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Effect of Valenced Vicarious Online Contact on Outgroup Prejudice and Perceived Outgroup Variability: A Study of Online Poker

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Abstract

Online poker has become a multibillion dollar industry, with millions of people from around the world both playing and watching online poker each year. Unlike live poker, players and watchers, typically cannot rely on physical cues of other players; in fact, the only information readily available to poker players is others' nationality. Because these poker games often involve members of different national groups, it constitutes an instance of indirect contact that has considerable research potential. This provides a unique opportunity to examine how attitudes and beliefs about people from other nationalities can be influenced by interactions in online poker. In the current research, we examined how observing an ingroup player have positive or negative contact with a player of another nationality impacted one's own attitudes and beliefs about the outgroup nation. Participants (N = 157) watched an online poker video recording of a fellow ingroup member have negative, positive, or no intergroup contact with an outgroup member at an online poker table. Subsequent affective (outgroup attitudes) and cognitive (perceived outgroup variability) measures of intergroup bias were taken. Data revealed that while observing negative contact increased outgroup prejudice, observing positive contact reduced prejudice (all relative to no intergroup contact). However, no differences were found in perceived outgroup variability, suggesting that merely watching positive and negative online poker interactions may only impact affective responses, but not cognitive representations about outgroups. Implications for online poker and future research in virtual and vicarious contact are discussed.

KEYWORDS: Online Poker; Prejudice; Positive contact; Negative contact; Vicarious contact; Outgroup variability

Since the emergence of the first online poker room, Planet Poker in 1998 (Philander & Abarbanel, 2014), online poker has evolved into a multibillion dollar industry, which in 2013 garnered an estimated €2.8 billion in gross profit (van Loon, van den Assem, & van Dolder, 2014). These numbers remain high despite a large drop in online poker players (mainly from the USA) due to new financial regulations (Lang, 2014; O'Leary & Carroll, 2013; van Loon et al., 2014). The largest internet poker operator PokerStars has purportedly registered over 100 million players since its inception in 2001 (PokerStars, 2016), although traffic to its website fell by 26 percent after the regulations established by the U.S. government (Stewart, 2011). Nevertheless, each day tens of thousands of players (van Loon et al., 2014) from at least 85 different nations (Stewart, 2011) interact with each other through online poker.

Interestingly, unlike the numerous cues one gets about others whilst playing live poker, the only information typically available about other players in online poker (other than usernames and playing styles) pertains to their respective nationalities (the country where they signed up for their user account).[1] This information is often available by either seeing the nationality of each player when choosing a poker table to sit at and/or when hovering over or right clicking a player's username. In other words, unlike face-to-face interactions or even communication through other online mediums, information about age, sex, ethnicity, appearance, and other characteristics is not available in online poker. This provides researchers with a unique context in which to study intergroup relations.

Given the number of people who use online poker venues to play, or simply watch games at tables before they sit down to play at one, the present research examines how such indirect exposure to positive or negative interactions between players of different nationalities

[1] However, there are some exceptions of poker websites where nationality is either not apparent or hidden, and there are some other poker websites that use cameras where one can see the players online. The top poker websites in terms of traffic, however, all have nationality displayed as the primary source of information about other players besides their usernames.

might influence their views of people from those countries. To do this, the present work examines the effects of both positive and negative contact in an online poker context, a context previously ignored in research on intergroup contact. Previous research on online poker has mostly focused on problem gambling (e.g., Mitrovic & Brown, 2009), judgment and decision making (Siler, 2010), gender and race representations in poker avatars and advertisements (Ingen, 2008), or the subculture that exists for online poker players (O'Leary & Carroll, 2013). However, no work to date has examined how online interactions between poker players from different national groups could have spill over effects on one's views about people from other nations.

Intergroup Contact as a Means of Reducing Prejudice

Over the years, social psychologists have established that an important way to reduce intergroup prejudice is via intergroup contact (Al Ramiah & Hewstone, 2013; Pettigrew & Tropp, 2008). The contact hypothesis, first proposed by Gordon Allport (1954), stated that under certain conditions, positive contact with outgroup members should result in less prejudice toward outgroup members compared to those that do not have contact with outgroup members. Allport (1954) proposed that the conditions necessary to reduce prejudice were: equal status among the participants (e.g., background, wealth); intergroup cooperation; working towards a common goal; and the contact must have institutional support (Allport, 1954). However, subsequent research has shown these conditions to be facilitating, rather than necessary, conditions (Pettigrew & Tropp, 2006).

Since Allport's (1954) original contact hypothesis, scores of research studies have demonstrated the efficacy of direct, face-to-face contact (Al Ramiah & Hewstone, 2013; Pettigew & Tropp, 2006). For example, having friends from a minority outgroup is especially effective at reducing levels of intergroup prejudice (Davies, Tropp, Aron, Pettigrew, & Wright

2011). A meta-analysis combining data from over 500 studies examining the relationship between direct contact and prejudice revealed an overall effect, whereby contact significantly reduces prejudice (r = -.22; Pettigrew & Tropp, 2006), but this effect was augmented when Allport's optimal conditions were realised.

