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REDUCING PREJUDICE: THE ROLE PLAYED BY PHYSICAL CONTACT IN INTERGROUP RELATIONS

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Introduction

It's early in the morning, just around that time where people head off to work or school. Walking down the street, a dad waves his child goodbye before leaving him for a long day at school. The child doesn't seem happy. His face is cross and does not want to go. A few instants of silence, they come closer and hug. The child calms down. He then enters the big building.

Along the street, two strangers accidently bump into each other. The person reacts with an instant soft tap on the shoulder of the other person. A smile pops into their faces; They seem to have found an agreement and carry on walking.

The situations mentioned above are clear examples of interactions in which non-verbal forms of communication, such as physical contact, are used to convey messages. Indeed, communication via touch is commonly found in daily life from childhood to adulthood (Hertenstein, 2002; Gallace & Spence 2010 for a review). For example, we rely on physical cues during social interactions not only to accompany words, but also to convey messages whose immediacy is at times more effective than words (Jones & Yarbrough, 1985; Thayer, 1982). For instance, we may use touch to greet, express appreciation, support, affection etc. Touch may affect people, not only when the touch involves individuals who know each other well and who have an existing close bond, but also when it occurs between strangers. In the present work touch may be conceptualized as any type of tactile exchange which occurs between individuals, such as hand touch and or a pat on the shoulder, to more intimate forms

of physical contact (e.g., hugs and massages). The forms of touch mentioned in the studies will be specified in the following chapters in order to clarify the type of touch used.

In the current critical review of the literature, we start from an analysis of the effects of physical contact at the intrapersonal level (e.g., effects one the person that receives the touch), we will later focus on the effects of the use of touch within interpersonal contexts (e.g., effects which affect the touchee and ultimately the toucher). At last, the current contribution further aims at discussing, for the first time, the effects of physical contact within intergroup contexts, this is when physical interactions occur between individuals pertaining to different groups (e.g., Italians and Moroccans or Chinese). Indeed, people's interactions may not only be conceptualized in terms of individual characteristics, but also based on intergroup characteristics such as being part of a social group (e.g., Asian or European; see Tajfel, 1982). This is important as this distinction may, in some cases, shape people's interactions which may be built, in the case of intergroup interactions, upon negative attitudes towards the outgroup member (e.g., Italians and Africans; see Tajfel, 1982 for a discussion). Given that our society is becoming more and more diverse, with increasing levels of international migration around the globe (IOM 2018), it is crucial to also consider how touch is perceived when the situation is governed by an intergroup mind-set and better understand whether and how intergroup touch affects intergroup relations. Given the well acknowledged individual-group discontinuity effect (Allport, 1924; Brown, 1954; Insko, Hoyle, Dardis & Graets, 1990; Le Bon, 1895), namely the manifest difference between behavior within an interpersonal and group-based context, this review will address whether or not the effects of touch found at the intrapersonal and interpersonal level, may replicate also when the touching behavior is embedded into an intergroup context. Thus far, to our knowledge none of the previous reviews found in the literature has specifically focused on the consequences of touch at the intergroup level. This review aims at filling this gap.

Altogether, this review aims at presenting evidence attesting the effects of touch at the intrapersonal level, at the interpersonal level and importantly at the intergroup level.

This review will further discuss about a line of research, which introduced physical contact not through direct experiences, but rather through simulation of this experience. This recent endeavour has recently developed taking into account that touch is highly discouraged in Western societies (Field 2010). Also, when physical contact is reframed as an intergroup behavior, touching an outgroup member may be counteracted by avoidance-like behavioral tendencies (Bianchi, Carnaghi, Shamloo, 2018; Carnaghi & Maass, 2006) and by establishing physical distance with this member (e.g., Amodio & Devine, 2006; Word, Zanna & Cooper, 1974). To the best of our knowledge, this is the first review on touch that also comprises extensive evidence on simulating intergroup touching.

The effects of touch at the intrapersonal level

Touch plays an important role in human life starting from infancy (Field, 2001; Hertenstein, 2002). Research on the effects of touch during the early stage of life has pointed out how touch is involved in neuro-development and socio-emotional development in infants (e.g.; Weiss, Wilson, Hertenstein, & Campos, 2000; Weiss, Wilson, & Morrison, 2004). Indeed, low birth weight infants who had been greatly stimulated by touch during their first months showed better visual-motor skills and more advanced gross motor development at 1 year of age (Weiss et al., 2004). Also, robust and healthy infants who had received nurturing touch at the age of three months were more likely to be described as having a secure attachment style compared to infants who had been less exposed to this type of touch (Weiss et al., 2000).

Other studies have also shown how the frequency of parental touching during childhood may also affect individuals as they grow older. Indeed, low frequency of physical contact during childhood is linked to higher levels of depression in young adults (Takeuchi et al., 2010). In a similar vein, a study by Field and colleagues (1992) found that the use of

physical contact in hospitalized depressed children and adolescents positively impacted those children who received back massages for one week compared to those who viewed relaxing videotapes (control group). Indeed, these children were found to be less anxious and depressed.

In addition, the use of touch during childhood has also been linked to the development of body image. Specifically, Gupta & Schork (1995) found that perceived nurturing touch during childhood was inversely correlated with drive for thinness and body dissatisfaction among female individuals.

Taken together, these results demonstrate how physical contact in infancy and childhood affects children's neuro-development and socio-emotional development as well as improve different facets of well-being in later stages of life.

As children grow up, with the acquisition of language, verbal communication becomes the primarily source of interaction among people, but non-verbal signals such as tactile exchanges (i.e., touch) still remain an important way of communicating various meanings and may thus strongly affect individuals also during adulthood (Jones & Yarbrough, 1985).

Several studies involving adults have relied on physiological measures to investigate the effects of touch in adulthood. These studies have provided evidence showing that the use of touch in couples enhances oxytocin (e.g., Holt-Lunstad, Birmingham, & Light, 2008; Morhenn, Beavin, & Zak, 2012) and decreases cortisol levels and heart rate. As a case in point, Ditzen and colleagues (2007) found that female participants who had been touched (i.e., massaged) on the neck/shoulder prior to a stressful event showed lower heart rate responses and lower cortisol levels compared to participants who had received verbal social support from their partner and a no partner condition. Cortisol is a hormone which is also released in response to stressing events and the link between stress and cortisol levels has been consistently found in the literature (Dickerson & Kemeny, 2004; Kirschbaum, Pirke, &

Hellhammer, 1993) Thus, the study by Ditzen and colleagues (2007) indicates that touch leads to a reduction in the stress-response system, through a reduction in cortisol levels and heart rates. Interestingly, mere verbal social support was not associated with reduced stress responsiveness. Furthermore, physical contact also affects oxytocin levels, which is a peptide hormone/neuropeptide likely playing a relevant role, among others, in social bonding (Holt-Lunstad, Birmingham, & Light, 2008). In this study, oxytocin levels were measured after an intervention involving touch between husbands and wives, in which couples were asked to engage in physical contact several times a week (e.g., massage) compared to a control group who was asked to just keep a diary of their physical affection with the partner and of their mood. The intervention group showed enhanced salivary oxytocin levels both early and late in the intervention compared to the control group. The reverse pattern was also found, this is oxytocin has been found to affect interpersonal touch. Scheele and colleagues (2014) showed that when heterosexual men believed they were being touched by a female participant, compared to a man, intranasal administration of oxytocin (compared to placebo) led them to perceive this touch (i.e., a touch on the shin and calf of both legs, moving from the knees toward the ankles) as more pleasant. Specifically, oxytocin administration increased the response of brain regions such as the insula, precuneus, pregenual anterior cingulate cortex and orbito-frontal cortex which represent regions associated with reward (Phillips, Drevets, Rauch & Lane, 2003). In sum, oxytocin increased the hedonic value of the heterosexual touch and thus may ultimately help individuals maintain social interactions (see, Ma, Shamay-Tsoory, Han & Zink, 2016).

This evidence indicates that touch is linked to physiological responses (but that the opposite pattern is also true, as in the case of oxytocin administration). Touch modulates individuals' physiological responses such as oxytocin and cortisol levels as well as individuals' heart rate, which may ultimately shape individuals' social behavior. Indeed, not

only touch may allow people to enhance their well-being, allowing the person to feel less social stress, but also strengthen the bond with the individuals involved in the interaction.

Furthermore, touch has shown to be linked to reduced anxiety levels in patients (e.g., Henricson, Ersson, Määttä, Segesten, & Berglund 2008; Mitchinson, Kim, Rosenberg, Geisser, Kirsh, Cikrit, 2007; Field et al., 1998) and to well-being as demonstrated by reduced feelings of pain (see Field, 2010 and 2014 for a review). Field and colleagues have found support for this in a wide range of situations including all chronic pain conditions as labor pain, back pain and migraine headaches (see Field et al., 2006 for a review).

Studies on touch have also targeted elderly individuals. As the need for touch is even greater than the need to verbalize among elderly clients (Bush, 2001), touch indeed plays a major role in this time of life and this is especially true when curative treatment is no longer useful. Indeed, comfort measures such as the use of touch assume greater importance in this stage of life because it represents a way of facilitating communication and enhances physical and psychological well-being (Sims, 1988).

In sum, evidence attests the importance of touch at intrapersonal level and in several domains of life from childhood to adulthood and ultimately among the elderly. These positive effects seem to not only be prompted by physiological reactions to touch, such as enhancement of oxytocin levels or reduction of cortisol levels, but seem also to be linked to psychological changes (e.g., reduced feelings of anxiety) which ultimately trigger an increase in general well-being at the intrapersonal level.

The power of touch at the interpersonal level

People are extremely receptive when it comes to understand non-verbal cues such as touch. In a series of studies, Hertenstein and colleagues (2006a) asked participants to sit at the table. Their task was to recognize emotions through touch administered by a person they did not

know. The dyad was not allowed to talk to each other nor see each other and was separated by a curtain in order to be sure that they could not rely on other forms of communication, other than physical contact, to complete the task. The encoder was presented with twelve emotions and was asked to covey these emotions to the decoder only by relying on touch. They were allowed to touch the decoder's arm, specifically from the elbow to the hand. The decoder was then asked to report what emotion he thought the toucher wanted to convey. Results showed that participants were very accurate in their detection of the emotion. Hertenstein and colleagues (2006a) further investigated whether people are capable of recognizing an emotion also by simply watching two strangers communicating emotions through physical contact. Results of this study proved that this is the case. Indeed, also when merely watching physical exchanges, people are able to understand and discern the emotions involved in the interaction. Altogether these results show that individuals can interpret the meaning of touch, both when being the target of the touch and the observer of the touch, and suggests that we have a spontaneous ability of communicating precise information also via non-verbal paths.

As far as the effects of touch on partner interaction is concerned, it is common to refer to touch as having a "Midas Effect" (see, Fisher, Rytting, and Heslin,1976; Crusco & Wetzel 1984; Schirmer, Wijaya, & Liu 2016) based on Midas, a greek mythical figure who turned everything he touched into gold. For example, several studies have found that touch increases compliance towards a request. As a case in point, back in the '70s, Kleinke (1977) instructed a confederate to "accidently" leave a dime in a public telephone boot. Once the participant had entered the boot, the confederate was told to go back and to ask the participants whether they had found it. Participants were more likely to return the dime when they had been touched by the experimenter compared to when they had not received any touch with the mentioned request. Also, people were more willing to lend a dime to a person when the request was accompanied by a touch compared to when no touch was involved. In line with

this evidence, people are more likely to participate in a survey after having been touched compared to when there was no tactile contact (Hornik & Ellis, 1988), to respond to more items in a survey (Nannberg & Hansen, 1994) and to agree to respond to a follow-up questionnaire (Hornik, 1987). Again, compliance with a request was found to be enhanced by touch in a different study which showed that people agreed to look after a large dog while the owner entered a pharmacy, when touched by the owner compared to when no touch was given during the request (Gueguen & Fischer-Lokou, 2002). In a subsequent study by Guéguen & Fischer-Lokou (2003b), male and female confederates were instructed to ask a male bus driver to take a ride even though they did not have enough money to pay for the bus fare. Bus drivers were either touched on the forearm or not touched by the confederates while they asked him for a bus ticket. Results showed that when the request had been made by a female confederate, bus drivers tended to accept the request more often when touched. Surprisingly, some studies have shown that people comply to requests also in the absence of awareness of the touch (Patterson, Powell, & Lenihan, 1986; Guéguen, 2002).

Studies carried out in consumer settings have testified to the fact that consumers' behavior is frequently influenced by nonverbal cues, including but not limited to touch. As a case in point, Guéguen, Jacob, and Boulbry (2007) found that clients touched by the employee were, for example, more willing to follow advice for a meal. Also, interacting via touch with costumers, enhanced people's willingness to taste products and ultimately buy the product (Smith, Gier, & Willis, 1982). Consistently, Kaufman and Mahoney (1999) showed that people consumed more alcohol when touched by a waitress, compared to people who were not touched. These studies are of particular relevance, especially when considering ways to induce people to come into contact with certain products and thus may represent a powerful tool to use also in consumer's settings.

In addition, the use of physical contact in interpersonal settings increases people's helping behavior (e.g., Goldman & Fordyce, 1983; Guéguen & Fischer-Lokou, 2003a). In one famous experiment carried out by Guéguen & Fischer-Lokou (2003a), people were approached at a bus stop by a young man asking for directions. In half of the cases the confederate briefly touched them on their forearm. Following the interaction, the confederate "accidently" dropped a pile of data diskettes on the ground. Their helping behavior was then recorded. Participants who had been previously touched by the confederate, helped collecting the diskettes more often than participants who had not been approached with a touch. The effects of physical contact on prosocial behavior have been recently investigated in a laboratory setting. Contrary to results found in field settings, touch (administered by using a brush) delivered in a laboratory setting failed to increase prosocial behavior or altruism in participants (Rosenberger, Ree, Eisenegger, & Sailer, 2018; see also, Koppel, Andersson, Västfjäll, & Tinghög, 2017). In this experiment, participants were not able to see the person giving the touch, thus the only sensory input involved, consisted in a tactile experience administered by means of a brush. In sum, not only participants did not see the person involved in the touch but they also did not engage in any direct physical contact with the person, given that the tactile experience was provided by means of an external object. Based on these findings, Rosenberg and colleagues (2018) argued that, in order for touch to have beneficial effects, it is important that the touch is delivered by a person and not by an object, and that the touch is inserted in a social context, thus accompanying the touch with a broader psychological and social meaning. By contrast, if the touch in an interpersonal setting is understood just as part of a neutral stimulation, namely with no social meaning involved, the effectiveness of the touch on social behavior is impoverished. Hence, the discrepancy between the results may be due to the fact that when people are touched in a social interaction

within the social setting, they may interpret the touch as connected to a meaning stemming from that interaction (Rosenberger et al., 2018)

As far as the consequences of touch are concerned, these may also be contingent upon the person delivering the touch (i.e., toucher). Fisher, Rytting, and Heslin (1976), carried out a study in a public library and trained the library clerks to either briefly touch the hand of the students when handing them back the library card or to just interact with them without involving in any physical contact. Fisher and colleagues then measured students' evaluation of the clerk and found that students who had been touched evaluated the library clerk more positively compared to students who had not been touched. In this study, researchers also measured people's awareness of the touch and found that the effects were present independently of whether people were aware they had been touched or not. Thus, although casual tactile exchanges may come unnoticed, they can still shape a basic process as impression formation. In line with the idea that touch, may facilitate positive evaluations towards the toucher, are results from Hornik (1992) who found that clients in a restaurant setting rated the server in a more positive way when a brief touch had been administered to them compared to when no touch was involved. Erceau, & Guéguen, (2007) also conducted an experiment in which they trained a car seller to either briefly touch or not touch the costumers while answering questions about the car. Again, a similar pattern of results was found in a different context in which the car seller was evaluated more positively by the costumer if he had engaged in a brief touch with the costumer compared to when he did not. Indeed, when the car seller touched the costumers on the arm while interacting with them, these evaluated the car seller more positively on several different dimensions. In sum, these results indicated that the impression formation process is largely and positively biased by physical contact established with the target of impression.

Similar effects have been found in educational settings. As a case in point, Steward & Lupfer (2007) found that students touched by their instructors (males and females) not only showed superior performance on a following examination but also rated their instructor more positively compared to students who had not been touched. Similar results among college students have been found also by Legg and Wilson (2013), further supporting the idea that the use of physical contact positively shapes the evaluation of the toucher.

The above-mentioned studies all suggest that social touch bears the possibility for personal and more intimate interactions which may ultimately affect people's behavior and attitudes. Indeed, Mehrabian (1968) suggested that touch leads to immediacy which is characterized by reduced physical distance, enhanced psychological closeness, openness, warmth and friendliness (Andersen, 1985 in Legg & Wilson, 2013). Also, touch has been said to trigger a sense of proximity while establishing the "human connection" (Montagu & Matson, 1979 in Haans & Ijsselsteijn, 2006).

The concept of physical contact or touch has also been discussed by Fiske (1992, 2004), a psychological anthropologist. According to Fiske, the use of physical contact or touch is at the basis of close relationships in which individuals share resources and consider the others to be like themselves (i.e., Communal Sharing Relationships). In the so-called communal sharing relationships, people are treated as "undifferentiated and equivalent" (Fiske, 1992, p. 699, see also Fiske, 2004). Physical proximity and touch make the others and the self, less distanced from each other, giving rise to a merging between the self and the other (Aron, Aron, Tudor, & Nelson, 1991, see Seger et al., 2014). Indeed, as physical contact involves physical overlap between two people, it is suggested that this may also contribute to a cognitive overlap between these individuals (Jakubiak & Feeney, 2016). Jakubiak and Feeney (2016) argue that, based on theories of embodied cognition which attribute a close link between mind and body (e.g., Barsalou, Niedenthal, Barbey, & Ruppert, 2003; Smith,

2008), physical overlap (i.e., inclusion of the other into one's body space) that occurs during touch may subsequently lead to a psychological overlap due to the fact that body states may activate a dyadic self-concept. In line with this rationale, recent studies have demonstrated that touch in romantic couples correlates with self-other overlap (Ledbetter, 2013). Also, research has shown that communal feelings with a person can be developed when receiving a friendly touch by a person, compared to a control condition of no touch (Simão and Seibt, 2015). These authors asked participants to take part in a study in which people were called to participate in pairs (i.e., participant and confederate). The study was introduced as being about teams and friendship. They were then seated at an individual computer and asked to perform an online team task (i.e., a line bisection task). In the touch condition, the confederate touched the shoulder of the participant while giving her one piece of paper. In the no touch condition the physical encounter did not take place. Authors then measured communal feelings towards the toucher and specifically communal sharing, perception of the team as a social unit and extent to which individuals were feeling connected. Results indicated that participants in the touch condition not only showed more positivity towards the toucher but also showed higher levels communality/communal feelings compared to the no touch condition.

Altogether these results suggest that the use of physical contact during interactions does indeed affect the recipients, based on the idea that touch may signal a more personal form of interaction, a closer bond being established, which ultimately unitizes the cognitive representation of the self and the other.

Touch in intergroup contexts

Other than focusing on the effects of touch at interpersonal level, starting from the '50s researchers have investigated whether touch between individuals pertaining to different groups (i.e., intergroup level; African-American individual for a European-American individual) would elicit different responses compared to when a touch was administered by a

same race individual. Initial studies have mainly relied on physiological responses such as galvanic skin responses (GSR). This measure taps uncontrollable automatic reactions associated with the activation of the autonomic nervous system and may be seen as representing a spontaneous, automatic, anxiety-related response (Amodio, 2013). One of the first studies which aimed at investigating the impact of intergroup touching on GSR dates back to the 50's. Rankin & Campbell (1955) asked 40 male European-American participants to take part in a study. As a cover story they were told that experimenters were interested in collecting data on a word association task and were told that their reaction times were going to be measured. During the trials, two experimenters, one African-American and a European American individual randomly entered the room purportedly to check participants' electrodes. This allowed them to physically interact with participants and consequently collect participants' GSR. Results showed that participants' levels of GSR were higher after having been touched by an African-American experimenter compared to a European-American one (see also Porier & Lott, 1967). These results suggest that there is a difference in the way participants react to a physical encounter with different individuals as in this case African-Americans and European-Americans. A more recent study (Vrana & Rollock, 1998) shed different results, showing instead that European-American individuals' galvanic skin response was not higher after having touched an African-American person compared to a European-American person. Hence, GSR results concerning intergroup touch are rather mixed. A potential explanation to the contradicting results may be associated to a growing familiarity with outgroup members gained form the 50' to nowadays, which ultimately reduces intergroup anxiety and prejudice in time (Guglielmi, 1999; Shamloo, Carnaghi, Piccoli, Grassi, & Bianchi, 2018).

Research which has used direct measures of attitudes such as a self-report appraisal of the outgroup suggests that the use of physical contact with outgroup members promotes

positive attitudes towards this outgroup because physical contact enhances not only the pleasantness and intimacy with the outgroup but also cooperation with the mentioned individuals (Shamloo, Carnaghi, & Fantoni, 2018). The fact that physical contact enhances cooperation is not new in the literature. Indeed, the mentioned research is in line with studies which have shown that the use of physical contact (in this case within a team) is associated with better team performance because it fosters cooperation between the individuals within the team (Kraus, Huang, & Keltner, 2010). Thus, physical contact is likely to reframe the context in a less conflicting and more cooperative fashion with individuals, irrespective of whether the individual is part of an ingroup or part of the outgroup.

The effects of physical touch on outgroup attitudes have also been studied by using implicit measures of outgroup attitude and by experimentally manipulating the presence (vs. lack) of touch in an intergroup encounter. As a case in point, in a study carried out by Seger and colleagues (2014), non-Black participants took part in a study in which data was purportedly going to be collected on some computer tasks. An African-American experimenter greeted each participant and gave them a seat in front of a computer. At this point, the experimenter randomly either touched participants briefly on the shoulder for 1-2 s while they entered the participants' code on the computer or did not touch them and let participants do it themselves. Results showed that participants in the touch condition showed more positive implicit attitudes towards the toucher's group (i.e., African-Americans) compared to participants in the no touch condition. A similar pattern of results was found in a following study (Exp. 2) in which the touch / no-touch conditions involved Asians as an outgroup. In sum, these results testify to the power of physical contact in shaping implicit intergroup attitudes and show that the effects can be generalized from the single outgroup individual to the outgroup as a whole. In line with evidence suggesting that physical contact is a hallmark of close relationships (Monsour, 1992) and an embodied cue to friendship (Seger

et al., 2014), Seger and colleagues (2014) claimed that the above mentioned findings were driven by the fact that touch may connect people through a merging of the cognitive representation of the self and the other (Aron et al., 1991). In other words, physical contact involves a physical overlap between people, which likely ends up creating an overlap between the cognitive representations of the individuals involved in the physical interaction (Jakubiak & Feeney, 2016). Seger and colleagues (2014) further reason that if touch induces a merging of the self and other representations, it may also produce a merging of the self with the other individual's group membership which ultimately results in more positive attitudes towards the outgroup (Seger et al., 2014).

Alternatively, touch may increase positive feelings towards the outgroup member and consequently to the outgroup as a whole as the results of a process of member-to-outgroup generalization. According to Hewstone & Brown (1986), member-to-group generalization occurs when group membership is made salient. This is, the positive effects experienced during an intergroup encounter, or physical encounter in this specific case, with an outgroup member may generalize to the outgroup as a whole when the group identities involved in the interaction are cognitively salient.

