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Birds of a Feather Sit Together: Physical Similarity Predicts Seating Choice

by

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Bachelor of Arts (Hons), Cape Breton University, 2006

THESIS

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Abstract

The relationship between physical similarity and seating preference was examined using two observational studies and one laboratory study. Using Campbell et al.'s (1966) seating adjacency formula, Study 1 found significant aggregation by glasses-wearing status and sex when observing seating patterns in a library computer lab. That is, men sat beside other men, glasses-wearers by other glasses wearers, and so on. Study 2 broadened this methodology by examining a wider variety of physical traits in university classrooms; specifically, race, sex, glasses-wearing, hair length and hair colour. Broadly speaking, multivariate tests revealed an overall tendency for people to sit beside physically similar others more frequently than expected by chance alone. These results remained significant even when controlling for sex, race or prior acquaintanceship. Study 3 conceptually replicated these results in a laboratory setting. Photos of participants were coded for physical similarity to a confederate and attractiveness by independent coders. The more physically similar participants were to a confederate, the closer they sat. This finding remained significant even when controlling for sex, race and attractiveness similarity. Other nonverbal measures were also examined as potential dependant variables; however, only speech disfluencies emerged as a significant correlate with physical similarity. As physical similarity increased, the number of speech disfluencies uttered by the participant during a short interaction also increased. The potential moderating role of implicit self esteem and body esteem on the physical similarity / seating distance relationship was also examined. However, these results were nonsignificant. Finally, as perceived similarity to the confederate increased, so did positive ratings of the confederate using Likert scales; however, perceived similarity did not predict any nonverbal measures. The current research rules out simple matching on sex, race or attractiveness as potential explanations for this finding. An evolutionary kin-recognition mechanism is discussed as a potential mechanism behind these findings, drawing on Debruine's (2004a) work. However, much work is left to be done to more concretely determine the driving force behind this relationship.

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"...Look about you and take the best parts of many beautiful faces, of which the beauty is confirmed rather by public fame than by your own judgment; for you might be mistaken and choose faces which have some resemblance to your own. For it would seem that such resemblances often please us; and if you should be ugly, you would select faces that were not beautiful and you would then make ugly faces, as many painters do. For often a master's work resembles himself. So select beauties as I tell you, and fix them in your mind."

"On the Selection of Beautiful Faces" Notebooks of Leonardo DaVinci (1452-1519, p. 587).

The idea that we are attracted to others who are similar to ourselves is not new. There has been a long history of varied research programs in the social sciences that have touched on this concept in one way or another. Broadly speaking, the literature on similarity and attraction can be organized into five specific areas, each with different theoretical rationales for their findings.

Sociologists have shown numerous examples of what they call "inbreeding homophily", or the tendency for social networks (i.e., friends, co-workers, romantic partners, etc.) to be more similar on a variety of sociodemographic variables than would be expected by chance alone. For example, most members of a specific social network tend to be similar in race, sex, age, religion, occupation and education level (see McPherson, Smith-Lovin & Cook, 2002 for a review). Sociologists argue that the common factor tying most of these demographic variables together is social status. In other words, the tendency for social networks to be homogenous on a variety of

demographic factors is simply representative of an overall tendency for people to associate with others similar in wealth, power and prestige to themselves. Research studying naturalistic seating patterns has tended to support the findings in the homophily research, though researchers in this area have tended to focus on race (e.g. Koen & Durrheim, in press), and tend to draw on Allport's (1954) Contact Hypothesis (see also, Pettigrew, 1997; 1998), a theory where social status also plays a prominent role.

In the psychological literature, there is a long history of studying physical attractiveness. Specifically, a "matching effect" has been found, whereby people tend to enter romantic relationships with others who are similar in physical attractiveness to themselves (Berscheid, Dion, Walster & Walster, 1971; Murstein & Christy, 1976; Little, Burt & Perrett, 2006). Most theories explaining this posit that physical attractiveness is a resource, not unlike wealth or prestige. People fear rejection from persons who are outside their "league," and as a result, unattractive people are less likely to approach an attractive person to start a romantic relationship unless they can somehow compensate for that lack of attractiveness with some other sort of resource, such as wealth (Huston, 1973; Takeuchi, 2006).

Another popular area in the psychological literature has been linking attitudinal similarity to attraction. That is, people similar in attitudes, values and beliefs tend to congregate together (Byrne, 1997; Byrne & Griffitt, 1973). Moreover, people tend to like others more when attitudinal similarity is perceived. It has been theorized that this occurs for two reasons: (1) Because associating with people who have similar beliefs validates our own values and (2) because we assume that people with similar attitudes will like us

more (Byrne & Clore, 1970; though see also Rosenbaum's 1986 dissimilarity-repulsion theory for a critique of Byrne's work).

Fourth, there is also a smaller literature, mostly within evolutionary psychology, which links facial similarity to increased attraction in romantic couples. Generally, it has been found that married couples look more physically similar to each other than randomly paired, non-married individuals (e.g. Alvarez, 2004). Within this literature, genetic and evolutionary theories are often posited, such as Rushton's much maligned Genetic Similarity Theory (Rushton & Nicholson, 1988) or kinship detection theory (DeBruine, 2004a). Given the evolutionary focus, little work has been done using non-romantic couples, and theoretical points made in the other literatures on similarity and attraction tend to be given little attention.

Yet another area which discusses similarity and attraction is the literature on implicit egotism. Much archival work has been done showing that people prefer people, places and occupations that share letters with their name initials (Pelham, Carvallo & Jones, 2005; Pelham, Mirenburg & Jones, 2002). Moreover, some research has found that people even choose romantic partners who have similar names (Jones, Pelham, Carvello & Mirenburg, 2004; Xinyue, Dingguo, Yina, Guohong & Yan, 2006). In this case, it is posited that conditioned, positive associations with the self are at work. That is, we tend to have consistent, positive associations with our own self-concept, and as a result, anything that reminds us of ourselves (even trivial things, like name letter preferences) tends to be viewed more positively. Implicit egotism is also viewed as a self-regulatory process; implicit egotism increases during threatening situations (e.g. Brownlow, Attea, Makransky and Lopez, 2007).

The current thesis crosses the boundaries of these varied research programs by studying the relationship between overall physical similarity and seating distance in non-romantic couples. That is, I predict persons will sit closer to one another as a function of physical resemblance. I intend to show that this phenomenon is conceptually distinct from social status and attractiveness explanations by controlling for sex, race, and physical attractiveness. Moreover, I diverge from previous research on attitudinal similarity by using overall physical similarity, rather than attitudinal similarity to predict seating distance. Finally, I will explore implicit self-esteem as a potential moderator of my effect, as a partial test of implicit egotism as a mechanism.

I will begin by discussing each of these five literatures in detail, highlighting important results and theoretical explanations. I will then discuss the limitations (both empirical and theoretical) of the similarity-attraction literature as a whole, and how my thesis research fits into the larger body of research on this topic.

Literature Review

Inbreeding Homophily in Social Networks

Contact between similar people occurs at a higher rate than dissimilar people, and as a result, social networks tend to be more homogenous than left to chance alone. This overall tendency is referred to as inbreeding homophily in the sociological literature and occurs in virtually every type of social group, from friends and spouses, to coworkers and acquaintances.[1] Homophily tends to occur based on race, ethnicity, age, religion, education, occupation and gender, in roughly that order in terms of effect sizes (see

[1] The literature also talks about "baseline homophily," which occurs because a particular environment has a more homogenous pool of potential relationships (e.g., there are more men in computer science programs, so male-male friendships occur more frequently within that program). I am not interested in studying baseline homophily, but it is worth noting that the distinction exists here. Throughout the paper, whenever I use the term "homophily," I am referring to inbreeding homophily.

McPherson et al., 2002). According to sociologists, the common denominator for all of these sociodemographic variables is social status. That is, dimensions such as race, gender and education level stratify society, so the homophily observed in social networks is seen as representative of a larger, society-wide tendency for people to aggregate based on similar wealth, power and prestige. Because the current research is concerned primarily with physical resemblance, my literature review of status homophily will focus on three dimensions: Race, age and sex.

Race is perhaps the most frequently studied dimension within the homophily literature, likely because of the implications such research has for understanding racial discrimination and prejudice. Researchers have found that the tendency to make friends within one's own racial group starts as early as elementary school, and becomes more pronounced as time goes on. Shrum, Cheek and Hunter (1988) show that, by middle school, cross-race friendships occur at only 10% of the expected rate, and this tendency does not improve by high school. Similar findings were reported 15 years later, in a study of elementary students by Aboud, Mendelson and Purdy (2003); cross-race friendships become less frequent as age increases and tend to be more unstable over a six-month period than same-race friendships. Using a large, national US sample (N = 58,000), Hallinan and Williams (1989) found that high school students were only one-sixth as likely to choose a cross-race friend, compared to same-race friends. In a large nation-wide study in the USA, only 8% of people mentioned having a close confidant of another race (Marsden, 1987), which is approximately one-quarter of the potential expected if left to chance alone. Over a decade later, a similar pattern is found in Kao and Joyner's (2004) research; cross-race friendships are least likely to occur among best friends, and

cross-race friends report fewer shared activities than within-race friends. Mollica, Gray and Treviño (2003) even found this tendency within a graduate school environment. First-year MBA students showed racial homophily in their friendship networks after only six weeks, despite the fact that there were fewer same-race relationships for minorities to choose from. Moreover, Mollica et al. found that this tendency was stronger for ethnic minorities, than for Caucasians. Though it might seem counter-intuitive for homophily to occur more strongly within minorities (after all, minority groups should have more opportunities to make cross-race friendships by chance alone), this finding is not unique. Using a large Detroit sample, Laumann (1973) found that the smaller an ethnic group was within a population, the more likely they were to have race-homogenous friends (Spearman r = -.82).

The tendency for racial homophily in relationships is not only observed in friendships, but also in marriages. Using a large national sample of over 488,000 marriages in the United States, Kang Fu (2001) found staggering levels of homophily in marriage pairings. Taking into account differences in education, Kang Fu found that Blacks were 18,603 times more likely to have a Black spouse, when compared to Whites. Similar results were found for Mexican Americans (585 times more likely to have a same-race spouse) and Japanese Americans (734 times more likely). Kang Fu favours a status-exchange approach (Merton, 1941) when interpreting his results. Essentially, he suggests that inter-racial marriage patterns reflect a racial status hierarchy within the United States, with White people at the top of the pecking order, which is consistent with prior theorizing within sociology (Kalmijn, 1993). Taken together with the findings on

friendship, a clear picture emerges from the sociological literature: People tend to form more frequent and more intimate relationships with people who match them on race.

There is also significant homophily in relationships based on age. Matching on age within marriage "...is so taken for granted, it is seldom studied in the literature" (McPherson et al., 2003, p. 424). Non-kin friends tend to be separated by only 6 years of age, on average (Fischer, 1982). Moreover, when controlling for kin relations, age-incongruent friendships occur about half the expected rate if left to chance alone (Marsden, 1987). Even relationships formed on the Internet tend to be homogenous in regards to age (Mech & Talmud, 2007). However, since most schools group classrooms based on age, there is far more opportunity to form age-congruent friendships early in life (Shrum et al., 1988). A great deal of the variance in age-related homophily observed can be explained by these early friendships; people often keep in contact with early childhood friends, even after moving away to new locations. This sort of *baseline homophily* (see McPherson et al., 2002) is of less interest to the hypotheses of the current study, as it is primarily caused by structural factors outside of the individual, rather than intrapersonal factors. As such, age will not be used as a predictor in the current research, though it is partially controlled for by using relatively age homogenous samples (first and second year university students).

Though the effects tend to be weaker than other sociodemographic variables, this sort of relationship matching tends to occur based on sex as well. The tendency towards same-sex friendships is strongest during elementary school, though Shrum et al. (1988) argue that it tends to lessen by puberty. Still, these early preferences set the stage for gender segregated friend groups later in life. In a large national sample of high school

students, only 8% of sophomore dyads and 12% of senior dyads were cross-sex relationships (Hallinan & Williams, 1989). Even among adults, confidants (people they "discuss important matters with") tend to be matched on gender, when controlling for kin relationships (Marsden, 1987). Relationships formed on the Internet too, also tend to be matched based on sex (Mech & Talmud, 2007). So, in a similar fashion to findings on race, people tend to form more frequent and more intimate friendships with people who match them on sex.

In a related vein to the homophily literature, there has also been a history of observational studies utilizing seating preference, most of which are interested primarily in racial segregation. In the seminal study on seating preference, Campbell, Kruskal and Wallace (1966) develop an *index of adjacency*, a statistical procedure which can be used to determine if the number of White/Black (or male/female) pairings within a group of seats (such as a classroom) are significantly different than would be expected by random assortment. For example, are women equally likely to sit beside a man or a woman, or do they tend to sit beside other women and not beside men? The findings of their initial research revealed significant aggregation by sex and skin colour within university classrooms. That is, women prefer to sit by women, White people by other White people, etc. More recently, Koen and Durrheim (in press) also used Campbell et al.'s (1966) measure of seating adjacency to examine aggregation by race. They improved on the original study by photographing classrooms and testing reliability of coding, thus reducing the impact of observer error. Moreover, they looked at three racial groups: White, Black and Indian. Generally speaking, they found significant aggregation within all three racial groups (e.g., Whites sit beside other Whites, etc.). Moreover, they found a

general tendency for aggregation to occur more strongly as the school semester progressed.

Clack, Dixon and Tredoux (2005) used more sophisticated spatial analyses to study the same phenomenon, and found that ethnic segregation existed both at the level of individual groups, and in overall clustering within a multi-ethnic university cafeteria. When observing commuters on buses in Singapore, Siram (2002) found similar results; there were significant levels of aggregation based on sex and ethnic group. Siram's study also had the additional benefit of being able to see seating preference in real-time. Results showed that females do not avoid sitting with males, but males do avoid sitting with females. Also, there is an overall tendency to prefer a younger person over an older person to sit beside on the bus, regardless of the age of the chooser. This potentially underscores the impact of ageism, and negative social stereotypes of the elderly (Kite, Stockdale, Whitley & Johnson, 2005), rather than a tendency to affiliate with one's own group. Broadly speaking then, naturalistic observations of seating patterns have shown a similar pattern to the literature on homophily: People tend to sit beside others who match them on race and sex. Again, age appears to be operating under a different mechanism and is of less interest to the current study. Thus, similar patterns are observed in this literature when compared to the sociological literature on homophily: People tend to aggregate based on race and sex. The little research that does examine age in the seating preference research (Siram, 2002) tends to find a stereotyping effect, rather than aggregation.

When interpreting the findings on race, many researchers use Allport's (1954) Contact Hypothesis to explain why contact alone does not seem to predict friendship

choice between different ethnic groups. In a more modern review of this theory, Pettigrew (1997; 1998) notes that intergroup contact leads to relationship formation *only* in the presence of four factors: Equal status within the situation, common goals, cooperation between the groups and support from authorities, law or custom. While perhaps not as useful to explain homophily based on sex (and later, as the reader will discover, attractiveness and overall physical appearance), it is an extremely useful theory to help predict when interethnic contact will (and will not) predict relationship formation. Moreover, it is broadly congruent with theorizing by sociologists (e.g. Hallinan & Williams, 1989; Kalmijn, 1993) to explain racial homophily in social networks: support from larger institutional structures and similarity in social status are often necessary precursors to successful relationship formation.

Matching hypothesis

Within the social psychological tradition, the notion of homophily has been studied most frequently in the area of romantic relationships. In the early 1970s, the "matching hypothesis" began receiving significant attention in the literature. The matching hypothesis postulates that we choose relationship partners who are similar in physical attractiveness to ourselves. However, making sense of the literature on the matching hypothesis requires us to reconcile some potentially contradictory findings in the literature. Namely, a person's preferences in a romantic partner differ greatly from their actual choices in realistic situations (Sprecher & Hatfield, in press).