However, direct contact is not the only means of contact that reduces prejudicial attitudes, stereotyping, and discriminatory behavior — indirect forms of contact have also been shown to be effective at reducing prejudice and intergroup conflict (Dovidio, Eller & Hewstone, 2011; Harwood, Hewstone, Amichai-Hamburger & Tausch, 2014; Lemmer & Wagner, 2015). Indirect contact may encompass (a) vicarious contact: observing an ingroup member interact with an outgroup member, typically through some form of media (Harwood et al., 2013; Mazziotta, Mummendey & Wright, 2011); (b) extended contact: knowledge that an ingroup member has direct contact/friendship with an outgroup member (Dovidio et al., 2011; Tausch, Hewstone, Schmid, Hughes, & Cairns, 2011); (c) imagined contact: imagining interacting with an outgroup member (Crisp & Turner, 2009); and (d) virtual contact: contact can made via the internet (Yablon, & Katz, 2001).

Indirect Contact for Prejudice Reduction. Over the last decade, there have been numerous studies demonstrating the efficacy of indirect contact for reducing outgroup prejudice (for a review see Vezzali, Hewstone, Capozza, Giovannini, & Wolfer, 2014). For example, children and adolescents who identified with the positive character "Harry" from the Harry Potter books (compared with those identifying with the villain Voldemort), had improved attitudes towards stigmatized groups such as immigrants and homosexuals (Vezzali, Stathi, Giovannini, Capozza, & Trifiletti, 2014). Similarly, virtual contact via internet chats between ingroup and outgroup members discussing a common goal reduced intergroup bias (White & Abu-Rayya, 2012). Specifically, internet chats between Australian Muslim and Australian Christian high school students around environmental issues was found to reduce

outgroup bias compared to those in the control condition, who only got to chat with ingroup members online, and this decrease in bias was maintained 6 months after the program (White & Abu-Rayya, 2012).

Of specific relevance to the present work is vicarious contact, which can be an effective and inexpensive way to reduce prejudice. Previous research that has investigated the effects of vicarious contact on attitudes and willingness to engage in contact with outgroup members has posited that vicarious contact offers ingroup members a model to show that cross-group contact *can* take place, and *how* it can be achieved (Harwood et al., 2013; Mazziotta et al., 2011). For example, Mazziotta et al. (2011) had German participants watch videos of either a Chinese student and a German student or two German students interacting positively in daily life. Those that watched the Chinese and German students interact positively had a greater willingness to engage in contact and showed improved attitudes towards outgroup members (Chinese). The present work examines the impact of positive *and* negative vicarious contact in an online poker setting on two indexes of outgroup bias.

Negative Contact and Increased Prejudice. While previous research investigating the effects of intergroup contact has mainly focused on the outcome of positive contact (e.g., Pettigrew & Tropp, 2006), considering the effect of negative contact is imperative in order to gain a fuller picture of the effectiveness of intergroup contact (Graf, Paolini, & Rubin, 2014; Harwood et al., 2013; Lolliot et al., 2014; Pettigrew, 2008). Indeed, researchers have started to investigate the effects of negative intergroup contact on outgroup attitudes and behavior (Barlow et al., 2012; Graf et al., 2014; Paolini, et al., 2014). However, with the exception of a few studies (e.g. Joyce & Harwood, 2014), previous research on negative intergroup contact has largely utilized surveys of participants (as opposed to experimentally manipulating contact valence) to ask how much positive and negative contact they have had with outgroup members (e.g., Barlow et al., 2012; Techakesari et al., 2015) and correlate these with outgroup attitudes.

For example, Barlow et al. (2012) revealed a positive-negative contact asymmetry, such that negative contact more strongly predicted hostile outgroup attitudes than positive contact predicted positive outgroup attitudes. Thus, any benefits from positive contact may be offset by negative contact experiences (Barlow et al., 2012). Prior research has also stipulated that negative intergroup contact (vs. positive contact) causes group memberships to become more salient (Paolini, Harwood, & Rubin, 2010), and greater salience will lead to negative views generalizing more strongly to the outgroup as a whole than positive contact elicits positive views of the outgroup (Paolini et al., 2014). Additional research has found that for outgroups that are typically perceived negatively, having negative contact with this outgroup provides a better "fit" to prior negative perceptions, which leads to greater salience (Harwood et al., 2017).

Recently, Graf et al. (2014) proposed an explanation as to why prior meta-analyses on positive intergroup contact (e.g., Pettigrew & Tropp, 2006) concluded that positive contact reduces prejudicial attitudes when other research has demonstrated that negative intergroup contact can reverse beneficial effects of positive contact (Barlow et al., 2012; Paolini et al., 2014). They suggest that the sheer number of positive contact experiences greatly outnumber the number of negative experiences. Thus, even though negative contact may be more powerful in influencing outgroup attitudes, the overall number of positive contact scenarios can buffer against increased prejudicial attitudes (Graf et al., 2014).