Regardless of the type of process that may account for the impact of intergroup physical encounter at the group level, one may argue that increasing the use of physical contact within intergroup contexts may be beneficial to infuse more explicit and implicit positive attitudes towards the outgroup as much as using physical contact within interpersonal contexts.

Unfortunately, people tend to avoid engaging in physical contact due to its negative connotation at society level. Tiffany Field, director of the Touch Research Institute in Florida, described society as suffering from lack of physical contact and touch hunger (Field, 2001). Especially when thinking about intergroup encounters, contact with outgroup members is

usually less frequent compared to ingroup members (e.g., Martin, 2006; Quillian, 2002), and by consequence this is also the case for physically based encounters. This may be due to structural constraints to intergroup encounter, as in the cases of local religious segregation and ethnic segregation. Fear of contagion also accounts for the reduction of physical exchange with specific outgroups (Neuberg, Kenrick, & Schaller, 2011). Moreover, intergroup dynamics may contribute to level the opportunity of physical intergroup encounters. For instance, avoidance-like behaviors elicited by the mere presence of outgroup members (e.g., Bianchi, Carnaghi, Shamloo, 2018; Carnaghi & Maass, 2006; Amodio & Devine, 2006; Word, Zanna & Cooper, 1974) and the general preference for interacting with ingroup members rather than outgroup members (Castelli, De Amicis, & Sherman, 2007) undermine the opportunity to establish physical intergroup interactions.

It is at this point that researchers have started to consider whether presenting physical contact in an alternative form, such as in a simulated fashion, might have worked as a valid substitute for real physical contact experiences, especially in those cases where contact, and by consequence physical contact, is less practical, less frequent or actively avoided.

Simulated touch in intergroup contexts

Imagined contact is described as 'the mental simulation of a social interaction with a member or members of an outgroup category' (Crisp & Turner, 2009, p. 234). It relies on the idea that imagining interacting with an outgroup member may cognitively resemble a real contact experience with the outgroup and, likewise direct contact (Turner, Crisp & Lambert, 2007), may ultimately improve outgroup attitudes.

As a case in point, Turner and colleagues (2007) demonstrated that imagining to shortly interact with an elderly man reduced intergroup bias in young adults. In this specific set of studies, participants were either asked to imagine talking to an elderly person or were assigned to a control condition in which they had to imagine an outdoor scene (Exp. 1). In all

conditions participants were given exactly one minute to imagine the situation. In Experiment 2, authors introduced a different control condition, in which participants had to simply think about the elderly in general. Participants' intergroup bias was assessed in both studies. Results demonstrated that young adults showed lower levels of intergroup bias when imagining interacting with an older person compared to the outdoor scene (Exp 1) and just think about the outgroup (Exp. 2). These findings suggest that imagined contact is indeed effective in promoting more positive attitudes towards the outgroup and that a priming effect is not responsible for the mentioned findings. Given that participants who were just asked to think about the outgroup did not show similar levels of intergroup bias as individuals in the imagined contact condition, authors could rule out the possibility that such positive effects could be the results of priming participants with an outgroup category which could have then led them to self-regulate their responses in a non-prejudiced way.

Several studies have now demonstrated the positive effects of imagined contact on a wide range of situations and involving different outgroups (see, Crisp, Husnu, Meleady, Stathi, & Turner, 2010) such as British Muslims (Husnu & Crisp, 2010a; Turner & Crisp, 2010), gay men (Turner et al., 2007), indigenous people and Mestizos (Stathi & Crisp, 2008), Greek Cypriots (Husnu & Crisp, 2010b) and the elderly (Turner, Crisp, & Lambert 2007). The improvement of intergroup relations and attitudes has been assessed through a variety of tools and measures. Indeed, imagined contact elicits greater projection of self-related positive traits to the outgroup (Stathi & Crisp, 2008), enhances outgroup variability (Turner et al., 2007), and positively impacts on implicit attitudes (Turner & Crisp, 2010).

Different accounts have been put forward to explain the manner in which intergroup contact in the form of imagined contact is successful (see, Husnu & Crisp, 2010a for a discussion). First, imagined experiences may elicit emotional and motivational responses similar to real experiences (Dadds, Bovbjerg, Redd, & Cutmore, 1997). It is widely accepted

that most of the neural processes that underlie the processing of actual stimulus and events are, at least in part, recruited in imagery and that imagery, may to some extent, represent a form of experience that is close to, albeit not overlapping with, the actual experience (Kosslyn, Ganis, & Thompson, 2001).

Second, imagining a particular situation and social context is capable, in some case, of eliciting cognitive effects and behavioral scripts partially in line with those experienced in reality. In one specific study, Garcia, Weaver, Moskowitz, and Darley (2002) found that the simple imagination of being in a crowded room led to significantly less helping behavior. Real life situations may similarly, partially resemble this situation as represented by the so called bystander apathy effect (Darley & Latane´, 1968; Latane´ & Darley, 1968).

Third, the mental simulation of a situation can also influence future behavior. Libby, Shaeffer, Eibach, and Slemmer (2007) found that imagining voting increased the probability of actually voting later. Also picturing oneself revising for an exam, ended in actually doing it (Pham & Taylor, 1999).

Thus, imagined contact seems to exert a strong impact in different situations and importantly seems to work, at least in part, based on similar mechanisms as the ones used in actual contact. Based on this rationale, during the imagined scenario, it is expected that people will actively engage in conscious processes found also in real contact situations (Crisp et al., 2010; Turner et al., 2007).

On the basis of these results, researchers have tested whether also imagining a more specific contact such as intergroup physical contact could have produced positive effects on outgroup attitudes. This line of research finds its reason in evidence showing that experiencing and imagining gentle touch to the arm partially recruits overlapping brain responses. Specifically, while the posterior insula is activated only when experiencing touch and thus is responsible for the decoding of the physical stimulus, the anterior insula is

responsive to both the experiencing and imagining of touch (Lucas, Anderson, Bolling, Pelphrey, & Kaiser, 2014). The authors interpreted their findings in line with the idea that the anterior insula plays a role in the interpretation of the affective meaning of the touch. This interpretation is also in line with previous studies demonstrating the role of the anterior insula cortex in social emotions and also in predicting emotional states (see, Lamm & Singer, 2010). In sum, it seems that the emotional and affective components of touch are present not only when touch actually occurs, but also when touch is experienced by mentally simulating this experience.

Recently, several studies have partially addressed the issue of whether imagined physical contact could indeed ameliorate intergroup attitudes. As a case in point, Hodson and colleagues (2015) asked participants to imagine an encounter with a homeless person. In this contact they introduced physical contact, cooperation and trust building exercises (vs. a neutral, control scenario). Compared to the control condition, the imagined intergroup contact weakened the relationship between disgust sensitivity and prejudice towards homeless individuals. Similarly, encouraging results were found by Choma and colleagues (2014) who asked participants to imagine a physical encounter with an outgroup member. Once again, imagined physical contact was introduced in the form of team-building exercises, in this case a "thumb war" session, in which participants had to cooperate to reach the final aim. Participants' prejudice was then assessed again, before and after an actual team-building session (i.e., wrist loops). Participants showed more positive attitudes following the imagined contact situation and these remained consistent across the following sessions.

Although these studies partially show that imagined physical contact does indeed produce positive effects on outgroup attitudes, it is hard to differentiate whether the effects were due to the intergroup physical contact situation or to the cooperative climate induced by the experimenter. Given that cooperation has been found to be linked to more positive

attitudes towards the outgroup (Gaertner, Mann, Dovidio, Murrell, & Pomare, 1990), more recent research tried to clarify this point specifically focusing on intergroup physical contact.

Shamloo, Carnaghi, Piccoli, Grassi and Bianchi (2018) carried out a study in which White-Italian participants were presented with a picture of an intergroup hand touch. They were asked to imagine being one of the two hands in the picture (i.e., the hand of a White individual) while touching the hand a Black individual (labelled as an immigrant). Following the imagined contact paradigm, participants were then asked to report all the feelings and thoughts that had come to their mind while envisaging themselves in that situation. In Experiment 1, an outdoor scene was used as a control condition, while in Experiment 2, a White-White touch was used. Finally, participants were told that a future study was going to be carried out in which researchers were interested in organizing conversational couples. In this respect, participants were asked to indicate their preference for being paired with another Italian and with an immigrant on a scale ranging from 1(= *not at all*) to 9(= *very much*). As a part of the cover story, the immigrant-immigrant couple was also mentioned and participants were asked to not consider the mentioned couple if they were Italians (for similar procedure see Turner et al., 2007). Results showed that imagining touching the hand of a Black individual reduced intergroup bias for those participants who imagined an intergroup physical contact compared to both the control conditions. These results suggested that it was not simply a touch with anybody which contributed to the effects found, but that specifically imagining touching the hand of a Black individual was at the basis of the reduction of intergroup bias. These results were then replicated using implicit measures of attitudes towards immigrants (i.e., Implicit Associated Test; Greenwald, McGhee, & Schwartz, 1998). Also, this last experiment used an additional experimental condition in which participants were simply asked to look at a picture representing an intergroup touch, but in this case to only evaluate the quality of the image and not to imagine themselves in that situation. This

third experimental condition was added in order to control whether the results found in previous studies could have been due to a priming effect (see the picture of the intergroup touch)/social influence effect (see an ingroup member involved in an intimate interaction with an outgroup member and consider this an ingroup norm). Indeed, social influence represents an important and powerful mechanism present in several interpersonal and intergroup contexts which has the power of leading people to shape their opinions and conform to a group's norm (e.g., Carnaghi & Yzerbyt, 2007). Studies have shown that ingroup members selectively conform to the ingroup but not to the outgroup norm, and thus align their attitudes and behaviors with the consensual ingroup norm (e.g., Sechrist, & Stangor, 2001; Stangor, Sechrist, and Jost, 2001). Individuals tend to interiorize the ingroup (but not the outgroup) norm and likely conform to the norms of the ingroup based on a self-categorization process (i.e., Hogg and Turner, 1987; see also Abrams & Hogg, 1990 for a discussion).

Results indicated that participants who imagined touching the hand of an immigrant showed lower levels of implicit prejudice compared to both participants who imagined touching an uncategorized person (likely pertaining to the ingroup) or participants who simply evaluated the quality of the image. In sum, being exposed to such intergroup touch or experiencing the intergroup touch as an ingroup norm, was not enough to trigger more positive implicit attitudes towards immigrants in general. In turn, results again suggested that participants needed to imagine themselves in an intergroup touch in order to improve outgroup attitudes.

A recent study (Shamloo, Carnaghi, & Bianchi, 2018) on imagined intergroup physical contact has questioned whether similar results could have been found when considering another target outgroup such as the group of homosexuals. The question of whether the previous results could also generalize to this outgroup target is based on evidence which shows that the group of gay men differs from the target groups involved in the above

mentioned studies (i.e., homeless people, Muslims, immigrants) for different reasons. Indeed, when considering touching behaviors, gender plays a crucial role in this specific intergroup encounter, namely when the to-be-touched individual is a gay man. For example, heterosexual men actively refrain from touching other men, and specifically gay men in order to eliminate the possibility of being miscategorized as gay (e.g., Roese, Olson, Borenstein, Martin, & Shores, 1992; Rozin, Nemeroff, Horowitz, Gordon, & Voet, 1995). Also, heterosexual men, differently from heterosexual women, aim at differentiating the representation of the ingroup from the representation of gay men as a whole (e.g., Carnaghi, Maass, & Fasoli, 2011; Falomir-Pichastor & Mugny, 2009) in order to preserve their "manhood". Indeed, manhood, compared to womenhood is seen as more elusive and tenuous and thus should always be proved (Bosson, Vandello, Burnaford, Weaver, & Arzu Wasti, 2009; Vandello, Bosson, Cohen, Burnaford, & Weaver, 2008). In Shamloo et al.'s (2018c) study, participants were either assigned to a condition in which they had to imagine touching the hand of a gay man or the hand of an uncategorized individual. Later, participants were asked to report all the feelings and thoughts that had come to their mind while imagining themselves in that situation. Second, participants were presented with a list of traits and were asked to rate how much each trait described them and the group of gay men in general. Based on the evidence outlined above, Shamloo and colleagues (2018c) put forward that women would have been the ones most positively affected by the manipulation compared to men, in line with previous studies on actual touch which show less touching behavior between male compared to female individuals due to fear of being miscategorized as gay (e.g., Roese et al.1992; Rozin et al.,1995). Findings showed that male participants, but not female participants, evaluated the imagined physical encounter with a gay man more negatively compared to a situation in which they had to imagine touching the hand of an uncategorized individual. Importantly, female and male participants did not show any difference in terms of evaluation with an

uncategorized individual, but they did when the interaction involved a gay man, suggesting that motivational processes might have prevented male participants from positively evaluating the interaction with a gay man.

Second, female, but not male participants, showed higher levels of self-outgroup similarity when they imagined touching a gay individual compared to an uncategorized individual. In turn, male individuals did not show any difference between conditions. Also and similarly to the results found on the evaluation of the encounter, male and female participants did not show any difference a priori on the level of similarity with gay men when they imagined touching an uncategorized person, but this pattern changed after imagining touching a gay individual. Indeed, female participants showed higher levels of self-outgroup similarity compared to male participants.

In sum, these results may hint to the fact that motivational processes (e.g., fear of being miscategorised as gay) may negatively shape male individuals' experience of the physical contact with a gay individual, which ultimately reduces the possibility of reaching higher similarity between the self and the group of gay men, although further research is needed to directly test this assumption. Also, these results suggest that imagining touching a gay individual elicits distancing behaviors within the intergroup encounter, in male compared to female participants, thus replicating real touching behavioral patterns.

Also, this study clarifies the specific role played by imagined intergroup *physical* contact in shaping outgroup attitudes, compared to a general mental simulation of an intergroup interaction. Indeed, while imagining an intergroup contact has shown to elicit more positive intergroup attitudes towards gay men, also when male individuals are involved (Turner et al., 2007; West, Husnu, & Lipps, 2015), imagining an intergroup *physical* contact seems to rely on different cognitive and motivational processes, which ultimately prevent men from developing more positive attitudes towards this outgroup, just like in real physical

contact situations. These results suggest there is a difference at the basis of the imagined intergroup physical contact and general imagined contact.

Altogether the results suggest that the use of imagined forms of intergroup physical contact may elicit more positive (implicit and explicit) attitudes towards the outgroup as a whole. In order to be effective in promoting more positive outgroup attitudes a) the imagined physical contact should involve an outgroup member, given that imagining touching any individual (i.e., an uncategorized individual) does not produce the same positive effects towards the outgroup; b) individuals should actively imagine themselves in the intergroup physical contact situation because seeing a picture of an intergroup touch does not produce the same results, and c) the intergroup encounter should involve outgroup members which do not a priori threaten the individuals' gender-identity and/or sexual orientation (as in the case of the group of homosexuals for male participants).

Conclusions and future directions

The present work aimed at discussing the effects of touch in a wide range of situations and at different levels. The review of the results outlined above clearly shows how physical contact plays a central role in human life. People use physical contact to convey messages, meanings and emotions. Humans can interpret the meaning of touch and studies suggest that we have an innate capacity of communicating via non-verbal paths. The use of this form of communication has shown to impact on individuals' well-being from childhood well into adulthood. Also, touch has the power of affecting interpersonal interactions and exerts a strong impact on compliance, pro-social behavior and attitudes towards the toucher. However, it is worth noting that studies mentioned in this review have taken into consideration body parts (e.g., arms) which have been found to be neutral and generally "accessible" also to strangers (Suvilehto, Glerean, Dunbar, Hari, & Nummenmaa, 2015). Nevertheless, there are

parts of the body and touching patterns that may not induce all the positive results found above and sometimes carry more negative emotional connotations (see Lee & Guerrero, 2001). Indeed, touch on the cheek by a stranger is, for example, usually seen as inappropriate (Lee & Guerrero, 2001). Also, touch may communicate status and power. For example, Henley (1973) suggested that touching is linked to status (i.e., in terms of sex, age, and socioeconomic status relations), with higher-status people initiating more touch over lower-status persons and not the reverse pattern. In line with this rationale, further studies demonstrated that the toucher is often seen as more dominant and of high status compared to the receiver (Major & Heslin, 1982). In addition, touch may not be equally perceived by people. For example, research has pointed out how autistic individuals respond atypically to somatosensory stimulation (i.e., gentle stroking with a soft brush) by showing a lack of response to pleasant somatosensory stimulation in those brain regions involved in social-emotional information (Kaiser et al., 2015; see also Cascio et al., 2012). Hence it is important to also acknowledge the different and at times negative connotation that touch may, in certain contexts and under specific conditions, carry within.

An important aspect of the present review is that it discusses for the first time, the role played by physical contact within intergroup contexts. Indeed, so far reviews have mainly focused on interpersonal consequences of touch leaving aside the discussion regarding the effects at intergroup level. Thus, it seems crucial to start analyzing what is known so far on this topic. Recent studies have pointed out how intergroup physical contact improves outgroup attitudes (Seger et al., 2014; Shamloo et al., 2018a), and have tried to explain some mechanisms involved in this relation (Shamloo et al., 2018a). Yet, much still needs to be investigated especially regarding the processes at the basis of the positive effects of touch in the intergroup encounter which ultimately shapes, and likely improves intergroup relations. Indeed, no research has yet investigated *how* imagined intergroup touch positively affects

outgroup attitudes. Previous research has suggested that touch may enhance positive feelings towards the toucher (i.e., valence driven process), establish and strengthen a cognitive, self-other member overlap (Seger et al., 2014; Jakubiak & Feeney, 2016), or enhance communal feelings with the touched individual (Simão and Seibt, 2015), which ultimately generalize to the toucher's group. More research is needed to understand the specific contribution of the above-mentioned mechanisms in improving intergroup relations via physical encounters.

Acknowledging the importance of the use of positive, neutral forms of physical contact not only at interpersonal level but also at intergroup level may help raise awareness on the positive functions of touch and ultimately reduce the taboo against this form of non-verbal communication. Indeed, touch is nowadays discouraged in western society (Field 2001; Field 2010; see also Gallace & Spence, 2010). As a consequence, the potential positive effects of physical contact on a wide range of situations might be diminished due to the pervasive refrain from engaging in physical contact. Notwithstanding the existing big taboo around touch, some attention on the power of touch as a type of communication has recently grown. An example comes from an American photographer, Richard Renaldi who has dedicated one of his photographic projects to the understanding of the meaning and use of touch between people. In his project entitled "Touching Strangers" he asks total strangers to physically interact while posing together for a portrait with the aim of creating an immediate connection between people from different backgrounds by making them go past their comfort zone (John Leland, 2013). Nevertheless, as previously mentioned also the same photographer pointed out that there are some barriers associated with the use of physical contact. Thus, a call for action is needed, in order to raise awareness on the potential beneficial effects of positive touch at intrapersonal, interpersonal and ultimately at intergroup level.

Overview of the present research

In the following chapters the effects of intergroup physical contact on outgroup attitudes will be investigated. In Chapter 1, a study testing the relationship between intergroup physical contact and attitudes towards foreigners will be presented. Chapter 2 will be dedicated to the presentation of three studies which have tackled this issue by testing whether also imagined forms of physical contact with an outgroup member (i.e., immigrant) may be effective in promoting more positive (explicit and implicit) attitudes towards the outgroup. In addition, this chapter further aims at investigating whether being exposed to a picture of an intergroup touch without actually imagining oneself in the intergroup touch situation improves attitudes towards the outgroup or whether it is specifically the mental simulation of the intergroup touch experience the basis of the subsequent improvement of outgroup attitudes. Finally, chapter 3 will test the external validity of the findings by examining whether imagined intergroup physical contact can improve attitudes towards another outgroup, the group of gay individuals.

CHAPTER 1

INVESTIGATING THE RELATIONSHIP BETWEEN INTERGROUP PHYSICAL CONTACT AND ATTITUDES TOWARDS FOREIGNERS: THE MEDIATING ROLE OF QUALITY OF INTERGROUP CONTACT

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1.1 Abstract

Recent research has shown that a brief, casual touch administered by an outgroup member reduces prejudice towards the group to which the toucher belongs. In this study, we take the research on physical contact and prejudice a step further by addressing the relation between individuals' amount of Experienced Intergroup Physical Contact (EIPC), across distinct contexts and involving different body parts, and attitudes towards foreign people. Specifically, we hypothesized that the amount of EIPC would be positively associated with both quantity and quality of intergroup contact, but that only quality would mediate the relationship between the amount of EIPC and outgroup attitudes, being quality more directly linked to the evaluative component of outgroup attitudes. To attain this aim, we asked participants to self-report the amount of EIPC, the quantity and quality of their intergroup contact and their attitudes towards foreign people. Consistent with our hypothesis: (1) As EIPC increased, positive attitudes towards foreign people increased; (2) Higher levels of EIPC were associated with better quality and higher quantity of intergroup contact; (3) Only quality of intergroup contact mediated the relationship between the amount of EIPC and attitudes towards foreign people. Results were discussed in relation to research on intergroup contact and physical contact.

1.2 Introduction

Challenges raised by conflicting intergroup relations have always been of primary interest for social sciences. Given the growing anti-immigration public opinion (e.g., Blinder & Allen, 2016), research focused on finding ways to promote harmonious intergroup relations and contrast social exclusion is highly needed.

Accumulated evidence has addressed the role played by intergroup contact in prejudice revision. In this respect, a wide range of studies has documented the effectiveness of direct, positive interactions with outgroup members in improving attitudes towards the outgroup (Allport, 1954; Pettigrew & Tropp, 2006). Not only direct contact but also indirect forms of contact, which do not require people to actually interact with each other, have shown to be effective in reducing prejudice towards different groups (Lemmer & Wagner, 2015; Brown & Paterson, 2016). Likewise direct contact, indirect contact bases its effectiveness on the possibility of experiencing social interactions, may this be in the form of mental simulation, as in the case of imagined contact (e.g., Crisp & Turner, 2009), or in the form of media portrayals in which one is exposed to positive interactions between groups, as in the case of vicarious contact (e.g., Mazziotta, Mummendey, & Wright, 2011).

In everyday life, people connect with others by relying on verbal but also on nonverbal communication, as in the case of physical contact. Touch in particular plays a pivotal role in human communication. Indeed, touch is at the basis of early human communicative interactions (Field, 2001; Hertenstein et al., 2006b) and develops into an elaborated symbolic system (Jones & Yarbrough, 1985). Touch can convey different emotions (Hertenstein et al., 2006a) and thus plays a major role in shaping interpersonal interactions (Gallace & Spence, 2010 for a review). As far as physiological responses to touch are concerned, studies have shown that touch increases levels of oxytocin thus demonstrating its comforting and positive effects on well-being (e.g., Holt-Lunstad, Birmingham, & Light, 2008). At the interpersonal level, the use of physical contact during interactions also promotes positive evaluations towards the toucher (Erceau & Guéguen, 2007),

enhances cooperation within groups (Kraus, Huang & Keltner, 2010) and elicits pro-social behavior (e.g., Guéguen & Fischer-Lokou, 2003). Within the literature on embodied cognition, empirical efforts were carried out to understand how aspects of social relationships are regulated by embodied cues, such as touch (Gallese, 2001; Decety & Grèzes, 2006; Smith, 2008; Fantoni et al., 2016). Based on this rationale, Fiske (2004) suggested that physical contact/touch among members is highly common within a specific form of relationship, namely the Communal Sharing Relationships. Communal Sharing Relationships are typical of close relationships in which group members share resources and focus on members' communality. These forms of relationships are said to be embodied by sharing among other things the use of physical proximity, touch and synchronized body movements (Smith, 2008) which may enhance cohesiveness among individuals (e.g., Wiltermuth et al., 2009).