As it turns out, just about everyone *prefers* a more attractive partner. Walster, Aronson, Abrahams and Rottman's classic (1966) study on physical attractiveness randomly matched students with opposite-sex partners for a get-acquainted dance. They

found that, regardless of their own physical attractiveness, students were more positive towards, and tried to arrange dates with others who were physically attractive. The tendency to prefer a more attractive partner has been confirmed in subsequent research both with heterosexual (Brislin & Lewis, 1968; Curran & Lippold, 1975; see Takeuchi, 2006 for a review) and homosexual (Sergios & Cody, 1985) couples. This is in line with the "what is beautiful is good" stereotype, whereby physically attractive people are seen as having more socially desirable personality traits overall and are expected to be more competent and successful than unattractive people (Dion, Berscheid & Walster, 1972).

Though virtually everyone prefers a more physically attractive partner, all things left equal, data collected in more realistic settings suggests a very different picture. In their classic study of the matching effect, Berscheid et al. (1971) asked each student in their sample to pick from 6 pictures of potential dates for a dance. Moreover, for half of the students, they were told that "mutual consent" was required for a date to accept them; the other half were guaranteed their choice of dance partner. Regardless of condition, they found that people tended to choose potential dates that were similar to them in physical attractiveness. In subsequent studies of actual couples, psychologists found further support for the matching hypothesis. Couples tend to be more similar in physical attractiveness than would be expected by chance alone, including relationships such as dating partners (Murstein, 1972), married couples (Murstein & Christy, 1976; Little et al., 2006) and even friends (Cash & Derlega, 1978). Moreover, there is also some evidence that couples have more successful relationships when they are matched on physical attractiveness. Couples matched on physical attractiveness have longer dating relationships (White, 1980), and report higher marital satisfaction (Zajonc, Adelmann,

Murphy & Niedenthal, 1987).[2] Thus, in realistic settings, there is considerable support for the matching hypothesis: People tend to choose romantic partners who are similar in physical attractiveness to themselves.

Perhaps one of the most comprehensive theories of why the matching effect occurs comes from Takeuchi (2006), who ties together previous research and theory into one comprehensive theory of mate choice. Takeuchi uses a combination of social exchange theory and operant conditioning, creating a complex set of propositions and formulas to predict mating choice. Takeuchi argues that people desire physically attractive partners, but after comparing their own level of attractiveness to that of a prospective partner, may decide not to pursue the relationship because the threat of rejection is too high (see also Huston, 1973). Thus, people seek out the others with the highest level of attractiveness they feel they can safely pursue: Which, as it turns out, tends to be someone similar in physical attractiveness. Moreover, physical attractiveness can be viewed as a form of resource, not unlike wealth or prestige (Sprecher & Hatfield, in press). In this light, mis-matches on attractiveness can sometimes make sense. A wealthy, unattractive man might be successful at marrying a beautiful supermodel, because he compensates for his lack of good looks with his wealth.

Attitudinal Similarity and Attraction

There is also a body of research in psychology that suggests that attitudinal similarity also leads to interpersonal attraction. The amount of research in this field is immense, partially due to the strength and reliability of the findings in this area (see Byrne & Griffitt, 1973 for a review). A full review of the research in this area would

[2]However, Zajonc et al. (1987) also found that couples tend to become more physically similar to one another after 25 years of marriage, which could be another reason this effect is so strong when studied among married couples in naturalistic environments.

overwhelm the purpose of this thesis. Instead, I intend to provide an overview that illustrates the main thrust and findings of this literature. Though not directly related to the topic of this thesis (physical similarity and seating distance), this literature is relevant insomuch that people might attribute attitudes to others based on physical appearance, which could in turn lead to attraction based on physical similarity more generally.

Perhaps one of the first landmark studies in this area was Byrne's (1961) work on attitudinal similarity. He first asked participants to fill out attitude questionnaires on varied topics, such as attitudes about God and musical preference. Later, participants were provided with a completed copy of the questionnaire from a bogus participant. He had three conditions: One where the bogus participant agreed with 100% of the actual participant's responses, one where there was 50% agreement, and one where there was 0% agreement. Participants both liked, and were more willing to work with this bogus participant (as rated on single-item Likert scale items) as attitudinal similarity increased. Hundreds of subsequent studies followed this landmark study using similar methodologies, most finding significant results in a similar direction.[3] In fact, the strong, linear relationship between attitudinal similarity and interpersonal attraction has been touted as one of the strongest and most replicable findings in all of social psychology (Berger, 1975).

[3] Years later, when Byrne was reflecting on his prior work, he noted that a bogus participant was used partially to control for a variety of factors (such as height and physical attractiveness), but perhaps more candidly: "The primary constraint was financial; as a new PhD, I had no grant money and no doctoral students. The department could afford to pay for paper and duplication, but little else, so the independent and dependant variables had to remain within the technological boundaries set by the ditto machine" (Byrne, 1997, p. 420). So, the tendency to avoid using an actual confederate in these experiments was (at least in part) driven by simple convenience and cost-effectiveness.

Though less frequently studied than interpersonal attraction as measured by Likert scales, it is worth noting that seating distance is occasionally used as a dependent variable. As noted by Byrne and Griffit, "Because [nonverbal] measures are related to verbal attraction measures somewhat weakly, and often in a rather complex fashion, these behavioural measures cannot be considered interchangeable with verbal assessments" (1973, p. 319). Thus, generally speaking, the relationship between attitudinal similarity and seating distance is somewhat more complex. Snyder and Endelman (1979) asked participants to fill out personality tests, and then gave them a personality profile of another participant who had a profile that was either slightly, moderately or highly similar to themselves. They were then told to pull up a chair beside another empty chair which would eventually contain the other participant whose personality profile they received. A curvilinear relationship was observed; a participant sat closest to the other participant's chair when there was moderate similarity in personality and furthest away when there was only a slight similarity. Though it is hard to make generalizations based on a single study, this could potentially indicate that very highly similar individuals threaten a participant's sense of uniqueness, which might account for the nonlinear trend.

Skitka, Bauman and Sargis (2005, Study 3) placed a gender-neutral book bag and jacket on an empty chair in a discussion room. A small "Pro-choice" or "Pro-child" pin (depending on experimental condition) was placed on the book bag, supposedly belonging to a participant who was gone to the bathroom. Participants were asked to get a chair from a stack at the far side of the room while waiting for the research to start. Seating distance between the two chairs was measured at the end of the study. A two-way interaction between attitude similarity and moral conviction was found to predict seating

distance. As moral conviction increased among those who were pro-choice, the physical distance between the participant's chair and a supposedly pro-choice other's chair decreased. On the other hand, as moral conviction increased among participants who were pro-life, seating distance between themselves and the pro-choice other person increased.

Byrne (1997; Byrne & Clorne, 1970) argues that the relationship between attitudinal similarity and interpersonal attraction results from a person's need to maintain a consistent, logical view of the world (otherwise known as the effectance motive). According to this theory, associating with people who have similar beliefs to our own is positively reinforcing because it validates our own, personal worldview. As a result of this worldview validation, positive emotions arise, which increases interpersonal attraction. Moreover, he argues that we tend to assume others with similar beliefs and values will like us more, and as a result, perceive less threat of rejection from such individuals. Of course, Byrne's work is not without its detractors. Rosenbaum (1986) calls into question the causal direction of the relationship. Given that the vast majority of research in this area has been correlational, many of the observed findings could instead be a result of attitudinal dissimilarity leading to repulsion, rather than attitudinal similarity leading to interpersonal attraction. The idea here is that inconsistency in attitudes between individuals creates psychological discomfort, which in turn leads to repulsion. Rosenbaum's (1986) research presents evidence consistent with this view, though it was hotly contested by Byrne and colleges at the time (see Smeaton, Byrne & Murnen, 1989 for a rebuttal). Rosenbaum's dissimilarity-repulsion theory is certainly

worth considering when interpreting the results in this literature, but it has generally received much less attention in the psychological literature as a whole.[4]

In a meta-analytic review of 306 studies, Montoya, Horton and Kirchner (2008) argue that perceived similarity, rather than actual similarity, is key in finding this effect. Their meta-analysis found that the relationship between actual similarity and interpersonal attraction is significantly reduced when participants interact with their partner for 5-10 minutes and disappears entirely when existing relationships are studied (see another meta-analytic study by AhYun, 2002, for similar results). On the other hand, results for perceived similarity remain large, and significant throughout all studies. Montoya et al. discuss numerous reasons for this discrepancy (without settling on any one explanation), including environmental factors during short interactions which introduces error, methods used to manipulate similarity, information salience to participants, the roles of communication (e.g. we are attracted to those whom we are able to achieve stable communication with), and desensitization to physical stimuli in naturalistic environments. What is most important then might simply be how similar a person *believes* another's attitudes are, regardless of any real similarity in attitudes.

Evolutionary Psychology and Attraction

After reviewing the above literatures, it might come as a surprise to learn that social psychologists have rarely used physical similarity as an independent variable when predicting interpersonal attraction. On the other hand, there has been a great deal of research studying *assortative mating*, or the tendency for married couples to be more similar in physical appearance than would be expected by chance.

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[4] A cursory search using PSYCInfo on June 4, 2009, revealed 472 hits for "similarity-attraction," and only 35 hits for "dissimilarity-repulsion," which provides some indication of the relative popularity of both theories.

Perhaps one of the first studies of assortative mating was by Pearson and Lee (1903). They found that husbands and wives tended to have similar height, arm span, and forearm length (correlations of about 0.20).[5] At the time of this paper, Pearson and Lee were quite puzzled by the findings, and had no clear mechanism, though they expected that the process could "...hardly be in any great part due to conscious selection" (p. 396). Much later, research by Rushton, Russell and Wells (1985) found that spouses were slightly more likely to be similar to each other on weight, hair colour, eye colour, chest breadth, wrist circumference and inter-pupillary breadth, though correlations remained at approximately the .20 level. Mates have even been found to be similar on traits as obscure as finger length ratios (Voracek, Dressler, & Manning, 2006).[6] In all of these cases, the correlations have been low, approximately 0.20 throughout the literature.

Observed in naturalistic settings, married couples are also found to have similar facial structures. Alvarez (2004) had participants rate pictures of married couples individually on both perceived facial similarity and attractiveness. These raters tended to rate the married couples as more similar in attractiveness and facial similarity than non-married pairs of pictures, even though they had no idea who was married or not (see also Thiessen, Young & Delagado, 1997 for similar results). Moreover, Alvarez notes that attractiveness alone could not explain all of the variance, because judges can still match couples when looking just at the nose or eyes. Swedish researchers found that American and Swedish couples also tended to have similar personality traits, such as trust,

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[5] Curiously, though some more modern papers in this area sometimes cite this paper as finding assortative mating based on ear length as well, I could find no evidence of this in Pearson & Lee's (1903) original manuscript.

[6] Though finger length might seem innocuous, Voracek et al. (2006) note length of the ring and index finger (or rather, the ratio between those two fingers) is a marker for prenatal androgen exposure, which could in turn be related to numerous sex-linked biosocial traits. So it is not possible to rule out potential matching on attitudes or behavioral tendencies as an explanation for assortative mating on this trait.

compulsiveness, activity, conformity and empathy (Price & Vandenburg, 1980). People even tend to resemble their dogs! Roy and Christenfeld (2004) found that, when picking pure-bred dogs, owners tend to pick dogs that resemble their own physical appearance in some way (that is, pictures of dogs can be matched to pictures of their owners' faces by judges).

Outside of findings in naturalistic environments, manipulating facial similarity using computer imaging has revealed numerous other interesting findings. Laeng, Mathisen and Jan-Are Johnsen (2007) found that pictures of women seemed more attractive to blue-eyed men, when the eye colour was manipulated to be blue. Laeng et al. argue that this makes sense evolutionarily, because it offers the father assurance of paternity if a child were to be born. Debruine (2004a) found that, if faces are manipulated via computer imaging to resemble the person viewing them, they are seen as more attractive. This holds more strongly for same sex ratings than for opposite sex ratings. Debruine argues that "attractiveness" in the context of same-sex friends (assuming a heterosexual orientation) can be construed more broadly as non-sexual positive regard. Facial similarity also tends to inspire positive attitudes towards children (Debruine, 2004b). More amazingly still, wives are found to resemble their mother-in-laws, suggesting that husbands select wives that are similar to their mothers in some way (Bereczkei, Gyuris, Koves & Bernath, 2002). As a potential caveat to these findings, some researchers have argued that it is facial averageness, rather than similarity, that people find attractive (Penton-Voak, Perrett, & Peirec, 1999). That is, people find averagely proportioned faces more attractive, and the preference for average faces will tend to overwhelm the tendency to prefer similar others.

Rushton's Genetic Similarity Theory is one way of explaining these findings. Essentially, his theory argues that people will act more altruistically towards others who are genetically similar to the self. He suggests the people can determine the genetic relatedness of others via phenotypic expressions of genetic traits – according to Rushton, these are diverse traits such as height, skin colour, IQ, personality and even values (Rushton & Nicholson, 1988). As a result, his theory not only attempts to explain why assortative mating occurs, but also why prejudice and segregation might exist more broadly in a population. Rushton's theory has met with significant criticism by his contemporaries and is widely regarded as a poor theory to explain these phenomena both on theoretical and methodological grounds (e.g. Bereczkei et al., 2002). Moreover, taken to its logical conclusion, Genetic Similarity Theory has rather negative social consequences for many ethnic groups, such as African-Americans (Cronshaw, Hamilton, Onyura & Winston, 2006).

Some evolutionary theorists argue that assortative mating is evolutionarily beneficial to the organism practicing it, both by influencing genetic stability in a population, and by allowing the organism to more confidently propagate its own set of genetic material to a second generation (Alvarez, 2004). There are limits to this effect, of course; incest is evolutionarily maladaptive, by increasing the likelihood of miscarriage and recessive genetic disorders (Bittles, 2001). It is perhaps most accurate to say then, that the optimal mate is not too similar, but not too dissimilar either. This might account for the relatively small correlations observed between mates based on physical similarity in the literature.

Another theory in the evolutionary psychology literature that attempts to explain these findings is kin selection theory. Debruine (2004a) argues that the tendency to like others who have similar faces is really just a kin-recognition system that carries over into romantic relationships. She argues that people are hardwired to have slightly more positive regard for people that look similar to themselves, regardless of sex, because these people are more likely to be our kin. Debruine's (2004a) explanation is a particularly useful way to understand the findings on facial similarity and attraction using an evolutionary standpoint. Some research has even implicated a kin-recognition mechanism in the findings for attitudinal similarity; attitudinal similarity is linked to implicit kinship cognitions using a modified Implicit Association Test (Park & Schaller, 2005). Moreover, Park and Schaller found that activation of kinship cognitions is related to pro-social behaviours towards unrelated strangers

Implicit Egotism

The literature review so far has discussed numerous examples of the tendency for people to form relationships with others who are similar to themselves, especially when that relationship is a romantic one. There have been numerous theoretical explanations for this finding throughout the literature, ranging from social stratification (McPherson et al., 2002), to fear of rejection by attractive individuals (Huston, 1973; Takeuchi, 2006), to evolutionary adaptations (Debruine, 2004a). Though all are useful explanations within their respective fields, there is another process that has been discussed in the literature in social psychology which might contribute to this process: implicit egotism.

The tendency to prefer people, places, or things that that are connected to the self in some way is known as *implicit egotism (*Pelham et al., 2005). Examples of implicit

egotism have been shown in a variety of domains. People tend to prefer the letters in their initials more than other letters, a phenomenon known as the *name letter effect* (Nuttin, 1985; Pelham et al., 2002). Pelham and colleagues (2002) found that a disproportionate number of people have careers that match their name initials, and tend to live in cities which are very similar to their names. For example, people with names starting with "Den-" are more likely to be dentists than people whose names begin with "La-", and people named Virginia are disproportionately likely to be living in the US state of Virginia, compared to people with names like Florence, Georgia and Louise even after controlling for the possibility that they were named after their location. Brownlow et al. (2007) have also found evidence for name letter matching on a variety of other less consequential preferences, such as hobbies, bands, favorite movies and pet names, to name a few. It is interesting to note that the name letter effect can be influenced by gender; Kitayama and Karasawa (1997) found that the name letter effect is stronger with last names for men, and stronger for first names in women, presumably because many women do not retain their last name after marriage. Similar effects have also been found using birthdays; for example, someone born on 02/02, is more likely to live in Two Rivers (Pelham et al., 2002). The notion that implicit egotism might play a role in important life decisions has met with both theoretical and statistical criticism (see Galluci, 2003), but Pelham and colleagues have tended to find support for their hypotheses even when controlling for confounding variables, such as name rarity (Jones, Pelham, Mirenberg & Hetts, 2002) and by using more conservative statistical analyses (Pelham, Carvallo, DeHart & Jones, 2003).