In the context of vicarious contact, recent research has looked at intergroup contact through media exposure (Joyce & Harwood, 2014). Specifically, participants in this study watched video clips from a documentary about a volunteer border patrolman from the U.S. who is sent to live with a family of undocumented immigrants for 30 days. Participants were randomly assigned to watch intergroup interactions between the border patrolman and undocumented immigrant that were primarily positive, negative, or mixed (or unrelated in the control condition). Their results revealed that participants who watched the positive interaction

between the two characters reported less prejudicial attitudes compared to the negative and control conditions. However, there was no difference in prejudicial attitudes between the negative and control conditions. While this work is very informative about the impact of vicarious contact on outgroup attitudes, this study drew explicit attention to the social identity of the characters in the video as a U.S. citizen and undocumented immigrant, while ensuring that the interactions between the characters were a central focus of the manipulation. This raises the question of whether people need to be acutely aware of the nature of the intergroup contact and social group membership to show changes in their outgroup attitudes. To address this, we examine whether the valence of intergroup contact in the background of a task (in the form of chat messages) would have similar carry over effects on outgroup attitudes, and use a more subtle manipulation of group membership (i.e., flags as avatars to indicate nationality). Additionally, while Joyce and Harwood (2014) focus on the impact of vicarious intergroup contact on outgroup attitudes, the present study also examines whether vicarious intergroup contact has carry over effects on cognitive representations of the outgroup, by assessing perceptions of outgroup variability.

Perceived Outgroup Variability. Perceived outgroup variability measures beliefs concerning the homogeneity of the outgroup, i.e., how similar or dissimilar members within the outgroup are on various dimensions (Swart, Hewstone, Christ & Voci, 2011). Such an index provides insight into how the outgroup is cognitively represented. In a study of inter-religious contact between Muslims and Hindus in Bangladesh, Islam and Hewstone (1993) found that intergroup contact was associated with increased perceived outgroup variability, as well as positive attitudes towards the outgroup, and intergroup anxiety partly mediated these relationships. Research has also found that imagined contact can increase perceived outgroup variability (e.g., Turner, Crisp, Lambert, 2007). Perceived outgroup variability has been shown to predict…

However, it is unclear whether *vicarious* intergroup contact can impact perceived outgroup variability. According to the social identity model of deindividuation effects (SIDE), when there are limited cues to individuate a person, as in computer mediated communication (CMC), even subtle cues (e.g., gender, ethnicity) are magnified, and interaction partners form more stereotypical representations about their outgroup partner (Kim & Park, 2011; Walther, 1996). This would suggest that because there are limited cues about opponents in online poker, players may use stereotypes or heuristics based on a player's nationality to try and gain some kind of knowledge about their opponent. In line with this, Aberson (2015) found that negative contact was not only related to affective measures of prejudice, but also a cognitive dimension of intergroup bias (i.e., stereotypes). Notwithstanding this evidence that contact *can* change stereotypes, it does not always do so. In general, positive intergroup contact tends to have a stronger effect in changing affective dimensions of prejudice such as emotions or feelings about the outgroup than cognitive dimensions of prejudice such as stereotypes (see meta-analysis by Pettigrew & Tropp, 2006). While some previous work has examined the effects of negative contact on cognitive dimensions of intergroup bias such as stereotyping, no work (to the best of our knowledge) has examined the impact of negative contact on perceived outgroup variability particularly. The current research therefore examines the effects of positive and negative vicarious intergroup contact on perceived outgroup variability as well as outgroup attitudes.

The Present Research

The present research utilizes a vicarious contact paradigm by experimentally manipulating participants to watch videos of various Texas Hold'em online poker hands[2]

[2] In Texas Hold'Em poker, players are each dealt two cards (hole cards) and given the chance to bet before three community cards are dealt (the 'flop') upon which players may bet again. Following this, two more cards are dealt (the turn & the river) both of which encompass a round of betting each.

with a positive or negative form of contact between an ingroup and outgroup player (compared to a no contact control condition) on two important dependent variables: outgroup prejudicial attitudes and perceived outgroup variability. While prejudicial attitudes gauge how favorable/ unfavorable one feels about an outgroup as a whole, perceived outgroup variability measures how similar or dissimilar members within the outgroup are on various dimensions (Swart et al., 2011). We chose to look at these measures because they measure different constructs, and map onto a distinction between affective and cognitive dimensions of intergroup bias (e.g., Aberson, 2015; Tropp & Pettigrew, 2005). Measures that assess attitudes towards outgroup members probe affective aspects of bias, whilst measures that assess variability of the outgroup (e.g. stereotyping) tap more into the cognitive aspects of bias (Tropp & Pettigrew, 2005).

