here by successfully using all three methodologies in the same location.

Each individual methodology also came with small limitations, largely relating to sample size. In the social network analysis for example the first two waves suffered an unnecessary loss of participants through mislaid surveys in the school, and if I were to conduct further surveys in an educational setting I would make sure I was present at the school at the time of the survey administration (as in Wave 3), in order to help with the process. A different problem arose in the sixth form college (online) survey however, in that the Year 13 students were on study leave, and thus had a lower response rate than the Year 12 students. Although the composition of the survey participants was representative nonetheless, participation rates would be higher in similar studies if conducted at a time when no group was on study leave. In the observational studies, Study 2 overcame the limitation of only observing one cafeteria in Study 1, and allowed a more accurate measure of students' self-segregation. Ideally it would have been possible to match students' seating choices to their responses on the cafeteria survey – in this context it was not possible to identify individual students in the cafeteria, though in more controlled (and possibly less ecologically valid) settings it has been possible to administer surveys to students who were already seated at locations that were marked on their survey (McKeown et al., 2012).

Something the present research does not provide is experimental data. The decision not to include experiments was made for reasons of practicality, but is worth exploring for the purpose of identifying what such possible future research could do. There are two main avenues of experimental study that I would argue would be most interesting in a context such as this: interventions, or cognitive or neurobiological experiments studying the underlying processes. An intervention could for example manipulate factors which have been implicated in self-segregation, such as mandatory cross-ethnic seating assignments in classrooms, or cooperative activities within gender groups. The difficulty however lies in having a valid control group, where either no intervention or a sham intervention takes place. Such a control group would need to exist either in the same school (such that some classes undergo an intervention, and others do not), or between schools (such that one school undergoes an intervention, and another does).

In both cases, there are practical and ethical difficulties. If within the same school, a practical difficulty arises in making sure that the expected positive effects of the intervention in some classes do not affect the behaviour or attitudes of other classes – for example, students in the intervention condition may experience the positive effects and then happen to make friends with an outgroup member who was *not* in an intervention condition; alternatively, the positive effects of extended contact (Wright et al., 2011) may mean that students whose friends have formed outgroup friends as a result of the intervention also experience improved attitudes towards the outgroup – in short, longitudinal experiments present particular difficulties in a school environment. Ethically, the school may also be reluctant to deliberately keep many of their students out of the intervention, since it is hypothesised to have positive effects.

Using another school as a control comparison is similarly problematic. Any two schools are likely to vary on a wide range of factors, such as their ethnic composition,

religious affiliations, academic standing, or policies regarding fostering integration; as such, differences in behavioural integration or intergroup attitudes cannot reliably be compared on the basis of experimental condition. Similarly to within a school, there is also an ethical consideration in that schools are unlikely to agree to be a control condition when an intervention has the promise of positive effects – researchers would likely have to carry out this intervention again at the control school after the experiment has finished.

Beyond interventions, it would be theoretically possible to conduct short experiments using the same participants as those studied in the present research. For example, based on some of the themes discussed in my research, one could test whether gender primes reduce implicit intergroup prejudice and/or self-reported willingness to engage in intergroup contact in early adolescent students. While any experiment targeting cognitive factors involved in intergroup prejudice would be interesting and provide more direct evidence of underlying mechanisms in self-segregation, I chose to focus on methods which minimised awareness of my research focus, i.e., did little to prime salience of intergroup relations. My longitudinal research can in some regards be seen as a control condition in itself, since I was interested in the naturally-occurring phenomenon of self-segregation and whether opportunities for contact really could result in integration over time, as a passive process. I did not therefore want to introduce myself into the situation where avoidable, such as in experiments asking about intergroup attitudes, in case my research itself became an unintended intervention that influenced behavioural integration (or, alternatively, provided a social desirability cue to report outgroup friends in the social network study).

Given time, however, such experiments would have been less problematic *after* the longitudinal study of behavioural integration and social networks had been completed. In particular, implicit and/or neuropsychological experiments would be particularly complementary to the results found here. Future research could, for example, link studies of

self-segregation with the emerging field of social neuroscience. Studies using electroencephalography (EEG) methodology have for example already demonstrated that event-related potentials (ERPs) in face processing are influenced by ethnic group membership, such that the P200 peak has a larger amplitude (often seen as a ‘threat response’) to outgroup than ingroup faces (Ito & Bartholow, 2009; Ito & Urland, 2003).