Perhaps more relevant to the current study, implicit egotism has also been found to influence physical attraction as well. Using archival research, it was found that people tend to marry others who have similar names (Jones et al., 2004; Xinyue et al., 2006). Moreover, in a series of experimental studies, Jones and colleagues (2004) found that participants felt more attraction towards people who had been assigned an experimental code number which resembled their own birth date and whose surnames shared letters with their own surnames. In addition, participants felt more attracted to a female confederate who was wearing a t-shirt with a number previously paired subliminally with their own names during a conditioning procedure.

Implicit egotism is theorized to occur because most people have highly favorable unconscious associations with their self-concept. The notion of implicit egotism is closely linked to the more general concept of implicit self-esteem. An exact definition of implicit self-esteem has proven elusive, and a variety of approaches are taken to measure it, such as computerized reaction time tests, word completion tasks, name letter preference tasks, birthday number preference tasks and Stroop colour naming tasks (see Bosson, Swann & Pennebaker, 2000 for a review). However, implicit self-esteem can be generally conceptualized as preconscious, evaluative associations with the self-concept. Generally speaking, implicit self-esteem tends to be positively biased; that is, most people evaluate stimuli related to the self more favorably than stimuli not related to the self (Greenwald & Banaji, 1995). Within this light, it is not unreasonable to think that persons, places and things that remind people of their self-concept would also have positive associations. Thus, since we have consistent, positive associations with our own self-concept, anything

that reminds us of ourselves (even trivial things, like name letter preferences) tends to be viewed more positively.

However, a substantial literature also views implicit egotism as a self-regulatory process. Numerous research studies have shown that a self-concept threat can enhance implicit egotism; for example, threat can increase name-letter preferences (Brownlow et al., 2007; Jones et al., 2002; Koole, Smeets, van Kippenberg, & Dijksterhuis, 1999), increase consumer brand choices that are similar to one's name (Brendl, Chattopadhyay, Pelam & Carvallo, 2005) increase implicit self-esteem using reaction-time measures (Rudman, Dohn, & Fairchild, 2007), and increase the perceived attractiveness of similar others (Jones et al., 2004; Xinyue et al., 2006). On the other hand, the effects of implicit egotism are attenuated (or even disappear altogether) when people are provided with self-affirmation (Koole et al., 1999; Brendl et al., 2005; Xinyue et al., 2006; Rudman et al., 2007). People may increase the perceived value of self-related stimuli after a receiving threatening feedback, as a way of validating their own sense of self-worth. Thus, implicit egotism can also be seen as a way of protecting one's sense of self-worth, and is theorized to be a reaction to the arousal that occurs during threatening situations (Jones et al., 2002). However, though certainly amplified by threatening situations, implicit egotism within personal relationships is not necessarily contingent on threat, as preferences for similar others are found even when participants do not expect to interact with their partner (Jones et al., 2004, Study 7).

Gaps Left in the Literature

Because the literature on similarity and attraction has been characterized by isolated pockets of researchers across disciplines, with a variety of theoretical

explanations and foci, there have been some theoretical and empirical gaps left in the literature overall. It is clear from the above literature review that persons similar in sex, race, attractiveness, attitudes and facial similarity are more likely to form relationships with others who are similar on these traits. Within each of these literatures, there also seems to be a coherent theoretical explanation as to why people match on these variables. However, taken as a whole, there are two significant gaps in the literature that can be identified.

First, research has not tended to separate matching based on physical attractiveness from matching based on physical similarity. When physical similarity is used as a variable, hypotheses are usually framed such that "physical similarity increases perceived attractiveness" (Laeng et al., 2007; DeBruine, 2004a; Penton-Voak et al., 1999). This is in part because research has tended to focus on romantic relationships almost exclusively (though see Cash & Derlega, 1978 for an exception), rather than a more basic process that affects all social interactions to some extent. Regardless, it is not clearly demonstrated in the literature if matching based on physical similarity and matching based on attractiveness are part of the same phenomenon, or if they are conceptually distinct (though see Alvarez, 2004 for some indirect evidence that these processes are distinct).

Second, research on overall physical similarity and interpersonal attraction has tended to disproportionately focus on existing relationships, so the processes by which people end up in relationships with physically similar others are not yet clear. It is certainly reasonable that matching based on overall physical similarity could also be explained by social status theories (i.e., physical traits such as race are often indicative of

socioeconomic status and social prestige), attitudinal theories (i.e., we expect physically similar others to be similar in attitude) or implicit egotism explanations (i.e., a form of self-regulation). However, researchers using physical similarity as an independent variable have typically been evolutionary psychologists and sociobiologists, so current theoretical explanations for this phenomenon typically rely on evolutionary theory to explain the findings (e.g. Alvarez, 2004; Debruine, 2004a). As a result, data collection methods in this area often focus on romantic relationships exclusively, since the efficient propagation of one's genetic material is often seen as the primary force guiding the attraction to similar others. Regardless, any research which would help shed some light on *how* people end up in relationships with physically similar others would be a significant advance in this area.

The Current Research

Broadly speaking, the current research seeks to examine the matching phenomenon at one of the earliest stages of potential relationship formation: Seating choice. Specifically, I propose that people will sit closer to others who physically resemble them. Though appearing innocuous on the surface, the simple process of choosing to sit closer to people similar to us can have broad implications at a macro level. By consistently choosing to sit closer to physically similar others, people put physical space in-between themselves and dissimilar others. As a result of simple proximity, people have greater opportunities to form a relationship with similar people, while decreasing their opportunities to form relationships with dissimilar people. This is one process (of many) that could contribute to homophily in relationships more broadly.

Though the primary purpose of this thesis is to establish a relationship between physical similarity and seating distance, some attempts at unraveling the mechanism behind seating choice are explored. Unfortunately, there are so many competing explanations for the similarity-attraction phenomenon within a variety of domains (at least four, as identified in my literature review), a single set of studies could not hope to disentangle all aspects of the problem. In fact, the true explanation for why similarity breeds attraction is likely multifaceted, with no single theory predicting all of the variance. Thus, in the current research, I simply hope to rule out a few of the many possible explanations for this phenomenon. Specifically, I have four supplementary hypotheses:

First, I propose that the tendency to sit beside physically similar others is not simply a reflection of matching based on sex and race. To test this, race and sex will be used as control variables in both a set of naturalistic observations, and in an experimental study.

Second, I propose that the tendency for people to sit closer to physically similar others is conceptually distinct from similar tendencies based on physical attractiveness. To test this hypothesis, attractiveness similarity will be measured and entered as a control variable in Study 3.

Finally, potential moderators of the tendency to sit closer to physically similar others will be tested. Specifically, moderators will include name letter preferences, implicit self-esteem, explicit self esteem and body esteem. I test the possibility that people will only react more positively towards a physically similar other when they have positive associations with their own self-concept. Thus, it is predicted that the tendency

to sit closer to physically similar others will be amplified for participants who have positive self-associations.

Study 1

Overall, the current research proposes that people will sit closer to physically similar others. One problem with this hypothesis is that physical similarity is a somewhat nebulous variable by nature, composed of many individual physical traits. In order to study physical similarity in a naturalistic environment, we decided to break this variable down into meaningful, manageable facets. Study 1 represents an initial attempt at breaking down this variable, by studying only two aspects of physical appearance: Glasses-wearing status and sex.

Like virtually any physical trait, glasses-wearing comes with its own host of attitudinal, behavioural and socioeconomic correlates. Indeed, finding a physical trait completely uncorrelated with such things might very well be an impossible task. Even seemingly trivial physical characteristics found to influence interpersonal attraction can be linked to attitudes, social status or stereotypes. Finger digit ratios are associated with behavioural differences based on prenatal androgen exposure, hair and eye colour is conflated with racial differences, waist size and weight is associated with numerous stereotypes associated with body ideals; this names only a few of the physical similarity variables touted by various researchers (Rushton et al., 1985; Voracek et al., 2006). In terms of the current research then, a physical trait was chosen to meet the following criteria: (a) the trait is not conflated with both gender and race, so control analyses can be conducted if necessary (b) the trait should elicit no strong social stereotype or prejudice,

(c) and the trait should be a dichotomous variable or at least able to be dichotomized reasonably.[7]

There are a number of benefits to using glasses as a variable in naturalistic observations of seating patterns. First, glasses-wearing is unlikely to be conflated with gender; 2002 census research in the United States found no sex differences in prevalence rates for visual impairment (Vitale, Cotch, & Sperduto, 2006). Second, the stereotype of glasses wearers that does exist is largely a positive one. Glasses wearers are seen as relatively intelligent, hardworking, successful, dependable, intense, possessing a sense of humor, having good job, having many friends, likely to be a leader and married, self confident, desirable as a friend, well educated and conscientious (Borkenau, 1991; Harris, Harris & Bochner, 1982; Harris, 1991). There are, however, a few potentially negative stereotypes surrounding glasses wearers as well: They are seen as less active, less outgoing, less attractive, less popular, less athletic and more introverted (Borkenau, 1991; Harris, Harris & Bochner, 1982; Harris, 1991). Fortunately, it does seem that overall, the positive stereotypes tend to overshadow the negative ones, and the effect sizes tend to be very small. Thus, if affiliation occurs between non-glasses wearers, implicit prejudice is less likely to be the driving mechanism. Finally, the presence or absence of glasses is a clearly dichotomous variable that can be unambiguously coded by independent raters, which is an important criteria for the statistical procedures being used.

Glasses-wearing is correlated with numerous physical, attitudinal and socioeconomic factors, which could be seen as a disadvantage. Most simply, visual impairment increases with age, and is transmitted genetically within families, so both age

[7] Suffice it to say at this point, the calculation used by Campbell, Kruskall and Wallace (1966) to determine seating aggregation in naturalistic settings requires a dichotomous variable.

and familial relatedness could play a role in seating choice. Moreover, people who are below the poverty line, are of Hispanic or mixed ethnic backgrounds, and have less education are more likely to have visual impairments (Vitale et al., 2006). However, this finding might not necessarily be related to glasses-wearers specifically; wearing glasses is a choice (with contact lenses, corrective surgery and simply refusing to wear corrective lenses as possible alternatives), and it is not known if people who choose to wear glasses as a solution to visual impairment will differ on these traits to the same extent. Some correlational evidence also suggests that people with glasses are less extroverted, less open to experience, and more intelligent (Borkenau, 1991; Rosner & Belkin, 1987), matching could be a result of attitudinal, rather than physical similarity. This is not necessarily a serious flaw, because it is possible that part of the process is actually assuming that, if a person is 'like me' on one trait (e.g. glasses) they may be 'like me' on other traits (e.g. intelligence). However, it is certainly possible that systematic differences in these individual difference variables could influence liking of other people, so it is important to note.

Finally, sex will also be used as a variable of secondary interest. Seating aggregation by sex has been consistently found in all the available studies on naturalistic seating arrangements (Campbell et al., 1966; Clack et al., 2005; Sriram, 2002). For this reason, sex is included in the current study to ensure that the observed location (a computer lab) is comparable to locations used in previous research, and to ensure that the statistical procedure used is sound. In addition, the male to female ratio of glasses-wearers will be compared, to ensure that glasses-wearing is truly unrelated to sex.

The hypotheses for the current study are as follows:

H1: When observing naturalistic seating arrangements there will be significant aggregation in terms of glasses wearing. That is, glasses-wearers will tend to sit beside non-glasses-wearers less frequently than expected by chance alone.

H2: When observing naturalistic seating arrangements, there will be significant aggregation in terms of sex. That is, women will tend to sit beside men (and men by women) less frequently than expected by chance alone.

Method

Participants

An on-campus computer lab was observed on 21 different (non-overlapping) occasions, from February 12, 2008 to April 22, 2008. In total, 356 persons were observed; 23% were wearing glasses (N=82), whereas 77% did not wear glasses (N=274). Also, 42.4% were men (N=151) and 57.6% were women (N=205).

Procedure

Seating arrangement was observed at a computer lab with 31 seats in the library at Wilfrid Laurier University. Using a seating diagram, the researcher indicated whether or not a particular seat was occupied by a person. If so, the researcher recorded (1) the sex of the person sitting, (2) whether or not the person was wearing glasses. If unable to determine a participant's gender or glasses-wearing status, the researcher recorded that person as "unknown." For the purposes of analysis, unknowns (N = 2) were treated as an empty seat. Observations were recorded 1-3 times daily on weekdays, most frequently during the mid-day, which is when the library computer lab is most populated. Each observation occurred only once each time the experimenter visited. On days where the lab was visited more than once (5 out of the 21 times the lab was visited) there was

always a minimum of 4 ½ hours between recordings. If the lab had fewer than 9 total people in it, or if nobody in the room was wearing glasses, these trials were not recorded. Figure 1 shows a typical seating diagram for this research.

Analysis Strategy

A statistical method devised by Campbell et al. (1966) was used to determine the amount of aggregation in seating patterns. An "index of adjacency" was calculated using the following formula (see Appendix A for a full description of how each part of the formula is calculated):

$$I = (A - EA) / \sigma_A$$

I = Index of Adjacency

A = # of observed glasses / no-glasses adjacencies

EA = expected number of glasses / no-glasses adjacencies under randomness

σ_A = Standard deviation of the expected number of glasses / no-glasses adjacencies under randomness

Thus, the index of adjacency will be a negative value when more aggregation is occurring than under randomness (e.g. men avoid sitting by women and vice versa), a positive number when less aggregation is occurring than under randomness (e.g. men tend to sit beside women more frequently than chance, and vice versa), and exactly zero when persons are evenly, randomly distributed throughout all of the seats. Thus, if my hypotheses are supported, the index of adjacency scores will be significantly less than zero, overall. Simple one-sample t-tests, comparing the mean index of adjacency scores to zero will be used to test the hypotheses.

It is important to understand the nature of the index of adjacency, so the results can be interpreted correctly. Specifically, a negative index of adjacency when measuring sex shows that men and women sit beside each other less frequently than expected by chance. By definition, this means that the converse is true: if not sitting beside women, men must be sitting beside other men, or alone entirely. The index of adjacency cannot, however, determine whether the effect is driven primarily by men or women, only that they tend to avoid sitting beside each other.

A small modification to Campbell et al.'s (1966) formula is used in the current study. Given that people tend to avoid sitting beside strangers if there is any other option, and it is generally considered common courtesy in North America to leave one seat between oneself and another person when possible, an "adjacency" is defined as both a person sitting directly beside another person, and two people with only one empty seat between them. Counting participants with only one empty seat between them as adjacent is a modification of Campbell et al.'s (1966) original procedure, and was used in a relatively recent paper by Koen and Durrheim (in press). This modification reduces the number of people sitting alone (known as "isolates"). This is important, because the number of isolates is accounted for in the standard deviation formula; as the number of isolates increases, so does the standard deviation. Thus, this modification increases the power of Campbell et al.'s index of adjacency. Please consult Appendix A, or Campbell et al.'s (1966) article for more detailed information on the statistical formula being used.

Results

An examination of histograms plotting the distribution of seating adjacencies for each observation reveals that the indexes of adjacency are approximately normally

distributed for both the glasses and sex data. When examining the indexes of adjacency for glasses, seventeen classrooms had a negative index of adjacency and four classes had a positive index. The mean index of adjacency (M = -0.57, SD = 0.90) was significantly lower than zero, $t(20) = 2.88$, $p = .009$. This shows that glasses-wearers sat by non-glasses wearers (and vice versa) less frequently than expected by chance alone. Thus, it can also be inferred that glasses wearers tend to sit beside other glasses wearers, and people without glasses tend to sit beside other people without glasses.