We predicted that observing positive contact between a member of the national ingroup with a poker player from another country would lead observers to feel more positively about the outgroup and rate them as having more variability. Conversely, we predicted that observing negative contact between an ingroup member with a poker player from another country would lead observers to feel more negatively about the outgroup and rate them as having less variability and being more homogenous in their thoughts and behavior. Whilst previous research in vicarious negative contact has mainly utilized survey data (e.g., Barlow et al., 2012; Techakesari et al., 2015, but see Joyce & Harwood, 2014), our current study tests the effects of both positive and negative contact in an experimental paradigm.

Investigating the effects of watching online intergroup interactions takes place is important because millions of viewers each year watch online gaming (including poker; Davy, 2017) and most people have more exposure to outgroup members via mass media than direct contact (Mutz & Goldman, 2010). Observing others playing at online poker tables is a

form of passive observation which is quite common in online communication formats (e.g., multiplayer games, blogs, and forums; Ramirez, Walther, Burgoon, & Sunnafrank, 2002). Such passive viewing of poker tables is also referred to as "lurking" in the computer mediated communication (CMC) literature. "Lurkers" are people who tend to observe rather than participate in online forums (Ramirez, Zhang, McGrew, & Lin, 2007), and it has been stated that the overwhelming majority of members in online forum groups "lurk"; in some instances over 90% of members "lurk" without actively participating (Nonnecke & Preece, 2000). Online poker is another platform where members can observe others playing poker and interacting, either while they are sitting at an online poker table, or invisibly by purely watching tables, analogous to "lurking".

People can also watch online gaming, via websites such as YouTube or a streaming site such as Twitch. Users can let others watch them play online games via a live stream. The top ten channel views for online gamers Twitch streaming are in the hundreds of millions per streamer with the highest twitch streamer having over 900 million channel views (compared to the top online poker streamer who has over 18 million channel views; Davy, 2017). Due to the popularity of this format, it is of considerable interest to see if viewers' attitudes and beliefs about outgroups can be affected just by watching an ingroup and outgroup member play games.

In the current study, participants were recruited under the guise that they were to analyse a few No Limit Texas Hold'em (NLHE) poker hand plays. In actuality, participants watched one of three videos edited from actual poker hands from a real online poker client, that portrayed either negative, positive, or no contact situations between a New Zealand (NZ) and Russian poker player. These contact situations were subtle and involved text dialogue in the chatbox (a window which participants can use to talk to each other) located at the bottom left of the screen. In real life, online poker players use these chatboxes when playing and sometimes players use these spaces to insult or compliment each other. In the present work,

Russia was chosen as the target outgroup because not only is it in the top five countries that have registered online poker players (Fiedler & Wilcke, 2011), but Russians comprise less than 1% of the New Zealand population (Statistics New Zealand, 2013), making it unlikely that participants had experienced much personal contact with Russians previously, or that they had particularly strong positive or negative feelings toward them beforehand.

Method

Participants

One hundred and fifty-seven adults recruited from a large public university in New Zealand participated in the study, including 52 males and 105 females. Previous research using an experimental paradigm for vicarious intergroup contact (Cooley & Burkholder, 2011; Joyce & Harwood, 2014; Mazziotta et al., 2011) utilized between 23 to 41 participants per condition and found medium to large effect sizes. A power analysis based on the effect sizes observed in previous work (Cooley & Burkholder, 2011; Joyce & Harwood, 2014; Mazziotta et al., 2011) suggests that an overall sample size of 85 is required to obtain 80% power. However, we chose a more conservative estimate and recruited at least 50 participants per condition based on the recommendations of Simmons, Nelson and Simonsohn (2013). The ethnic composition of the sample comprised New Zealanders of European (N = 101), Maori (N = 9), Asian (N = 25), Pasifika (N = 5), Indian (N = 8), and Middle Eastern (N = 2) descent, and some identified as "other" (N = 7). All participants were New Zealand residents or citizens. Participants were recruited via posters displayed around campus, a subject recruitment website, or via the psychology participant pool. Those recruited via posters or the subject recruitment website were compensated with a $10 gift voucher, with an additional chance to go into the draw to win a major prize of either a $100 or $50 gift voucher, whilst those in the participant pool

received course credit for their time. Participants provided informed consent for their participation in the study. Most participants reported having limited experience with online poker, including a majority saying they had not played online poker before (67.5%), while others indicated varying levels of experience ranging from those playing a few times in their life (23.7%) to others playing a few days each month or week (8.3%).

Materials

Poker Video Manipulation. Three videos of online poker hands, each approximately six minutes in length, were created by editing actual screen captured footage from an online poker client software. All videos involved a NZ player at an online poker cash/ring table with five other players, including one Russian player (in actuality it was the primary researcher as the NZ player, and a Russian player as a confederate).[3] When playing online poker there are no cues about what players look like, so they can choose an assortment of avatars or personal images to display at the table beside their user name. For the purpose of this study, the NZ player had the New Zealand flag as their personal image, and the Russian player had the Russian flag (it is not uncommon to do so in the game). The other five players did not have flags as their image; instead they had images such as a chicken, fish, or wizard etc.