However, there is fascinating scope for such experiments to be conducted in the field, particularly in a setting like the merger school where students are provided with (at minimum) passive intergroup exposure on a scale they have never had before. EEG studies could test the correlation between intergroup contact and implicit threat responses, either cross-sectionally or longitudinally – cross-sectionally, the individual levels of intergroup contact (or number of outgroup friends) each participant has had can be correlated with their P200 amplitude, while repeated waves of EEG studies could test whether these outgroup face responses diminish over time in the school. There was not unfortunately time to collect this additional data within the present research, but there is great potential for neuropsychological contributions to the literature in the future.

Future Research: Summary

While the current research has used the advantage of several key methodologies to triangulate research on self-segregation, there are further studies which could be conducted to provide yet further dimensions of understanding to the processes underlying self-segregation. The examples I have given which have the most promise are experimental studies, such as neuropsychological measures of implicit intergroup processes, or computer tasks testing the effect of manipulated factors on intergroup bias or attitudes. I would however argue that the three methods used in the present research are the most valuable and fundamental to the study

of self-segregation within diverse settings, although optimally all (three) would be conducted at once in the same school. Ideally, it would also be valuable to be able to match observed participants with their social network and survey responses, though the difficulty lies in identifying students in a way which does not draw their attention to the observational study, and thus influence their behaviour.

Although Dixon has called for more micro-ecological research (Dixon, Durheim et al., 2005; Dixon, Tredoux et al., 2005; Dixon et al., 2008), the presence of self-segregation at the interpersonal level *has* already been demonstrated in a variety of countries and settings (Campbell et al., 1966; Clack et al., 2005; Dixon & Durrheim, 2003; Tredoux & Dixon, 2008; Koen & Durrheim, 2009; Schofield & Sagar, 1977), and further studies documenting self-segregation at one time point and without additional methodologies provide diminishing additional information⁹. For additional meaningful contributions, I would further specify that there is a need for further *longitudinal* studies of micro-ecological self-segregation, which is so far largely lacking, and more directly tracks the effects of contact than interpretations of a single time point. Furthermore, triangulating observations of self-segregation with social networks or other survey data is another way to build on the self-segregation literature, by exploring beyond the phenomenon of self-segregation to the individual-level processes involved.

Experimental interventions in real-world settings would be difficult to control and ultimately unreliable in interpretation. On the other hand, interventions based on the best hypotheses of scientific research are, practically speaking, useful and to be encouraged in real-world settings – obvious examples include more active policies for encouraging cross-

⁹ Each study has, undoubtedly, contributed to methodological practice in self-segregation research, by making use of improved indices and demonstrating how to use them in novel settings. This is, however, separate from contributions made to our *understanding* of self-segregation phenomena.

ethnic interactions within diverse settings (and will be discussed in greater detail in the overall summary).

Thesis Summary and Conclusion

In this thesis I have demonstrated strong self-segregation by ethnicity within two diverse educational settings, replicating similar findings in previous self-segregation research. The data here added to this research however by not only taking place in a unique setting of new diverse educational environments, but also adding to the literature methodologically by both triangulating key methods, and conducting these longitudinally.

Comparisons of self-segregation between participants (gender, ethnicity, and school attended) as well as within participants (ethnic versus gender self-segregation) allowed rich in-depth analysis of self-segregation phenomena. While I did not find any evidence of gender differences in ethnic self-segregation, there was evidence suggesting that Asian British students were more open to ethnic integration than White British students – an important and perhaps surprising finding given the current climate of fear regarding Asian immigration in the UK, which centres around the widespread media belief that Muslim immigrants are culturally isolating themselves (e.g., Pearson, 2016).

Meanwhile, differences in ethnic versus gender self-segregation between the two educational settings – and the finding that ethnic integration only increases in the merger school where gender segregation is high – suggested a developmental hypothesis whereby early adolescents' preference for own-gender interactions may in fact increase their

likelihood of having cross-ethnic interactions, compared with in later adolescence. Such a theory can only be cautiously suggested from the current data, but is an important consideration in future research given the implication that intergroup contact opportunities are optimally used in this developmental window.