Significant aggregation based on sex also occurred. When examining the indexes of adjacency for sex, fourteen classrooms had a negative index of adjacency and seven classes had a positive index. The mean index of adjacency (M = -0.53, SD = 0.99) was significantly lower than zero, $t(20) = 2.44$, $p = .024$. This shows that men sat by women (and women by men) less frequently than expected by chance alone. Thus, it can also be inferred that men tend to sit beside other men, and women tend to sit beside other women. Finally, 26.5% of men wore glasses, compared to 20.5% of women. Using a simple test of proportions, it was found that this is a non-significant difference, $z = 1.20$, $p = .34$.

In the interest of being thorough, separate indexes were calculated for men and women in order to examine possible interactional effects. That is, an index was calculated with all the men treated as empty seats, and an index was calculated with all the women treated as empty seats. This approach is far from ideal, but was used in Campbell et al.'s (1966) article. Eight observations had sample sizes too small to use in this analysis (e.g. all males were isolates; no females wore glasses, etc), and were omitted from the analysis. The index of adjacency for males (M = -.032, SD = 1.11) was not significantly

different from the index of adjacency for females (M = -0.24, SD = 1.22), $t(12)$ = -.015, p = .88.

Discussion

The two hypotheses of this study were supported. Significant aggregation occurred based on sex, which replicates previous work and provides some confidence in the soundness of the methodology. Significant aggregation also occurred based on glasses-wearing status, which extends prior work by looking at a previously unexamined physical trait. There was also no difference between the proportions of males and females who wore glasses, and there was no moderation of the aggregation effect for glasses-wearing status in the current sample. There are a few clear problems with using such a crude index of seating adjacency. Specifically, there is no way to tell if the effect is stronger within one group, versus another (e.g. do men tend to sit by other men more often than women sit by other women?). Moreover, there is no way to tell for certain if what is being observed represents an attraction towards similar individuals, or a repulsion from dissimilar individuals, since both processes would lead to similar seating patterns. If the literature on attitudinal similarity is any indication, it is likely that both processes play a role (Rosenbaum 1986; Smeats et al., 1989). In sum, this method can tell us little, if anything, about the mechanism behind a person's seating choice. At the very least, these results suggest that glasses-wearing status is a promising variable for future studies of physical similarity and interpersonal attraction, and Study 1 serves as a starting point for my contention that people sit closer to those whom they physically resemble.

Though Study 1 provides a conceptual starting point for my research, there are limitations to this initial study. Clearly, numerous other physical traits will have to be

examined in order to test the idea that people sit closer to people they physically resemble. Moreover, given that visual impairments may be more frequent among non-Caucasians (Vitale et al., 2006), future studies of naturalistic seating patterns might need to include race as a potential control variable. Ideally, all physical traits examined should be unrelated to sex and race, so that artifactual findings can be avoided. Of course, this could prove to be a difficult task, so controlling for race and sex is probably the most realistic choice for future analyses. Finally, a larger sample size within each observation would be required if control analyses are to be conducted. Study 2 attempts to address these limitations, using a similar methodology.

Study 2

Returning to the primary purpose of this thesis, I theorize that the tendency to sit closer to physically similar others is a spontaneous process that occurs upon first meeting another person. This tendency, in turn, increases opportunities to create relationships with physically similar others, which is one process by which homophily occurs based on physical appearance more broadly. The reader might question the use of observational methods, given the difficulty in ascertaining cause-and-effect when testing my theory. By using one-time naturalistic observations, only a snapshot of the entire process is captured, and the mechanism behind seating choice remains unknown. Nevertheless, observational studies are useful to provide a certain amount of ecological validity to the phenomenon being studied. Given the relatively limited work in the area of physical similarity and seating aggregation (but see (Campbell et al., 1966; Koen & Durrheim, in press; Clack et al., 2005), it is important first to establish that this phenomenon actually

exists in the real world, before moving on to experimental research. Thus, Study 2 expands upon the naturalistic observation approach used in Study 1.

In order to more adequately show that people sit beside others who physically resemble themselves in real-world environments, a more broad set of physical characteristics must be examined to better approximate a measure of overall physical similarity. After all, it could be something about glasses-wearing specifically, rather than physical similarity more broadly, that leads to seating aggregation. Specifically, Study 2 will examine glasses, sex, skin colour, hair colour and hair length. Moreover, given the strong levels of aggregation expected based on sex and race (Campbell et al., 1966; Koen & Durrheim, in press), it is important to determine whether or not the proposed physical traits are conflated with sex and/or race, to rule out artifactual findings due to seating aggregation based on sex and race. Finally, it could be useful to use prior acquaintanceship as an additional variable of interest in the current research. If seating choice is one mechanism by which homophily occurs in relationships more broadly, the seating aggregation observed should not simply be a function of prior friendships; a significant tendency for like to sit beside like should also occur even among strangers.

Study 2 has four primary hypotheses:

H1: Seating aggregation will occur based on sex and race, replicating previous research.

H2: Seating aggregation will also occur based on physical similarities such as glasses-wearing status, hair length, and hair colour extending prior research by examining a wider array of physical attributes.

H3: The seating aggregation observed based on glasses-wearing, hair length and hair colour should remain statistically significant, even when controlling for sex and race.

H4: Seating aggregation observed on all five physical traits (sex, race, glasses-wearing, hair length and hair colour) should remain statistically significant, even when prior acquaintanceship is controlled.

Method

Participants

Eighteen introductory university classes (100 and 200 level courses) were observed, from September 8th, 2009 to September 26th, 2009. Classrooms were selected semi-randomly from the available pool. Three classrooms at Wilfrid Laurier University (BA101, BA102 and BA201) were chosen, and professors who taught introductory courses in those classrooms were emailed for permission to use the classroom in data collection. Permission was requested from 36 classes, so the overall response rate was 50%. No particular academic discipline was over-represented. Classes which were less than 40% of full capacity (N = 4) were omitted from the sample, leaving the total sample size at 14 classrooms, or 2228 total people.[8] Of this reduced sample, 36.7% were men, 18.1% wore glasses, 71.1% were White, 36.9% were blonde and 28.3% had long hair (these variables correspond with the categories used to examine seating aggregation, described below). Also, 2.5% were Indian, 1.5% were Black, 6.0% were Asian, and 21.2% were mixed/other ethnicities. Unknowns (participants who were unable to be coded due to picture quality or ambiguity on any particular variable) encompassed less than 0.04% of the sample (N = 43, on average).

Physical Traits Recorded

[8] Low density classes were removed because in a very low density classroom virtually everyone sits alone, which reduces the power and accuracy of the index of adjacency. When comparing high and low density classrooms in the current sample, the mean index of adjacency (all 6 variables averaged) is much more negative for the fourteen high density classes (M = -1.13, SD = 0.60) than for the four omitted low density classes (M = -0.29, SD = 0.71), $t(16) = 2.39$, $p = .029$.

A total of five physical traits were recorded in seating diagrams, in a similar manner to Study 1. Note again that, in order to compute an index of adjacency, each physical trait must be coded as a dichotomous variable. Sex was coded as male or female. Skin colour was coded as Caucasian versus Not-Caucasian (with the Not-Caucasian group including Asian, Black, Indian, and Mixed/Other racial groups). Glasses status was coded as either the presence or absence of glasses, coding persons with sunglasses (N = 72) as non-glasses wearers. Hair length was coded as long versus short hair (with long hair defined as shoulder length or longer) and anyone with headwear that obscured their actual hair length was excluded from the analysis (N = 22). Hair colour was coded as blonde versus not-blonde hair ("blonde" encapsulated pure blonde hair, dirty blonde hair, blonde highlights and strawberry blonde hair), and anyone who had a buzz cut or headgear that obscured their hair colour was excluded from the analysis (N = 130). Inter-rater reliabilities were moderate to high for all variables (see Table 1). Unknowns and excluded participants were treated as empty seats within each analysis.

Procedure

The researcher entered the classroom (with the instructor's prior permission) and verbally outlined the details of the project, as well as how to avoid participating if so desired. As a rough measure of prior acquaintanceship, students were asked if they knew the name of the persons next to them before coming to this class session. They were asked to raise their right hand if they knew the name of the person on their right, raise their left hand if they knew the name of the person on their left, and raise both hands if they knew the name of the person on either side of them. Then, the researcher took digital photos of all students in the classroom as they were sitting in their seats. Multiple pictures

were taken to ensure the entire classroom was captured. The pictures were examined to create seating diagrams, in a similar fashion to Study 1, except with more variables being recorded. As in Study 1, Campbell et al.'s (1966) index of adjacency was employed to determine the amount of aggregation in seating patterns.

Results

Multivariate one-sample tests (Hotelling's Trace) comparing the mean indexes of adjacency to zero were used to test the four hypotheses of this research. The univariate results using this method are identical to a one-sample t-test. Given that I theorize physical similarity more broadly is the driving mechanism behind seating aggregation, the multivariate results are useful to determine an overall effect from all the physical traits combined together. Examining a histogram of the frequencies for all indexes of adjacency, the indexes appeared to be normally distributed given the sample size, though the distributions tended to be slightly less peaked than normal (platykurtotic). The multivariate t-tests used in the analyses should be robust to such small deviations from normality.

Hypothesis 1 Analysis

The mean indexes of adjacency for sex and race were compared to zero using a multivariate one sample test. The multivariate test showed that the mean indexes of adjacency for sex and race were significantly less than zero overall, Hotelling's Trace = 12.1, $F(2,12) = 72.6$, $p < .001$.This shows that people who are physically similar in sex and race tend to sit beside each other more frequently than expected by chance alone. Overall, this effect is highly statistically significant. Means and univariate results are contained in Table 2.

Hypothesis 2 Analysis

The mean indexes of adjacency for glasses-wearing, hair length and hair colour were compared to zero using a multivariate one sample test. The multivariate test showed that the mean indexes of adjacency for glasses-wearing, hair length and hair colour were significantly less than zero overall, Hotelling's Trace = 1.25, $F(3,11) = 4.57$, $p = .026$. This shows that people who are physically similar in glasses-wearing, hair length and hair colour tend to sit beside each other more frequently than expected by chance alone. This effect is much smaller than the findings for sex and race, though it is still statistically significant. However, it is worth noting that hair colour does not reach statistical significance by itself in the univariate analyses, though it is in the expected direction. Means and univariate results are contained in Table 2.

Hypothesis 3 Analysis

When calculating an index of adjacency, control analyses can only be conducted by omitting participants, and treating the omitted participants as empty seats. Because of this, each control analysis reduces the sample size substantially. For this reason, I decided to run control analyses for sex and race separately, rather than controlling for both variables at the same time. Though this might not be an ideal procedure, an analysis controlling for both race and sex at the same time would omit over 60% of the sample, creating too many isolates to properly analyze.

The first control analysis excluded all males from the analysis. The multivariate test showed that the mean indexes of adjacency for glasses-wearing, hair length and hair colour were significantly less than zero overall, even when considering only female participants, Hotelling's Trace = 1.87, $F(3,11) = 6.85$, $p = .007$. This shows that the

tendency for people who are physically similar in glasses-wearing, hair length and hair colour tend to sit beside each other more frequently than expected by chance alone is not the result of confounding between these variables and sex. Hair colour does not reach statistical significance by itself in the univariate analyses, and glasses-wearing is only marginally significant (p = .074), though both are still in the expected direction. See Table 2 for means and univariate results.

The second control analysis excluded all non-Caucasians from the analysis. The multivariate test showed that the mean indexes of adjacency for glasses-wearing, hair length and hair colour were significantly less than zero overall, even when considering only Caucasian participants, Hotelling's Trace = 0.95, $F(3,11) = 4.57$, p = .054. Thus, the findings of Hypothesis 2 cannot be explained by a confounding of glasses-wearing, hair colour, and hair length with race. Again, hair colour does not reach statistical significance by itself in the univariate analyses, though it is still in the expected direction. See Table 2 for means and univariate results.

Hypothesis 4 Analysis

Another multivariate analysis was conducted, this time excluding all acquaintances from the analysis (i.e., those who raised their hands, indicating they knew each other's names). The multivariate test included all five physical variables. The multivariate test showed that the mean indexes of adjacency among strangers based on sex, race, glasses-wearing, hair length and hair colour were significantly less than zero overall, Hotelling's Trace = 4.16, $F(5,9) = 7.48$, p = .005. However, a further analysis of the univariate results reveals that the indexes for glasses and hair colour were non-significantly different from zero in this analysis, and were no longer in the expected

direction. Thus, it is most accurate to say that people tend to sit beside physically similar strangers, based on sex, race and to a lesser extent, hair length. Means and univariate results can be found in Table 2.

In the interest of thoroughness, another analysis was conducted where only mutual acquaintances were included; all strangers were omitted from the analysis. The multivariate test showed that the mean indexes of adjacency among mutual acquaintances based on sex, race, glasses-wearing, hair length and hair colour were significantly less than zero overall, Hotelling's Trace = 7.26, $F(5,9) = 13.1$, $p = .001$. This suggests that mutual acquaintances who sit beside each other tend to be more similar on all five physical traits measured than expected by chance alone. The univariate analyses were only marginally significant for hair colour ($p = .077$) and hair length ($p = .051$), though both were in the expected direction. Means and univariate results can be found in Table 2.

Discussion

The four hypotheses of the current study received support. There was significant seating aggregation based on sex and race; people tended to sit beside others who matched themselves on these traits, which replicates findings from previous research (Campbell et al., 1966; Koen & Durrheim, in press; Clack et al., 2005). In addition, there was a weaker, but statistically significant trend for persons to sit beside others who were similar in glasses-wearing status and hair length. Findings for glasses-wearing and hair length appear to remain significant even when controlling for sex and race. However, hair colour did not appear to be a very useful predictor by itself; findings on this variable may simply be an artifact of the strong aggregation found for sex and race. Regardless, there

does seem to be some support for the notion that people sit closer to physically similar others in real-world environments.

The results using prior acquaintanceship provide some interesting information. People tend to sit beside physically similar strangers, based on sex, race and hair length, which suggests that aggregation is not merely a function of prior friendship for these variables. There was also significant seating aggregation based on all five variables when an analysis was conducted using only mutual acquaintances. Groups of mutual acquaintances can be considered one limited form of social network; thus, the current research also shows the general tendency for social networks to be more homogenous in physical appearance than due to chance, congruent with previous research (McPherson et al., 2002; Rushton et al., 1985). Seating aggregation based on glasses-wearing was not found with strangers, but was strongly found when an analysis was conducted with only mutual acquaintances. It is possible that this represents a process whereby people are simply more likely to wear their glasses (instead of contacts or not wearing them at all), when their friends also wear glasses, though this is merely speculation. The findings using prior acquaintanceship are difficult to interpret because any seating aggregation found with acquaintances could very well reflect the tendency to sit beside physically similar strangers in earlier class meetings, leading to their initial acquaintance.

It is also worth noting the statistical difficulties of controlling for variables using Campbell et al.'s (1966) measure. When participants are removed from the sample through control analyses, this typically increases the number of isolates (people sitting alone), which in turn increases the standard deviation of the expected number of adjacencies under randomness (see formula in Appendix A). Given the way the index is

calculated, any increase in the standard deviation will lower the absolute value of the overall index of adjacency, and make it harder to find a statistically significant effect. For similar reasons, it is also important to keep in mind that the analysis I conducted looking at mutual acquaintances only had more statistical power than the analysis with strangers only, because there are no isolates within groups of mutual acquaintances (i.e., people sitting alone). For these reasons, it would be premature to assume that aggregation occurs only among pre-existing friends, though the evidence here does seem to suggest that the tendency to sit beside similar others is more pervasive among pre-existing acquaintances.

The idea that physical similarity more broadly is associated with seating distance is key to the overall rationale of the study, and the impetus behind using multivariate analyses to test the above hypotheses. I do not propose that any one physical trait by itself is necessarily the sole determinant of seating choice; rather, the physical traits chosen for analysis in the current study are merely facets of an overall physical similarity variable. The first two studies of this research have shown that people tend to sit beside others who match them on a variety of physical traits within naturalistic environments. Future research will need to use a broader, overall measure of physical similarity in order to more accurately test my hypotheses, and to more adequately use control analyses for sex and race. A continuous physical similarity variable is advantageous both in terms of generalizability and in terms of statistical power; dichotomizing physical similarity variables (as in Study's 1 and 2) reduces power by discarding a lot of information otherwise available in a continuous variable. Moreover, laboratory research will be required to more adequately test the notion that people tend to sit closer to physically

similar strangers; an easy enough task, with the use of a confederate. Thus, Study 3 attempts to examine this phenomenon in a more controlled environment.