Recently the impact of physical contact in intergroup relations has been partially addressed by research relying on the imagined intergroup contact paradigm (Shamloo et al., 2018b). In general, this paradigm requires that participants mentally simulate an intergroup encounter (Crisp et al., 2010). For instance, participants who were requested to imagine interacting with an outgroup member, reported lower levels of prejudice towards the outgroup as a whole than participants in a control condition (Turner, Crisp & Lambert, 2007). Research that relies on fMRi (i.e., functional magnetic resonance imaging) and PET (i.e., positron emission tomography) shows that mental imagery involves, at least in part, similar brain networks as those recruited in actual perception and emotion (Kosslyn et al., 2001). Based on this evidence, Turner and colleagues (2007) argue that the mental simulation of intergroup encounters allows the recruitment of mental structures that are present also during actual encounters with outgroup members (Crisp et al., 2009). In line with this insight, Hodson and colleagues (2015) required participants to imagine a cooperative interaction with a homeless person, in which physical contact was encouraged, or to simply imagine meeting a homeless person. Also, a neutral imagined scenario was included in the experimental design as a control condition. Results indicated that, compared to the other conditions, only participants who

imagined a cooperative interaction that involved a physical contact with a homeless person reported a weaker association between outgroup disgust and outgroup trust, which in turn mediated the relationship between disgust sensitivity and outgroup prejudice. Similarly, Choma and colleagues (2014) first assessed participants' prejudice, and then participants were asked to imagine physically interacting with an outgroup member. In this case the imagined physical encounter was based on team-building exercises (i.e., "thumb war" session), which required cooperation with the outgroup member. Before and after engaging in actual physical contact (i.e., wrist loops) with the outgroup member, participants' prejudice was assessed again. Results showed that following the imagined physical contact task, participants' levels of prejudice significantly decreased and remained stable across the following sessions.

The mentioned studies (Choma et al., 2014 and Hodson et al., 2015) suggest that physical contact may ameliorate outgroup attitudes. Nevertheless, these studies involved cooperation (e.g., trust-building or team-building exercises) between individuals which may have played a role in this respect (Gaertner et al., 1990). Said otherwise, as in this research the (imagined) physical encounter with an outgroup member was associated with a cooperative setting, and given that intergroup cooperation improves per se outgroup attitudes (Gaertner et al., 1990), the unique contribution of intergroup physical contact in ameliorating intergroup relations was only partially addressed by the above-mentioned research. To our knowledge, only a research carried out by Seger and colleagues (2014) has restricted its analyses to the impact of actual intergroup physical contact per se on outgroup attitudes. Specifically, Seger and colleagues (2014) tested the idea that a real touch, which is at the basis of Communal Sharing Relationships, would not only positively affect the evaluation of the individual toucher but also the group to which the toucher belongs.

In this respect, Seger and colleagues (2014) showed that a brief and casual touch (i.e., a single physical contact encounter) on the shoulder of European-American participants, performed by an African-American experimenter, reduced prejudice towards African-Americans, compared to when participants did not receive any touch. In other words, this research demonstrated that

intergroup touch positively impacts on the evaluation of the outgroup toucher, and this positive experience generalizes to the toucher's group as a whole.

This research (Seger et al. 2014) underlines the potential role played by intergroup touch in reducing outgroup prejudice and opens up the question of why intergroup physical contact (i.e., physical contact between ingroup and outgroup members) contributes to the improvement of outgroup attitudes. Notwithstanding the importance of this research, the psychological mechanism that brings perceivers, who have experienced a physical encounter with an outgroup member, to improve their attitudes towards the outgroup as a whole has not been addressed yet. Said otherwise, the 'how' physical contact in intergroup relations shapes intergroup attitudes has not been investigated by previous research (Choma et al., 2014; Seger et al., 2014; Hodson et al., 2015). The current research intends to fill this gap by analyzing the role of potential mediating variables in the relation between intergroup physical contact and outgroup attitudes. In other words, we first intend to gather further evidence on the positive association between intergroup physical contact and outgroup attitudes thus strengthening the idea that enhanced levels of intergroup physical experience are associated with more positive attitudes towards the outgroup, and, more importantly, analyze the potential mediators that could account for the relation in question. To reach this aim, we analyze the relationship between individuals' amount of Experienced Intergroup Physical Contact (i.e., EIPC) with foreigners and attitudes towards this outgroup. Differently from Seger and colleagues' operationalization of intergroup physical contact, which involved a single casual touch, we assess participants' amount of EIPC, including a variety of types of physical contact involving different body parts and across a variety of contexts, thus relying on a comprehensive experience of physical contact with foreign individuals (i.e., outgroup). We hypothesize that the extent to which participants have experienced different intergroup physical contact encounters with outgroup members would work as the basis for the generalization of these positive experiences to the outgroup as a whole (Hypothesis 1). Second, we reasoned that intergroup physical encounters may facilitate intergroup contact which ultimately improves outgroup attitudes. As a case in point, recent

research has shown that physical contact helps ameliorating close interpersonal relations (Gulledge, Gulledge & Stahmannn, 2003), backs pro-social behavior (Guéguen & Fischer-Lokou, 2003) and enhances cooperation (Kraus, Huang & Keltner, 2010). Also, physical contact is at the basis of cooperative relationships, in which individuals share a close interpersonal tie (Fiske, 2004) and create a sense of communality with others (Seger et al., 2014). If physical contact itself has the power of triggering such outcomes at the interpersonal level, it may be reasonable to think that it may exert similar effects at the intergroup level. Said otherwise, physical contact could enhance the perceived cooperation, pleasantness and the depth of intergroup encounters. These characteristics of an intergroup interaction are typically operationalized by the quality of intergroup contact. Hence, we would expect that higher levels of physical contact would predict better overall quality of intergroup contact. Not only physical contact might improve the quality of intergroup contact but it might also enhance the quantity of intergroup encounters. Indeed, it is plausible that the positive experience triggered by engaging in intergroup situations, in which also physical contact is involved, may enhance the opportunity of intergroup encounters by weakening the common avoidance-like reactions towards outgroup members (e.g., Paladino & Castelli, 2008; Bianchi, Carnaghi & Shamloo, 2018) and by encouraging more approach-like behaviors towards outgroup members, which ultimately impact on the frequency of intergroup encounters (Kawakami et al., 2007).

We thus hypothesize (Hypothesis 2) that higher levels of EIPC will be associated with a more positive appraisal of the intergroup contact (i.e., quality of intergroup contact) as well as enhanced opportunities of intergroup encounters (i.e., quantity of intergroup contact).

The distinct impact of quantity and quality of intergroup contact on different aspects of outgroup attitudes contributes to clarify the potential mediating role of these variables in the relation between the amount of EIPC and outgroup attitudes. Indeed, keeping these two aspects of intergroup contact distinct would help to better understand which aspect of intergroup contact plays a major role in the relationship between intergroup physical contact and outgroup attitudes. This

decision is supported by empirical evidence attesting to a different and distinct association between quality/quantity of intergroup contact, and outgroup attitudes and beliefs. Specifically, research which has focused on these two aspects of intergroup contact separately, has pointed out that quality, more so than quantity of intergroup contact, greatly predicts positive attitudes toward the outgroup (Islam and Hewstone, 1993; Stephan, Diaz-Loving, & Duran, 2000; Viki et al., 2006). By contrast, quantity of intergroup encounters greatly impacts on perceived outgroup variability (Islam & Hewstone, 1993). Hence, quality, more so than quantity of intergroup contact seems to be associated with affective, evaluative-based reactions towards the outgroup (e.g., prejudice), while the frequency of intergroup contact is likely to be associated with the cognitive representation of the outgroup (e.g., outgroup homogeneity). For this reason, it might be plausible that the quality, rather than the quantity of intergroup contact would more likely predict participants' prejudice towards the outgroup. In the current study we assessed participants' evaluative-based reactions towards the outgroup by means of the General Evaluation Scale (Wright et al., 1997), which taps participants' evaluative responses to the target outgroup.

In sum, given that physical contact would positively predict the positive appraisal of intergroup encounters (quality of intergroup contact) as well as the frequency of intergroup encounters (quantity of intergroup contact), and due to the preferential association of quality over quantity of intergroup contact with prejudice, we hypothesized that quality of intergroup contact would be a solid candidate to mediate the association between the amount of EIPC and attitudes towards the outgroup. Therefore, we put forward that increased amounts of EIPC will be associated with more positive attitudes towards the outgroup because EIPC positively shapes the quality of the intergroup contact (Hypothesis 3).

1.3 Pilot study

1.3.1 Materials and Methods

Prior to the main research, a scale tapping participants' amount of experienced physical contact with known people (i.e., EPC-known person scale, see Appendix A) was developed and taken into examination, thus allowing us to use the scale and adapt it to the purpose of the main study. A principle component analysis was performed in order to analyze its factor structure. In addition, we tested its reliability, and then its association with a proxy of physical contact, namely the Comfortable Interpersonal Distance scale (i.e., CID scale; Duke & Nowicki, 1972) in order to test convergent and discriminant validity.

1.3.1.1 Participants and Procedure

Ninety-four participants (n = 74 female and n = 19 male participants, n = 1 did not report this information; age: M = 20.53, SD = 3.99) took part in the pilot study. Participants were told we were interested in collecting opinions regarding the social domain. Participants were provided a questionnaire and answered the following measures.

1.3.1.2 Measures

Amount of experienced physical contact with a known person (EPC-known person). A twelve-item scale tapping participants' amount of experienced physical contact with known people involving different body parts and regarding different situations was administered to participants. Participants rated the amount of experienced physical contact with a known person on a 5-point scale, ranging from 1 (= *never*) to 5 (= *often*)[1].

Comfort with interpersonal distance (CID). Comfort with interpersonal distance was measured by using the Comfortable Interpersonal Distance scale (i.e., CID scale; Duke & Nowicki,

[1] Participants also rated the EPC scale referring to unknown people (i.e., EPC-stranger), albeit this measure is beyond the scope of this pilot study.

1972) with a known person (i.e., CID-known person) and a stranger (i.e., CID-stranger). Higher scores in this scale indicated lower comfort with interpersonal distance.

1.3.2 Results

We first performed a principal component analysis (Varimax Rotation) on participants' ratings of the items pertaining to the amount of experienced physical contact regarding known people. Results revealed a single factor structure that explained 47.7 % of variance and factor loading ranged between .45 and .83 (see Table 1).

Table 1:
Factor loadings of the Principle Component Analysis on the EPC-known person items in the Pilot Study.

	Component
Items	1
EPC-known person 1	.75
EPC-known person 2	.80
EPC-known person 3	.83
EPC-known person 4	.68
EPC-known person 5	.45
EPC-known person 6	.72
EPC-known person 7	.67
EPC-known person 8	.79
EPC-known person 9	.51
EPC-known person 10	.73
EPC-known person 11	.62
EPC-known person 12	.65

Note. EPC-known person = experienced physical contact with a known person; EPC-known person from 1 to 12 refer to the twelve items used in the scale.

Alpha could not be increased by eliminating any item. The reliability of the scale was high (α = .89). Therefore, participants' ratings on the EPC-known person were averaged to reach a single composite measure of experienced physical contact (*M* = 3.93, *SD* = .70).

We then proceeded by testing the association of the EPC-known person scale with the CID-known person (*M* = 1.11, *SD* = .64) and CID-stranger scale (*M* = 2.71, *SD* = 1.03). As the CID scale in general is a measure of how comfortable people feel with interpersonal distance, it might

represent a proxy of physical contact. Hence, participants' ratings on the EPC-known person scale were regressed on their reactions to the CID-known person and CID-stranger scale. The CID-known person negatively predicted the EPC-known person (β = -.27, t = 2.12, p = .04), indicating that the more comfortable one felt with interpersonal distance with a known person, the higher the amount of physical contact experienced with known people. On the other hand, the CID-stranger positively predicted the EPC-known person (β = .28, t = 2.15, p = .04), showing that the less comfortable one felt with interpersonal distance with a stranger the higher the amount of physical contact experienced with known people.

To sum up, the EPC-known person scale has a good reliability and shows significant association with a proxy of physical contact and thus will be used in the main study.

1.4 Study 1

Although past research (Choma et al., 2014; Seger et al., 2014; Hodson et al., 2015) has focused on an experimental approach to study the effects of intergroup physical contact on attitudes towards the outgroup, in the current study we tackle this issue by using a correlational approach for two distinct, albeit related reasons. Firstly, this method has been largely used in research addressing the relationship between intergroup contact and outgroup attitudes, and constitutes a reliable approach to the study of social psychological processes involved in the intergroup contact (e.g., Voci & Hewstone, 2003; Turner, Hewstone & Voci 2007; Christ et al., 2010). Secondly, the current work aims to study the frequency of different types of physical contact involving different body parts and across a variety of contexts. In other words, we intend to capture a broad and comprehensive experience of physical contact with foreign individuals (i.e., outgroup), rather than a single intergroup touch (Seger et al., 2014), across different everyday life contexts, rather than in a specific context (Choma et al., 2014; Hodson et al., 2015). For this reason, a survey would match the current aim as it does not constrain the analyses to a limited number and types of physical

experiences as well as contexts in which the intergroup physical experiences occurred. Although relying on a cross-sectional/correlational designs allow to explore how intergroup physical contact relates to outgroup attitudes in a natural setting, thus enhancing the ecological validity of our findings, it prevents us from strong claims about the causal relationship among variables.

1.4.1 Materials and Methods

1.4.1.1 Participants and Procedure

We decided to rely on a sample of 100 participants. This decision was backed by a sensitivity analyses (G Power 3.1; Faul et al., 2007), α err. prob. = .05, Power (1-β err. prob.) = .8, N = 100, which indicated a Minimal Detectable Effect (MDE) size f = .11. Hence, the smallest *real* effect size which we would be able to detect (at 80% power) with this sample size falls within the small-effect size area (Cohen, 1988). We decided to collect more than 100 participants to be sure to reach the estimated sample size given the probability of coming across missing data (see Simão & Seibt, 2015, Study 2, for mediation analysis with similar sample size). One hundred eleven students from a university in northern Italy participated in this study. Two participants did not report their gender and could not be entered in the *lme* model which treated this variable as a covariate. The remaining participants did not fully rate the variables included in the mediation models (n = 1 on the EIPC scale; n = 2 on quality of intergroup contact; n = 1 on the prejudice scale; n = 1 on both the prejudice scale and quality of intergroup contact). Given that we relied on aggregated measures of participants' ratings as indexing the variable under examination, the exclusion of the participants who did not rate all the items of a given scale is needed as calculating the synthetic value of the scale on a different and limited number of rated items would undermine the reliability of the entire measures (Supplemental Analyses S1). The final sample comprised n = 58 female participants and n = 46 male participants (age: M = 22.12, SD = 2.99). Among these participants, n = 98 were Italians, n = 5 were not Italians and n = 1 indicated two nationalities. The current sample size approximated the N rule.

Prior to filling in the questionnaire, the researcher provided participants with the written consent and assured they had understood it.

We decided to rely on the outgroup target 'foreigners' for different reasons. First, Asbrock and colleagues (2014) found that when participants are asked to think about foreigners, they tend to indicate and think about the most salient ethnic minorities in a given country (p. 6, Asbrock et al., 2014), thus suggesting a large overlap between the term 'foreigners' and ethnic minorities. In line with the above-mentioned claims, several studies rooted in the intergroup relation tradition have often measured prejudice towards foreigners in general (e.g., Liebkind & McAlister, 1999; Raijman, Semyonov, & Schmidt, 2003; Christ et al., 2010). Second, the term 'foreigners', at least in the Italian context, is typically used as synonym of nonItalian, ethnic minorities and recently employed by the National Institute of Statistics to assess Italian respondents' attitudes towards ethnic minorities (ISTAT, 2018).

Quantity and quality of intergroup contact, the amount of EIPC with foreign people and outgroup attitudes were self-assessed. Half of the participants rated the measures in the above-mentioned order, whereas the other half rated outgroup attitudes first, then quantity and quality of intergroup contact and then the amount of EIPC with foreign people (i.e., order of presentation).

1.4.1.2 Measures

*Quantity and quality of contact with foreign people***.** Two items (adapted from Voci & Hewstone, 2003) tapped the quantity of intergroup contact (α = .71), namely: "How many foreign people do you know?" (*None-More than 10*), "How frequently do you have contact with foreign people?" (*Never-Very frequently*). All answers were given on a 5-point scale. As for the quality of intergroup contact (α = .75; adapted from Voci & Hewstone, 2003), participants were asked: "When you meet foreign people, in general you find the contact…" and presented with three adjectives: pleasant (*piacevole* in Italian), cooperative (*cooperativo* in Italian), superficial (*superficial* in Italian). Answers ranged from 1 (= *Not at all*) to 5 (= *Totally*). As an aggregated measure of the

quantity of intergroup contact and quality of intergroup contact, we relied on the median value of the corresponding items.

*Amount of experienced physical contact with foreign people***.** Given the single factor structure yielded by the EPC- known person scale used in the pilot study, its good reliability and association with a proxy of physical contact (i.e., the comfortable interpersonal distance), the EPC-known person scale was adapted to assess the amount of EPC with foreign individuals in particular (α = .91). Participants' ratings were averaged to form a synthetic score of EPC with foreign individuals.

*Attitudes toward foreign people***.** Participants were asked to "describe how you feel when thinking about foreign people in general" by using six bipolar adjectives (e.g., warm/cold) on a 7-point scale (α = .88; Wright et al., 1997). Participants' ratings were averaged to form a general score of intergroup prejudice. Higher values indicated a more positive attitude towards the outgroup.

At last, participants reported their gender, age, nationality and native language. Participants were then thanked and fully debriefed. This study was carried out in accordance with the Ethical Committee of the University of Trieste (approval number 84) and in accordance with the declaration of Helsinki.

1.4.2 Results

To verify whether higher amounts of EIPC predicted more positive intergroup attitudes we performed a causal mediation analysis. The EIPC to intergroup attitudes relationship exhibited both a direct and an indirect pathway through quality and/or quantity of contact with foreign people. We extracted these pathways together with the indices of their statistical reliability, using the mediation R software and performing a causal mediation based on linear mixed effect as mediator model types. In particular path coefficients (i.e., $\beta \pm 1$ standard error of the mean) were estimated using linear mixed effect models fitted by minimizing the restricted maximum likelihood criterion (Laird & Ware, 1982). The advantages of this type of models over the more traditional one based on

mixed-model ANOVAs is discussed by Kliegl and colleagues (2010). In particular, *lme* was shown to be more robust to unbalanced dataset and to suffer less severe loss of statistical power compared to mixed-model ANOVAs. We followed Bates (2010) and used this statistical procedure to obtain two-tailed p-values by means of likelihood ratio test based on χ^2 statistics when contrasting *lme* with different complexities. Furthermore, we used type 3-like two tailed p-values for significance estimates of *lme*'s fixed effects and parameters adjusting for the F-tests the denominator degrees-of freedom with the Satterthwaite approximation based on SAS proc mixed theory. Finally, as indices of effect size, of the predictive power and of the goodness of fit for the relevant paths estimated through *lme* models, we selected the Pearson-r^2 and the concordance correlation coefficient, the r_c. According to Vonesh, Chinchilli & Pu, (1996; but see also Rigutti, Fantoni & Gerbino, 2015) this latter index provides an optimal measure of the degree of agreement between the observed values and the lme predicted values, in the -1 to 1 range. As an additional measure of significant effect size associated to *lme* estimated coefficient, we provided Cohen's *d*. To implement our mediation analysis, we used a default simulation type quasi-Bayesian Monte Carlo method based on normal approximation (Imai, Keele, & Tingley, 2010). In addition, a bootstrapping method with a number of re-samples large enough to guarantee reliable results (i.e., 2000) was used to compute confidence intervals of the proportion of effect mediated by quality and/or quantity of contact as inferred from the average causal mediation (ACME), average direct (ADE) and average total effects. The main mediation model we tested resulted from two preliminary analyses, contrasting competing models with increasing complexities (i.e., degrees of freedom), but with the same random component. In particular, in both analyses participant gender and nationality were treated as both fixed and random intercepts throughout our analysis for two major reasons: (1) We did not have any specific predictions on the way gender and nationality might affect the EIPC to intergroup attitudes relationship; (2) We aimed to maximize the robustness of the mediation analysis over individual variability.

In the first analysis a comparison of *lme* models with nested fixed effects showed that the outcome variable was not affected by our balancing variable (i.e., order of presentation, $\chi^2_1 = 0.02$, $p = .90$). We thus excluded such a factor from the remaining analyses. The second preliminary *lme* analysis was aimed at identifying the statistical structure of the *lme* model that best represented the EIPC to intergroup attitudes relationship. The best representative structure indeed might be characterized by either a multiplicative model including all interaction terms or a simpler additive model including only the main effects. We selected the best model amongst our two competing models thus entering the amount of EIPC as the predictor variable, quality and quantity of intergroup contact as two independent mediators, and outgroup attitudes as the outcome variable, with participant gender and nationality treated as both fixed and random effects. Importantly, contrasting the two models, no interaction term turned out to be significant ($\chi^2_{16} = 22.43$, $p = .13$) and we thus proceeded by performing the causal mediation analysis treating our predictors as independent factors with gender and nationality not significantly affecting the outcome variable ($F_{1,98} = 0.30$, $p = .58$ for nationality; $F_{1,98} = 1.64$, $p = .20$ for gender). This model accounted for a significant portion of the outcome variance ($r^2 = 0.34$, $r_c = 0.51$, 95% CI [0.38 - 0.62], $F_{5,98} = 10.28$, $p < .001$).