Given these findings, it is immediately clear that more active approaches to encouraging integration need to be taken within diverse settings, particularly where the context is recently desegregated or there is residential self-segregation, such that ethnic groups have not had previous opportunities for contact. Homophily preferences are a powerful determinant of whom people interact with, and result in significant differences between opportunities for contact and whether those opportunities are used, and outgroup friends formed. We know on the other hand that actual intergroup contact has a significant impact on reduced prejudice and improved intergroup relations, and it is not enough to assume that putting students from different ethnic groups in the same campus will create all these positive effects.

Examples of active approaches depend on the setting involved, but there are several that would be possible in educational settings. As discussed in Chapter 1, educational settings provide excellent *opportunities* for the optimal conditions of contact, such as suggested by Allport (1954). Such settings are nominally equal-status for ethnic groups (except in the case of academic streaming, which can provide *de facto* segregation as in Schofield & Sagar, 1977); even more importantly, they have in-built structure and authority, which allows not only for a clear demonstration of authority's support for intergroup contact, but also provides opportunities for a consistent structure and message across all teachers and classrooms, including opportunities for the introduction of cooperative and stereotype-disconfirming activities. That these schools only provide 'opportunities' for optimal contact is clear; however, not only may some not provide clear support for integration, but even those schools

where the management support ethnic integration do not necessarily facilitate it. As discussed in Chapter 1, ‘colour-blind’ approaches to race in education in desegregated America were in fact detrimental to intergroup relations, and schools such as those studied here have not made any obvious attempts to emphasise interethnic cooperative activities, or demonstrate their active support for interethnic contact. Meaningful interactions between students of different ethnic groups could be increased by mandatory cross-ethnic seating assignments, and the use of cooperative exercises between students sat next to each other. Alternatively, diverse schools could identify whether there is ethnic self-segregation occurring between sports or extracurricular activities, and encourage diversity within these activities. In fact, there are almost limitless ways to create and foster interethnic interactions in schools, and any and all should be encouraged in order to maximise the positive effects of intergroup contact. While there are currently government initiatives to incentivise schools and universities to increase their ethnic diversity, and the diversity of their leadership roles, results in the current research have demonstrated in summary that diversity itself is not enough: for the full effects of intergroup contact to take hold, such *meaningful* intergroup contact must be occurring, which requires further action and encouragement. Such governmental funding incentives should therefore require educational institutions to document and demonstrate their active efforts to foster such intergroup contact within their diverse settings.

There is a real need for more longitudinal, interpersonal-level data on integration in diverse settings, in order to both target interventions promoting cohesion, and raise awareness of the efforts already underway. This is a pivotal time in White British-Asian British relations in Europe, especially with Muslim minorities, and an important opportunity for social psychological research to continue to contribute to our understanding of intergroup relations.

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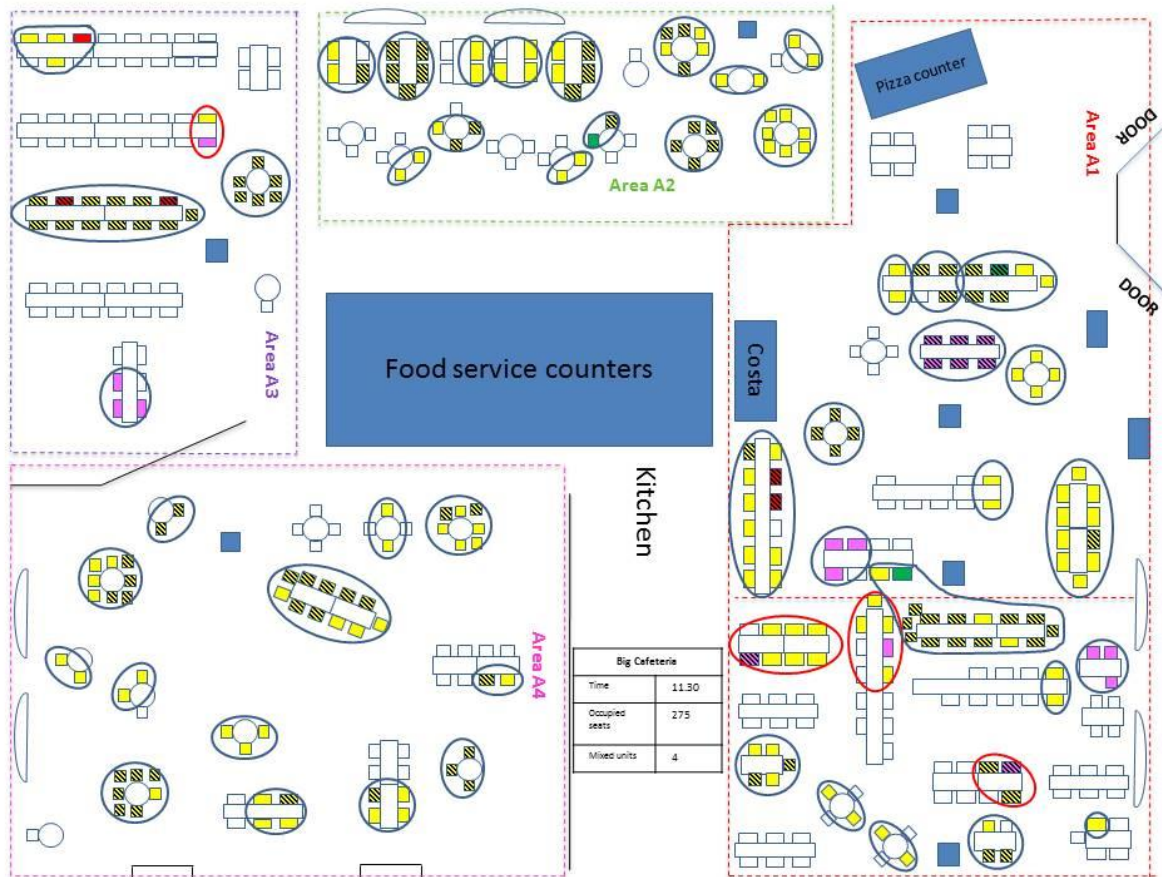
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APPENDICES