Study 3

Studies 1 and 2 have shown a general tendency for physically similar others to sit beside each other in naturalistic environments, even when controlling for sex and race. Study 3 attempts to address the methodological shortcomings of naturalistic observations by conceptually replicating these findings within a laboratory setting. The current study improves upon the previous studies in numerous ways. First, environmental factors can be more easily controlled within laboratory settings. Second, physical similarity and seating distance can be measured as continuous variables within a laboratory study, providing greater statistical rigor. Third, by asking participants to sit beside a confederate, the notion that people sit closer to physically similar strangers can be more directly tested. Finally, other measures of interest, such as attractiveness, attitudes, implicit self-esteem, and nonverbal behaviours can be more easily measured within a laboratory setting. Of these additional variables, similarity in attractiveness is perhaps the most important; it remains to be seen if the tendency to sit closer to physically similar others occurs over and above matching based on attractiveness. In addition, it is desirable to control for similarity in sex and race in the current study as well, to conceptually replicate findings from Studies 1 and 2. Thus, the first hypothesis of this study is as follows:

H1: Physical similarity to the confederate will be negatively associated with seating distance. That is, the more physically similar participants are to a confederate, the closer

they will sit. This relationship will remain significant, even when controlling for similarity in attractiveness, sex and race.

In addition, it might be interesting to look at individual physical traits, both for exploratory reasons, and to provide results that are more directly comparable to Studies 1 and 2. It might be that certain individual physical traits are stronger predictors of seating distance than others. On the other hand, it might be the case that only an overall, generalized sense of physical similarity, as opposed to any one individual trait, serves as the best predictor of seating distance. Thus, the first research question of this study is as follows:

RQ1: Does similarity on any one single physical trait predict seating distance? Specifically, when participants are similar to a confederate in sex, race, hair colour, hair length, eye colour, glasses-wearing or body mass index, will they sit closer to that confederate?

Seating proximity might be considered one facet of the larger construct of "nonverbal immediacy." That is, seating proximity is one nonverbal measure that communicates liking or positive affect towards others. Other such nonverbal behaviours include eye contact, body lean, smiling and body relaxation, to name just a few (see Guerrero 2005). Moreover, Chartrand and Bargh (1999) present results which suggest that nonverbal mimicry (i.e., copying the nonverbal behaviours of the other person) is associated with greater liking and smoother interactions, a phenomenon known as the "chameleon effect." Thus, it seems possible that physical similarity might influence positive nonverbal behaviours more generally, rather than just seating distance specifically. Studies examining attitudinal similarity and nonverbal behaviours have been

conducted in the past (see Byrne & Griffitt, 1973 for a review), but to my knowledge, no studies to date have looked at overall physical similarity as a predictor of nonverbal behaviours in a short social interaction. Thus, the second hypothesis of this study is as follows:

H2: Physical similarity to the confederate will be positively associated with nonverbal immediacy and nonverbal mimicry, even when controlling for attractiveness, sex and race. That is, the more physically similar participants are to the confederate, the more positive their nonverbal behaviour towards the confederate will be.

Given that some research has indicated a relationship between name-letter preferences and romantic partner choice (Jones et al., 2004; Xinyue et al., 2006), it seems reasonable to expect that implicit self-esteem could also play a role in the tendency for a person to sit beside others who are physically similar to themselves. Though there is a great deal of contention as to what exactly implicit self-esteem is (see Bosson et al., 2000), high implicit self-esteem can be broadly conceptualized as preconscious, positive associations with the self-concept. It has been proposed that these positive associations can sometimes "spill over," to other things that are associated with a person's self concept remind a person of his/herself (Jones et al., 2004). As a result, people tend to like persons, places and things that are similar to themselves. Thus, if implicit egotism is playing a role in the tendency for people to sit closer to physically similar others, it is possible that implicit self-esteem moderates the relationship between physical similarity and seating distance. People high in implicit self-esteem should be more likely to sit beside people who look similar to themselves, whereas people low in implicit self-esteem might not show this tendency. A similar presumption could be made using body esteem

(i.e. how much a participant likes his/her physical appearance) as a measure. Presumably, if egotism is playing a role in seating choice, persons will only tend to sit beside physically similar others to the extent that they have positive feelings about their own physical appearance. Thus, both implicit self-esteem and body esteem could be significant moderators of the tendency for physical similarity to predict seating distance. If the second hypothesis of this study holds true, these variables could also be significant moderators of nonverbal immediacy and nonverbal mimicry. Thus, the third hypothesis of this study is as follows:

H3: Implicit self-esteem and body esteem will moderate the relationships found in the above hypotheses. That is, the relationships will be stronger when participants have high levels of these moderators, and weaker when participants have low levels of these moderators.

Finally, meta-analyses suggest that perceived similarity is a strong, consistent predictor of interpersonal attraction in laboratory studies (AhYun, 2002; Montoya et al., 2008); thus, it makes sense to examine how perceived similarity[9] relates to the variables of interest in the current research. Given the voluminous literature showing a strong, positive correlation between perceived attitudinal similarity and interpersonal attraction using self-report measures (Byrne & Griffitt, 1973), it seems probable that perceived similarity will be correlated with positive attitudes toward the confederate as measured by self-report scales. It seems reasonable that perceived similarity could also predict behavioural measures, but since results in this domain tend to be much more complex

[9] I mean this to represent overall perceived similarity, not similarity in attitudes or physical appearance specifically (though "perceived similarity" is almost certainly composed of both of these aspects).

(Byrne & Griffitt, 1973), I have no firm predictions for behavioural correlates of perceived similarity. Thus, the fourth hypothesis of this research is simply as follows:

H4: Perceived similarity will be positively correlated with positive attitudes towards the confederate.

Method

Participants

Seventy-two undergraduate psychology students participated in this study. One participant did not given consent to use her photos and videos for coding, and was omitted from the analyses. Approximately 15.7% of participants had brown hair, 76.1% were Caucasian, 18.4% had hazel eyes, 25.4% wore glasses, 69% were female, 71.4% had an average BMI, and 29.2% had short hair. Note that each of these traits are a match to the confederate's physical appearance (except for glasses wearing; the confederate was instructed to wear glasses only half of the time).[10] Of the non-Caucasians, one was Black, five were Indian, five were Asian and six were Mixed/Other. Of the non-glasses wearers, 38% required corrective lenses, but were not wearing them at the time of the experiment and 32.4% did not require corrective lenses at all. No participants in the current study wore contact lenses. Age was relatively homogenous among participants, with 98.6% of participants being from ages 17-20. One participant was 33 years old.

Procedure

[10] Some of the original hypotheses of this study examined glasses-wearing specifically, rather than physical similarity more generally. The counterbalancing of glasses-wearing status of the confederate represented an experimental manipulation in this paradigm. However, glasses-wearing status of the confederate did not significantly predict any variable by itself in the current study. In fact, it can perhaps be best conceptualized as merely one facet of the primary predictor variable, physical similarity. Counterbalancing glasses-wearing for the confederate should not interfere with the proposed hypotheses of this study.

As each participant arrived, there was a female confederate already sitting down in the room, posing as another participant. The experimenter feigned forgetting consent forms, and asked the participant to "take a chair" from the stack at the back of the room, while the researcher left the room. After the researcher came back, the participant filled out the consent form, and went to a separate cubicle to complete the Implicit Association Test and the Name Letter Preference Task (see materials section below). The distance between the chairs was surreptitiously measured by the researcher (using measuring tape) while the participant completed this task in a separate cubicle.

After completing the IAT and Name Letter Preference Task, the participants were informed that the next portion of the experiment would be a "short video-taped interview," and they were asked to pull up a chair to face the confederate (the experiment was designed such that the confederate always appeared to finish the IAT first, and had time to place her chair in the designated spot). The researcher flipped a coin, ostensibly to decide who was in each "condition." The coin flip was rigged, and the confederate was always the "interviewer" and the participant the "interviewee." In this short interaction, the confederate asked the participant some simple icebreaker questions, which were given to her on a piece of paper from the researcher (see Appendix B for a complete listing of questions). The interview went until all nine questions were asked. Actual observed interview lengths ranged from 1:37 to 3:45, with a mean length of 2:37. The confederate was coached to display a foot-tapping nonverbal behaviour throughout the interaction, and to act in a similar way towards all participants. The videotape of this social interaction was the source of coding for nonverbal immediacy and nonverbal mimicry.

After the short social interaction, the researcher took a photograph of both the confederate and the participant. Following this, both the participant and the confederate returned to separate cubicles to complete the remaining questionnaire measures, including positive attitudes towards the confederate after the social interaction, perceived similarity, body esteem, and demographics. The chair distance was measured by the researcher while the participant filled out these questionnaires. Following this, participants were fully debriefed and thanked for their time. Physical similarity, attractiveness and the nonverbal measures were coded from the photos and videos by research assistants at a later date.

Materials

Individual physical traits. Photographs of participants were taken. These photos were then coded for the following individual physical traits: race, presence of glasses, hair colour and hair length (sex was self-reported). The percent of exact agreement between independent coders was moderate for hair colour (74% agreement), hair length (83.3% agreement) and race (74.6% agreement), and there was 100% agreement on glasses-wearing. After this initial test of inter-rater reliability, the coders discussed each discrepancy, until 100% agreement on each variable was achieved. In addition, participants self-reported their eye colour as well as their height and weight to calculate a body mass index. Similarity variables were calculated from these coded traits (1=same as confederate; 0 = different from confederate). In addition, a composite physical similarity variable was calculated from these coded variables, excluding race and sex (See Appendix C for details). This composite physical similarity variable ranges from 0 (complete dissimilarity) to 5 (complete similarity).

Overall physical similarity ($\alpha = .76$). Three independent coders (one male, two female) rated each participant's photo for overall physical similarity. Photos of the confederate and the participant were examined side-by-side, and coders were asked to rate "how physically similar are these people to each other?" on a 5-point scale, ranging from 1 (Extremely Dissimilar) to 5 (Extremely Similar). The ratings from all three coders were added together and used as an overall measure of similarity.

Physical attractiveness ($\alpha = .76$). Three independent coders (the same coders as above; one male, two female) rated each participant's photo for overall physical attractiveness. Photos of the participants were examined individually, before rating overall physical similarity to the confederate. The confederate's level of attractiveness was also coded by two of the coders, before knowing which picture was the confederate (the confederate's photo was mixed in with the rest of the photos at random). Coders were asked to rate "how physically attractive is this person?" on a 5-point scale, ranging from 1 (Extremely Unattractive) to 5 (Extremely Attractive). The ratings from all three coders were added together and used as an overall measure of physical attractiveness. For the purposes of this research, attractiveness similarity (i.e. how closely levels of attractiveness between participants and the confederate match) is perhaps of more interest. Since the confederate's level of attractiveness was gauged to be about average (coders rated her as a three, on average), the squared term for attractiveness will be used as a measure of attractiveness similarity. Though not without its own limitations, the curvilinear trend should provide an adequate test of similarity in attractiveness, if one assumes an average level of attractiveness for the confederate (an assumption that is not unreasonable, given how naive coders rated her level of attractiveness).

Seating distance. This variable is defined as centimeters in distance between the participant's chair and the confederate's chair, after the participant has had a chance to place the chair somewhere relative to where the confederate is sitting. The confederate always sat in the same location for each participant, and was sitting in the room before the participant arrived. As a cover story for why the confederate was already in the lab, participants were told the following before entering the lab: "There is another participant who was late for a previous session that is going to do the study with you today. She is going to participate in the study with you, to make up the lost credit. Is that okay with you?" All participants indicated that they did not mind the additional participant.

Seating distance was measured two times during the course of the experiment. The first seating distance measure occurs at the very beginning of the study. Chairs were stacked up against the back wall, and the confederate was already sitting in the room. Almost immediately after the participant arrives in the lab, the researcher told that participant: "I forgot consent forms in the other lab. Could you just pull up a chair while I go get them? I'll be back in a minute or so." Measurements were made surreptitiously, when the participant went to another cubicle to complete other tasks. The second seating distance measure occurred shortly before a short social interaction. Participant was told: "The next part of the experiment is a short, video-taped interview. Please pull up a chair, facing her [gesturing to the confederate], while I set up the video camera." Seating distance was again measured surreptitiously, while the participant was in a cubicle to complete other tasks. When measuring seating distance, the following procedure was used: First, the distance from the right leg of the participant's chair to the right leg of the confederate's chair was measured using measuring tape. Second, the distance between the

left leg of the participant's chair to the left leg of the confederate's chair was measured. Then a mean distance was computed by adding each of those distances together, and dividing by two. The two seating distance measures were only modestly correlated with each other, $r(60) = .29$, $p = .029$, and will be used as separate variables in analyses[11].

Nonverbal Immediacy. A coding scheme for nonverbal immediacy was adapted from Guerrero's (2005) measures of nonverbal behaviour. Specifically, measures used in the current study included eye gaze (percentage of time spent looking at the confederate), smiling (percentage of time spent smiling), total number of speech disfluencies (e.g., stutters, repeated words, filler words, etc), and body relaxation. In the current report, the number of smiles per minute will not be used as separate predictor, since it was very strongly correlated with the percentage of time spent smiling, $r(70) = .79$, $p < .001$.To increase levels of focus for coders, each video was divided into thirds, and each video third was coded separately on each variable. The variables used for analysis represent an average of the rating given to each third of the video. The primary coder for this variable was also involved in coding attractiveness and similarity; inter-rater reliability was coded by a coder unfamiliar with the rest of the study. A copy of the coding sheet used can be found in Appendix D, and the specific instructions given to coders can be found in Appendix E. A second, independent coder unfamiliar with the rest of the study also rated a sub-sample of the videos (N = 18) for inter-rater reliability. Intra-class correlations (consistency) are as follows: eye contact (ICC = .65), percent of time spent smiling (ICC = .57), total number of speech disfluencies (ICC = .80) and body relaxation (ICC = .23).

[11] An average measure of seating distance was also computed, by adding both measures together. The results were similar to findings using seating distance two alone, though the findings were less strong overall. Ultimately, the analysis did not seem to benefit from their combination, so they are kept separate in the analyses reported in this thesis.

Inter-rater reliability was high for speech disfluencies, moderate for smiling and eye contact, and very low for body relaxation.

Nonverbal Mimicry. The confederate was coached to display a certain nonverbal behaviour (i.e., foot-shaking) during the videotaped social interaction. The extent to which the participant mirrored this behaviour was recorded. Specifically, both the number of times per minute the participant shook his or her foot and the overall percentage of the total interaction time that participants spent shaking their feet during the 3-minute videotaped social interaction was recorded (see Appendix D & E). In the current report, only the total percentage of time spent foot shaking will be used as a predictor variable, since it was very strongly correlated with the number of foot shakes per minute, $r(70) = .87$, $p < .001$. Inclusion of this variable is based on prior literature on the chameleon effect, which suggests that nonverbal mimicry is associated with greater liking and smoother interactions (Chartrand & Bargh, 1999). A second, independent coder unfamiliar with the rest of the study also rated a sub-sample of the videos (N = 18) for inter-rater reliability. Reliability was low for this variable (ICC = .58).