The model, shown in Figure 1, revealed a significant *Total Effect*, with higher amounts of EIPC associated with more positive outgroup attitudes (consistent with H1, $\beta = 0.41 \pm 0.12$, $df = 100$, $t = 3.49$, $p < .001$, $d = 0.70$, $r^2 = 0.18$, $r_c = 0.304$, 95% CI [0.179- 0.419]). Importantly, the amount of EIPC contributed to the variance of outgroup attitudes, and also contributed to the variance of both quality ($r^2 = 0.25$, $r_c = 0.40$, 95% CI [0.27 - 0.51], $F_{1,100} = 20.48$, $p < .001$) and quantity ($r^2 = 0.38$, $r_c = 0.55$, 95% CI [0.43 - 0.65], $F_{1,100} = 54.10$, $p < .001$) of intergroup contact (consistent with H2). Also, quality ($r^2 = 0.33$, $r_c = 0.50$, 95% CI [0.37 - 0.61], $F_{1,100} = 37.28$, $p < .001$) and quantity ($r^2 = 0.14$, $r_c = 0.24$, 95% CI [0.12 - 0.35], $F_{1,100} = 6.75$, $p < .011$) affected the outcome variable. Furthermore, outgroup attitudes improved as quality ($\beta = 0.59 \pm 0.10$, $df = 100$, $t = 6.10$, $p < .001$, $d = 1.22$) and/or quantity ($\beta = 0.27 \pm 0.10$, $df = 100$, $t = 2.53$, $p < .01$, $d = 0.51$) of

intergroup contact increased, which in turn enhanced with the increase of the amount of EIPC (quality: β = 0.45 ± 0.10, *df* = 100, *t* = 4.53, *p* < .001, *d* = 0.91; quantity: β = 0.69 ± 0.09, *df* = 100, *t* = 7.35, *p* < .001, *d* = 1.47). Such a pattern of mutual relationships provided a strong ground for a potential mediation of the total effect by quality and/or and quantity of intergroup contact. The mediating role of quality of intergroup contact was attested by the fact that when it was added as a covariate to the effect of the amount of EIPC on outgroup attitudes, the direct association (i.e., Direct Effect) between the amount of EIPC and outgroup attitudes significantly decreased, reaching a coefficient statistically equal to zero (β = 0.17 ± 0.12, *df* = 99, *t* = 1.48, *p* = .14). Also, no significant loss in the fit was found when contrasting an *lme* model with quality as the only fixed effect vs. an *lme* model including all fixed effects (with r_c slightly decreasing from 0.51, 95% CI [0.38- 0.62] to 0.50, 95% CI [0.37- 0.60], χ^2_1= 2.29, *p* = .13). By contrast, no such mediating effect was found for quantity of intergroup contact. No reliable modification of the direct association between the amount of EIPC and outgroup attitudes was found when quantity was included as a mediator (β = 0.35 ± 0.15, *df* = 99, *t* = 2.37, *p* = .02, *d* = 0.48), with a significant loss in the fit when contrasting an *lme* model with quantity as the only fixed effect vs. an *lme* model including all fixed effects (with r_c increasing from 0.24, 95% CI [0.12 - 0.35] to 0.31, 95% CI [0.19- 0.43], χ^2_1= 5.74, *p* = .02). The *Total Effect* was accounted for by quality of intergroup contact (consistent with H3), with a significant proportion of mediation (0.58, 95% CI [0.27 - 1.21], *p* < .001) supported by the highly reliable Average Causal Mediation Effect (ACME= 0.24, 95% CI [0.11 - 0.40], *p* < .001). No such mediation was found for quantity of intergroup contact (proportion mediated = 0.15, 95% CI [-0.30 - 0.70], *p* = .49; ACME= 0.06, 95% CI [-0.12 - 0.24], *p* = .49).

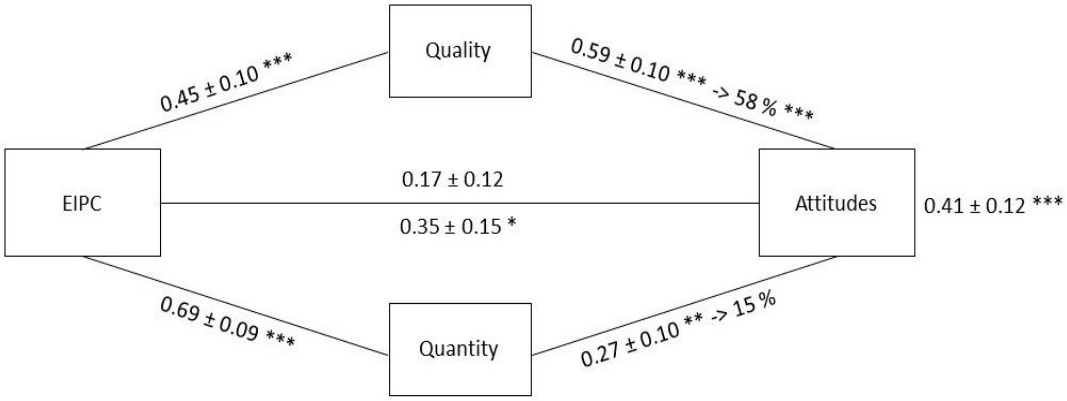

Figure 1.Causal lme mediation analysis on attitudes towards foreigners with the amount of experienced intergroup physical contact (EIPC) as predictor variable and quality and quantity of intergroup contact as mediators (assessed independently). Coefficients marked with one, two or three asterisks are significant at $p < .05$, $p < .01$ and $p < .001$ level, respectively. The effects of the predictor variable on the mediators (i.e., quality and quantity of intergroup contact) are shown on the arrow lines connecting EIPC to the mediators. The contribution of the mediators to outgroup attitudes is depicted on the line connecting the mediators to outgroup attitudes. The lme estimates of the Total Effect of the predictor variable on attitudes is included in the rightmost part of the model next to the Attitudes box. The Direct effects (with quality and quantity as mediators) are depicted in the middle part of the model. The proportion of effect mediated by quality and quantity of intergroup contact is depicted above the line connecting the mediators to attitudes, following the arrows.

To better ascertain the directionality of the relationship suggested by the previous analysis, we proceeded by comparing the goodness-of-fit of the above specified mediation model (i.e., Model 1) with that of an alternative mediation model, by inverting the directionality of the relationship between the mediators and the predictor (i.e., Model 2). In this alternative model only the *Total Effect* specified by the relation between quality of contact and outgroup attitudes was significant ($\beta = 0.56 \pm 0.10$, $df = 104$, $t = 5.53$, $p < .001$, $d = 1.08$; $r^2 = 0.33$, $r_c = 0.50$, 95% CI [0.37 - 0.61], $F_{1,104} = 30.6$, $p < .001$). However, when the amount of EIPC was entered as a mediator, this relationship still remained significant ($\beta = 0.53 \pm 0.10$, $df = 98$, $t = 4.89$, $p < .001$, $d = 0.99$; $r^2 = 0.34$, $r_c = 0.51$, 95% CI [0.38 - 0.62], $F_{1,98} = 23.91$, $p < .001$), thus proving that the amount of EIPC did not mediate the relation between quality of contact and outgroup attitudes.

We further compared the two models. To attain this aim, we contrasted the two models by using the Structural Equation Analyses (SEA), Lavaan R software (Rosseel, 2012). This analyses allowed us to quantify the differential fit of the two models by means of distinct and different

indices, such as χ^2/df ratio, SRMR, CFI and AIC. It is worth noting that, and according to Hu and Bentler (1999), acceptable fit is revealed by a χ^2/df ratio of less than 3, SRMR less than .08, and a CFI greater than or equal to .95; comparative measure of fit is also given by lower levels of AIC in a model over the alternative model. Based on the analyses of these parameters, Model 1 showed a good fit of the data ($\chi^2 = 2.3$, $df = 1$, $p = .61$; SRMR = .07; CFI = .97; AIC = 954.8), and a higher goodness-of-fit than Model 2 ($\chi^2 = 15.52$, $df = 1$, $p = .05$; SRMR = .15, CFI = .85; AIC = 975.7).

1.5 Discussion

This study aims at understanding the role played by intergroup physical contact in shaping attitudes towards foreigners, and at testing the mediating role of intergroup contact (i.e., quantity and quality) in this respect.

Results indicate that higher amounts of EIPC are associated with more positive outgroup attitudes. This result confirms Seger and colleagues' (2014) findings, and suggests that the effect of physical contact goes beyond a brief and casual touch. Indeed, the EPC scale allowed us to assess individual differences in the amount of EIPC by capturing broader and detailed aspects of body-based encounters. Moreover, the amount of EIPC likely facilitates intergroup encounters, as testified by the fact that as the amount of EIPC increased, the frequency of intergroup interactions also increased. In addition, the amount of EIPC was also associated with the perceived quality of the intergroup contact. Indeed, higher amounts of EIPC were linked to more pleasant, less superficial and more cooperative intergroup interactions. Importantly, and in line with our hypothesis, only quality, and not quantity of intergroup contact, mediated the relation between the amount of EIPC and outgroup attitudes.

However, one may claim that quantity, and quality of intergroup contact in particular, would be linked to the amount of EIPC (and not vice versa), which in turn would mediate the relation between intergroup contact and outgroup attitudes. Indeed, intergroup contact in general, and

quality of intergroup contact in particular, has been found to be predictive of social distance (Binder et al. 2009), which is also related to physical distance (Brewer, 1968). We directly tested this alternative model (i.e., Model 2), which showed a lower goodness-of-fit than the hypothesized one (i.e., Model 1). Moreover, the comparison between the two models showed that quality of intergroup contact mediated the relation between the amount of EIPC and outgroup attitudes, while the amount of EIPC did not mediate the relation between quality of intergroup contact and outgroup attitudes. Hence, we may suggest that the amount of EIPC likely plays a role in shaping the appraisal of intergroup encounters, since the reverse relation was not supported by our data.

1.6 Conclusions

These results suggest that intergroup physical encounters may facilitate intergroup contact, and therefore should be taken into account when discussing about strategies aimed at ameliorating outgroup attitudes. Also, these results add further support to the existing relation between intergroup physical contact and outgroup attitudes (i.e., Choma et al., 2014; Seger et al., 2014; Hodson et al., 2015; Shamloo et al., 2018b), and for the first time shed light on the mediating variables involved in this relation. We do believe these results may raise awareness on how physical contact may represent a way to facilitate more pleasant relationships with the individuals we communicate with, by enhancing the quality of these interactions and then improving attitudes towards the group to which these individuals belong. This pattern of results opens up to future studies which might experimentally vary the quantity of intergroup physical contact (i.e., high frequency of physical contact vs. low frequency of physical contact), assess a general appraisal of future intergroup contact, and test whether the variation in the frequency of intergroup physical contact shapes outgroup attitudes because it improves the anticipated quality of the intergroup contact.

Nevertheless, some limits should be acknowledged. First, this is a correlational study and we reckon this study to be exploratory. Although these results hint to the fact that intergroup physical contact improves the quality of intergroup encounters, future studies should test this hypothesis also by using a longitudinal approach and/or an experimental design, thus ascertaining the causal direction of the variables in question.

Second, when considering participants' physical contact experience, their disposition towards engaging in and receiving physical contact should be assessed (Webb & Peck, 2015). Also, given the cultural differences in terms of preferred interpersonal distances (Sorokowska et al., 2017), willingness to engage in physical contact, and in the meaning associated with this type of encounters (Remland, Jones, & Brinkman, 1995), future studies should test the proposed model in different cultural settings, thus strengthening its external validity. Despite the significance of our findings more works are needed, especially experimental research is requested to test the validity of the presented model.

CHAPTER 2

IMAGINED INTERGROUP PHYSICAL CONTACT IMPROVES ATTITUDES TOWARD IMMIGRANTS

Shamloo, S. E., Carnaghi, A., Piccoli, V., Grassi, M., & Bianchi, M. (2018). Imagined intergroup physical contact improves attitudes toward immigrants. *Frontiers in psychology*, 9.

2.1 Abstract

In this set of research, we investigated the effects of intergroup physical contact on intergroup attitudes by relying on indirect contact strategies, namely the imagined contact paradigm. We implemented the imagined contact paradigm by leading participants to shape the mental imagery upon pictorial information. Specifically, in Study 1 participants saw a picture of a white hand touching a black hand (i.e., intergroup physical contact condition; InterPC) or a picture of an outdoor scene (i.e., control condition), and were asked to imagine being either the toucher or in the outdoor scene, respectively. Results demonstrated that InterPC compared to control condition reduced intergroup bias. In Study 2 we compared the InterPC condition to a condition in which participants saw a white hand touching another white hand (i.e., intragroup physical contact; IntraPC), and imagined to be the toucher. Again, we found that participants in the InterPC condition showed reduced intergroup bias compared to the IntraPC. Study 3 replicated results of Study 1 and 2 by using an implicit measure of prejudice. Also, Study 3 further showed that asking participants to merely look at the picture of a white hand touching a black hand, without imagining being the toucher was not effective in reducing implicit prejudice. Results were discussed with respect to the literature on physical contact and prejudice reduction processes.

Keywords: touch, physical contact, imagined contact, prejudice, immigrants, intergroup bias, implicit attitudes

2.2 Introduction

Touch is among human senses the first to develop and it is mainly through touch that infants interact with others (Field, 2001; Hertenstein et al., 2006b; Montagu, 1971). Though language then becomes a central source of communication, touch still remains an important communicative tool throughout adulthood (Hertenstein et al., 2009). Touch positively impacts on impression formation, and promotes prosocial behavior at interpersonal level (see Gallace & Spence, 2010). Importantly, physical contact with an outgroup member constitutes the ground for generalizing the positive encounter to the outgroup as a whole, thus reducing outgroup prejudice (Seger et al., 2014). Some factors may undermine the achievable positive outcomes of physical contact in intergroup settings. Cultural norms regulating social interactions rule and, at least in certain cases, constrain the use of physical contact (Field, 2001). In some circumstances, touch can be also perceived as a vector of pathogen transmission, as in the case of intergroup physical contact (Golec de Zavala et al., 2014; Neuberg et al., 2011). Hence, cultural norms and self-protecting motivations can boost the tendency to avoid physical contact in social contexts in general, and intergroup contexts in particular. As a consequence, the possibility of using physical contact *per se* as a way to improve the quality of interpersonal interaction and possibly to reduce prejudice is strongly challenged.

The specific contribution of this work is to start posing the question of whether indirect forms of physical contact, which do not require face-to-face intergroup interactions, are effective in achieving prejudice reduction.

The current set of studies intends to bridge two strands of literatures that have developed independently so far, namely the research on physical contact and the studies on indirect forms of intergroup contact. With respect to research on physical contact, given the very limited amount of research that has addressed whether touch in intergroup settings improves intergroup attitudes, the current set of studies intends to corroborate evidence on the positive effect of intergroup touch, by exploring its effectiveness beyond the direct contact. With few exceptions (Choma et al., 2014; Hodson et al., 2015), research on indirect intergroup contact has mainly focused on positive and

generic interactions with outgroup members. Hence it is still not clear whether specific forms of indirect intergroup contact, as those represented by physical contact, are also effective in improving intergroup relations. The current set of studies intends to gather evidence on this issue by analysing whether a specific form of indirect contact, namely a positive intergroup physical encounter, may work as a basis for improving intergroup relations.

2.2.1 Physical contact: from interpersonal to intergroup contexts

Empirical evidence on physical contact has prevalently addressed the effects of touch at interpersonal level. Interpersonal touch exerts a strong impact on human's well-being (Jakubiak & Feeney, 2016), as demonstrated by decreased cortisol levels, an increase in oxytocin levels (Ditzen et al., 2007; Holt-Lunstad et al., 2008), and reduced feelings of pain in patients with chronic pain conditions (see Field et al., 2007). Touch also influences interpersonal interactions (see Gallace & Spence, 2010). A casual touch between strangers improves the evaluation of the toucher (Erceau & Guéguen, 2007). Moreover, willingness to engage in prosocial behaviors is enhanced when touch occurs between the potential helper and who is in need (Guéguen & Fischer-lokou, 2003). Touch also helps creating "communal sharing" relationships in which the other comes to be seen like oneself. Indeed, touch affects human relations, as touch makes sharing resources become part of the relationship's modus operandi, like in the caregiver-child relationship (Fiske, 1992; 2004).

Notwithstanding the contribution of the above-mentioned studies to the understanding of how touch positively impacts on interpersonal contexts, only few studies have addressed whether these positive effects may also be extended to outgroup members, and possibly to attitudes towards the outgroup as a whole. As far as interethnic touch is concerned, the effect of touch has been investigated either by analysing physiological reactions and attitudes in a *hic et nunc* intergroup interaction (Rankin & Campbell, 1955; Seger et al., 2014; Vrana & Rollock, 1998), or by

addressing the consequences of a contextual interethnic touch on attitudes towards the outgroup as a whole (Seger et al., 2014).

Research assessing physiological reactivity in a physical interethnic encounter has typically relied on experimental procedures in which European-American students were touched either by an African-American or a European-American experimenter. This line of research has produced mixed findings. Studies completed in the 1950s and 1960s showed that interethnic touch triggered high levels of physiological reactivity (i.e., high levels of skin conductance) in European-American students. More recent research has instead shown that being touched by an European-American or an African-American elicits a similar physiological reactivity in European-American participants, both in terms of skin conductance and facial expression (i.e., zygomatic and corrugator, Vrana & Rollock, 1998). The discrepancy between the results of these two studies might be attributed to historical and cultural changes both in terms of diversity in the University campus, that contextually increases the familiarity with African-Americans (U.S. Department of Education, 2016), and also in terms of less general negative public opinion towards African-Americans compared to the past (Firebaugh & Davis, 1988). Corroborating this conjecture, recent findings have shown that being touched by an African-American triggers, at least nowadays, a positive evaluation of the toucher (Seger et al., 2014). Specifically, Seger and collaborators (2014) reported that European-American participants showed a positive evaluation of an African-American experimenter, both when they only interacted with the experimenter as well as when the interaction was further qualified by an intergroup touch. Importantly, although the positive evaluation of the experimenter was found both when interacting and when also physically interacting with the outgroup member, the positive intergroup encounter generalized to the outgroup representation, thus weakening outgroup prejudice, especially when participants were touched by the African-American experimenter. This study demonstrates that when a positive intergroup contact has been established, physical contact facilitates the generalization of the positive experience of the intergroup encounter to the outgroup as a whole.

Although the authors claimed that being touched by anyone, including an individual who shared the participant's race (Seger et al., 2014), rather than an outgroup member, was highly unlikely to produce comparable effects on outgroup prejudice, this claim has not been directly addressed yet. Indeed, whether it is a touch per se, which could constitute a positive experience, or an intergroup touch specifically the generative mechanism of prejudice reduction, still remains an open issue.

The current set of studies aimed at gathering additional evidence on the positive relationship between intergroup touch and intergroup attitudes, given the limited amount of research on this issue. Furthermore, we aim at ascertaining whether a touch with an outgroup member rather than an individual likely pertaining to the ingroup, can account for prejudice reduction, as previous research has failed to clarify this point. Importantly, these aims are fulfilled by investigating physical contact within a novel context, namely the imagined physical contact.

2.2.2 Imagined physical contact and prejudice

Physical contact has numerous effects on a wide range of situations including the possibility of ameliorating intergroup attitudes. Unfortunately, establishing physical contact in general, and in intergroup contexts in particular is not always straightforward, for different albeit related reasons. First, physical encounters are subject to cultural variation, with some cultures promoting physical contact while other cultures discourage physical interactions (e.g., Remland et al., 1995). This cultural difference limits the possibility of relying on physical contact to those cultures in which this form of interaction is not at odds with cultural prescriptions. Second, when interacting with outgroup rather than ingroup members, physical distance is typically enhanced (Ryen & Kahn, 1975). Third, avoidance behavioral tendencies are automatically entailed by outgroup members (Bianchi et al., 2018; Carnaghi & Maass, 2006; Paladino & Castelli, 2008) which dampens the likelihood of establishing intergroup physical contact. Finally, although avoidance-like behaviors

are triggered by a huge variety of outgroups, some social categories are stronger than others in discouraging physical contact, as in the case of those outgroups that raise fear of pathogen transmission (Golec de Zavala et al., 2014; Neuberg et al., 2011). Therefore, given the general reluctance to engage in physical contact with outgroup members and given the limited opportunity of establishing intergroup physical encounters, the beneficial effects of direct intergroup physical contact on prejudice can be impoverished.

To overcome these limitations, we suggest the use of physical contact within indirect forms of intergroup contact. It is worth noting that we do not argue in favor of indirect rather than direct forms of physical intergroup contact as a tool to ameliorate intergroup relations, rather we suggest that indirect forms of intergroup physical contact might be widely applicable in different cultural contexts. Indeed, indirect contact strategies do not imply direct interactions between groups, and are based on less intrusive approaches. One of the most effective indirect contact strategies is imagined contact (e.g., Crisp et al., 2010), in which participants are asked to imagine themselves interacting with an outgroup member. Although this manipulation implies a simulated scene, rather than an actual intergroup interaction, its positive effects on outgroup evaluation have been consistently observed on a variety of outgroup targets (Miles & Crisp, 2014) both on explicit (e.g., Turner et al., 2007) and implicit attitudes (Turner & Crisp, 2010). Also, indirect forms of contact such as the imagined contact, might be very important as they may actually prepare people for future contact with outgroup members (e.g., Choma et al., 2014).

Research on imagined contact has also stressed that mental imagery allows the activation of mental structures which could trigger responses associated with real experiences (see Crisp et al., 2009). Specifically, Turner and colleagues (2007) suggest that the mental simulation of an interaction with an outgroup member may lead participants to trigger processes which resemble the ones involved in real contact situations.

Beyond findings regarding the intergroup context, research carried out with fMRi (i.e., functional magnetic resonance imaging) and PET (i.e., positron emission tomography) has

demonstrated that mental imagery recruits similar brain networks as those involved in perception, memory, emotion and motor control (Kosslyn et al., 2001). As far as touch is concerned, Lucas and colleagues (2015) compared the brain regions recruited during actual and imagined touch. Results indicated that the anterior insula is involved both when experiencing and also imagining touch (i.e., sensation of the touch), suggesting that imagined physical contact could, at least in part, resemble direct physical contact.

Notwithstanding these promising results showing an overlap between actual and imagined physical contact, few studies have recast the analyses of imagined physical contact within intergroup contexts. However, these studies (Choma et al., 2014; Hodson et al., 2015) provide only indirect support to the positive relationship between imagined intergroup physical contact and outgroup attitudes. Hodson and colleagues (2015) asked participants to imagine an elaborated contact with a homeless person, in which physical contact, cooperation and trust building exercises were encouraged (vs. a neutral, control scenario). An elaborated contact requires participants to imagine an interaction with an outgroup member, and implements the imagery by asking them to provide details of the intergroup encounter (see Husnu & Crisp, 2010). Compared to the control condition, the elaborated imagined contact weakened the relationship between disgust sensitivity and prejudice towards homeless individuals. In similar vein, Choma and colleagues (2014) after having assessed participants' prejudice, asked participants to imagine a physical encounter with an outgroup member. Imagined physical contact was introduced in the form of team-building exercises (i.e., "thumb war" session), which again, did not only require a physical contact with an outgroup member but also a cooperative interaction to solve the task. Participants' prejudice was then assessed again, before and after an actual team-building session (i.e., wrist loops) which required cooperation with an outgroup member and served as a cover story to establish a real physical contact. Results indicated that participants reported significantly reduced prejudice after the elaborated imagined physical contact session and these positive attitudes remained stable across the following sessions.

Although these studies suggest that imagined physical contact with an outgroup member may be effective in improving intergroup relations, the experimental manipulation described above did not only involve an imagined intergroup physical contact, but also included other variables, such as cooperation which has shown to improve per se intergroup attitude (Gaertner et al., 1990). Specifically, Gaertner and colleagues found that cooperation leads participants to perceive individuals as being part of one common group and also leads to reduced intergroup bias, and suggested that intergroup cooperation decreases intergroup bias because it modifies participants' representation of two groups to one larger group. Hence, the specific contribution of imagined physical contact on the outcome variables still remains unclear. The current set of studies intends to fill this gap, by gaining a deeper understanding of whether and how imagined intergroup physical contact per se might improve intergroup attitudes. As previous evidence on this issue has mainly relied on explicit measures (Study 1 and 2 of the current paper), we sought to understand whether imagined intergroup physical contact could be effective in ameliorating implicit intergroup attitudes (Study 3). It is worth noting that only few studies on imagined intergroup contact have relied on implicit measures so far (Turner & Crisp, 2010; Vezzali et al., 2012). Hence, this study further contributes to the understanding of how particular forms of imagined contact may affect not only explicit but also implicit attitudes.