In the positive contact condition, participants witnessed positive exchanges between the NZ and Russian player including exchanges making small talk (e.g., "is it weekend there?"), throwing virtual trophies at one another, and complimenting each other on good hands (e.g., "well played!"). In the negative contact condition, participants witnessed a series of unpleasant exchanges, including throwing virtual eggs at each other and negative verbal exchanges such as calling the other player a "fish" (a player that generally loses lots of money because they

[3] The NZ and Russian players did not disclose their hands in real time to each other or collude in any way as this violates online poker rules, thus all hands were played legitimately.

will call any bet) or "donkey" (very poor player), and sharing personal insults (e.g., "U STUPID" or "shut up moron"). In both conditions, the Russian player initiated the positive or negative exchange, and in each case the NZ player was quick to respond with an equivalent reaction; this kind of valenced back and forth between the players lasted throughout the video.[4] Finally, the neutral condition showed no virtual exchange between the same Russian and NZ players; although the same NZ and Russian players sat at the table, there were simply no chat exchange between them. Across all conditions, any exchanges or comments that were made by the other players at the table were edited out. Verbal exchanges were a side distraction from the actual task and made via the chatbox located in the bottom corner of the screen, away from the main action of the poker hands being played. It should be noted that in the current study the compliments and insults were personal in nature and directed at the opposing player; these were not insults or compliments toward Russian or NZ national identities.

Measures

Demographic measures. We included questions about participants' sex, ethnicity, nationality, level of university study, and subject major. They then filled out questions relating to their previous poker playing experiences, including questions on how frequently they play or have played poker, and if they had played online poker before. There were also filler questions relating to poker to ensure the study's cover story was believable.

Prejudicial Attitudes. A feeling thermometer (Converse & Presser, 1986) was used to gauge participants' attitudes towards Russians as it is a standard measure of prejudicial

[4] As these were real games, we could not control the outcome of any particular round. However, the outcome of the game was similar across the two intergroup contact conditions with the Russian player winning 3 out of 6 hands in the positive condition, and 4 out of 7 hands in the negative contact condition. In the control condition, the Russian player won only 1 out of 6 hands, but this was because Russian player folded early in several of these rounds and other unrelated players won instead. Participants were only asked to rate how well they thought hands were played after watching the whole hand, and not how much any single player won or lost during the hand.

attitudes in the literature. Participants were instructed to indicate on a thermometer-style scale from 0 – 100, how they felt about various ethnic groups, with lower scores indicative of cold/unfavorable feelings and higher scores indicative of warm/favorable feelings. To make participants less suspicious about the true nature of the study, feeling thermometers for other national groups were also answered, and participants rated how they felt about Russians, Chinese, Arabs, Americans, and New Zealanders.[5]

Perceived Outgroup Variability. Perceived outgroup variability was measured by a two-item scale taken from Swart et al. (2011). Participants had to rate on a 5-point scale (1 = Completely Agree; 5 = Completely Disagree) to what extent they thought people within the various national groups were similar/ different: "All Russians think the same and have similar views and opinions on things"; "I think all Russians behave in the same way". To make participants less suspicious about the true purpose of the study, we also asked them the same questions about Chinese, Arabs, Americans, and New Zealanders. Ratings on both items were collapsed into a single index for each national group (all *r*'s > .50).

Procedure

Participants were recruited under the guise that they were to analyze a few hands of Texas Hold'em poker. Participants were welcomed into the lab and asked to take a seat in front of a computer. Participants were verbally briefed that they would be doing two separate studies as both were independently too short to be eligible for course credit or a $10 voucher. Therefore, participants were told that the poker study would be combined with another short survey (which was presented as the experimenter collecting data on behalf of another

[5] As an anonymous reviewer kindly pointed out, these measures could be used to examine whether there was evidence of secondary transfer effects (Pettigrew, 2009) of valenced contact from the primary group, Russians, to other secondary outgroups. Below, we report these analyses, but note that our study was not designed to test such effects; had it been, we would have assessed prior contact with the secondary groups, a prerequisite for strong tests of secondary transfer effects (see Tausch et al., 2010).

researcher). Both studies were actually part of the same study, but in order to prevent participants from connecting pieces of the study, deception was necessary.

Participants were then given an information sheet and consent form to sign for the "poker study", and once consented, participants began the first survey, which consisted of them first filling out their demographic information and previous poker playing experience questions. They were then prompted to let the researcher know that they had finished filling out the survey so that the poker videos could be loaded. Participants were asked to judge how well the poker hands were played overall based on their own level of poker playing experience by taking the perspective of the player with the hole cards[6] showing (the NZ player). The participants were then randomly assigned to one of the poker videos (positive, negative, or no contact) uploaded to YouTube. At the end of each hand, a screen popped up telling the participants to rate on the "Poker Hands Response Sheet" in front of them how well the hands of poker were played overall. The sheet contained two questions asking participants to rate how well the NZ player managed their hands. As participants varied in their level of knowledge about the game, we provided them with a sheet detailing the ranking of poker hands and asked them to make their best judgment using the information available to them. The answers to the response sheet were not of interest to the current research, it was merely included to enhance the illusion that participants were assessing poker hand plays.