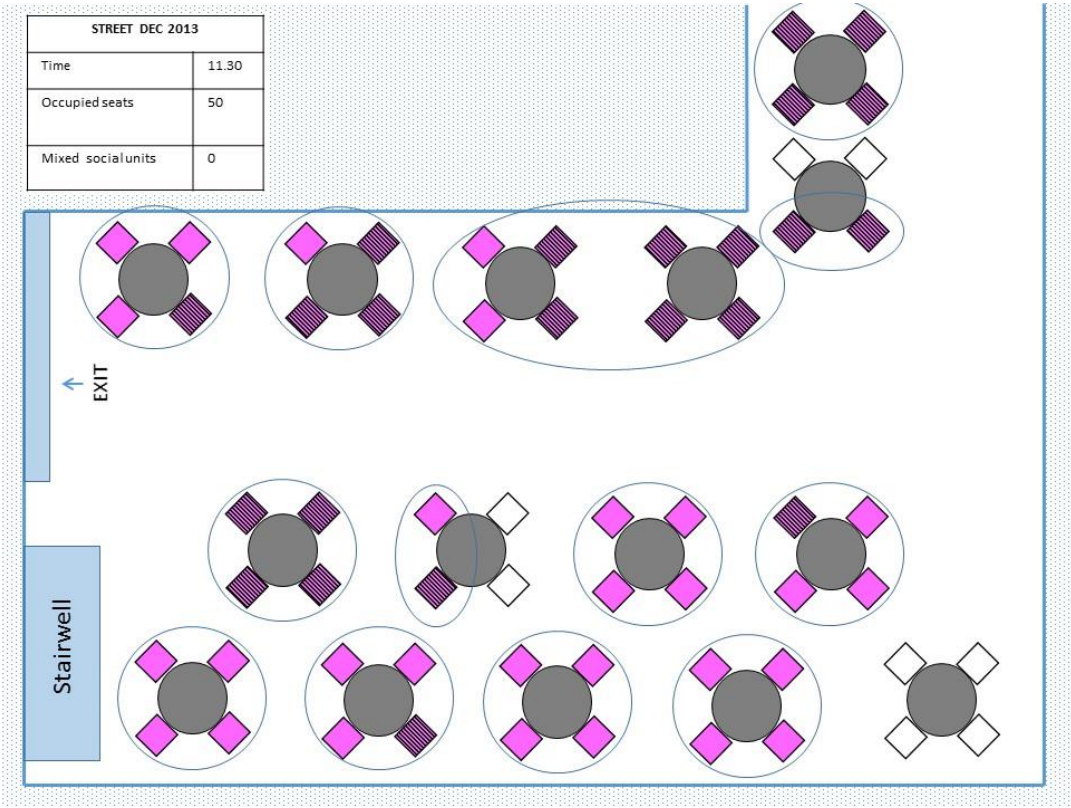
Appendix 1: Example Coded Map of the Sixth Form College Main Cafeteria