Furthermore, we intend to ascertain whether it is the experience of imagining a physical contact per se that promotes harmonious intergroup relations or it is the specific imagined experience of a physical contact with an outgroup member that translates in improved intergroup attitudes (Study 2 and 3). Importantly, this research question has not been addressed yet by both studies on actual and imagined physical intergroup encounters (Choma et al., 2014; Hodson et al., 2015; Seger et al., 2014). This aim is of particular significance as it starts specifying the psychological mechanisms entailed by the imagined intergroup physical encounters, since it specifies whether the generalization of the information gathered in the imagined physical encounter to the group as a whole occurs only when the (out)group membership of the encountered individual

is salient (Hewstone & Brown, 1986; Rothbart & John, 1985). Additional information on the psychological processes involved in the imagined intergroup physical contact is provided by Study 3, in which participants were either primed with a physical intergroup encounter or imagined the same physical intergroup encounter. In so doing, we were able to test whether it is the perceptual experience or the mental simulation of an intergroup physical contact that exerts its positive impact on intergroup attitudes.

2.3 Study 1

In Study 1, we question whether specifically imagining a physical contact with an outgroup member (i.e., an immigrant) compared to a standard control condition (i.e., an outdoor scene) reduces intergroup bias. This would allow gathering initial evidence on the effectiveness of imagined intergroup physical contact on intergroup attitudes. To address this aim we take advantage of the elaborated imagined contact paradigm. Elaborated imagined contact allows participants to imagine a more vivid, contextually situated intergroup contact scenario, contributing to the creation of a more detailed behavioral script which has shown to enhance the positive effects of imagined contact on intergroup attitudes (Crisp et al., 2010; Husnu & Crisp, 2010).

We implement this paradigm by introducing printed pictures of a physical encounter. With respect to the traditional paradigm employed in imagined contact research, we reckon that a visual cue could guide participants in the situation and help create a more vivid idea of the physical encounter, giving rise to a detailed form of elaborated imagined contact. This endeavour is guided by research demonstrating that a vivid imagery process is found after prompting participants with a concrete picture of the to-be-imagined content compared to a condition in which no picture is administered, and this leads to a more positive attitude towards the content (Babin & Burns, 1997). Also, providing participants with visual cues together with imaginary instructions facilitates individuals to create a vivid mental imagery (Finke, 1989; Ram et al., 2007).

The choice of providing participants with a specific form of physical contact, displayed by the visual cue (i.e., picture of a hand touch), rather than asking them to merely imagine a physical contact, is guided by two different, albeit related reasons. First, this procedure would secure us to make clear the body parts involved in the contact. Specifically, we decided to rely on a picture portraying a hand touch as the contact involving these body parts is likely to be processed as not intrusive and is widely accepted also when administered by a stranger (Suvilehto et al., 2015). Second, relying on a picture of a hand touch cues the specific modality in which the physical contact occurs. Indeed, even when physical contact involves the same specific body parts, the modality in which the physical contact is established may convey different emotional meanings (Hertenstein et al., 2006a). Exposing participants to the same picture portraying the same modality of physical contact enhances the chance that mental imagery would be elaborated based on that modality.

2.3.1 Material and Methods

2.3.1.1 Participants

One hundred twenty-seven undergraduate students from a university in northern Italy voluntarily took part in the study. We decided a priori to rely on a sample of 120 participants. This decision was backed by a sensitivity analyses (α err. prob. = .05, Power [1-β err. prob.] = .8, N = 120) which indicated a Minimal Detectable Effect (MDE) size f = .11. Hence, the smallest *real* effect size which we would be able to detect (at 80% power) with this sample size falls within the small-effect size area (Cohen, 1988).

As we a priori decided to not include in the experimental sample nonItalian participants that did not speak Italian as their first language, we collected additional participants to achieve the required N.

Moreover, and by computing the achieved power of the current study ($f = [\eta^2_p/(1- \eta^2_p)]^{0.5} = .18$, α err. prob = .05, N = 122), we showed that Power [1-β err. prob.] = .99.

Participants who indicated to be nonItalian and who did not speak Italian as their first language ($n = 5$) were eliminated from analysis, leaving the final sample to $n = 122$[2]. Participants were $n = 61$ female and $n = 60$ male students, and $n = 1$ did not report the gender. Participants' age ranged between 19 and 33 years ($M = 22.94$, $SD = 2.89$). Participants were randomly assigned to one of two experimental conditions, namely either to the imagined intergroup physical contact condition (i.e., InterPC; $n = 62$) or to the control condition ($n = 60$).

2.3.1.2 Procedure

Participants were provided a questionnaire purportedly concerning the way people imagine social situations. Participants reported their nationality and native language on the first page, thus making their national-group identity salient (for similar procedure, see Steele & Aronson, 1995). Subsequently, they were presented with a colored picture which was located in front of them. Participants in the intergroup physical contact condition (i.e., InterPC) saw a picture displaying two hands of two distinct persons. One hand was depicted on the left side and one hand was displayed on the right side. The hand on the right was portrayed palm-down on the back of the hand displayed on the left, thus portraying a hand touch. The hand displayed on the right side of the picture was the hand of a White individual, while the hand on the left side was the hand of a Black individual, thus portraying an intergroup hand touch.

In the InterPC condition participants read the following instruction displayed above the picture:

We ask you to look at this picture for one minute and to identify with one of the two main characters. Specifically, we ask you to imagine that the hand depicted on the right side is yours and that it is touching the hand of an immigrant. Participants further read: "Imagine feeling at ease

[2] Among the sample no participant belonged to the African-Italian community.

during this contact and imagine it to be a positive experience in which you discover unexpected things" (for similar procedures see Stathi & Crisp, 2008; Turner et al., 2007).

In the control condition participants saw a picture portraying an outdoor scene (for similar procedures, see Turner et al., 2007) and were asked to follow the instruction displayed above the picture:

"We ask you to look at this picture for one minute and to identify yourself in that scene. Specifically, we ask you to imagine that you are outdoors, in the portrayed environment". As in the InterPC condition, participants further read: "Imagine feeling at ease and imagine it to be a positive experience in which you discover unexpected things" (for similar procedures see Stathi & Crisp, 2008; Turner et al., 2007). In sum, participants saw one picture per condition which was presented to them only once. The fact that participants went on a single (and not multiple) imaginary trial is consistent with the experimental procedure outlined by research on imagined intergroup contact (Crisp et al., 2010).

Following this manipulation, like in experiments dealing with imagined contact, to reinforce the effect of the imagery task participants were asked to report all the feelings they had experienced and the thoughts that had come to their mind while imagining themselves in that situation. Participants were given up to two minutes to report their reactions and were then provided with the dependent measures. Specifically, we intended to measure participants' intergroup bias. To attain this aim, participants read that our lab was about to organize a short study in conjunction with our department, and that data collected would be used to organize a future study which would have taken place the next month. Moreover, participants read that the study aimed at making Italians interact with other Italians, immigrants with other immigrants, or Italians with immigrants. As a cover story, participants subsequently read that we were interested in knowing whether they were willing to take part in the study. Participants were then requested, regardless of their willingness to actually participate in the study, to indicate with whom they would be happy to work, and in which of the following couples they wanted to be put into (for similar procedure, see Turner et al., 2007).

In this respect, participants were asked to indicate their preference for being paired with another Italian and with an immigrant on a scale ranging from 1(= *not at all*) to 9(= *very much*). As a part of the cover story, the immigrant-immigrant couple was also mentioned and participants were asked to not consider the mentioned couple if they were Italians.

After completing the dependent measure, participants reported the gender and age; they were thanked and fully debriefed. This study was carried out in accordance with the recommendation of APA guidelines and the local Ethical Committee. All participants gave written informed consent in accordance with the declaration of Helsinki.

2.3.2 Results and Discussion

Participants' ratings were analysed by means of an ANOVA 2 (Condition: control vs. InterPC) X 2 (Target: Italian vs. immigrant), with the former factor as a between-participants variable and the latter factor as a within-participants variable. As participants' gender did not impact on any variable of interest, analyses were carried out leaving this factor aside.

The analysis of variance revealed that no main effect of target was found, $F(1,118) = .45$, $p = .51$, $\eta_p^2 = .004$. The condition by target interaction turned out to be significant, $F(1,118) = 4.03$, $p = .05$, $\eta_p^2 = .033$, indicating that the relative preference for being paired with an Italian over an immigrant was lower in the InterPC ($M_{diff.} = -.25$, $SE = .27$) than in the control condition ($M_{diff.} = .49$, $SE = .25$; see Figure 1). These results provided initial support for the role of imagined intergroup physical contact in leveling intergroup bias. Participants who imagined to take the perspective of an ingroup member touching the hand of an outgroup member (labeled as an immigrant) while imagining it to be a positive situation, showed lower levels of intergroup bias compared to those participants who were asked to imagine themselves in a positive outdoor scene.

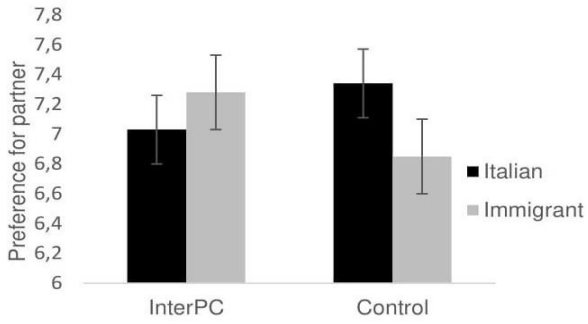

Figure 1. Preference for partner as a function of the experimental condition in Study 1. Error bars represent standard errors.

The second study sought to replicate results found in Study 1, and started questioning whether the touch itself could account for a reduction of intergroup bias or whether touching an outgroup member, but not another individual, could likely be responsible for a reduction in intergroup bias responses.

2.4 Study 2

In Study 2, we intended to investigate whether it is imagining a physical contact with an outgroup member (i.e., an immigrant) rather than an individual (i.e., a person) the basis for intergroup bias reduction. This study is particularly informative on the generative mechanism at the basis of the expected effects as it would clarify that it is not a physical contact per se, but that a specific physical contact with an outgroup member is needed to improve intergroup attitudes.

2.4.1 Material and Methods

2.4.1.1 Participants

One hundred twenty-eight undergraduate students from a university in northern Italy voluntarily took part in the study. As the experimental design of Study 2 was similar to the experimental design

of Study 1, the same N rule was adopted in this study. Moreover, and by computing the achieved power of the current study (f [η^2_p/(*1*- η^2_p)]$^{.5}$= .19, α err. prob = .05, *N* = 122), we showed that Power [1-β err. prob.] = .99.

Participants who stated to be nonItalian and who did not speak Italian as their first language (*n* = 6) were eliminated from analysis, leaving the final sample to *n* = 122[3]. Participants were *n* = 67 female and *n* = 55 male students whose age ranged between 18 and 33 years (*M* = 22.67, *SD* = 3.15). Participants were randomly assigned to one of two experimental conditions: IntraPC (*n* = 59) and InterPC (*n* = 63).

2.4.1.2 Procedure

The experimental procedure was the same as in Study 1, otherwise specified. Participants were exposed to a picture of one hand touching another hand. In the InterPC condition, participants saw a hand of a White individual touching the hand of Black individual, which had been labelled as an immigrant as in Study 1. In the intragroup physical contact condition (i.e., IntraPC), participants saw the same hand of a White individual as in the InterPC, but in this case touching the hand of another White individual. In the IntraPC condition participants received exactly the same instruction as participants in the InterPC, except that the term "immigrant" was replaced by the term "person". The dependent variable was the same as in Study 1.

After completing the dependent measure, participants reported their gender and age. Finally, they were thanked and fully debriefed. This study was carried out in accordance with the recommendation of APA guidelines and the local Ethical Committee. All participants gave written informed consent in accordance with the declaration of Helsinki.

[3] Among the sample no participant belonged to the African-Italian community.

2.4.2 Results and Discussion

Participants' ratings were analysed by means of an ANOVA 2 (Condition: IntraPC vs. InterPC) X 2 (Target: Italian vs. immigrant), with the former factor as a between-participants variable and the latter factor as a within-participants variable. As participants' gender did not interact with any variable, analyses were carried out leaving this factor aside.

The analysis of variance revealed that no main effect of target was found, $F(1,115) = .58$, $p = .45$, $\eta_p^2 = .005$. The condition by target interaction turned out to be significant, $F(1,115) = 4.26$, $p = .04$, $\eta_p^2 = .036$, showing that the relative preference for being paired with an Italian over an immigrant was lower in the InterPC ($M_{diff.} = -.54$, $SE = .29$) than in the IntraPC ($M_{diff.} = .25$, $SE = .25$) condition (see Figure 2).

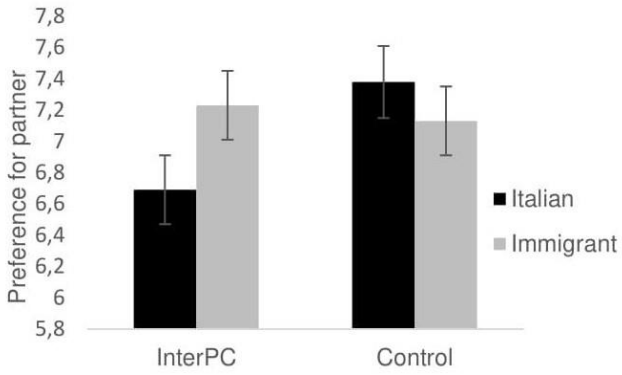

Figure 2.Preference for partner as a function of the experimental condition in Study 2. Error bars represent standard errors.

This pattern of results corroborated our hypothesis that imagined intergroup physical contact worked as an intergroup bias reduction device. Participants who imagined to take the perspective of an ingroup member touching the hand of an outgroup member, labeled as an immigrant, showed lower levels of intergroup bias compared to those participants who took the perspective of an ingroup member touching the hand of another individual. Importantly, this study further clarifies

the generative mechanism at the basis of the observed results. Indeed, it is not imagining taking the perspective of an ingroup member touching anyone that leads to a reduction in intergroup bias. By contrast, our results pointed that the imagined physical interaction, molded on the visual cue, should specifically involve an outgroup member to be effective in leveling intergroup bias.

The results found in Study 1 and Study 2 show slightly different patterns of preference for working with an ingroup member and working with an outgroup member, although both studies show a clear reduction of intergroup bias after imagining touching the hand of an outgroup member compared to the control conditions. In order to better understand the general pattern at the basis of these results we decided to merge the two studies and carry out a cross-experimental study which will be detailed in the next paragraph.

2.5 Cross-Experimental Analyses

The participant sample of Study 1 and of Study 2 came from the same pool. Also, the procedure and the stimuli were the same, except for the control conditions, being these an outdoor scene in Study 1 and an imagined physical contact involving a White individual in Study 2. The sample sizes of the experimental samples were almost identical. Data collection occurred in an overlapping time period. Hence, the two studies were homogenous. Statistical cross-examination of these studies could be theoretically reliable (for a similar rationale and procedure, see Cherubini et al., 2013). The cross-experimental analyses would inform us about whether results in Study 1 and 2 were a) stable across studies as far as the InterPC conditions were concerned, and b) independent of the type of controls.

Data from these studies were merged together, and analyzed by using the type of study (i.e., Study 1 vs. Study 2) as a between-participants factor. Specifically, participants' ratings were analyzed by means of an ANOVA 2 (type of study: Study 1 vs. Study 2) X 2 (Condition: controls vs. InterPC) X 2 (Target: Italian vs. immigrant), with the former two factors as between-participants variables and the latter factor as a within-participants variable. Results indicated a significant

condition by target interaction, $F(1,233) = 8.29$, $p = .004$, $\eta_p^2 = .034$. Inspection of the means revealed that the relative preference for being paired with an Italian over an immigrant was lower in the InterPC ($M_{diff.} = -.39$, $SE = .20$) than in the control ($M_{diff.} = .37$, $SE = .18$) conditions. Importantly, the condition by target interaction was not further qualified by the type of study, $F(1,233) = .010$, $p = .92$, $\eta_p^2 = .001$. No other significant effects were found ($Fs < 1.02$, $ps > .31$). This pattern of results corroborates our hypothesis about the effectiveness of the InterPC in leveling participants' intergroup bias. The cross-experimental analyses confirmed that this effect was similar across studies. Indeed, intergroup bias was reduced in the InterPC compared to the control condition, regardless of the type of controls. It is worth noting that intergroup bias, being this a relative measure, has been operationalized as the preference for the ingroup over the outgroup. However, and to gather more information about the cognitive and motivational processes entailed by our manipulation, we further inspected the interaction by relying on pairwise comparisons. We performed these analyses on the Cross-experimental analyses because no significant differences occurred between studies on the main dependent variable. In so doing we could gather a more reliable conclusion on whether InterPC compared to the control condition enhanced preference for the outgroup or weakened the preference for the ingroup. Participants in the control conditions preferred working with an Italian rather than an immigrant person ($p = .05$), while participants' preference for working with immigrants was higher compared to working with Italians in the InterPC condition, ($p = .03$). Also, in the InterPC condition preference for working with Italians was lower compared to the control conditions ($p = .03$), while no difference occurred between conditions in terms of preference when considering immigrants ($p = .26$). Hence, it seems that imagined intergroup physical contact, compared to the control conditions, reduced ingroup bias (i.e., preference for the ingroup) rather than decreased rejection towards the outgroup (see Figure 3).

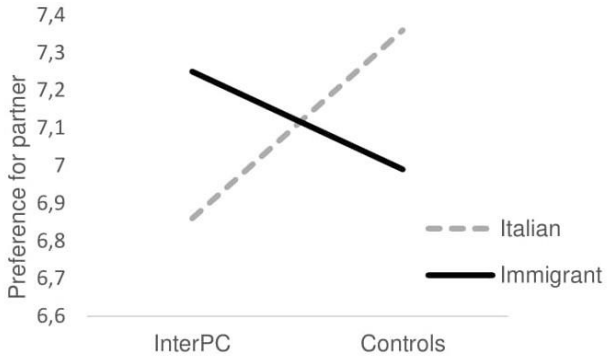

Figure 3.Preference for partner as a function of the experimental condition in the cross-experimental analyses.

It is worth noting that ingroup preference and outgroup derogation may represent two distinct, albeit not necessarily independent, processes. Indeed, and in line with Allport's (1954, see 'Ingroup Formation') claims, ingroup favouritism comes prior to the development of attitudes towards outgroups, and ingroup bias does not necessary imply negativity towards the outgroup. Indeed, ingroup bias could coexist with different types of attitudes towards the outgroup, including indifference and disdain (Brewer, 1999; Brewer and Campbell, 1976). Also, participants are typically reluctant to differentiate the ingroup from the outgroup on negative outcomes (outgroup derogation or rejection) while they are more willing to achieve intergroup differentiation on positive outcomes, thus testifying to a primacy of ingroup bias over outgroup derogation (i.e., positive-negative asymmetry; Mummendey et al., 1992). This pattern of behaviors typically occurs in non-conflictual intergroup contexts and in intimate intergroup contact (Brewer, 1999; Duckitt & Mphuthing, 1998). Evolutionary-based research also corroborates the idea that formation of group bonds (e.g., cooperation) and ingroup bias are often and primarily characterized by partiality towards the ingroup rather than hostility towards the outgroup (Fu et al., 2012).

As far as intergroup contexts are concerned, especially intimate intergroup encounters provide perceivers insights not only about the outgroup but also about the ingroup. Indeed, having intimate contact with members of national outgroups, leads ingroup members to display less ingroup

attachment and ingroup pride (Pettigrew, 1997). This pattern of results is consistent with the 'deprovincialization' process (Pettrigrew, 1998) which claims that intergroup contact can lead ingroup members to reappraise, namely questioning, the ingroup as the default standard and to distance from the ingroup (Verkuyten et al., 2010). Recasting the InterPC condition within this theoretical frame, InterPC represents an intimate contact with outgroup members, as it evokes a non-conflicting intergroup setting, and leads participants to establish a close form of intergroup contact based on communality (Seger et al., 2014). Hence, it might be plausible that these characteristics of the InterPC might activate a 'deprovincialization' process that maps onto an enhanced distancing from the ingroup (or a reduction of ingroup bias), which is observed in a lower probability of selecting ingroup members in the InterPC than in the control conditions. This line of reasoning is consistent with recent research endeavours that have found support for the idea that ingroup distancing may underlie part of the intergroup contact effects (Kauff et al., 2016; Pettigrew, 2009; Tausch et al., 2010).

2.6 Study 3

In Study 3, we aimed to further understand whether the effects of the intergroup physical contact manipulation could extend beyond explicit attitudes and affect also implicit attitudes. In Study 3, participants were exposed to the same pictures as in Study 2, depicting a white hand touching another white hand (i.e., IntraPC) or a white hand touching the hand of a Black individual labelled as an immigrant (i.e., InterPC). Additionally, a third experimental condition was here added. Participants in this condition were exposed to the same picture used in the InterPC condition, but in this case they were asked to evaluate the quality of the picture and therefore did not engage in the imagination task (i.e., InterPC-quality). We reasoned that being exposed to a picture of an intergroup physical contact without imagining oneself in the depicted situation (i.e., InterPC-quality) would not lead to a consistent level of prejudice reduction as in the InterPC. If this were the

case, we put forward that a visual cue portraying an intergroup physical contact would become effective only when used as the basis for the imagery process.

In Study 3, we relied on an implicit measure of attitudes, the paper-and-pencil Implicit Association Test (i.e.; IAT; Schwartz et al., 2003), to tap participants' spontaneous outgroup attitudes (i.e., prejudice and stereotypical prejudice). The IAT measures the automatic association of positive and negative attributes and concepts (i.e., Italians and immigrants in this case), in other words, the presence/absence of an automatic preference for one group over another (e.g., Newheiser & Olson, 2012). For this reason, we reckoned that this measure could represent a useful tool to assess intergroup bias from an implicit point of view, extending the results obtained in Study 1 and 2.

On the basis of results of Study 1 and 2, we hypothesized that, compared to participants in the InterPC, participants in the IntraPC would display a less positive/more stereotypical attitude, thus extending the effectiveness of InterPC to implicit measures (Hypothesis 1). Second, although participants were exposed to the same pictorial stimulus displaying an intergroup touch both in the InterPC and InterPC-quality condition, we expected participants in the InterPC condition to show reduced levels of implicit prejudice/stereotype than participants in the InterPC-quality condition, thus testifying to the key role played by mental imagery over the mere pictorial intergroup touch in reducing outgroup prejudice (Hypothesis 2). In sum, we put forward that participants in the interPC would display a more positive/less stereotyped attitude towards the outgroup than in both the IntraPC and InterPC-quality condition, while no difference should occur between the IntraPC and InterPC-quality condition (Hypothesis 3).