Implicit self-esteem. Implicit self-esteem was measured two ways: the Name Letter Preference Task, and the Implicit Association Test (IAT). The Name Letter Preference Task (Jones et al., 2002) asks participants to rate how much they like each letter of the alphabet on a 9-point scale. Two other symbols (☺ ☹) are included as distracters. People high in implicit self-esteem will rate the letters in their own initials (first and last name only, in this case) as more favorable than other letters of the alphabet. Participant initials were collected in the demographic section, after the name letter preference task was completed. A difference score was calculated for the Name Letter

Preference Task for each participant by taking the rating given to their first and last name initials, and subtracting the mean rating given to those letters by all other participants without those initials in their name.[12]

The IAT is a computer-based response-mapping task that measures the degree of association between an attitude-object and positive or negative affect. Participants categorize words that belong to one of two categories: (1) pleasant versus unpleasant words (e.g., holiday, cockroach), and (2) Self versus Object words (e.g., me, it). During the two critical blocks of trials, participants make both of these categorizations, on alternate trials, using only a single set of response keys. In one critical block, "pleasant" and "self" words share a single response (whereas "unpleasant" and "object" words share another); in the other critical block, "pleasant" and "object" share one response. A person with positive implicit self-esteem (i.e., a strong association between themselves and positive affect) should be faster to respond to when "self" and "pleasant" share a response than when "self" and "unpleasant" share a response, because the positive affect associated with the self should interfere with the processing of unpleasant words in the latter (but not the former) condition. Average response times during the block in which "self" and "pleasant" share a response are subtracted from average response times during the block in which "self" and "unpleasant" share a response to create an index of implicit self-esteem, with higher scores indicating higher implicit self-esteem. The IAT scores of participants who had error rates of more than 20% (N = 13) were omitted.

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[12] The other way to compute a score from the name letter preference task is to simply subtract the mean rating given to the 24 non-initial letters from the ratings given to the participant's first and last name initials, within each participant. In the current data, these two scores correlate highly, $r(72) = .83$, $p < .0001$, so this second way of calculating a score from the name letter task will not be used in the current report.

Positive attitudes towards the confederate ($\alpha = .81$). Given the context of the experiment, participants can only really judge the confederate based on her capacity as an interviewer. Thus, after the social interaction, the participants rated their interaction with the confederate on four items related to the confederate's interviewing skills: how smooth the social interaction went overall, as well as how likeable, talkative and articulate the confederate was. Each item was measured on a 7-point scale ranging from 1 (strongly agree) to 7 (strongly disagree). These four items were combined together to make a four-item scale. See Appendix F for the exact wording of these questions, and for the entire questionnaire used in this study.

Perceived similarity. A single questionnaire item was used to assess how similar participants perceived the confederate to be to themselves: "Generally speaking, how similar were you and your partner to each other?" This item was measured using a 7-point scale ranging from 1 (Extremely similar) to 7 (Extremely dissimilar). Though not directly related to the hypotheses of the current research, a more specific measure of perceived physical similarity was also collected for exploratory purposes: "How similar in physical appearance do you think you were to your partner?" These two items were only modestly correlated, $r(71) = .34$, $p = .003$, so they will not be combined together to create a single measure.

Body esteem ($\alpha = .67$). A seven-item measure was created to assess how content participants were with their physical appearance. Items were rated on a 7-point scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). A sample item is "I like the natural colour of my hair." A complete listing of items is contained in Appendix F.

Results

Before conducting any analyses, the data were examined for normality and outliers. See Table 3 for a listing of means, standard deviations, ranges and skewness. After examining the skewness values, along with the histograms of the data, it became apparent that two variables were positively skewed (percent of time spent smiling; positive attitudes toward the confederate) and one variable was negatively skewed (Name Letter Preference Task). Given that parametric statistics which rely on the normality of the data are used throughout the analysis section, data transformations were performed on these three variables (see Tabachnick & Fidell, 2001 for a discussion of when to use different types of data transformations)[13]. A square-root transformation was conducted on the "percent of time spent smiling" variable, which improved normality. The positive attitudes towards the confederate variable was more strongly skewed, so a $\log_{10}$ transformation was necessary to improve normality. The scores on the name letter preference task were first reflected (a necessary first step when the variable is negatively, rather than positively skewed), and then a $\log_{10}$ transformation was computed, which improved normality more than a square-root transformation. Also, after examining z-scores and boxplots for all variables, one outlier was found on the body esteem variable (z = -4.08). This single outlier value was transformed, so that it was one unit lower than the next lowest score in the sample.[14] These transformed variables were used in all subsequent analyses.

Hypotheses 1 analysis

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[13] All analyses were conducted without the data transformations as well. Generally speaking, the results were all in the same direction, and statistical significance using the $p < .05$ criterion was no different than relationships found using the transformed variables. However, the significant results that do exist are slightly stronger using the transformed variables, which is to be expected since the assumptions for parametric statistics are more adequately met.

[14] Results were virtually identical if the outlier was dropped, instead of transformed.

The first two hypotheses of this research propose that physical similarity will be negatively associated with seating distance, even when controlling for similarity in attractiveness, sex and race. To test this, two hierarchical multiple regressions were conducted using both seating distance measures in turn as the dependant variables. The first step included only overall physical similarity (based on coder ratings) as a predictor. The second step included attractiveness, attractiveness squared (as a measure of attractiveness similarity), sex and race as control variables. Results of these analyses can be found in Tables 4 and 5. Physical similarity was a significant predictor of the second seating distance measure (the measure taken right before the social interaction); the more physically similar the participant was to the confederate, the closer the participant sat to the confederate, supporting the first hypothesis of this study. Moreover, this relationship remained a significant even when controlling for sex, race and attractiveness similarity. Though it is not the focus of the current study, it is also worth noting that attractiveness similarity (e.g. attractiveness squared) is a significant predictor of both seating distance measures; participants with average levels of attractiveness sat closer to the confederate than participants with high or low levels of attractiveness.

Research question 1 analysis

Exploratory analyses were conducted to see if the tendency observed in the above analysis could be found when examining any single physical trait. Dichotomous similarity variables were calculated for each variable (as described in appendix C), including sex, race, glasses-wearing, hair colour, hair length, eye colour and body mass index. A series of independent *t*-tests were conducted using these variables as predictors of the second seating distance measure (see Table 6 for results). Since overall physical

similarity did not predict the first seating distance measure, exploratory analyses are not presented for this variable.[15] Results reveal that no single, individual physical trait serves as a statistically significant predictor of seating distance. However, it is worth noting that all the results are in the expected direction; participants who were similar to the confederate on any given trait tend to sit closer. Interestingly, if all of these variables (excluding sex and race) are combined together to create one composite variable of overall similarity, similar results are found to analyses using the overall physical similarity variable (see Table 7 for a multiple regression using this composite variable), though the previously analyzed measure of physical similarity appears to be a stronger predictor. It appears then, that overall physical similarity, rather than any specific individual trait, is the primary predictor of seating distance.

Hypothesis 2 analysis

The second hypothesis of this study posits that physical similarity might also predict other positive nonverbal behaviours in addition to seating distance, such as more nonverbal mimicry, more eye contact, more smiling, a more relaxed body posture and fewer speech disfluencies. Given the number of correlations being conducted, a more conservative p-value of .01 will be used. There were no significant correlations found between physical similarity and other non-verbal behaviors (see Table 8). It is worth noting, however, that the pattern of correlations suggests a non-significant trend in the opposite direction from my hypotheses. There are nonsignficant trends which suggest that physical similarity to the confederate is associated with less eye contact ($p < .10$), a less relaxed body posture ($p < .10$) and a greater number of speech disfluencies ($p < .05$). The

[15] All analyses presented for RQ1 were conducted with the first seating distance measure as well; they were all non-significant.

relationship between physical similarity and speech disfluencies remains marginally significant at the $p < .05$ level when controlling for sex, race and attractiveness similarity, using a multiple regression procedure (see Table 9).[16] Physical similarity was not related to nonverbal mimicry or smiling.

Hypothesis 3 analysis

The third hypothesis of this study posits that implicit self esteem, name letter preferences and body esteem will moderate the relationships found between physical similarity and nonverbal behaviours. A series of 21 multiple regressions were conducted to examine the potential impact of each moderator has on the relationships between physical similarity and seven dependent variables: seating distance 1, seating distance 2, nonverbal mimicry, eye gaze, smiling, body relaxation and speech disfluencies. Even dependent variables that appear uncorrelated with physical similarity when examining zero-order correlations are included, in case the zero-order effect is masked by an interaction. In addition, because of a reasonably limited sample size ($N = 72$), attractiveness, sex and race are not included as control variables in these models, to increase power. A full listing of analyses can be found in Table 10. Broadly speaking, Hypothesis 3 was not supported. The interaction term was statistically significant only once out of 21 analyses (similarity x body esteem interaction predicting nonverbal mimicry); with the number of analyses conducted here, I would expect at least one significant result at the $p < .05$ level due to chance alone, so this finding is likely spurious. Thus, it appears that name letter preferences, implicit self esteem and body

[16] Similar multiple regressions were calculated for the other nonverbal variables. Neither physical similarity, nor the covariates were statistically significant predictors of the other nonverbal behaviours. Since these analyses did not provide much additional information over and above the correlation matrix, they are not included in this report to conserve space.

esteem do not moderate the relationship between physical similarity and nonverbal behaviours in the current sample.

Hypothesis 4 analysis

There was a strong, positive correlation between perceived similarity and positive attitudes towards the confederate, $r(70) = .40$, $p = .001$. As perceived similarity (i.e. "Generally speaking, how similar were you and your partner to each other?") increased, so did the participant's positive evaluations of the confederate. This result remained significant even when controlling for sex, race and attractiveness similarity, $r(64) = .41$, $p = .001$. However, similar results were not found when a more specific measure of perceived physical similarity (i.e. "How similar in physical appearance do you think you were to your partner?") was used, $r(70) = -.10$, $p = .40$. Thus, Hypothesis 4 is only supported when a more general measure of perceived similarity is used.

Discussion

The first hypothesis of this study was supported. Participants sat closer to a confederate as physical similarity increased, even when controlling for similarity in attractiveness, sex and race. Given the results of the multiple regression analysis, it appears that overall physical similarity and attractiveness similarity (i.e., attractiveness squared) account for unique portions of the variance, which suggests that they are conceptually distinct predictors of seating distance. Using the squared term for attractiveness suffers from some limitations in interpretation. Strictly speaking, it tests for a curvilinear effect for attractiveness when predicting seating distance. The statistically significant curvilinear trend that was found using attractiveness showed that participants of average attractiveness sit closest to the confederate, while very attractive and

unattractive participants sit furthest away. While it is certainly possible that people of average attractiveness are friendlier, and sit closer to the confederate as a result, in light of previous work in this area (Takeuchi, 2006) I tend to interpret this finding as an effect of attractiveness similarity. That is, people will sit closer to others whom they match on physical attractiveness. Given that coders rated the confederate as approximately average in attractiveness, I believe that a curvilinear effect should adequately capture similarity in attractiveness. Nevertheless, it is worth noting that using the squared term for attractiveness could be considered a somewhat indirect method of measuring attractiveness similarity.

Moreover, it appears that none of the single physical trait measures we took are a strong predictor of seating distance within a laboratory context. An index of overall similarity produced stronger results than single trait measures in this study, and given both the continuous quality of the data and the theoretical rationale behind this thesis, I expect that this would be true in general. Consistent with this possibility, the multivariate tests combining results from multiple physical traits in Study 2 produced stronger results overall. The findings of Study 3 also conceptually replicate the findings of Study 2 in a controlled environment, using different measures (seating distance, rather than seating aggregation). Moreover, it is notable that the participants and the confederate were unacquainted at the beginning of the study, suggesting that the tendency to sit closer to physically similar others is not merely a function of prior acquaintanceship.

As a caveat to these findings, these results were found only for the second seating distance measure. The two seating distance measures are qualitatively different from one another, which could have contributed the difference in findings. The first seating

distance measure was recorded after the participant placed his/her chair relative to the confederate while waiting for the researcher to retrieve consent forms from another room. In this case, there was little expectation of interaction with the confederate, and the chair was placed before having any chance to interact with the confederate at all. The second seating distance measure was recorded after the participant placed his/her chair relative to the confederate before a short video-taped "interview." In this case, some sort of social interaction with the confederate was clearly expected. It is possible that the linear relationship between physical similarity and seating distance will only occur when there is an expectation of social interaction with another person. This is, of course, a post hoc explanation. Though it is not of direct interest to the current hypotheses, it is worth noting that attractiveness similarity did predict the first seating distance measure (see Table 4), which further suggests a conceptual distinction between physical and attractiveness similarity.

Broadly speaking, the second hypothesis was not supported; physical similarity was not consistently associated with more nonverbal immediacy and more nonverbal mimicry. However, there did appear to be a small, nonsigificant trend in the opposite direction, whereby physical similarity was weakly associated with less eye contact, less body relaxation and more speech disfluencies. Speech disfluencies can represent anxiety or discomfort while speaking to others (Eklund, 2004), so it is possible that participants are slightly more anxious when speaking to a physically similar confederate, because they want to make a good impression on a physically similar other, though this is merely conjecture. Given the number of correlations conducted, these findings could simply be due to type 1 error. Moreover, the nonverbal behaviours coded had low inter-rater

reliability (except for speech disfluencies), and did not tend to be consistently correlated with each other. For this reason, measurement error may also explain the nonsignificant results for these other variables. Nevertheless, the trends are worth reporting, given that they appear to be in the same direction (e.g. all showing that physical similarity leads to more negative nonverbal behaviors). In any case, it is hard to come to any definitive conclusions regarding these variables because of the apparent difficulties in coding these behaviours consistently.

The third hypothesis of this study was also not supported. Name letter preferences, implicit self-esteem and body esteem did not moderate any of the relationships found in the current study. It is hard to make definitive conclusions based on a set of nonsignificant results, so these findings do not necessarily rule out implicit egotism as a potential mechanism for physical similarity and interpersonal attraction. The effect sizes for implicit egotism effects tend to be very small, and are frequently detected using massive archival samples (e.g. Xinyue et al., 2006), so the current sample size might be too small to detect an effect. Moreover, conducting a moderation analysis might not be the best way to test implicit egotism as a mechanism behind physical similarity and interpersonal attraction. Given that implicit egotism effects tend to be amplified by self-concept threats (Brownlow et al., 2007; Jones et al., 2002; Koole et al., 1999), it might have been more powerful and informative to manipulate self-concept threat, and examine the resultant effect on the physical similarity / seating distance relationship. Presumably, if the tendency to sit closer to physically similar others is a self-regulatory process, the relationship would be amplified under self-concept threat. Regardless, Study

3 does not provide definitive support for the mechanism underlying the relationship between physical similarity and seating distance, so further research is clearly required.

The fourth hypothesis of this study was supported; as perceived similarity increased, so did the participant's positive evaluations of the confederate, consistent with the long history of research on this topic using these variables (Montoya et al., 2008). Given that there was no correlation between a more specific measure of perceived physical similarity and positive attitudes towards the confederate (and the relatively weak correlation between both perceived similarity variables), it seems likely that perceived *attitudinal* similarity was being measured. Single Likert-scale items quite similar to the one I used were common in older research on attitudinal similarity and interpersonal attraction (Byrne & Griffitt, 1973). It is interesting to note that perceived attitudinal similarity and actual physical similarity appear to be differential predictors of interpersonal attraction; perceived similarity is only correlated with positive attitudes towards the confederate, whereas actual physical similarity is correlated with seating distance and speech disfluencies. Thus, there is some evidence that actual physical similarity is conceptually distinct from perceived attitudinal similarity in terms of the types of behaviours and attitudes it predicts.

General Discussion

When I first began researching this topic, I naively thought that the wide array of research findings linking similarity to interpersonal attraction could be united under a single theoretical banner, that they were all simply different examples of the general tendency for "like attracting like." I now understand that the tendency for similarity to breed attraction is a multifaceted phenomenon that varies greatly depending on the

variables of interest and methodologies used. As my theoretical understanding increased, I narrowed my focus to physical appearance and seating distance specifically, with the understanding that consistent biases in seating choice could contribute to homophily in relationships more broadly. The current research examined the relationship between seating preferences and a wide variety of physical similarity variables in both naturalistic and laboratory settings. There are a few similarities and differences between these two approaches which are worth discussing.

The first and most important commonality in findings across all three studies is that people tend to sit closer to physically similar others in a variety of locales. This finding remained significant in all three studies, even when controlling for sex and race. In addition, overall similarity, rather than any one single trait, seems to be the most robust predictor of seating distance in both naturalistic and laboratory studies. On the other hand, it appears that people tend to sit beside people who match on sex and race in naturalistic environments, but do not tend to sit very much closer in a laboratory setting. All things equal, people usually prefer to sit beside their friends, and people tend to be friends with people who match them on sex and race (McPherson et al., 2001), so the increase in effect size for Study 2 could potentially be a function of prior friendship. However, since seating aggregation by sex and race remained statistically significant in Study 2 when removing all mutual acquaintances from the sample, this explanation seems to be untenable. In any case, differences between naturalistic and laboratory research findings are not uncommon in similarity research (Byrne, 1997; Byrne & Griffitt, 1973). Since the sex and race of the confederate were held constant in the laboratory study, it is possible that different results would have been found with a male,

non-Caucasian confederate (e.g., perhaps Caucasians avoid sitting close to other racial groups, but not the other way around) though I have no data available to test this notion.