Next, participants were given the consent form for the "second study" (a second consent form was used to aid in the illusion of participants taking part in two different studies). This study was framed as a survey on social attitudes. Participants then answered the questions on the second survey (the feeling thermometers and the perceived outgroup variability scales). Participants were then probed for suspicion before being debriefed about the true nature of the

[6] Hole cards or pocket cards: Cards dealt to a player. In Texas Hold'em each player gets dealt two cards.

study. None reported being particularly suspicious about the tasks they completed. Participants were finally thanked and given their voucher or course credit.

Results

Six participants failed to complete all measures of the study and were therefore not included in the analyses reported. Another participant was excluded because they had disclosed to the experimenter that they had extremely negative feelings towards Russians as their family's home country had been invaded by Russia.

Prejudicial Attitudes

A one-way analysis of variance (ANOVA) revealed that exposure to intergroup contact in an online poker context had a significant effect on prejudicial attitudes toward Russians using the feeling thermometer measure, $F(2, 147) = 8.75$, $p < .001$, $\eta^2_{p = .}11$ (see Table 1). Specifically, planned contrasts revealed that observing positive intergroup contact between a NZ poker player and a Russian poker player ($M = 62.63$; $SD = 18.68$) significantly increased positive attitudes toward Russians relative to observing no intergroup contact ($M = 55.55$; $SD = 14.28$), $t(147) = -2.14$, $p = .03$, $d = 0.424$, or negative contact ($M = 48.79$; $SD = 16.48$), $t(147) = 4.18$, $p < .001$, $d = 0.784$. Planned contrasts also revealed that exposure to negative contact in online poker ($M = 48.79$; $SD = 16.48$) led to increased prejudice toward Russians relative to exposure to no intergroup contact ($M = 55.55$; $SD = 14.28$), $t(147) = -2.01$, $p = .05$, $d = 0.439$. Subsequent analyses also revealed that participants' level of poker experience did not interact with the experimental conditions to influence prejudicial attitudes toward Russians, $F(2, 143) = 1.35$, $p = .26$, $\eta^2_{p = .}02$. Moreover, controlling for the effects of participants' level of poker experience did not alter the effects of intergroup contact on prejudicial attitudes toward Russians, $F(2, 140) = 8.71$, $p < .001$, $\eta^2_{p = .}11$.

Perceived Outgroup Variability

A similar one-way ANOVA revealed that exposure to intergroup contact in an online poker context had a non-significant effect on perceived outgroup variability toward Russians, $F < 1$, $p = .83$, $\eta^2_p = .003$ (see Table 2). Additionally, participants' level of poker experience did not interact with the experimental conditions to impact perceived variability of Russians, $F < 1$, $p = .67$, $\eta^2_p = .01$, and controlling for participants' level of poker experience had no impact on the results, $F < 1$, $p = .63$, $\eta^2_p < .01$.

Supplementary Analyses

As mentioned earlier, attitudes and perceived outgroup variability of people from other nationalities were included as distracters, but these could be analysed to examine for potential secondary transfer effects (Pettigrew, 2009; Tausch et al., 2010). However, it is important to note that these items were not included in the study with a priori predictions about a secondary transfer effect and therefore prior intergroup contact with these outgroups was not measured (a strong pre-requisite for secondary transfer; Tausch et al., 2010). Nevertheless, we examined whether positive and negative vicarious contact with a Russian player impacted attitudes toward people from other nationalities. A series of one-way ANOVAs revealed a significant effect of vicarious intergroup contact on attitudes toward Chinese, $F(2, 146) = 4.51$, $p = .01$, $\eta^2_p = .06$, but not toward Arabs, $F > 1$, $p = .40$, $\eta^2_p = .01$, or Americans, $F = 1$, $p = .37$, $\eta^2_p = .01$ (see Table 1). Planned contrasts on attitudes toward Chinese revealed that vicarious positive contact with Russians ($M = 66.17$; $SD = 16.61$) led to more positive attitudes toward Chinese relative to both no intergroup contact ($M = 56.06$; $SD = 18.14$), $t(146) = 2.82$, $p = .01$, and negative contact ($M = 58.08$; $SD = 19.00$), $t(146) = 2.27$, $p = .03$. However, there was no significant difference between vicarious negative contact with Russians and the no contact condition on attitudes toward Chinese, $t < 1$, $p = .58$.

Similarly, a series of one-way ANOVAs examined whether positive and negative vicarious contact impacted perceived variability of other national outgroups. All analyses

revealed a non-significant effect of vicarious intergroup contact with a Russian player on perceived variability of Chinese, Arabs, and Americans, all Fs < 1, all ps > .54, all η^2_p < .01 (see Table 2).