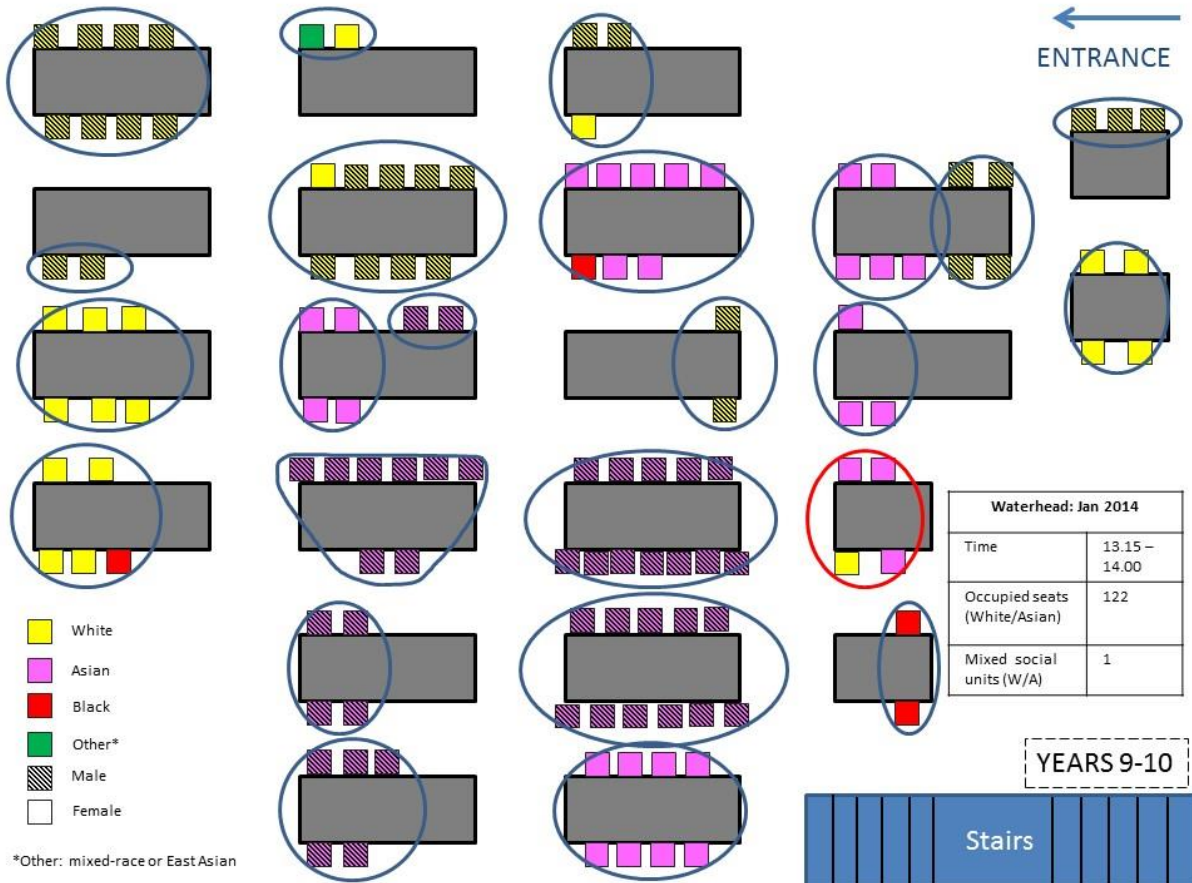
Appendix 2: Photo of Sixth Form Small Cafeteria



Appendix 3: Example of Coded Map of the Sixth Form Small Cafeteria



Appendix 4: Example Coded Map of the Merger School Cafeteria



Appendix 5: Social Network Questionnaire

For these questions, we are interested how you get on with other students in your year group.

In this survey, we are looking at how friendship groups form in a new school. In a school, there will always be some people you get on well with, and some you get on less well with. So that we can get a good idea of the friendship groups in your school, please answer these questions as honestly as you can, and remember that we will not show your answers to your school.

In these questions we will ask you to write down the names of **up to ten** students. For example 'up to ten of your closest friends'. Please write down as many names as you think makes sense. If you don't think anyone from your year group is right for that question, please cross that question out.

Please think of up to ten students from your year group who you are most friendly with.