The mechanism behind the physical similarity / seating distance correlation has not yet been clearly established. However, Study 3 provided some useful information in terms of ruling out a few alternative explanations. The results of this study showed that overall physical similarity predicts seating distance over and above attractiveness similarity, which suggests that physical similarity is not merely a function of attractiveness similarity. Results remain significant when controlling for race and sex as well. Given the previous research conducted in this area, I tend to favor an evolutionarily based explanation for the results, in a similar fashion to Debruine's (2004a) kin-recognition explanation for choosing similar romantic partners. In this light, choosing to sit closer to physically similar others can be seen as a side-effect of a hardwired kin-recognition system. Staying in close proximity to kin (as represented by seating distance) could certainly be seen as evolutionarily adaptive. Since attitudinal similarity has been found to trigger kinship cognitions (Park & Schaller, 2005) it is not unreasonable to expect physical similarity to trigger kinship cognitions in a similar fashion. Of course, evolutionary theories tend to be very difficult to falsify, and the current study does not test this mechanism, but a kinship recognition system explanation appears to be the explanation most grounded in prior theorizing on the topic.

There are a few other explanations that could also explain the findings of the current research, but have also not been clearly tested in the current study. Participants could sit closer to physically similar others because they assume that others who resemble them also have similar attitudes; thus, the observed results could merely be

another example of attitudinal similarity. The measure of general similarity, which most likely encompasses attitudinal similarity, in Study 3 was correlated only with positive attitudes towards the confederate (and not seating distance), and was also unrelated to actual physical similarity as measured by objective raters, so this alternative explanation seems unlikely. Nevertheless, this idea has not been directly tested in the current research, so it remains as a potential explanation. Implicit egotism explanations have not yet been completely ruled out either, though the nonsignificant moderation effects in Study 3 argue against that particular explanation. Until future research manipulates self-threat (or self-affirmation), it is not known if the tendency to sit beside similar others can be seen as a self-regulatory process reflecting implicit egotism.

There are numerous avenues for future research in this area. Future research could measure perceived attitudinal similarity more directly, and test a meditational model to support (or rule out) the notion that people assume that physically similar others are similar in attitudes, which in turn predicts seating distance. Measuring socioeconomic status could also be useful as a covariate, given the sociological argument that people aggregate based on social status. As discussed previously, future research would also do well to manipulate self-related threat (or affirmation) to see if this process is a self regulatory process, which would lend support to the implicit egotism mechanism. It could also be useful to measure implicit liking of the confederate with a modified IAT task that uses pictures of the confederate. It seems reasonable that participants would have more positive implicit associations with physically similar others, and that these positive associations in turn predict seating distance, though this has yet to be tested. Finally, to more adequately test the idea that seeing physically similar others activates a kinship

detection mechanism, it would be useful to determine if persons who strongly resemble the self are associated with kinship cognitions. This could be done in a similar fashion to a methodology developed by Park and Schaller (2005), who used a modified IAT task to link attitudinal similarity to kinship cognitions. Two photos would be created via computer generation, one which strongly resembles the participant and one which does not (for the sake of argument, let's name the similar photo Mary and the dissimilar photo Sue). In the IAT task, participants would categorize whether the stimulus photos depicted Mary or Sue, and would also categorize words as denoting either "family"(e.g., family, kin, sister) or "stranger" (e.g., outsider, unfamiliar). Presumably, reaction times would be faster when associating "family" and "Mary," if physically similar others really are associated with kinship cognitions.

In conclusion, there is still much work to be done in this area. The current research showed a novel effect, whereby persons tend to sit closer to physically similar others, and ruled out a few alternative explanations, by controlling for sex, race and attractiveness. The most plausible explanation given the current research conducted in this area is an evolutionary kinship detection mechanism that "spills over" into our interactions with anyone who physically resembles us, though further research is needed to rule out alternative explanations. Though perhaps appearing innocuous on the surface, the simple process of choosing to sit beside people similar to us can have broad implications at a macro level. If a person implicitly avoids sitting with a person based on the colour of their skin, or the length of their hair, they miss out on the opportunity to develop a relationship with that person. As a result, segregation occurs, which can result in a myriad of prejudices and misunderstandings. Of course, this tendency is merely one

portion of the overall process that contributes to segregation more generally, but given the implications for racial segregation, it is certainly worth pursuing.

Appendix A: Details on the Index of Adjacency Formula

All calculations using the index of adjacency formula were calculated using Microsoft Excel.

To Calculate the Expected number of Glasses-No Glasses Adjacencies under randomness, use the following formula:

$$EA=2\frac{M(N-M)}{N(N-1)}(N-K)$$

To calculate the Standard deviation of the expected number of glasses / no-glasses adjacencies under randomness, use the following formula:

$$\sigma_A^2=2\frac{M(N-M)}{N(N-1)}(2N-3K+K_1)+4\frac{M(M-1)(N-M)(N-M-1)}{N(N-1)(N-2)(N-3)}$$
$$[(N-K)(N-K-1)-2(N-2K+K_1)]-4\frac{M^2(N-M)^2}{N^2(N-1)^2}(N-K)^2$$

Legend:

N = Total number of students in the lab
M = Number of students with Glasses
N – M = Number of students without glasses
K = number of groups of row-wise contiguous students
K_1 = The number of students with no one next to them (isolates)
EA = Expected number of adjacencies under randomness

Figure 1 shows a typical seating chart from our study. Using the data from figure 1:

N = 13	M = 4	K = 6
K_1 = 3	A = 1	EA = 3.23
σ_A^2 = 1.32		I = -0.87

(Remember, in this thesis, persons with only one empty seat in between still count as adjacent)

Also note that Campbell, Kruskall and Wallace's original (1966) article suffered from a small typo in the standard deviation formula (this is corrected in the above formula). For this erratum, see:

American Sociological Association (1967). Erratum: Seating Aggregation as an Index of Attitude. *Sociometry, 30,*104.

Appendix B: Interview Questions for Study 4

1. What is your hometown?
2. Which university course is your favorite (or least favorite) this year, and why?
3. What are some of your hobbies and/or interests?
4. Do you have any brothers and sisters?
5. Do you have any pets?
6. If you could travel anywhere in the world, where would it be?
7. What is your favourite holiday, and why?
8. What is one of your favourite movies or TV shows, and why do you like it so much?
9. Could you describe some of the material you are learning in any of your university courses?

Appendix C: Computation for overall physical similarity

Description of confederate: Twenty-year old Caucasian female, with short brown hair, hazel eyes and an average BMI. She was wearing glasses for half of the participants. She was rated a 3/5 in attractiveness by objective raters, on average.

To compute an overall physical similarity variable, the participant's status on each of five different traits will be compared to the confederate's status on those same traits. Separate similarity variables were coded as follows:

Glasses Similarity
1 = Participant matched the glasses-wearing status of confederate
0 = Participant did not mach glasses-wearing status of confederate

Hair Colour Similarity
1 = Participant had brown hair / 0 = Participant had any other colour hair

Hair Length Similarity
1 = Participant had short hair / 0 = Participant had medium-length or long hair

Eye Colour Similarity
1 = Participant had hazel eyes / 0 = Participant had any other eye colour

Body Mass Index Similarity
1 = Participant had an average BMI / 0 = Participant had an underweight or overweight BMI
(Low BMI < 18.5; Average BMI: 18.5 to 25; High BMI > 25)

Computed Formula:

Overall Physical Similarity = (Glasses Similarity + Hair Colour Similarity + Hair Length Similarity + Eye Colour Similarity + Body Mass Index Similarity)

This formula will give values ranging from 0 (complete dissimilarity) to 5 (complete similarity)

Appendix D: Nonverbal immediacy coding sheet

ID # Video Length_____ Section Length _____

Nonverbal Mimicry: Foot Shaking

Section	Total # of foot shakes	Percentage of time spent foot shaking
1		0---10---20---30---40---50---60---70---80---90---100
2		0---10---20---30---40---50---60---70---80---90---100
3		0---10---20---30---40---50---60---70---80---90---100

Eye Gaze

Section	Percentage of Time Spent Looking at the Confederate
1	0---10---20---30---40---50---60---70---80---90---100
2	0---10---20---30---40---50---60---70---80---90---100
3	0---10---20---30---40---50---60---70---80---90---100

Speech Disfluencies

Number of Vocal Pauses_____
Number of Filler Words Used _____
Number of Stutters/Repeated Words _____
Total: _____

Smiling

Section	Total # of smiles	Percentage of time spent smiling (s)
1		0---10---20---30---40---50---60---70---80---90---100
2		0---10---20---30---40---50---60---70---80---90---100
3		0---10---20---30---40---50---60---70---80---90---100

Body Relaxation: Overall, the target's body position was:

Tense 1 --- 2 --- 3 Relaxed (1st Section of Video)
Closed 1 --- 2 --- 3 Open
Rigid 1 --- 2 --- 3 Loose

Tense 1 --- 2 --- 3 Relaxed (2nd Section of Video)
Closed 1 --- 2 --- 3 Open
Rigid 1 --- 2 --- 3 Loose

Tense 1 --- 2 --- 3 Relaxed (3rd Section of Video)
Closed 1 --- 2 --- 3 Open
Rigid 1 --- 2 --- 3 Loose

Appendix E: Nonverbal coding instructions given to coders

Note: Except for speech disfluencies, divide each video into three equal time sections, and code each separately. This is to increase variability, and to help improve reliability and focus on the task.

Nonverbal Mimicry

The confederate tapped her foot throughout the interaction. We coded both (1) The total number of foot taps by the participant and (2) the percentage of time spent foot-tapping, on a 11-point scale. Note that a single "foot-tap" is defined by bringing the foot up, then back down again. When measuring time spent tapping, any foot movement that results in a tap counts.

Eye Gaze

This is the amount of time the participant spent looking at the confederate during the interaction. The percentage of the time spent looking at the confederate will be measured using an 11-point scale for each third of the video:

1st
0---10---20---30---40---50---60---70---80---90---100

2nd
0---10---20---30---40---50---60---70---80---90---100

3rd
0---10---20---30---40---50---60---70---80---90---100

To arrive at a percentage, it's best to use a stopwatch and measure the amount of time in seconds that the participant seems to be looking at the confederate, and calculate a rough percentage. We are rounding to the nearest 10%, because eye gaze is often ambiguous in the videos, and improving inter-rater reliability is desirable.

Speech Disfluencies

These are operationalized as vocal pauses, filler words (um, uh) and stutters (t-table, c-crane), or repeated words (I don't don't know). The total number of speech disfluencies will be counted, and summed into a single measure.

Vocal Pauses_____
Filler Words_____
Stutters/ Repeated Words _____
Total: _____

Smiling

Enjoyment smiles (symmetrical, teeth-bared), social smiles (tight-lipped, symmetrical smiles), and duchene smiles (asymmetrical, teeth-bared) smiles will be all be coded. Coders will disregard smiles that appear to be sarcastic or inappropriate, as well as expressions of contempt (tight-lipped, unilateral raise of one side of the mouth). This variable should be coded with the volume up, to distinguish smiles from speech inflections while the participant talks.

Both the total amount of time spent smiling, and the total number of smiles will be coded.

Body Relaxation

A three item scale measuring overall body relaxation will be taken from Guerrero's (2005) measure. All three items will be coded for each third of the video:

Overall, the target's body position was:

Tense 1 --- 2 --- 3 Relaxed

Closed 1 --- 2 --- 3 Open

Rigid 1 --- 2 --- 3 Loose

A tense body includes sitting in a stiff, erect position and having clenched limbs.

A closed body position is defined in terms of a defensive stance, with arms and/or legs stiffly crossed and the body taking up little space.

A rigid body position was defined by stiffness, and lack of expressive movement (i.e., lack of hand gestures, head or leg movements).

Appendix F: Complete Study 3 Questionnaire

After-Interview Rating Questions

1. Overall, the interview with my partner went smoothly

Strongly Agree 1——2——3——4——5——6——7 Strongly Disagree

2. How friendly was your partner?

Extremely Friendly 1——2——3——4——5——6——7 Extremely Unfriendly

3. How talkative was your partner?

Extremely Talkative 1——2——3——4——5——6——7 Extremely Untalkative

4. How articulate (i.e. uses language easily and fluently; talks clearly) was your partner?

Extremely articulate 1——2——3——4——5——6——7 Extremely Inarticulate

5. Generally speaking, how similar were you and your partner to each other?

Extremely Similar 1——2——3——4——5——6——7 Extremely Dissimilar

6. How similar in physical appearance do you think you were to your partner?

Extremely Similar 1——2——3——4——5——6——7 Extremely Dissimilar

Name Letter Preference Task

Instructions:

Consider each letter of the alphabet in turn. You may have a gut, intuitive reaction regarding how much you like or dislike each letter. For each of the 26 letters of the alphabet, please indicate your level of liking or disliking by placing a number in the appropriate box. Also rate your liking of the smiling and frowning face symbols using the same 9-point scale.

1 Dislike Very Much
2
3
4
5 Neither like nor dislike
6
7
8
9 Like very much

Example: If you really like the letter X, you might place an 8 or 9 in the appropriate box

X	8

Please fill in each of the boxes below):

A	B	C	D	E	F	G
H	I	J	K	L	M	N
O	P	Q	R	S	T	U
V	W	X	Y	Z	☺	☹

Body Esteem Scale

INSTRUCTIONS: The next section asks about your self-views regarding your body. There are no right or wrong answers to any of these statements; we are interested in your honest reactions and opinions. Please read each statement carefully, and respond by using the following scale from 1 to 7 by circling the appropriate numbers:

		Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Strongly Agree
1.	I like the natural colour of my hair.	1	2	3	4	5	6	7
2.	I like the wave pattern of my hair (e.g. straight, wavy, curly, etc.)	1	2	3	4	5	6	7
3.	I like the current length of my hair	1	2	3	4	5	6	7
4.	I am content with the natural tone and colour of my skin	1	2	3	4	5	6	7
5.	I am content with my current height	1	2	3	4	5	6	7
6.	I am content with my current weight	1	2	3	4	5	6	7
7.	I like my natural eye colour	1	2	3	4	5	6	7

Demographics

1. Age: _____

2. Nationality _____

2. Sex (Check one):

❒ Male ❒ Female ❒ Other

3. Which hand do you use to write with? (Check one)

❒ Right ❒ Left ❒ Both/Either

4. Do you have any problems with your vision that requires corrective lenses? (check one)

☐ Yes, and I'm wearing glasses right now

☐ Yes, and I'm wearing contact lenses right now

☐ Yes, but I'm not wearing glasses or contact lenses right now

☐ No, I do not need corrective lenses to correct my vision

5. How tall are you? _____

6. Approximately how much do you weigh? _____

7. What colour are your eyes? _____

8. Please indicate the initials of your first and last name in the blank provided
(i.e. John Doe would be J. D.). _____

Comments (Optional)

VIDEO AND PHOTO RECORDS RELEASE FORM

As part of this project we have taken your picture and made video recording of you while you participated in the research. We would like you to indicate below what uses of these records you are willing to consent to. This is completely up to you. We will only use the records in ways that you agree to. In any use of these records, your name will not be identified.

Please place a checkmark on the appropriate line, and **sign in the appropriate blank at the bottom**

---

1. The records can be studied by the research team for use in the research project. This includes only the researchers directly involved in conducting this study.

Photo: Yes _____ No_____
Video: Yes _____ No_____

2. The records can be shown to subjects in other experiments. For example, we might use your photo for stimuli in reaction time tests, or ask future participants to compare how physically similar your face is to other photos we present them with.

Photo: Yes _____ No_____
Video: Not Necessary (Will not be shown to other participants)

I have read the above descriptions and give my consent for the use of the records as indicated above.