2.6.1 Material and Methods

2.6.1.1 Participants

One hundred thirty-eight undergraduate students from a university in northern Italy took part in the study in exchange for course credits during a social psychology class. Data were gathered in a

collective session in class. The total number of students enrolled in the first year was around 150, with class attendance estimated around 80%. As we could not anticipate the number of participants that would attend the class on the day in which the experiment was scheduled, we were not able to anticipate the exact number of participants albeit, based on prior class attendance, we estimated to collect at least $N = 120$ participants. A sensitivity analyses (α err. prob. = .05, Power [1-β err. prob.] = .8, $N = 120$) indicated an MDE equal to f = .29. Hence, the sample size is adequate to detect a real effect size that falls within the small to intermediate effect size area (Cohen, 1988). The final sample approximated the required N. Moreover, and by computing the achieved power of the current study ($d = .403$, α err. prob = .05, $N = 133$), we showed that Power [1-β err. prob.] = .71.

Participants who stated to be nonItalian and who did not speak Italian as their first language ($n = 2$) were eliminated from analysis. In addition, three other participants were eliminated from analysis due to an error rate on the IAT greater than 3.5 *SD*, leaving the total sample to $n = 133$[1].

Participants were $n = 96$ female and $n = 37$ male students whose age ranged between 18 and 54 years ($M = 20.53$, $SD = 3.30$). Participants were randomly assigned to one of three experimental conditions: InterPC-quality ($n = 36$), IntraPC ($n = 51$) and InterPC ($n = 46$).

2.6.1.2 Procedure

Data were collected during a collective session in class. The same procedure used in Study 1 and 2 was adopted. Participants answered the questions on nationality and native language as in Study 1 and 2. Participants in the InterPC-quality and in the InterPC conditions were exposed to exactly the same picture. Specifically, in these two conditions, the hand on the left side was the hand of a Black individual. In sharp contrast, in the IntraPC condition the hand on the left side belonged to a White individual, as in Study 2.

In the InterPC-quality condition participants read the following instruction displayed above the picture: “We ask you to look at this picture for one minute and evaluate whether the picture is out-of-focus, overexposed, at high-resolution, grainy. In other words, we ask you to evaluate the

photographic quality of the image". In the InterPC and IntraPC conditions participants received the same instructions used in the previous studies.

In sum, participants in the InterPC-quality as well as in the InterPC condition were exposed to exactly the same visual information cueing an intergroup physical contact. However, these two conditions differed in terms of imagery task which was present in the InterPC condition but not in the InterPC-quality condition.

Following this manipulation, participants in the InterPC-quality condition reported their judgment on the quality of the picture while participants in the IntraPC and InterPC were asked to report all the feelings they had experienced and the thoughts that had come to their mind while imagining themselves in that situation. Participants were given up to two minutes to report their reactions and were subsequently provided with the dependent measures.

Participants' prejudice and stereotypical prejudice were evaluated by means of two independent paper-and-pencil IATs (see Lowery et al., 2001; Schwartz et al., 2003). These measures were administered to all participants in the InterPC, IntraPC and InterPC-quality conditions. In the prejudice-IAT, participants had to classify a list of words that fit into two categories (i.e., "Italians" and "Immigrants") and two attributes ("positive" and "negative"). The categories and the attributes were presented on the top left and top right of the paper. On one sheet, the category 'immigrant' was paired with the attribute 'negative' on the upper left side of the paper, and the category 'Italian' was paired with the attribute 'positive' on the upper right side (see Figure 4). We herewith refer to this category-attribute combination as congruent block. Participants were presented with two separate columns of stimuli and they were asked to mark a sign to the left or to the right of each stimulus to indicate its appropriate category or attribute. The stimuli items included: Italian proper names, nonItalian proper names; positive words and negative words (see Greenwald et al., 1998 and Table 1 for an example of the list of words used).

Table 1
Example of Stimuli used in the Prejudice (Positive vs. Negative) and in the Stereotypical Prejudice (Crime vs. Justice)-IAT

Italian names	Immigrant names	Positive	Negative	Justice	Crime
Andrea	Hassad	Stupendo (Wonderful)	Male (Bad)	Onestà (Honesty)	Omicidio (Murder)
Antonio	Goran	Amore (Love)	Odio (Hate)	Legalità (Legality)	Stupro (Rape)
Mario	Abdul	Gioia (Joy)	Vomito (Vomit)	Lecito (Lecit)	Furto (Theft)

For example, in the congruent condition, the to-be-classified word 'Andrea' should be check marked on the right, thus indicating its correct categorization as 'Italian'. If the to-be-classified word was check marked on the left side, this indicated an incorrect categorization of that word. On the next sheet the pairing was switched so that the category 'immigrant' was paired with the attribute 'positive' on the upper left side, and the category 'Italian' was paired with the attribute 'negative' on the upper right side. We herewith refer to this category-attribute combination as incongruent block. The order of presentation of the congruent and incongruent block was counterbalanced across participants.

The same procedure was adopted to measure participants' stereotypical prejudice. In this case, the categories were again "Italian" and "Immigrant", and, differently from the previously described IAT, the two attributes were "crime" and "justice". The list of the to-be-categorized words were adjusted accordingly (Marchese & Milazzo, 2002).

Immigrant Negative		Italian Positive
O	Andrea	O
O	Love	O
O	Abdul	O
O	Bad	O

Figure 4. Example of the prejudice-IAT used in Study 3.

Participants were given 20 seconds to classify the words in both the congruent (e.g., Immigrant+negative) and incongruent versions of each IAT (e.g., Immigrant+justice). The order of presentation of the prejudice- and the stereotypical-prejudice-IAT was counterbalanced among participants. Moreover, and for each type of IAT, the congruent and the incongruent versions were counterbalanced among participants. Participants then reported their age. Finally, they were thanked and fully debriefed. This study was carried out in accordance with the recommendation of APA guidelines and the local Ethical Committee. All participants gave written informed consent in accordance with the declaration of Helsinki.

2.6.2 Results and Discussion

2.6.2.1 Prejudice-IAT

The number of correct categorizations in one block compared to the other is the measure of relative association strength. Close associations (i.e., congruent block) between the category and the attribute that share the same response localization should make the task easier and the performance should be better (i.e., more correct categorizations) compared to the incongruent block. Specifically, in the prejudice-IAT, the (prejudice) congruent block indicated the extent to which i) Immigrant names were more accurately associated with negative than positive attributes, and ii) Italian names

were more accurately associated with positive than negative attributes. Conversely, the prejudice incongruent block indicated the extent to which i) Immigrant names were more accurately associated with positive than negative attributes, and ii) Italian names were more accurately associated with negative than positive attributes. Prejudice was here operationalized by subtracting the accuracy of incongruent associations from congruent associations.

As participants' gender did not interact with the condition, analyses were carried out leaving this factor aside.

Based on previous results, we carried out a planned contrast comparing InterPC (contrast weight: +1) to IntraPC (contrast weight: -1), and InterPC-quality (contrast weight: 0). This contrast allowed us to test whether intergroup bias was lower in the InterPC compared to the IntraPC condition, as previously demonstrated. This contrast was significant, $t(130) = 1.95$, $p = .05$. Also, we directly test whether InterPC lowered intergroup bias to a greater extent than the InterPC-quality. Therefore, we tested InterPC (contrast weight: +1) to IntraPC (contrast weight: 0), and InterPC-quality (contrast weight: -1), and this contrast was significant, $t(130) = 2.01$, $p = .05$. Also, the level of intergroup bias was very similar in the IntraPC and InterPC-quality condition, as demonstrated by the planned contrast comparing InterPC (contrast weight: 0) to IntraPC (contrast weight: -1), and InterPC-quality (contrast weight: +1), which was not significant, $t(130) = .23$, $p = .82$. In addition, the contrast InterPC (contrast weight: +2), IntraPC (contrast weight: -1) and InterPC-quality (contrast weight: -1) turned out to be significant $t(130) = 2.30$, $p = .02$, (see Figure 5).

These results confirmed the effectiveness of the InterPC in levelling intergroup bias over the two other conditions, which did not differ from each other.

2.6.2.2 Stereotypical-prejudiced-IAT

In the stereotypical-prejudice-IAT, the congruent block indicated the extent to which i) Immigrant names were more accurately associated with words regarding crime rather than justice, and ii)

Italian names were more accurately associated with words regarding justice rather than crime. Conversely, the incongruent condition indicated the extent to which i) Immigrant names were more accurately associated with words regarding justice rather than crime, and ii) Italian names were more accurately associated with words regarding crime rather than justice. Similarly, to the prejudice-IAT, stereotyping was here operationalized by subtracting the accuracy of incongruent associations from congruent associations.

We performed the same contrast analysis as for the prejudice-IAT. We performed a planned contrast comparing InterPC (contrast weight: +1) to IntraPC (contrast weight: -1), and InterPC-quality (contrast weight: 0), and this contrast was not significant, $t(130) = .67$, $p = .50$. We then tested InterPC (contrast weight: +1) to IntraPC (contrast weight: 0), and InterPC-quality (contrast weight: -1), and this contrast was not significant, $t(130) = 1.25$, $p = .21$. Also, the planned contrast comparing InterPC (contrast weight: 0) to IntraPC (contrast weight: -1), and InterPC-quality (contrast weight: +1), was not significant, $t(130) = .65$, $p = .52$. The contrast InterPC (contrast weight: +2), IntraPC (contrast weight: -1) and InterPC-quality (contrast weight: -1) was not significant $t(130) = 1.13$, $p = .26$, (see Figure 5). These results indicated that the levels of implicit stereotypical prejudice were unaffected by the experimental manipulation.

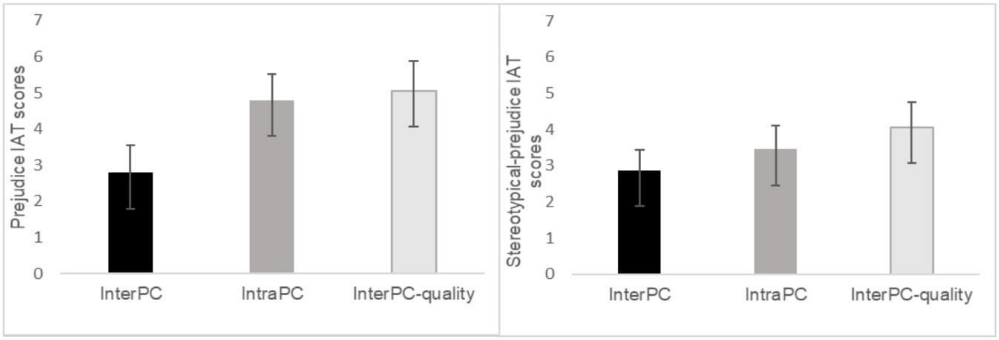

Figure 5. Prejudice and stereotypical-prejudice-IAT scores as a function of the experimental condition in Study 3. Error bars represent standard errors.

Results of Study 3 confirm and extend the results of Study 2 to implicit measures, as InterPC compared to IntraPC reduced implicit prejudice towards the outgroup, confirming hypothesis 1. Therefore, results of Study 3 further corroborate the idea that it is not physical contact *per se* that promotes prejudice reduction, but that the physical encounter should involve an outgroup member in order to trigger prejudice reduction. Furthermore, results of Study 3 clarify the boundaries conditions of the imagined intergroup physical contact manipulation. InterPC levelled implicit outgroup prejudice only when participants were asked to imagine themselves in the intergroup physical contact interaction. Indeed, when participants were asked to merely process the perceptual features of the picture as in the InterPC-quality condition, they did not show consistent prejudice reduction, confirming hypothesis 2.

Interestingly, the InterPC affected participants' implicit prejudice but not participants' implicit stereotypical prejudice. Indeed, no difference among conditions was found on the stereotypical-prejudiced-IAT (for a discussion of this null effect, see below).

2.7 General Discussion

In three studies we analysed the role played by imagined physical contact in ameliorating intergroup attitudes. Built upon the cross-over of studies showing that imagined contact, on the one hand, and actual physical contact on the other hand, can reduce outgroup prejudice and improve intergroup perception, we put forward that the mental imagery involving an intergroup physical contact may be a promising psychological device to lead perceivers to display more positive intergroup attitudes. To test this hypothesis, we tested whether seeing an image of an intergroup touch while imagining touching the hand of an outgroup member (i.e., an immigrant) improved intergroup attitudes.

Results of Study 1 indicate that imagining a physical contact with an outgroup member (i.e., an immigrant) compared to a control condition (i.e., an outdoor scene) reduced intergroup bias.

These results allowed us to gather initial evidence on the effectiveness of imagined intergroup physical contact on intergroup attitudes. Although Study 1 answers to our initial question of whether imagined physical contact could improve outgroup attitudes, Study 1 does not allow to clearly understand whether it is a touch in general or an intergroup touch in particular which triggers a more positive intergroup attitude. Study 2, specifically addresses this question and provides information in this respect. By comparing an intragroup physical contact condition (i.e., IntraPC) and an intergroup physical contact condition (i.e., InterPC) we were able to demonstrate that it is not an imagined physical contact per se, but that specific imagined physical contact with an outgroup member is needed to ultimately improve intergroup attitudes.

In sum, and corroborated by the cross-experimental analyses, results of Study 1 and 2 suggest that the positive imagined experience of touching an outgroup member specifically constitutes the grounds for generalizing the positive effects of the imagined encounter to the representation of the intergroup relation as a whole, independent of the type of control.

Furthermore, results from Study 3 show that the effects of imagined intergroup touch can be also detected at an implicit level. Indeed, participants in the InterPC condition showed lower levels of implicit prejudice compared to participants in the IntraPC condition, confirming the results found in Study 2. Study 3 sheds light on the crucial role played by mental imagery in ameliorating intergroup attitudes. Indeed, the exposure to a picture of an intergroup touch (i.e., InterPC-quality) did not produce the same positive outcomes as to when participants were also asked to imagine the intergroup touch (i.e., InterPC).

In sum, the combining results of the three studies suggest that imagined intergroup physical contact ameliorates intergroup attitudes both at explicit and implicit level. The fact that the imagined physical contact exerts its beneficial effects on overt and covert attitudes rules out the possibility that the observed effects were driven by demand characteristics, and suggests that imagined intergroup physical contact ameliorated both controlled and spontaneous attitudes.

Importantly, findings of Study 3 show that imagined intergroup physical contact ameliorates evaluative attitudes but does not alter group stereotyping. Two different reasons might account for these results. First, stereotypes refer to the semantic knowledge associated with the outgroup (Hamilton, 1981; Rumiati et al., 2014). Stereotype revision is typically triggered by the exposure to actual or imagined counterstereotypical exemplars (e.g., Carnaghi & Yzerbyt, 2007; Dasgupta & Greenwald, 2001). Since in the imagined intergroup physical contact perceivers are not exposed to any counterstereotypical instance, there is no reason for stereotype revision to occur. Second, prejudice is conceived as the affective response toward the outgroup (Amodio & Devine, 2006), and is found to be predictive of appetitive behaviors. Indeed, evidence shows that prejudice, but not stereotype about an outgroup, is associated with both avoidance tendency and physical distance from a member of that outgroup, thus proving a selective relation between prejudice, and aversive behaviors (Amodio & Devine, 2006; Dovidio et al., 2002). The imagined intergroup physical contact might be framed as induced appetitive behavior, since the perceiver is requested to be physically close to the outgroup member. Together, these claims suggest that imagined intergroup physical contact likely operates under affective rather than semantic learning mechanisms (Amodio & Lieberman, 2009), and opens up the question of whether intergroup physical contact additionally works through intergroup anxiety route to reduce outgroup prejudice.

Our findings extend and further clarify the results found by Choma et al. (2014) and by Hodson et al. (2015) by showing that imagined intergroup physical contact is per se effective in ameliorating intergroup attitudes even when participants are not provided with additional information concerning the type of interaction with the outgroup (e.g., intergroup cooperative setting). Also, this set of studies broadens the theoretical frame of imagined contact by showing that even specific forms of imagined contact, such as the one represented by a physical encounter, could be a promising strategy to improve intergroup relations. Note that this set of studies was not designed to compare the traditional form of imagined contact with imagined intergroup physical contact. Indeed, the primary aim of this research is to inform on the effects of physical contact also

in intergroup contexts, a topic which has not yet been fully investigated in its indirect forms. In addition, most of the research has focused on the effects of direct physical contact in interpersonal settings while less attention has been given to the role played by physical contact in intergroup settings in both its direct and indirect forms. Thus, this research is informative in the sense that it expands the limited literature on the effects of intergroup physical contact on outgroup attitudes by using indirect contact strategies. Nevertheless, future studies could aim at comparing imagined intergroup physical contact and traditional forms of imagined contact to test if and in which contexts (e.g., countries in which touch is more frequently used or countries which do not often involve in physical contact), one could be more effective than the other.

There are also a number of limits which should be taken into account when evaluating the effectiveness of the imagined intergroup physical contact. First, despite the promising results found both on explicit and implicit attitude measures, we did not test the efficacy of the imagined intergroup physical contact over time. Indeed, we did not ascertain whether the predicted shift in intergroup attitudes was stable over time and resistant to subsequent negative information concerning the outgroup. Said otherwise, for an intervention to be useful in improving intergroup relations, immediate effects on intergroup attitudes should be acknowledged, but also longer lasting effects should be demonstrated (Dasgupta & Greenwald, 2001). Second, the impact of imagined intergroup physical contact on intergroup attitudes is small in terms of effect size. Despite the size of the effect, our findings are not trivial as they are the outcome of a brief and single imagined physical contact. It might be plausible that reiterated experiences of imagined intergroup physical contact could reach a larger effect. More studies are needed to truly identify the boundaries conditions that allow the imagined intergroup physical contact to be successful in changing outgroup attitudes.

CHAPTER 3

DIFFERENT FACETS OF TOUCHING HANDS: IMAGINING TOUCHING A GAY MAN ENHANCES WOMEN'S (BUT NOT MEN'S) PERCEIVED SIMILARITY WITH GAY MEN

Shamloo, S. E., Carnaghi, A., & Bianchi, M. (2018). *Different facets of touching hands: Imagining touching a gay man enhances women's (but not men's) perceived similarity with gay men*. Manuscript submitted for publication.

3.1 Abstract

Individuals respond positively to touch as demonstrated by studies showing the positive effects of touch at intrapersonal and interpersonal level (i.e., well-being, pro-social behavior, positive evaluation of the toucher). Recently touch has shown to positively affect individuals also when the person involved in the touch pertains to a different social group (i.e., intergroup level, e.g., European-American and African-American). Also, imagining touching a racial outgroup member, similar to actual touch, leads people to develop a sense of communality with that member as well as improve attitudes towards the whole outgroup. This research addressed whether imagined physical contact with a gay man (i.e., outgroup) increased similarity between the toucher and gay men. We asked male and female participants to imagine touching the hand of a gay man (i.e., Intergroup physical contact; InterPC) compared to an uncategorized individual (i.e., Un-CatPC). Differently from previous studies on InterPC, gender differences are particularly relevant in this context. Indeed, heterosexual men prefer to maintain physical and psychological distance from gay men to stress intergroup distinctiveness, and refrain from touching a gay man to avoid being miscategorized as gay men. Results showed that male but not female participants reported a less positive appraisal of the imagined encounter in the InterPC compared to Un-CatPC condition. Furthermore, female, but not male participants, showed higher levels of self-outgroup similarity in the InterPC compared to the Un-CatPC condition. Both results were independent from previous contact with gay men. Results were discussed with respect to the literature on physical contact and intergroup relations.

Keywords: touch; physical contact; homosexuality; gender differences; imagined contact; self-outgroup overlap; similarity

3.2 Introduction

Being touched exerts significant psychological effects at the intrapersonal, interpersonal and intergroup levels (see Gallace & Spence 2010 for a review; Shamloo, Carnaghi, & Fantoni, 2018). At the intrapersonal level, touch contributes to the neuro-development and socio-emotional development of infants (e.g.; Weiss, Wilson, Hertenstein, & Campos, 2000; Weiss, Wilson, & Morrison, 2004). Weiss and colleagues (2000) found that nurturing touch during infancy was associated with a secure attachment style in robust infants compared to infants who were less exposed to this type of touch. Also, more frequent use of touch in low birth weight infants elicited better visual-motor skills and more advanced gross motor development at 1 year of age (Weiss et al., 2004).

The effects of touch at the intrapersonal level have not only been documented during infancy, but also later in life in adulthood. For example, low, unsatisfactory levels of physical contact are associated with higher levels of depression in adults (Cochrane, 1990). The use of touch in couples enhances salivary oxytocin levels (e.g., Holt-Lunstad, Birmingham, & Light, 2008), decreases heart rate and cortisol levels in response to stressing events (e.g., Ditzen et al., 2007). Furthermore, touch reduces anxiety levels in patients during intensive care (e.g., Henricson, Ersson, Määttä, Segesten, & Berglund 2008) and contributes to the improvement of their physical health as demonstrated by reduced feelings of pain (see Field, 2010 and 2014 for a review).

In addition to the effects at the intrapersonal level, research on touch has also been dedicated to the understanding of its effects on adults within interpersonal contexts. In everyday life, interaction does not only occur through verbal communication but also by relying on nonverbal cues (see Gallace & Spence, 2010 for a review). For instance, the use of physical contact in general and of touch in particular conveys communal sharing relationships in which the individuals are treated as "equivalent and undifferentiated" (Fiske, 1992, p. 699, see also Fiske, 2004). Indeed, touching softens the cognitive boundaries between the self and the other, and makes the other be perceived as similar to oneself. In other words, physical contact leads to represent the other as a part

of the self (i.e., inclusion of the other in the self; Aron, Aron, Tudor, & Nelson, 1991; see Seger, Smith, Percy, & Conrey, 2014). As a case in point, Simão and Seibt (2015) showed that friendly touch, compared to a control condition of no-touch, increases communal feelings with the touched individual, namely experiencing the relationship as communal in which inter-agents are cognitively represented as connected.

A potential consequence of representing the touched other as part of the self is the improvement of attitudes towards the touched individual. Studies demonstrated that interacting via touch (e.g., brief touch on the arm or shoulder) elicits positive impression regarding the toucher (Hornik, 1992; Erceau & Guéguen, 2007; Simão & Seibt, 2015). In addition, the use of touch at interpersonal level enhances compliance with requests (Willis & Hamm, 1980; Smith, Gier, & Willis, 1982), and pro-social behavior towards the toucher (e.g., Guéguen & Fischer-Lokou, 2003).

Together, the above-mentioned studies suggest that physical contact exerts several and distinct effects at the intrapersonal level as well as interpersonal level. Based on these findings, research has recently tested whether the positive effects of touch may also occur at the intergroup level, this is when the touch occurs between individuals who do not share the same group membership (e.g., European-Americans and African-Americans). These studies have concentrated both on the immediate physiological reactions to the touch by an outgroup member as well as the consequences of an outgroup touch in terms of the subsequent appraisal of the group to which the toucher belongs (i.e., attitudes towards the toucher's group).

As far as the immediate physiological reactions to an intergroup touch are concerned, research has assessed the galvanic skin response of group members involved in the physical contact situation. Galvanic skin response signals the activation of the autonomic nervous system and may be interpreted as representing an automatic, uncontrollable anxiety response (Amodio, 2013). Back in the 50 and 60's, research found that European-Americans who had been touched by an African-American individual showed higher levels of galvanic skin response compared to when touched by a European-American individual (Rankin & Campbell, 1955). A more recent study (Vrana &

Rollock, 1998) showed instead that European-American individuals' skin conductance was not enhanced after having touched an African-American person compared to a European-American person. This line of research has produced mixed findings. A potential explanation to the contradicting results may be linked to an enhanced intergroup contact, thus familiarity with the outgroup members as well as a reduced racial prejudice across time (Shamloo, Carnaghi, Piccoli, Grassi, & Bianchi, 2018).