Please list their FULL names in order of how close friends they are (with 1. being your best friend, etc.)

Please also tick the boxes next to any friends who you often sit with at lunch, or who you often hang out with out of school time.

	FIRST NAME	LAST NAME	I often sit with this person at lunch (tick IF TRUE)	I often hang out with this person out of school time (tick IF TRUE)
1)			☐	☐
2)			☐	☐
3)			☐	☐
4)			☐	☐
5)			☐	☐
6)			☐	☐
7)			☐	☐
8)			☐	☐
9)			☐	☐
10)			☐	☐

Appendix 6: Social Network Questionnaire with Retrospective Network

In this survey, we are looking at how friendship groups form in a new school. In a school, there will always be some people you get on well with, and some you get on less well with. Sometimes you stay friends with the same people, and sometimes the people in your friendship group changes.

In these questions, we will ask you to list the names of **students in your year that you were friends with before, or are friends with now**. So that we can get a good idea of the friendship groups in your school, please answer these questions as honestly as you can, and remember that we will not show your answers to your school.

MARCH 2014

For these questions, we would like you to think back to **MARCH LAST YEAR**, before the Easter holidays. If you were not at Waterhead Academy at that time, please skip ahead to the questions on the next page.

Please think of up to ten students from your year group who you were most friendly with **LAST MARCH**.

Please also tick the boxes next to any friends who you often sat with at lunch, or who you often hung out with out of school time.

	FIRST NAME	LAST NAME	I often sit with this person at lunch (<i>tick IF TRUE</i>)	I often hang out with this person out of school time (<i>tick IF TRUE</i>)
1)	_____	_____	☐	☐
2)	_____	_____	☐	☐
3)	_____	_____	☐	☐
4)	_____	_____	☐	☐
5)	_____	_____	☐	☐
6)	_____	_____	☐	☐
7)	_____	_____	☐	☐
8)	_____	_____	☐	☐
9)	_____	_____	☐	☐
10)	_____	_____	☐	☐

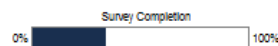
Appendix 7: Example Vignette from the Sixth Form College Survey



For these next questions, we are going to ask you to imagine a situation where you enter one of the college cafeterias to have your lunch. The cafeteria is extremely busy. You see only one table where there is room for you to join the group, and sit down. You can either leave, or join this table.

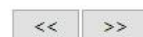
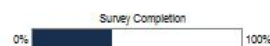
We will ask you to imagine how likely you would be to join this table, given that the people seated there are **familiar, but not your personal friends.**

We know that many factors normally influence where you sit in the cafeteria, but we are interested in how gender and ethnicity can be social factors, influencing how students interact. If you do not wish to answer any of the questions, you may select 'No response.' However, please remember that we are not looking for 'right' or 'wrong' answers, and that your answers will be completely anonymous.



Imagine that the only table with a space left for you has a group of **FOUR Asian male** students sat together. You are not friends with these students, but you recognise them from lessons. As your best guess, how likely would you be to go join them?

Very Unlikely Undecided Very Likely No response



**Appendix 8: Table of Mean Approach Likelihood (0-100) for the Sixth Form Cafeteria
Survey**

Table	Participant			
	White Male	White Female	Asian Male	Asian Female
White male	42.48 (31.73)	27.58 (26.48)	46.05 (35.45)	19.26 (24.68)
White male and female	42.31 (31.73)	38.97 (29.59)	45.18 (37.77)	28.33 (29.17)
White female	32.00 (30.44)	45.13 (29.47)	41.08 (40.89)	40.75 (30.55)
White and Asian male	38.23 (31.48)	24.44 (23.14)	62.37 (26.51)	20.89 (29.59)
White and Asian male and female	37.57 (31.45)	35.37 (28.25)	53.70 (31.86)	41.20 (30.79)
White and Asian female	27.12 (29.39)	37.83 (29.87)	42.90 (34.20)	54.13 (30.58)
Asian male	28.69 (29.08)	18.88 (21.46)	65.75 (32.81)	20.53 (24.18)
Asian male and female	26.16 (27.28)	26.59 (24.18)	57.95 (31.50)	44.29 (31.41)
Asian female	20.98 (24.88)	32.75 (27.75)	42.41 (34.96)	62.79 (26.03)
Mean	32.84 (30.48)	31.95 (26.85)	50.80 (34.21)	36.91 (28.03)

Standard deviations shown in parentheses.