Discussion

The aim of the current study was to examine whether exposure to positive or negative contact in the context of online poker (a real-world venue where thousands of intergroup interactions take place each day) influenced outgroup attitudes and perceived outgroup variability. The results support the hypothesis that watching a fellow ingroup member in an online poker context (a context for vicarious contact) engage in negative contact can lead to more negative attitudes towards an outgroup compared with watching positive or neutral contact, while watching positive contact between the players can lead to less prejudicial attitudes towards the outgroup compared to watching negative or neutral contact. The present findings are striking as the interactions between the ingroup and outgroup members in the online poker context were extremely subtle and occurring in the background of the primary task of the participants. Even though participants were not asked to focus on the contact, but rather to decide whether the poker hands were being played well or not, they were still influenced by watching subtle interactions at the poker table.

Consistent with prior research demonstrating that positive indirect contact can reduce outgroup prejudice (e.g., Cooley & Burkholder, 2011), we find that simply observing a fellow co-national engage in brief positive exchanges with someone from a different country can improve our positive attitudes toward their entire national group. On the other hand, observing a fellow co-national engage in brief negative exchanges with someone from a different country in an online poker context can create more negativity toward the entire national group. Contrary to previous research (Barlow et al., 2012; Paolini et al., 2010), we find that positive and negative contact in such a context are both equally strong in changing

attitudes toward another group (but see Aberson, 2015) as the magnitude of the effect sizes for positive and negative vicarious contact relative to the no contact control was nearly identical. Moreover, our work is one of the few studies to use an experimental paradigm to compare positive and negative contact.

Contrary to the hypothesis regarding perceived group variability, there were no significant differences across the conditions. Although studies of both direct (Islam & Hewstone, 1993) and indirect (Turner et al., 2007) contact have reported that contact increased perceived outgroup variability, this result is consistent with findings that positive contact is more likely to change affective aspects of prejudice such as feelings/attitudes, rather than changing cognitive aspects of prejudice such as stereotypes (Pettigrew & Tropp, 2006; Tropp & Pettigrew, 2005; but see Paolini, Hewstone, & Cairns, 2007). It is also consistent with research, including meta-analyses which found stereotyped perceptions were not affected by, extended, and virtual intergroup contact (Alvidrez, Pineiro-Naval, Marcos-Ramos, & Rojas-Solis, 2015; Lemmer & Wagner, 2015), To change perceived outgroup variability, at least using a vicarious contact paradigm like the current study, perhaps participants need to have repeated exposure to positive or negative vicarious intergroup contact. In the current study, participants were exposed to only one Russian player and therefore they may not have had enough exposure to influence how much variability or dispersion they see of the outgroup (i.e., on whether all Russians think or behave the same way), although experimental studies of exposure to a single outgroup member have shown that this can change perceived variability, but not attitudes (Paolini, Rubin, Hewstone, & Pay, 2004). According to research on SIDE, anonymous, deindividuated players should be seen as being prototypical members of their nationality, and therefore those that have had limited or no direct or indirect contact with that outgroup would be more likely to assume that all members of that outgroup think and behave the same (Kim & Park, 2011). Therefore, it would be advantageous for future studies to have

repeated exposure to different members from the same outgroup, to be more in line with actual online gaming sessions which can last for hours with multiple players from a specific nation. Research on CMC reveals that having multiple sources reiterate the same message (multiple source effect; Harkins & Petty, 1987) can be persuasive in altering people's attitudes and behavior (Hsueh, Yogeeswaran & Malinen, 2015; Walther, Liang, Ganster, Wohn & Emington, 2012).

And finally, prior research has proposed that negative contact is a more consistent predictor of changing cognitive dimensions of prejudice, with negative beliefs being strengthened with negative contact (Aberson, 2015). Here, however, we found no evidence of negative vicarious contact changing perceived outgroup variability; again, this maybe because only one outgroup member was not sufficient to change perceptions of the entire group. With limited prior exposure to Russians, participants in the study may not have strong positive or negative stereotypes, and their perceptions of the group may simply not change based on observing interaction between one Russian player with a NZ player. Mean ratings of the Russians on both attitudes (56 on a 0-100 degree feeling thermometer; and 4.01 on the 5-point scale of perceived variability) bear this out; outgroup attitudes are mildly positive, and they are seen as quite varied.

Limitations and Future Research

Although the present study reveals some promising effects of positive and negative vicarious contact through online poker on intergroup attitudes, we acknowledge some limitations. First, our study took approximately 45 minutes to complete, so it is unclear how long-lasting these effects would be. It is worth noting that in actual online poker, the amount of exposure people would have to positive or negative contact is much greater than the 6-minute video used here. Playing the game in one sitting often takes hours (some tournaments last over

12 hours, and even viewers can watch games for hours), and frequent players can even participate as a full-time job. This means that if our subtle 6-minute manipulation could produce changes in prejudicial attitudes toward an outgroup, more extended exposure could be even more potent. However, the longevity of such effects is far from clear.