As far as the effects of an outgroup touch on the consequent appraisal of the outgroup as a whole are concerned, recent studies suggest that the use of physical contact within intergroup contexts is associated with more positive attitudes towards the outgroup because physical contact enhances the perceived cooperation, pleasantness and the intimacy with the outgroup (Shamloo et al., 2018a). This pattern of results is in line with experimental evidence on this issue. Seger and colleagues (2014) found that a light casual touch on the shoulder by an African-American individual elicited more positive attitudes towards the group of African-Americans as a whole (i.e., Experiment 1). In other words, the positive effects of touch can be generalized beyond the evaluation of the toucher and ultimately reach the toucher's group.

Unfortunately, physical contact is generally discouraged in our society, thus limiting the possibility of using it during interactions (Field, 2001, see also Gallace & Spence, 2010 for a review). Also, when interacting with outgroup members compared to ingroup members avoidance-like behaviors typically arise (Bianchi, Carnaghi, & Shamloo, 2018; Carnaghi & Maass, 2006; Paladino & Castelli, 2008) as well as enhanced physical distance (Amodio & Devine 2006; Dotsch & Wigboldus, 2008; Word, Zanna, & Cooper, 1974) thus weakening the possibility that intergroup physical contact occurs.

Several studies have therefore investigated whether this limit could be addressed by using physical contact in an indirect rather than direct way, and specifically within the theoretical frame of the imagined intergroup contact (see Miles & Crisp, 2014). This approach is based on the idea that mental imagery may involve emotional, motor and cognitive processes that are also recruited,

albeit to a different extent, in real situations (Kosslyn, Ganis, & Thompson, 2001), such as those represented by the intergroup contact (Turner, Crisp, & Lambert, 2007).

To be effective, the imagined intergroup contact should meet few criteria (Turner, West, & Christie, 2013). First, perceivers should mentally simulate an interaction with an individual member whose category membership is salient (e.g., category salience). Category salience accounts for the generalization of the outcome of the intergroup encounter experience to the outgroup as a whole (Hewstone & Brown, 1986). Second, the imagined outcome of the intergroup encounter experience should be positive. Indeed, compared to a relative less positive outcome of the intergroup encounter experience, more positive outcome of the intergroup encounter experience is highly effective in promoting self-outgroup similarity (Stathi & Crisp, 2008, Experiment 1). Third, perceivers should actually simulate an interaction with the outgroup member, given that just thinking of an outgroup member does not lead to the same positive effects on intergroup attitudes (Turner et al., 2007, Experiment 2; Shamloo et al., 2018b, Experiment 3).

Following these criteria, research studying the manner in which imagined intergroup *physical* contact affects intergroup attitudes has typically requested participants to mentally simulate a positive interaction with an outgroup member which involves a physical contact. These empirical efforts are backed by the fact that brain regions recruited during actual and imagined touch are, at least in part overlapping, as demonstrated by the involvement of the anterior insula in both types of physical contact (Lucas, Anderson, Bolling, Pelphrey, & Kaiser, 2015). Consistently, research demonstrated that imagining a physical interaction with a homeless person in a positive setting (i.e., cooperation) weakens the association between disgust sensitivity and prejudice towards homeless individuals, compared to a control condition (Hodson, Dube, & Choma, 2015). Positive effects of imagined physical contact on outgroup attitudes have also been found in the case of racial and religious outgroup members (i.e., Muslims, immigrants; Choma, Charlesford, & Hodson, 2014; Shamloo et al., 2018b).

Notwithstanding the importance of this research in helping to understand the relation between imagined intergroup physical contact and intergroup attitudes, the above-mentioned studies have limited their investigation to homeless individuals and racial/religious outgroups, thus leaving the question of whether intergroup physical contact with other minority groups, such as gay individuals, improves intergroup relations with this outgroup unaddressed. The need to start analysing whether imagining a physical contact with a gay man would improve intergroup relations involving gay men is triggered by the unique role played by the gender in this specific intergroup encounter. Gender differences are particularly relevant when studying intergroup contexts in which gay men are involved (Costa, Carneiro, Esposito, D'Amore, & Green, 2018; Herek, 2004; Ioverno et al., 2018), thus preventing from extending previous findings on intergroup physical contact with other groups (e.g., immigrants, homeless individuals, African-Americans) to such intergroup context. Moreover, gender differences become even more crucial when intergroup encounters are characterized by physical interactions, for two distinct reasons. First, and at the physical intergroup encounter level, heterosexual men, more than heterosexual women, actively refrain from touching men in general, and gay men in particular as a way to avoid being miscategorized as gay men (Derlega, Lewis, Harrison, Winstead, & Costanza, 1989; Dolinski 2010; Floyd, 2000; Roese, Olson, Borestin, Martin, & Shores, 1992; Rozin, Nemeroff, Horowitz, Gordon, & Voet, 1995). Had this been the case, male participants, compared to female participants, who do not self-identify as gay, should evaluate more negatively the imagined physical encounter experience with a gay man. Indeed, expressing negative attitudes towards gay men has been found to be functional to maintain a positive gender identity that is unequivocally distinct from a homosexual identity (Falomir-Pichastor, & Mugny, 2009). Second, and at the intergroup level, heterosexual men, but not heterosexual women, are motivated to differentiate the representation of the ingroup from the representation of gay men as a whole (Berent, Falomir-Pichastor, & Chipeaux, 2016; Carnaghi, Maass, & Fasoli, 2011; Falomir-Pichastor & Mugny, 2009; Salvati, Ioverno, Giacomantonio, & Baiocco, 2016). One of the reasons which may account for the need for men to differentiate

themselves from gay individuals may be linked to the concept of precarious manhood (Bosson, Vandello, Burnaford, Weaver, & Arzu Wasti, 2009; Vandello, Bosson, Cohen, Burnaford, & Weaver, 2008). According to this idea, manhood compared to womenhood, represents a status which is achieved rather than ascribed (Gilmore, 1990) and is considered as both elusive and tenuous (Bosson et al., 2009; Vandello et al., 2008). It is elusive in the sense that it is not a "developmental certainty" (p. 1326, Vandello et al., 2008), and it is tenuous in the sense that also when this status has been achieved it can be lost at any time. Thus, any situation which challenges men's manhood will provoke anxiety responses in men and activation of behavioral patterns in order to demonstrate their manhood and restore masculinity (Vandello et al., 2008). In line with this reasoning is evidence showing that when masculinity is threatened, men's need to stress their heterosexuality is enhanced (Carnaghi et al., 2011).

Indeed, factors that undermine the gender identity distinction between heterosexual and gay men (e.g., threat to masculinity) activates heterosexual men's need for intergroup differentiation, namely the need to maintain a psychological distance between the ingroup and the ougroup representation (Berent et al., 2016; Talley & Bettencourt, 2008).

Given the specificity of physical intergroup context involving gay men, the analyses of gender differences in reaction to an imagined intergroup physical encounter appears to be mandatory and thus will be assessed in the present study. In so doing, we will address the crucial role of the outcome of the intergroup physical encounter experience, being this more positive for women than men, in triggering the generalization of this experience to the outgroup as a whole. This analysis will allow us to define the boundary conditions of the effects of the intergroup physical contact on the appraisal of intergroup relations.

3.3 Overview of the study and hypothesis

In the present research we asked participants to imagine touching either a gay man (i.e., imagined intergroup physical contact; InterPC) or imagine touching an individual whose category membership was not mentioned, namely an uncategorized individual (i.e., imagined contact with an un-categorized person condition Un-CatPC, for a similar procedure, see Shamloo et al. 2018b). The evaluative reactions to the imagined physical contact experience constituted the first dependent variable. Indeed, this variable is extremely important as it stands at the basis of the effectiveness of the imagined intergroup encounter on intergroup attitudes (Turner et al., 2013). Then, we assessed participants' representation of the perceived similarity between the representation of the self and of the outgroup. Self-outgroup similarity, has been operationalized by the extent to which participants consider themselves similar to the outgroup, namely, perceive the representation of the self as overlapping the representation of the outgroup (Bianchi, Machunsky, Steffens, & Mummendey, 2009; Cadinu & Rothbart, 1996; Cadinu, Latrofa, & Carnaghi, 2013; Carnaghi & Yzerbyt, 2007; Latrofa, Vaes, Cadinu, & Carnaghi, 2010; Robbins & Krueger, 2005).

We anticipated that male participants would report a relatively less positive experience of the imagined physical contact than female participants in the InterPC, while male and female participants would similarly and positively appraise the encounter experience in the Un-CatPC (Hypothesis 1a). Also, we hypothesized that male participants would report a less positive appraisal of the outcome of the imagined physical contact experience in the InterPC than Un-CatPC, while no difference between conditions should occur for female participants (Hypothesis 1b).

These hypotheses are backed by research showing that male participants, compared to female participants, refrain from touching men and gay men in particular (Derlega et al., 1989; Dolinski, 2010; Floyd, 2000; Roese et al., 1992; Rozin et al., 1995) and consistently express less positive attitudes towards the to-be-touched gay men as a way to preserve their gender identity (Falomir-Pichastor & Mugny, 2009).

Second, and coherently with the literature on the imagined intergroup contact, we put forward that the self-outgroup (i.e., gay) similarity would be enhanced when both the category membership of the touched individual is salient, as in the case of the InterPC but not in the case of Un-CatPC, and the outcome of the imagined intergroup physical contact experience perceived in a positive way, as in the case of female relatively to male participants (Turner et al., 2013; Stathi & Crisp, 2008, Experiment 1). In other words, by envisaging a *positive* physical contact situation with a gay man, female more than male participants can develop a sense communality with this outgroup member, which may ultimately generalize to the outgroup as a whole. If this were the case, we would expect female participants to display higher levels of self-outgroup similarity than male participants in the InterPC, and female and male participants to display similar levels of self-outgroup similarity in the Un-CatPC, in which the to-be-touched individual is an uncategorized person (Hypothesis 2a). Also, we hypothesized that female participants would display higher levels of self-outgroup similarity in the InterPC than Un-CatPC while male participants would report similar levels of self-outgroup similarity in the InterPC and Un-CatPC (Hypothesis 2b).

An ancillary aim of the current study is to assess the role of the amount of previous contact with gay men both in the appraisal of the outcome of the imagined physical contact experience and the perceived self-outgroup similarity. Individuals with extensive rather than reduced intergroup contact typically display less polarized, more diverse beliefs and more positive attitudes towards the outgroup, thus reducing the extent to which the discrete outgroup encounter would impact on the appraisal of the encountered member and the outgroup as a whole (Hewstone & Hamberger, 2000; Paolini et al., 2014). One may put forward that higher levels of contact with gay men would be associated with a more positive appraisal of the imagined physical contact experience as well as a higher self-outgroup similarity. However, the amount of previous contact with gay men is a general, unspecific measure, which may not necessarily tap the amount of previous *physical* contact with gay men. Hence, it might be plausible that both the appraisal of the outcome of the imagined physical contact experience and the perceived self-outgroup similarity would be overwhelmingly

driven by the experimentally salient encounter (i.e., imagined physical contact) rather than mainly being based on the previous amount of contact with gay men. Given that no research has been conducted on this issue thus far, the analysis of the role played by the amount of previous contact with gay men in this respect remains explorative.

We decided to focus on intergroup physical contact with a gay man rather than a lesbian woman for two different albeit related reasons. First, sexual prejudice towards gay men is stronger than sexual prejudice towards lesbian women (Herek, 2002). Second, and in line with the aim of the study, fear of being miscategorized as gay is particularly enhanced when touching a man or a gay man, at least for heterosexual men (Derlega et al., 1989; Dolinski, 2010; Floyd, 2000; Roese et al., 1992; Rozin et al., 1995). Hence, relying on a gay man as the imagined-to-be-touched individual represents a fertile ground to test our hypothesis, albeit this methodological choice limits the external validity of our findings.

3.3.1 Material and Methods

3.3.1.1 Participants

The experimental sample comprised N = 142 participants. Participants who indicated to be gay (n = 2), foreigners having trouble with the Italian language (n = 2), and who interrupted the experiment (n = 1), were not entered in the experimental sample. In addition, n = 1 participant was eliminated given that the score associated with the self-outgroup similarity measure was higher than 2.5 SD from the mean. The final sample comprised N = 136 participants (n = 68 female, n = 65 male participants, n = 3 did not report their gender). Participants' age ranged between 18 and 42 years (M = 23.3, SD = 3.51). Participants were randomly assigned to one of two experimental conditions, namely either to the imagined contact with an un-categorized person condition (i.e., Un-CatPC; n = 64) or to the imagined intergroup physical contact condition (i.e., InterPC; n = 72).

3.3.1.2 Procedure

After giving their written consent, participants were handed a questionnaire on the way people imagine social situations. We followed the experimental procedure outlined by Shamloo and colleagues (2018b). In the first page, as part of a cover story, participants reported demographic information such as age, in a free format response, and their sexual orientation by indicating whether they were heterosexual, bisexual or homosexual. This procedure allowed us to make participants' sexual orientation cognitively salient (for similar procedure, see Steele & Aronson, 1995). Then, they were provided with a picture which portrayed two hands of two distinct persons (see Appendix B). One hand was depicted on the left side and one hand was displayed on the right side. Importantly, the hand on the right was depicted palm-down on the back of the hand displayed on the left, thus, the hand on the right was depicted as touching the hand on the left. In the InterPC condition participants received the following instruction:

> We ask you to look at this picture for one minute and to identify with one of the two main characters. Specifically, we ask you to imagine that the hand depicted on the right side is yours and that it is touching the hand of a gay man (*un omosessuale* in Italian).

It is worth noticing that the instruction mentioned that the touched individual was a gay man, as in Italian the article (i.e., *un*) specifies the gender of the noun, in this case a gay man. Also, the category label 'homosexual' is used to point to gay men in the Italian context (Fasoli et al., 2016). In the Un-CatPC condition, the category label 'a homosexual' was replaced with 'a person' (*una persona* in Italian), thus not specifying any social identity of the touched individual.

In line with the procedure outlined by Crisp and colleagues (2009), participants then read: "Imagine feeling at ease during this contact and imagine it to be a positive experience in which you discover unexpected things".

After the experimental manipulation, participants reported all the feelings and thoughts they had experienced while imagining themselves in that situation (see, Turner et al., 2007). Participants

were given up to two minutes to report their reactions and were then provided with the dependent measures. Participants completed the dependent measures in the following order.

Self-ratings. Participants were presented with twenty-four traits (adapted from Carnaghi & Maass, 2007; see Appendix C): Eight traits were stereotypical of gay men, eight were counterstereotypical of gay men, and eight were irrelevant traits which could have been equally associated to gay and heterosexual individuals; half of the traits was positive and half was negative. Participants indicated to which extent each trait characterized themselves, by means of a 7-point scale, ranging from 1 (= *not at all*) to 7 (= *totally*). The presentation of the traits was counterbalanced across participants.

Gay-ratings. Participants were presented with the same traits as above, and indicated the extent to which each trait was typical of gay men, on a 7-point scale, ranging from 1 (= *not at all*) to 7 (= *totally*). The items were counterbalanced across participants.

Demographic. Participants reported their gender, and their sexual orientation based on the Kinsey Scale (Kinsey, Pomeroy, & Martin, 1948), ranging from 1 (= *totally homosexual*) to 7 (= *totally heterosexual*).

Contact. We also asked participants to report the amount of gay men they personally knew (0, 1-2, 2-5, *more than* 5). Finally, participants were thanked and fully debriefed.

This study was carried out in accordance the local Ethical Committee. All participants gave written informed consent in accordance with the Declaration of Helsinki.

3.3.2 Results

Data were analyzed by means of the JAMOVI software (Version 0.9; Jamovi Project, 2018).

Preliminary analyses:

In order to verify that equal number of male and female participants was distributed across conditions, a chi-square analysis was carried out. Results indicated that the number of male and female participants did not vary across conditions (n = 35 female and n =34 male participants in the

InterPC condition and n = 33 female and n = 31 male participants in the Un-CatPC condition, $\chi^2(1,133) = .01$, p =.92). Also, the experimental condition did not affect participants' amount of contact, $t(131) = .96$, $p = .34$, indicating a similar level of amount of contact in the Un-CatPC (M = 2.06, SE = .11) and in the InterPC (M = 1.91, SE = .11).

Given the equal distribution of male and female participants across conditions, and the fact that participants' amount of contact did not vary as a function of the experimental condition, these two variables were used in the main analyses.

Appraisal of the imagined physical encounter experience

Participants feelings and thoughts experienced while imagining themselves in the physical contact were read by two independent judges who rated their evaluative content (i.e., evaluative reaction) on a bipolar scale, ranging from -3(= very negative) to +3(= very positive). Inter-judgment agreement was high, and disagreement (8%) was solved via consensus. The evaluative reaction was regressed on the Condition (contrast code: Un-CatPC = 0, InterPC = 1), participant gender (contrast code: females = 0, males = 1), participants' amount of contact (centered variable), the first and second order interaction. The model was significant $R^2 = .24$, Adjusted $R^2 = .20$, $F(1,124) = 5.73$, $p < .001$. Participant gender was significantly associated with the evaluation reaction B = -1.64, SE = .72, t = 2.30, p = .023, indicating that female participants (M = 2.08, SE = .20, CI: 1.69, 2.47) reported more positive evaluative reactions than male participants (M = 1.02, SE = .20, CI: .63, 1.42). The effect of the condition was marginally significant B = -1.40, SE = .72, t = 1.95, p = .053, and it indicated a more positive evaluative reaction in the Un-CatPC (M = 1.90, SE = .21, CI: 1.50, 2.31) than in the InterPC (M = 1.20, SE = .19, CI: .82, 1.58). More importantly for Hypothesis 1a and 1b, the condition by participant gender interaction was significant B = -3.14, SE = 1.43, t = 2.20, p = .03. Female participants reported similar evaluative reactions in the InterPC (M = 2.06, SE = .27, CI: 1.53, 2.59) and Un-CatPC (M = 2.11, SE = .29, CI: 1.53, 2.69), t = .13, p = .9. Male participants reported lower, namely less positive evaluative reactions in the InterPC (M = .34, SE = .28, CI: -.20, .89) compared to the Un-CatPC (M = 1.70, SE = .29, CI: 1.13, 2.27), t = 3.41, p <

.001). No difference occurred between male and female participants in the Un-CatPC condition in terms of evaluative reaction, t = .99, p = .33, while the evaluative reaction was lower, that is less positive for male than female participants in the InterPC (t = 4.48, p < .001). The condition by amount of contact, and the participant gender by amount of contact interaction were not significant (t < 1.07, p > .29). Also, the condition by participant gender interaction was not further moderated by the amount of contact (B = .92, *SE* = .65, t = 1.42, p = .16).

Self-Outgroup Similarity

Within-participant (or intra-individual profile) correlations were computed between ratings of the self and ratings of gay men as a group[4] (for similar procedure, see Latrofa et al., 2010; Cadinu et al., 2013). The correlation allowed us to operationalize the degree of self-outgroup similarity or overlap. Correlation coefficients were Fisher Z-transformed (McNemar, 1962; herewith referred to as similarity score) to reach a normal distribution.

The similarity score was regressed on the Condition (contrast code: Un-CatPC = 0, InterPC = 1), participant gender (contrast code: females = 0, males = 1), participants' amount of contact (centered variable), the first and second order interaction.

The model was significant R^2 = .15, Adjusted R^2 = .11, F(1,119) = 3.10, p = .005. Neither participant gender B = -.12, *SE* = .17, t = .71, p = .48, nor the condition B = .07, *SE* = 17, t = .39, p = .69 significantly predicted the similarity score. The participant gender by condition fell short of significance B = -.64, *SE* = .33, t = 1.94, p = .055. In line with hypothesis 2a and 2b, inspection of this interaction (see Figure 1) revealed that female participants showed higher levels on the similarity score in the InterPC condition (M = .72, *SE* = .06, 95% CI [0.596, 0.844] compared to the Un-CatPC condition (M = .48, *SE* = .07, 95% CI [0.349, 0.615]; t = 2.59, p = .01, d = .64) while male participants did not show any difference between the InterPC condition (M = .41, *SE* = .07,

[4] Participants (n = 4) who reported no variability when evaluating a target (i.e., gay men or the self) were included in the sample but within subject correlations could not be assessed because of the correlational nature of the score.

95% CI [0.277, 0.535]) and Un-CatPC condition (*M* = .42, *SE* = .07, 95% CI [0.284, 0.549]; *t* = .09, *p* = .93, *d* =.02). Also, while no difference between female and male participants occurred in the Un-CatPC condition, (*t* = .71, *p* = .48, *d* = .18), female participants showed higher levels of similarity score compared to male participants in the InterPC (*t* = 3.46, *p* < .001, *d* = .84).

The effect of the amount of contact was not significant B = .07, *SE* = .04, *t* = 1.79, *p* = .076 although results indicated that higher levels of participants' contact with gay men tended to be associated with higher similarity score. This effect was not moderated by the condition B = .02, *SE* = .08, *t* = .32, *p* = .75. Also, the gender by condition interaction was not further qualified by the amount of contact, B = .20, *SE* = .15, *t* = 1.32, *p* = .19.

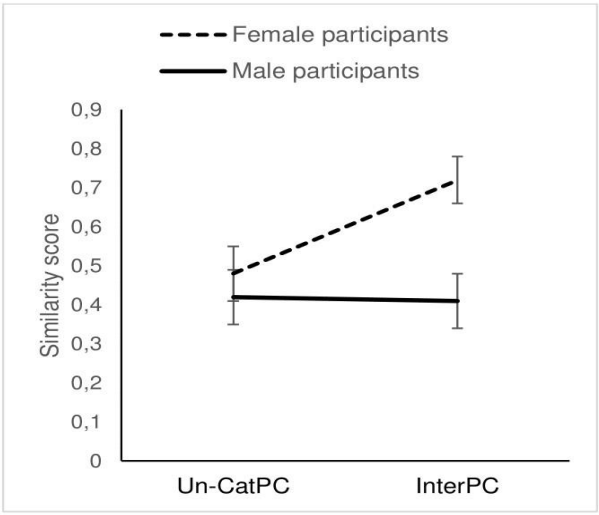

Figure 1. Self-Outgroup similarity as a function of the experimental condition and gender. Un-CatPC stands for imagining touching an uncategorized individual; InterPC stands for imagining touching a gay man; Similarity scores refers to the perceived similarity between the self and the outgroup. Vertical bars represent Standard Errors.