Signature _____ Date _____

Table 1: Inter-rater reliability for physical traits coded in study 2

Variable	% Agreement	Kappa	95% CI Kappa Lower	95% CI Kappa Upper
Sex	99.4%	.987	.969	1.00
Glasses	97.3%	.908	.846	.971
Skin Colour	86.0%	.658	.567	.750
Hair Colour	85.8%	.704	.619	.789
Hair Length	88.7%	.669	.567	.770

* Reliabilities based on a sub-sample of 2 classes (N = 312 participants)

Table 2: Univariate results comparing indexes of adjacency to zero

Variable	Mean (SD) Aggregation Index	Number of Negative Indexes	Univariate F-test (Comparing to zero)
All Inclusive			
Sex	-2.60 (0.92)	14 of 14	$F(1,13) = 111.7$, $p < .001$
Skin Colour	-2.01 (1.40)	14 of 14	$F(1,13) = 28.7$, $p < .001$
Glasses	-0.68 (1.11)	9 of 14	$F(1,13) = 5.26$, $p = .039$
Hair Colour	-0.45 (0.98)	8 of 14	$F(1,13) = 2.92$, $p = .111$
Hair Length	-0.94 (1.23)	9 of 14	$F(1,13) = 8.21$, $p = .013$
Females Only			
Glasses	-0.56 (1.07)	11 of 14	$F(1,13) = 3.79$, $p = .074$
Hair Colour	-0.35 (1.30)	12 of 14	$F(1,13) = 1.00$, $p = .336$
Hair Length	-0.90 (0.94)	10 of 14	$F(1,13) = 12.8$, $p = .003$
Caucasians Only			
Glasses	-0.51 (0.88)	10 of 14	$F(1,13) = 4.68$, $p = .050$
Hair Colour	-0.11 (0.90)	8 of 14	$F(1,13) = 0.22$, $p = .646$
Hair Length	-0.78 (1.07)	8 of 14	$F(1,13) = 7.36$, $p = .018$
Acquaintances Only			
Sex	-2.54 (1.39)	14 of 14	$F(1,13) = 46.9$, $p < .001$
Skin Colour	-1.95 (1.89)	12 of 14	$F(1,13) = 15.0$, $p = .002$
Glasses	-0.90 (0.94)	12 of 14	$F(1,13) = 12.8$, $p = .003$
Hair Colour	-0.51 (0.99)	9 of 14	$F(1,13) = 3.70$, $p = .077$
Hair Length	-0.56 (0.97)	10 of 14	$F(1,13) = 4.62$, $p = .051$
Strangers Only			
Sex	-0.80 (1.10)	12 of 14	$F(1,13) = 7.45$, $p = .017$
Skin Colour	-0.98 (0.80)	12 of 14	$F(1,13) = 21.34$, $p < .001$
Glasses	0.22 (1.05)	6 of 14	$F(1,13) = 0.63$, $p = .441$
Hair Colour	0.19 (0.90)	6 of 14	$F(1,13) = 0.62$, $p = .446$
Hair Length	-0.59 (1.17)	9 of 14	$F(1,13) = 3.61$, $p = .080$

Table 3: Means, standard deviations, range and skewness of all variables in study 3

Variable	Mean	SD	Range	Skewness (SE)
Physical Similarity	6.75	2.52	3 to 14	.399 (.285)
Composite Similarity	1.79	1.10	0 to 5	.519 (.306)
Perceived Physical Similarity	5.21	1.41	2 to 7	-.481 (.285)
Perceived Overall Similarity	4.04	1.10	2 to 7	.377 (.285)
Attractiveness	8.96	2.16	5 to 13	-.128 (.285)
1st Seating Distance (cm)	162.7	22.9	111 to 198.5	-.617 (.302)
2nd Seating Distance (cm)	132.2	23.2	60 to 179	-.609 (.291)
Nonverbal Mimicry (% time)	29.5	23.8	0 to 93.3	.882 (.287)
Eye Gaze (% time)	47.0	11.4	16.7 to 76.7	-.014 (.287)
Smiling (% time)	16.2	10.2	0 to 53.3	1.27 (.287)
Speech Disfluencies (per min)	5.90	2.27	1.24 to 13.2	.558 (.287)
Body Relaxation	15.5	3.21	9 to 23	-.024 (.287)
Implicit Association Task	.615	.346	-.200 to 1.36	-.09 (.314)
Name Letter Preference Task	1.84	1.74	-4.33 to 4.20	-1.33 (.283)
Body Esteem	37.0	6.37	11 to 48*	-.966 (.285)
Pos. Attitudes toward Confed.	10.6	5.40	4 to 27†	1.50 (.285)

Note, raw means before data transformations are reported here for ease of interpretation.

* After transforming the outlier, the range on body esteem was from 24 to 48

† Note that high scores on this variable = a negative attitude towards the confederate

Table 4: Physical similarity, attractiveness, sex and race predicting first seating distance measure

	Physical Similarity Only			Controlling for attractiveness, sex & race			
Variable	B	SE B	β	B	SE B	β	Partial Correl.
P. Similarity	.780	1.16	.086	1.62	1.38	.179	.144
Sex				-.817	6.60	-.016	-.017
Race				-2.38	8.02	-.045	-.040
Attractiveness				-.952	1.30	-.094	-.098
Attractiveness^2				1.69	.559	.377**	.374**
R^2		.007			.168†		

Note: Physical similarity and attractiveness were centered at their means

† $p < .07$ **$p < .01$

Table 5: Physical similarity, attractiveness, sex and race predicting the second seating distance measure

	Physical Similarity Only			Controlling for attractiveness, sex & race			
Variable	B	SE B	β	B	SE B	β	Partial Correl.
P. Similarity	-.388	1.11	-.394**	-.356	1.42	-.361*	-.303*
Sex				-2.86	5.71	-.058	-.063
Race				2.76	7.63	.051	.046
Attractiveness				-.481	1.27	-.044	-.043
Attractiveness^2				1.14	.552	.238*	.253*
R^2		.156**				.219**	

Note: Physical similarity and attractiveness were centered at their means

* $p < .05$ **$p < .01$

Table 6: Individual physical similarity variables predicting the second seating distance measure

	Similar to Confed.		Dissimilar to Confed.		
Variable	M (SD)	N	M (SD)	N	Independent t-test
Sex	130.2 (24.8)	46	136.2 (19.4)	22	$t(66) = 1.00, p = .32$
Race	129.9 (24.3)	52	139.6 (17.9)	16	$t(66) = 1.48, p = .15$
Glasses	130.9 (24.1)	37	134.2 (22.6)	30	$t(65) = 0.59, p = .56$
Hair Length	126.7 (16.7)	16	133.9 (24.1)	47	$t(61) = 1.11, p = .27$
Hair Colour	124.1 (26.9)	10	133.3 (22.6)	57	$t(65) = 1.16, p = .25$
Eye Colour	121.2 (27.0)	13	134.8 (21.7)	55	$t(66) = 1.94, p = .056$
BMI	130.2 (24.0)	47	136.7 (21.6)	20	$t(66) = 1.05, p = .30$

Table 7: Composite physical similarity, attractiveness, sex and race predicting second seating distance measure

	Physical Similarity Only			Controlling for attractiveness, sex & race			
Variable	B	SE B	β	B	SE B	β	Partial Correl.
P. Similarity	-5.88	2.62	-.283*	-5.60	2.82	-.269†	-.261†
Sex				-9.66	6.38	-.200	-.202
Race				-5.12	6.74	-.10	-.103
Attractiveness				.152	1.39	.014	.013
Attractiveness^2				1.21	.573	.261*	.276*
R^2		.062*			.126*		

Note: Attractiveness was centered at its mean, and this analysis uses a composite physical similarity variable as a predictor, as described in appendix C

† p = .05 *p < .05

Table 8: Zero-order correlations for all variables in study 3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1															
2	.39**	1														
3	-.28*	-.31*	1													
4	-.11	-.08	.34**	1												
5	-.18	-.14	-.30*	-.28*	1											
6	.08	.02	-.23†	-.06	.37**	1										
7	-.39**	-.28*	.09	-.05	.32**	.29*	1									
8	.09	.06	-.12	.02	-.09	-.08	-.03	1								
9	-.21†	-.02	.01	.08	.19	-.06	.32**	.15	1							
10	-.08	-.13	-.13	-.14	.15	-.23†	-.03	.01	.09	1						
11	.29*	.19	.02	-.19	.17	.074	-.04	-.17	-.27*	-.19	1					
12	-.20†	.00	-.11	-.05	.02	-.29*	-.14	.00	-.01	-.14	-.10	1				
13	.01	.23	.04	.01	-.00	-.19	.00	-.05	-.12	-.06	.32*	.03	1			
14	-.13	-.01	-.05	-.05	.29*	-.03	.09	-.06	.03	-.12	.12	.05	.34*	1		
15	.07	.07	-.12	-.12	.05	.06	.02	-.02	..19	.22†	.09	.02	-.05	.04	1	
16	.02	.01	-.10	.40**	.04	.17	-.03	-.13	-.04	-.10	-.13	.20	.03	-.02	-.23†	1

1 = physical similarity; 2 = composite physical similarity; 3 = perceived physical similarity; 4 = perceived overall similarity; 5= attractiveness similarity (attractiveness squared); 6 = first seating distance measure; 7 = second seating distance measure; 8 = % of time spent shaking foot; 9 = % of time making eye contact; 10 = % of time spent smiling; 11 = speech disfluencies per minute; 12 = body relaxation; 13 = implicit association test; 14 = name letter preference task; 15 = body esteem; 16 = positive attitude towards the confederate.

† $p < .10$ * $p < .05$ ** $p < .01$

Table 9: Physical similarity, attractiveness, sex and race predicting speech disfluencies

	Physical Similarity Only			Controlling for attractiveness, sex & race			
Variable	B	SE B	β	B	SE B	β	Partial Correl.
P. Similarity	.283	.106	.310*	.308	.134	.336*	.277*
Sex				-.466	.584	-.096	-.100
Race				.257	.760	.049	.043
Attractiveness				-.044	.126	-.041	-.043
Attractiveness^2				.101	.054	.222†	.217†
R^2		.096*			.157†		

Note: Physical similarity and attractiveness were centered at their means

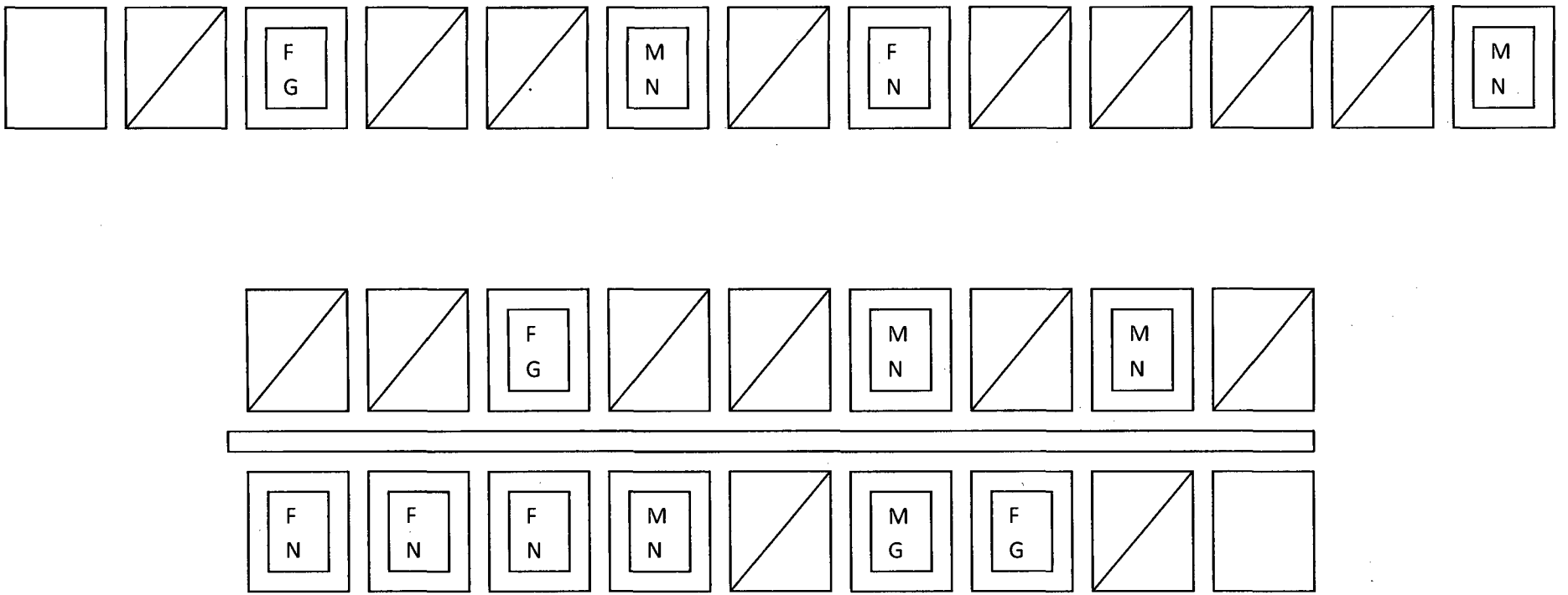
† $p < .07$ *$p < .05$

Table 10: Multiple regressions testing name letter preference, implicit self esteem and body esteem as moderators

	Physical Similarity			Name Letter Preference			Similarity x NLP Interaction			
Dependant V.	B	SE B	β	B	SE B	β	B	SE B	β	R^2
Distance 1	.655	1.19	.073	-1.51	14.8	-.013	-5.19	5.38	-.126	.024
Distance 2	-3.64	1.14	-.369**	1.33	1.55	.099	-4.02	5.46	-.085	.170**
Mimicry	.679	1.18	.071	-.493	1.72	-.035	-4.64	5.43	-.105	.019
Eye Gaze	-.868	.560	-.190	.490	6.74	.006	.712	2.57	.034	.038
Smiling	-.042	.069	-.076	-.878	.826	-.131	.113	.315	.044	.022
Disfluencies	.306	.105	.334**	1.61	1.27	.146	.719	.485	.170	.149*
Body Relax	-.224	.156	-.175	.636	1.88	.041	-.654	.717	-.111	.043
	Physical Similarity			Implicit Self Esteem			Similarity x ISE Interaction			
Distance 1	.323	1.24	.037	-15.9	10.2	-.228	-3.91	4.08	-.141	.056
Distance 2	-4.76	1.20	-.491**	-.432	8.21	-.007	-.799	3.48	-.029	.238**
Mimicry	1.92	1.19	.216	-1.63	8.87	-.025	2.90	3.72	.107	.056
Eye Gaze	-.713	.587	-.163	-3.11	4.37	-.097	1.33	1.83	.100	.053
Smiling	-.053	.079	-.093	-.271	.585	-.065	-.002	.245	-.001	.013
Disfluencies	.286	.116	.305*	2.07	.862	.302*	-.131	.362	-.046	.197**
Body Relax	-.262	.169	-.205	-.120	1.26	-.013	-.859	.528	-.220	.082
	Physical Similarity			Body Esteem			Similarity x BE Interaction			
Distance 1	.667	1.20	.074	.230	.565	.054	.086	.234	.048	.012
Distance 2	-3.97	1.14	-.403**	.101	.460	.025	-.106	.207	-.059	.160*
Mimicry	.747	1.15	.078	-.108	.493	-.026	.435	.207	.251*	.070
Eye Gaze	-.944	.544	-.206†	.408	.234	.208†	-.059	.098	-.072	.085
Smiling	-.045	.067	-.081	.053	.029	.222†	.006	.012	.055	.056
Disfluencies	.280	.108	.306*	.026	.046	.066	-.009	.019	-.056	.103†
Body Relax	-.223	.156	-.174	.018	.067	.032	-.025	.028	-.107	.042

Note: Physical similarity and all moderator variables were centered at their means

† $p < .10$ * $p < .05$ ** $p < .01$



Each Square represents a chair in front of a computer
F = Female; M = Male; G = Glasses; N = No glasses
If no letters are present, the seat is empty

Figure 1. Sample seating diagram with actual data from study 1

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