A second limitation of the present work is that we could not entirely control for the amount that the outgroup won or lost during a series of games as we utilized stimuli from real poker games and did our best to ensure that these were comparable across conditions. Future work would benefit from examining whether witnessing positive or negative intergroup contact while the outgroup wins or loses could influence the amount of outgroup prejudice that an observer later expresses. A third limitation is that in both the contact conditions, the outgroup member appeared to instigate the positive and negative contact and the ingroup member was quick to respond similarly. However, it may be interesting in future work to manipulate who is seen as the instigator in directing the nature of the intergroup contact to examine if this strengthens the impact of vicarious positive or negative intergroup contact.

Another limitation of the present work is that it does not examine the mechanisms underlying change in prejudicial attitudes through valenced intergroup contact. While previous research on intergroup contact has identified key mediators of direct and indirect forms of contact (see Pettigrew & Tropp, 2008; Swart et al., 2011; Vezzali et al., 2014), vicarious contact may reveal additional mediators. Future work should therefore examine the psychological mechanisms underlying the link between positive and negative vicarious contact and prejudice. And finally, although we did not set out to study secondary transfer effects (Pettigrew, 2009) in this work, and we emphasize that we could not control for prior contact with secondary outgroups, our results reveal mixed findings in this regard. We found a significant secondary transfer effect for positive vicarious contact on prejudice toward Chinese, but not on Arabs or Americans. As these items were only included as distracters and we did not have a priori

predictions about these (which is why we did not control for prior contact which is an important pre-requisite of secondary transfer effects; see Tausch et al., 2010), we do not read too much into these results. However, future work should more directly examine the possibility of secondary transfer in online poker by measuring prior intergroup contact (Tausch et al., 2010) and using a range of outgroups that perhaps vary in degree of similarity to the target outgroup.

Broader Implications

Online poker is a promising context in which to study intergroup contact as it is a real-life, albeit online experience for thousands of people every day. The present research demonstrates that even subtle contact in the background of a poker table can influence reactions from those just observing the game and not necessarily engaging in the intergroup contact themselves. Observing positive as well as negative contact between a member of our own group with someone from another group has the power to change our prejudicial attitudes toward the other group as a whole. If merely watching positive and negative intergroup contact can impact feelings toward people of other nationalities, then it is very likely that actual players would at least show similar if not stronger effects than observed here. Previous CMC research supports this notion that participating (vs. observing) leads to stronger reactions about other users (Ramirez et al., 2007).

Online poker also represents an important avenue for future research as it allows users to encounter outgroup members they may never have the chance to meet directly in the real world, and thus these players may be seen as prototypes or exemplars for the outgroup as a whole. When people personally witness someone from their own country having positive or negative contact with someone from an unfamiliar country, such interactions can be particularly potent in shaping their own attitudes about the group. Aside from vicarious contact, online poker offers a multitude of other contact scenarios to study. Virtual contact is a

prominent form of contact for those actually playing online poker as they are constantly interacting with players from around the world.

The present work also has applications for other forms of CMC including online platforms where people post comments or online games, all of which possess “lurkers” where other users can be observed. And with the prevalence of people streaming their games, this research can help inform how viewers of these streams may form impressions about others. With a multitude of options online to play games with people from all over the world, this research opens up the door to study how interacting with other players online can affect attitudes, behaviors, self-esteem, and more. As human behavior increasingly moves online, so must research, to do justice to the diversity of human social behavior. The present research provides a valuable starting point for future research on how intergroup contact in the context of online poker can help better understand intergroup relations.

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Table 1. Attitudes toward National Groups

	Positive Contact		Negative Contact		No Contact	
	n	**M (SD)**	***n***	**M (SD)**	***n***	**M (SD)**
Russians	52	62.63 (18.68)	49	48.80 (16.48)	49	55.55 (14.28)
Chinese	52	66.17 (16.62)	49	58.08 (19.01)	48	56.06 (18.14)
Arabs	52	55.00 (19.97)	49	50.51 (17.70)	49	50.78 (18.29)
Americans	52	63.62 (17.78)	49	58.43 (17.88)	49	60.86 (19.54
New Zealanders	52	78.10 (20.98)	49	82.45 (15.57)	49	81.12 (15.57)

Table 2. Perceived Variability of National Groups

	Positive Contact		Negative Contact		No Contact	
	n	**M (SD)**	***n***	**M (SD)**	***n***	**M (SD)**
Russians	52	3.96 (0.88)	52	4.06 (0.78)	49	4.02 (0.73)
Chinese	52	3.74 (1.11)	52	3.91 (0.87)	49	3.93 (0.82)
Arabs	52	3.88 (1.05)	52	3.94 (0.88)	49	4.07 (0.80)
Americans	52	4.02 (0.86)	52	3.91 (1.00)	49	3.92 (1.00)
New Zealanders	52	3.90 (0.98)	52	4.08 (0.85)	49	3.98 (0.92)