3.4 Discussion

In the current study we aimed to investigate the effects of positive touch, by expanding the limited literature on the role played by touch in intergroup settings. Indeed, most research has focused on the effects at the intrapersonal or interpersonal level, leaving the study of the effects of physical contact at intergroup level still very limited. In addition, for the first time, we decided to focus on physical contact with a particular stigmatized group, the group of gay men. The current

empirical effort was driven by the hypothesis that imagining a physical contact with an outgroup member would create a sense of self-other overlap that extends beyond the intergroup encounter to reach the outgroup as a whole (Seger et al., 2014). We reasoned that male participants, more than female participants, are reluctant to touch a same-sex individual in general, and a gay man in particular as they fear of being miscategorized as gay men (Derlega et al., 1989; Dolinski, 2010; Floyd, 2000; Roese et al., 1992; Rozin et al., 1995). Also, studies have shown that heterosexual men, compared to heterosexual women, strive to maintain distance and a cognitive representation of the self as distinct as possible from the cognitive representation of gay men (Berent et al., 2016; Carnaghi et al., 2011; Falomir-Pichastor & Mugny, 2009; Salvati et al., 2016). In line with this rationale we believed that these tendencies would shape the appraisal of an imagined touch with a gay man. Indeed, we found that male participants showed a less positive appraisal of the imagined physical encounter with a gay man compared to female participants while such difference between male and female participants was not present when an uncategorized person (i.e., a person whose sexual orientation was not mentioned) was involved (Hypothesis 1a). Also, our hypothesis that male participants would show a less positive appraisal of the encounter when a gay man was involved compared to an uncategorized person, found support in our results. On the contrary, female participants showed no difference in the appraisal of the encounter between conditions (Hypothesis 1b). This pattern of results indicates that gender differences appear to become relevant only when a gay male individual is the target of the physical interaction, but not when the target is an individual whose social identities have not been disclosed.

The current endeavor examined the consequence of imagined intergroup physical contact on the cognitive appraisal of self-outgroup similarity. We further reasoned that participants would enhance the self-homosexual similarity only when the category membership was made salient, as in the case of the InterPC condition, and when the imagined physical contact experience was positively perceived by the participants. Given that we expected female participants to generally

show a more positive appraisal of the encounter involving a gay man, we therefore expected female participants to be the ones most positively affected by our experimental manipulation.

In line with this rationale, we found that female compared to male participants enhanced the similarity between the representation of the self and the representation of gay men as a group after having imagined touching a gay man. Importantly, female participants did not show a higher self-gay men similarity than male participants by default, as no difference between female and male participants was found when participants imagined touching an uncategorized individual (Hypothesis 2a). Also, female participants showed higher levels of self-outgroup similarity after having being asked to imagine touching a gay man compared to an uncategorized person. Importantly, these results were not present in male participants who showed similar levels of self-outgroup similarity between conditions (Hypothesis 2b). Therefore, it seems that female participants were more likely to generalize the positive sense of communality established with the touched gay man to gay men as a group.

Importantly, the current pattern of findings regarding both the appraisal of the imagined physical encounter experience and self-outgroup similarity was independent of participants' levels of direct contact with gay men, although, our results indicated that higher amounts of contact with gay men tended to be associated with higher similarity scores. Thus, it may be plausible that the intergroup physical contact experience induced by the experimental manipulation might have been the most salient information to anchor subsequent judgments, thus overshadowing the association between previous general contact with the outgroup and the appraisal of both the intergroup encounter and the perceived similarity.

Altogether these results inform us on the effects of touch in a specific intergroup context such as the one involving gay men in this case and suggest that intergroup physical contact may work as an antecedent of self-outgroup communality at least in the female sample. In addition, these results inform to the theoretical frame of the imagined intergroup physical contact (Choma et al., 2014; Hodson et al., 2015; Shamloo et al., 2018b) by warning that factors impeding participants to

develop a sense of positive communality with the touched individual - as participant gender in our case - dampen the likelihood of generalizing the positive experience gathered in the intergroup encounter to the outgroup as a whole.

Importantly, this research also sheds light on the difference between the imagined intergroup physical contact and the general imagined intergroup contact. It is worth noting that participant gender has not been found to be a crucial moderator of the relations between imagining an intergroup contact with gay individuals and sexual prejudice (Turner, et al., 2013; Study 2; West, Husnu & Lipps 2015; Study 2). Also, studies that involved only heterosexual male participants (Turner et al. 2007; Study 3; West et al., 2015; Study 1) showed that imagined intergroup contact with a gay individual was effective in improving outgroup attitudes, even in cultural contexts which were characterized by high levels of sexual prejudice (i.e., Cyprus and Jamaica; West et al., 2015). The difference between the results stemming from the classical imagined contact paradigm and the findings of the current research testifies to the difference between the cognitive and motivational processes recruited by a general mental simulation of an interaction with a gay man, and the specific mental simulation of a *physical* contact with a gay man, which in this latter case can be perceived as threating male touchers' gender-identity and/or sexual orientation, similar to real contact experiences involving actual touch.

At the practical level, the imagined intergroup physical contact might be a powerful tool to improve intergroup relations with gay men in contexts in which heterosexual women are the target of intervention (e.g., health care professions or educational settings with higher rates of women than men). These results may raise awareness on the role of touch as a communication tool and as a means to induce a sense of communality with the person we communicate with. This is of extreme importance especially in those contexts (e.g., health care environments) where daily contact between professionals and users/patients make it desirable, if not necessary, to build positive relationships in order for both parts to work and receive attention in a favorable environment. For example, research has shown that the social representation of gay men is still associated with HIV-

infection (Carnaghi, Trentin, Cadinu, & Piccoli, 2011) and that, even among health professionals (e.g., nurses), HIV stigma can have a disruptive effect on interactions with minorities (Nyblade, Stangl, Weiss, & Ashburn, 2009). Interventions aimed at increasing interpersonal and intergroup closeness via self-other overlap (Aron et al., 1991) can improve patients' well-being (Holt-Lunstad, Smith, & Layton, 2010) and enhance patients' adherence to treatment (Zolnierek & DiMatteo, 2009).

In sum, we suggest that imagined intergroup physical contact may represent a feasible intervention strategy to use in those contexts where direct contact is less frequent or very limited. Indeed, it may not only prepare individuals for future direct contact but it may also shape the quality of future contact with individuals as future interactions may be molded on previous positive imagined contact experiences (see Miles & Crisp, 2014; Crisp & Turner, 2009). In addition, this strategy can be used in a parallel fashion to interventions involving direct contact with sexual minorities since these results suggest that intergroup physical contact represents a specific and salient way of communication which may have an additive effect to the more general intergroup contact.

Nevertheless, some limits should be acknowledged. First, the current research involved a gay man as the target of the imagined touch. As heterosexual men avoid contact with men and gay men in particular to weaken the risk of been considered as gay and thus maintain their manhood, it might be plausible that imagining touching a lesbian woman would not raise a comparable fear of miscategorization. However, as this claim is conjectural, future research may address whether imagining touching a lesbian woman, rather than a gay man, would lead also heterosexual male participants to show an enhanced self-outgroup similarity with this outgroup. Also, future studies may use alternative measures to test similarity (e.g., IOS; inclusion of the other in the self, Aron et al., 1991). Third, the current research was carried out in a specific cultural context, in which sexual prejudice is higher than the majority of other EU countries (ILGA, 2017). Given the specificity of this research context, caution should be taken when discussing the generalizability of our results to

other cultural contexts. Thus, taking into consideration other cultural contexts is necessary given that the use of touch does not occur similarly across cultures and countries (see Andersen, Hecht, Hoobler, & Smallwood, 2003). Indeed, the use of touch in Italy has been shown to be more acceptable and common compared to other cultures (e.g., United Kingdom, some parts of Northern Europe; Remland, Jones, & Brinkman, 1995). Third, individual differences in comfort with touch should also be assessed, as they may limit/enhance individuals' disposition to engage in social touch (Fromme et al., 1989; Trotter, McGlone, Reniers, & Deakin, 2018). Also, future endeavours may take into consideration the way the touch is given. In the current study the picture portrayed a touch that was administered from right to left (i.e., a hand on the right touching/on top of a hand on the left). Previous research indicated that action direction and agent positioning (e.g., from left to right or viceversa, and/or from top to bottom or vice versa) convey nonverbal information about dominance, agency, status, and power (Carnaghi, Piccoli, Brambilla, & Bianchi, 2014; Paladino, Mazzurega, & Bonfiglioli, 2017). As this information is critical in shaping intergroup relations, future studies should address whether action trajectory may affect intergroup physical contact. Last but not least, future studies could consider frequency of intergroup contact and frequency of intergroup physical contact and test whether these two variables may differently moderate the effects of imagined intergroup physical contact on outgroup attitudes.

CHAPTER 4

GENERAL DISCUSSION

The aim of this collection of studies was to gather evidence on the effects of the use of physical contact within intergroup contexts through direct (Chapter 1) and imagined experiences (Studies 1, 2, 3 of Chapter 2, & Chapter 3). Across 5 studies, it has been demonstrated that the use of physical contact, as a form of non-verbal interaction, is linked to the enhancement of the quality of the interaction (Chapter 1) and that intergroup touch is ultimately linked to the enhancement of positive attitudes towards the outgroup (Study 1, 2, 3 of Chapter 2 & partially by the study in Chapter 3). This effect has been demonstrated through a cross-sectional study (Chapter 1) and the existing positive effects of physical contact on outgroup attitudes were further supported by the following experimental studies (Studies 1, 2, 3 of Chapter 2 & partially by the study in Chapter 3). In order to test external validity of the findings, the effects of touch were tested not only on ethnic outgroups (Chapter 1 and Studies 1, 2, 3 of Chapter 2) but also extended to other groups such as gay individuals (Chapter 3).

As far as the type of measures used, both explicit and implicit measures of attitudes were assessed. This decision was made for two different reasons; First, to understand whether touch could also affect, more automatic, uncontrollable forms of attitudes. Second, to eliminate the possibility that the results found on the explicit measures could have been due to demand characteristics. Results show that imagined intergroup physical contact not only positively impacts on explicit attitudes but also affects implicit attitudes, thus eliminating the possibility that results found on the explicit measures were due to social desirability.

A specific aim of this project was to test whether *imagined* forms of physical interaction with an outgroup member are effective in improving attitudes towards the outgroup. Results consistently show an existing positive link between imagined intergroup physical contact and

attitudes towards the outgroup (Studies 1, 2, 3 of Chapter 2 & partially the study of Chapter 3). In addition, the presented studies offer a deep understanding of the processes at the basis of the results, as well as the necessary conditions for a successful outcome.

First, it is known that intergroup contact theory requires the intergroup contact to be positive (Allport, 1954) in order to be effective. Also, group membership should be made salient during the interaction in order for intergroup contact to elicit more positive attitudes towards the outgroup (Hewstone & Brown, 1986). Thus, in order to be effective, during the mental simulation of the intergroup encounter, participants should be aware of the group identities involved. This ultimately allows individuals to generalize the positive experiences from the single outgroup member to the outgroup as a whole (Study 2, Chapter 2). Also, just like for direct contact, also imagined forms of contact, require the contact experience to be positive in order to reach a positive effect (Crisp & Turner, 2009). Indeed, contact experiences which are perceived negatively as in the case of a hand touch between male participants and a gay individual (Chapter 3), do not allow individuals to have a positive basis on which to base a subsequent positive generalization of the experience to the outgroup as a whole.

Second, Study 2 of Chapter 2 supports the idea that it is not just the positive connotation of the touch with anyone that elicits more positive attitudes towards the outgroup, but rather that people are required to specifically focus on a physical contact with an outgroup member in order to achieve a positive outcome. In addition, Study 3 of Chapter 2 suggests that it is not being primed with an intergroup touch (see the picture of an intergroup touch) which shapes intergroup attitudes. Indeed, participants who are simply exposed to a picture of an intergroup touch and are not required to mentally simulate a physical contact experience with the outgroup, do not show more positive attitudes towards the outgroup. Thus, finding oneself in an intergroup touch situation, is a necessary condition in order to build more positive attitudes towards the outgroup as a whole.

In addition, Study 3 of Chapter 2 and partially the study presented in Chapter 3 (i.e., for male participants) demonstrate that social influence (seeing an ingroup member touching an

outgroup member) does not play a role in this specific context. It has been argued that individuals' beliefs commonly rely on the social norms and opinions of the group (e.g., Asch, 1951, 1952; Sherif, 1936), either because this is believed to make a person feel as part of that group or because it allows the individual to reach a better understanding of the world by gathering several points of view (see also Deutsch & Gerard, 1955). Stangor, Sechrist and Jost (2001) showed that merely changing the apparent consensus regarding an outgroup (i.e., African-Americans in this case) is enough to shape one's own attitudes in line with the believed consensus. Indeed, individuals expect to agree with ingroup members and through self-categorization they rely on the ingroup and not on the outgroup norm and likely conform to that norm (i.e., Hogg and Turner, 1987; see also Abrams & Hogg, 1990 for a discussion). Thus, one may argue that presenting individuals with an image of an intergroup touch may lead individuals to envisage this as the accepted ingroup norm. This could result in the endorsement of positive attitudes towards the outgroup in line with the ingroup norm. Although this could have been the case, our results show that it is not. Again, in this specific context, individuals who see the picture portraying an ingroup individual physically interacting with an outgroup member (InterPC-quality) do not show more positive implicit attitudes. Although Chapter 2 is informative in several ways on the effects of imagined intergroup physical contact on outgroup attitudes, one potential limit should be acknowledged. In the InterPC condition of Study 2 and 3 of Chapter 2, two social identities were manipulated, namely ethnicity conveyed by the skin color of the hands and "nationality" conveyed by the label "immigrant". Thus one may argue that it is unclear whether the observed effects are triggered by the ethnicity (imagining a physical contact with someone of a different ethnicity) or by the nationality (imagining a physical contact with an immigrant) of the touched individual or the combination of both. Further research is needed to disentangle this point.

In addition, Study 3 of Chapter 2 demonstrates that, as previously mentioned, being exposed to an intergroup touch is not enough to develop positive attitudes towards the outgroup, but that participants must imagine themselves in the situation. In addition, the study presented in Chapter 3

shows that both social influence nor imagining oneself in the intergroup touch situation is effective for male participants to develop more positive attitudes. In this case motivational processes overshadow the power of touch and may ultimately produce negative effects.

Third, results of Study 3 of Chapter 2 further inform us on the specific effects of imagined intergroup physical contact. Indeed, one aim of the research was also to understand whether intergroup touch could affect both evaluative/affective and cognitive forms of prejudice. For this reason, we used two types of IATs, one aimed to tap prejudice and the other to assess stereotypical-prejudice. Results show that while imagining touching the hand of an outgroup member shapes implicit prejudice, stereotypes are not influenced by the manipulation. This may be the case since stereotypes are usually modified after being exposed to counterstereotypical exemplars (e.g., Dasgupta & Asgari, 2004; Finnegan, Oakhill, & Garnham, 2015). In addition, prejudice has been shown to be linked to consummatory behaviors (e.g., appetitive or aversive behaviors) which include physical distancing from the outgroup, while stereotypes do not seem to have this selective link (Amodio & Devine, 2006). Thus, our results are in line with previous findings and further suggest the existence of different and selective associations between prejudice/stereotypes and behaviors.

In line with this reasoning, intergroup bias is reduced by imagining an intergroup touch, and this result is mainly driven by a reduction in the preference for working with an Italian individual (i.e., ingroup in this specific study) rather than an immigrant. This result may be discussed in terms of a deprovincialization process which stresses that contact with an outgroup may not only affect outgroup evaluation but may also involve a re-appraisal of the ingroup and a distancing from it (Pettigrew, 1997). Indeed, contact with an outgroup member may lead individuals to think about the values of other cultures and re-think about one's own cultural standards (see also, Verkuyten, Thijs, & Bekhuis, 2010), with positive outcomes in terms of attitudes towards the outgroup.

Fourth, and importantly these findings show how previous contact with the outgroup member does not moderate the effect of intergroup physical contact on outgroup attitudes (Chapter

3). Thus, it seems that the fact of entering in such a personal and intimate experience, although simulated, with an outgroup member, may represent such a salient experience, to become the basis on which build subsequent outgroup evaluations, more than previous intergroup contact.

Although this seems to be the case, further research is needed to test whether this effect is replicated also with other outgroups and whether this effect is present only in the short term or not.

At last, but not least important, the study presented in Chapter 3 suggests that general imagined contact and imagined physical contact may differ from each other in the sense that they may involve different motivational processes, although future studies are needed to further test this assumption. This assumption is based on the fact that previous studies on imagined intergroup contact with gay individuals show that generally, male and female individuals both benefit from imagining an intergroup encounter with a gay individual and ultimately improve attitudes towards the outgroup as a whole (West et al., 2015). In turn, results presented in Chapter 3, suggest that within the imagined intergroup *physical* contact situation, this is not the case. Indeed, motivational factors (such as identity threat in this case), play a fundamental role which may ultimately prevent individuals from perceiving the situation as a positive experience and ultimately generalize this experience to the outgroup as a whole. As a case in point, this study demonstrates that only female participants ultimately benefit from imagining to physically interact with a gay man by enhancing their perceived similarity with the outgroup. Male participants, in turn, evaluate the imagined contact with a gay individual more negatively compared to female participants, which ultimately prevents them from building a sense of similarity with the outgroup. These results are in line and replicate the pattern of same sex touching behavior found in real life. Indeed, in real situations, as well as during a mental simulation of the same interaction, male individuals compared to female individuals, are more reluctant to engage in same sex touch due to fear of being miscategorised as gay (e.g., Roese, Olson, Borenstein, Martin, & Shores, 1992; Rozin, Nemeroff, Horowitz, Gordon, & Voet, 1995). Therefore, it is possible to put forward that imagined and actual touch elicit similar

cognitive and behavioral responses which add support to the existence of a partial overlap between imagined and real touch experiences.

Although this project has shed light on some of the processes at the basis of intergroup physical contact, further research is needed to better understand how intergroup physical contact and imagined intergroup physical contact affect intergroup attitudes.

Specifically, direct physical contact should be further investigated through experimental studies which could further strengthen the idea of an existing link between intergroup physical contact and outgroup attitudes. Results presented in Chapter 1 show that the more intergroup physical contact one experiences, the more positive outgroup attitudes one may develop by enhancing the quality of the intergroup contact. Future studies may experimentally manipulate the frequency of intergroup physical contact to see whether it affects intergroup attitudes by shaping the quality of the perceived interaction. Also, this study, provides evidence that touch is positively associated with the quality of the interaction, but further studies should also experimentally test this assumption and investigate other mediational processes involved (e.g., inclusion of the other in the self, connectedness, anxiety etc.), both within the direct and indirect forms (i.e., imagined) of physical contact.

In sum, these results suggest that touch may have beneficial effects among intergroup contexts as it may induce a sense of communality with the person one communicates with, but also rises awareness on the boundary conditions of touch by further demonstrating that gender issues are crucial when considering touch as in the case of male to male touch. Thus, at the practical level, imagined intergroup physical contact might be specifically useful for certain contexts as for example in working environments where it is extremely important to build positive relationships such as health-care environments and educational settings. Indeed, these working environments are becoming more and more multicultural and it is every day more common to find individuals from different cultural backgrounds and origins. An intervention based on imagined intergroup physical contact might ultimately reduce the existing taboo on touch and prepare people for future (physical)

contact with individuals through a less intrusive way compared to direct contact. Nevertheless, also based on these results, it seems crucial to take into consideration the group with which we interact (e.g., gay individuals or immigrants), given that different outgroups may trigger different motivational processes which may ultimately interfere with individuals' willingness to engage in physical contact and ultimately with the improvement of outgroup attitudes.

Although these results provide broad evidence on the effects of physical contact on outgroup attitudes, further research is needed in order to better understand *how* physical contact improves outgroup attitudes. Study 1 demonstrated that the relation between intergroup physical contact and outgroup attitudes is mediated by quality of intergroup contact, this is by increased levels of cooperation, depth and pleasantness of the contact.

Research has pointed out that physical contact may enhance communal feelings and specifically the sense of unity and connectedness towards the touched individual (Simão and Seibt, 2015). Also, Seger and colleagues (2014) put forward that touch may blurry the boundaries between the self and the touched individual, indicating this as a key aspect of communal sharing relationships (Fiske, 1992). Indeed, it has been argued that as physical contact involves a physical overlap between two people, this may also contribute to a cognitive overlap between the representation of these individuals (Jakubiak & Feeney, 2016). None of the present studies has directly assessed whether and how touching or imagining touching an outgroup individual (vs. a control condition) selectively enhances communal feelings or strengthens the self-other member overlap. The study presented in Chapter 3 provides evidence that intergroup physical contact enhances the similarity between the self and the outgroup (at least for the female sample), but it fails to understand whether this outcome is mediated by an enhanced self-outgroup member overlap, namely whether the self-outgroup member cognitive merging through imagined physical contact may be the bases for generalizing this sense of unity to the outgroup as a whole. Also, it has been suggested that the positive experience with the single outgroup member during the physical contact situation is responsible for the generalization of the positive experience to the outgroup as a

whole. Although in the current research the evaluative reaction towards the to-be-touched outgroup member was assessed in the study presented in Chapter 3, this research program fails to identify whether this evaluative reaction could account for the improvement of the attitudes towards the outgroup as a whole.

In sum, further studies are needed to better comprehend the processes at the basis of the effects of intergroup touch on outgroup attitudes. Although some studies have put forward that a possible mechanism may be linked to an increase in positive feelings towards the toucher, increase in communal feelings with the touched individual (Simão & Seibt, 2015) or to the establishement/strengthening of a cognitive, self-other member overlap (Seger et al., 2014; Jakubiak & Feeney, 2016), which may ultimately generalize to the toucher's group, these possible mechanisms haven't been specifically tested yet. Studies testing the effects of physical contact on outgroup attitudes, via the above-mentioned mechanisms, is needed to ultimately broaden the theoretical framework on touch. In addition, future studies could consider frequency of intergroup physical contact and test whether this may differently moderate the effects of imagined intergroup physical contact on outgroup attitudes.

Last but not least, it is worth mentioning that the studies regarding imagined intergroup physical contact presented in this work focused on the effects of touching an outgroup member (see Chapter 2 and 3). Future studies should to take into consideration the possible difference between imagining being touched by an outgroup member or imagining initiating the touch, to test whether this may elicit different processes.

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APPENDIX A

How many times have you **held the hand** of a **X**[5]?

How many times have you **walked arm in arm** with a **X**?

How many times have you **caressed** a **X**?

How many times have you **got a massage** from a **X**?

How many times have you **got a hair wash** by a **X**?

How many times have you **put your hand on the shoulder** of a **X**?

How many times have you **sat on the knees** of a **X**?

How many times have you **hugged** a **X**?

How many times have you **shaken hands** with a **X**?

How many times have you **kissed** a **X**?

How many times have you **stood shoulder to shoulder** with a **X**?

How many times have you **high-fived** a **X**?

[5] In the EPC scale the "X" was replaced with different target groups for the pilot (X = known person) and for the main study (X = foreign person).

APPENDIX B

APPENDIX C

Traits

Stereotypical Positive

Elegante (Elegant), Artistico (Artistic), Sensibile (Sensitive), Educato (Polished)

Stereotypical Negative

Effeminato (Effeminate), Emotivo (Emotional), Instabile (Unsteady), Complicato (Complicated)

Counterstereotypical Positive

Energetico (Energetic), Leader (Leader), Forte (Strong), Pragmatico (Pragmatic)

Counterstereotypical Negative

Conservatore (Conservative), Rozzo (Rude), Intollerante (Intolerant), Offensivo (Offensive)

Irrelevant Positive

Onesto (Honest), Sicuro (Confident), Saggio (Wise), Affidabile (Trustworthy)

Irrelevant Negative

Timoroso (Fearful), Formale (Formal), Chiacchierone (Chatty), Ingordo (Greedy)

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