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Does Touch Bring Us Closer? Exploring the Role of Physical Contact in Intergroup Contexts

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ABSTRACT

The role of physical contact (PC) (e.g., touch) in interpersonal relationships is well documented, yet its effects in intergroup contexts remain underinvestigated. We examine whether positive intergroup physical contact (IPC) enhances perceived closeness with out-group members, measured as inclusion of the out-group in the self (IOS), and test its mediating role in improving intergroup attitudes. In Study 1 (longitudinal; $N = 550$), PC with foreign peers longitudinally predicted IOS. In Study 2 (cross-sectional; $N = 377$), PC with people with disabilities was associated with IOS, which in turn was linked to out-group attitudes. In Study 3 (experimental; $N = 86$), imagined PC with a gay man versus an uncategorized individual increased heterosexual individuals' IOS with gay men, which in turn improved out-group attitudes. Using multiple research methods and intergroup settings, we show that positive IPC improves attitudes towards the out-group by enhancing experienced closeness with out-group members.

1 | Introduction

Human interactions are shaped and regulated by both verbal communication and a broad array of nonverbal cues (Gallace and Spence 2010). Among the various types of nonverbal communication, physical contact (PC), as touch for instance, plays an important role. Indeed, by relying on PC, people express a wide range of meanings and emotions which may effectively and immediately be decoded by the recipients (Hertenstein et al. 2006; Hertenstein et al. 2009).

PC strongly influences interpersonal interactions, extending beyond the scope of communication alone. As a matter of fact, touch has been suggested to play a key role in relationship and bond formation (Suvilehto et al. 2015). In his relational models theory, Fiske (1992) explored how people structure their relationships and identified different relational models. More

specifically, and according to conformation theory (Fiske 2004; Fiske et al. 2009), bodily contact is a core feature of so-called *communal sharing relationships* characterized by sense of unity, solidarity, caring and altruism (Fiske 1992). In line with this framework, researchers have suggested touch to also represent a cue to friendship (Seger et al. 2014). This view is supported by studies showing that when interactions involve PC, such as touching, the toucher may be perceived more positively than when no PC occurs (for a review, see Gallace and Spence 2010).

Only recently have studies begun to examine whether PC could also exert positive effects within intergroup relations. Research tentatively suggests that imagining or actually engaging in PC with an out-group member can reduce intergroup bias and improve attitudes towards the out-group (Seger et al. 2014; Shamloo et al. 2018b; Shamloo et al. 2020). Despite the significance of these findings, the amount of evidence confirming such

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effects remains too limited to fully evaluate its effectiveness. More importantly, the psychological mechanisms that might explain how intergroup touch improves attitudes remain largely unexplored.

To address these issues, we bridge two strands of literature that have developed independently so far: research on intergroup contact and studies on interpersonal touch. The first line of research suggests that intergroup contact ameliorates intergroup relations and that perceived intergroup closeness plays a role in this process (e.g., Vezzali et al. 2014; Wright et al. 2005). Indeed, contact experiences have been shown to induce perception of closeness with the out-group by cognitively including the out-group as part of the self, which in turn is associated with more positive out-group attitudes (e.g., Abu-Rayya and Brown 2023; Turner et al. 2008). Second, at the interpersonal level, it has been suggested that PC, likely being it a bond-creator device, may bring the cognitive representations of both the toucher and the touched person closer together (Jakubiak and Feeney 2017). This psychological overlap could be regarded as mirroring the kind of closeness found in communal sharing relationships (Fiske 1992) of which PC represents a core feature. Within these relationships individuals focus on commonalities, minimizing identity distinctions to the extent that individuals are perceived as 'equivalent and undifferentiated' (Fiske 1992), likely facilitating self-other overlap.

On the basis of on these assumptions, the current research focuses on intergroup contexts and aims to test whether intergroup physical contact (IPC) fosters more positive intergroup relations by enhancing perceived closeness to out-group members. In three studies, relying on different research designs—longitudinal (Study 1), cross-sectional (Study 2) and experimental (Study 3)—we provide the first evidence on the effectiveness of IPC in creating a cognitive overlap between the self and the out-group. Moreover, Studies 2 and 3 demonstrate that increased PC with out-group members promotes more positive attitudes towards the out-group as a whole and provide initial evidence on the mediating role of perceived closeness in the relationship between IPC and out-group attitudes.

As intergroup relationships are often characterized by negative and conflicting dynamics, investigating whether touch affects intergroup settings seems rather crucial, as it could help understand alternative and targeted ways to improve mutual relationships among different groups.

1.1 | Touch in Intergroup Contexts: A Peculiar Aspect of Intergroup Contact?

Touch has profound implications for social interactions. Touch can shape interpersonal relations by facilitating social affiliation even between strangers (Gallace and Spence 2010). Impressions about others improve when touch is included in the interaction compared to when touch is not present (e.g., Erceau and Guéguen 2007; Fisher et al. 1976; Hornik 1992). Moreover, touch enhances social actors' propensity for pro-social behaviours, as people are more likely to respond to help requests following a soft touch rather than no touch (e.g., Guéguen and Fischer-Lokou 2003).

These results suggest that PC may represent a way of connecting with others, thereby fostering positive impressions.

In today's multicultural and diverse societies, a key question is whether PC may also shape perceptions within intergroup contexts where group membership shapes dynamics and often fuels negative attitudes and discrimination towards out-groups (European Commission 2023).

Scholars interested in intergroup relations have lately questioned whether PC could represent a peculiar aspect of intergroup contact (Seger et al. 2014; Shamloo et al. 2020). The concept of intergroup contact is grounded in the idea that contact with members of an out-group helps reduce prejudice between groups (Allport 1954; Pettigrew and Tropp 2006). To date, there is accumulated evidence that intergroup contact actually improves intergroup relations in different settings, among different groups and across diverse cultural contexts (e.g., Pettigrew and Tropp 2006; Vezzali et al. 2014). Notably, cross-group friendship, a specific form of intergroup contact, has been highlighted as particularly effective in this respect (Pettigrew 1998) as intimate interactions are thought to have greater impact than less intimate interactions (Amir 1969; Fuochi et al. 2020).

At the interpersonal level, touch has been framed as a cue to friendship (Seger et al. 2014) and considered a foundation for communal sharing relationships (Fiske 1992; Fiske et al. 2009). Touch is a signal associated with close and more intimate relationships (Suvilehto et al. 2015), typically observed among members of cohesive groups, where people focus on commonalities and share resources (Smith 2008). If PC exerts these effects at the interpersonal level, the question rises as to whether it could serve as an effective means of communication, fostering perceptions of closeness also within intergroup contexts.

To date only a few studies have investigated the role of touch in improving intergroup relations. For example, a cross-sectional study carried out in Italy found support for the link between intergroup touch experienced by majority group members with minority group members (i.e., foreign individuals) and more positive intergroup relations (Shamloo et al. 2018a). Experimental studies corroborate this evidence. In a study carried out in the United States, majority—non African American—participants who engaged in touch with an African American experimenter showed more positive implicit attitudes towards the group of African Americans in general compared to participants who did not engage in touch (Seger et al. 2014). Similarly, across three studies Shamloo et al. (2018b) found that also imagining touching the hand of an immigrant individual led Italian participants to display less intergroup bias and more positive implicit attitudes.

Yet, the role of touch in improving intergroup attitudes has received limited empirical support, being it mostly restricted to racial and ethnic groups, highlighting the need for further investigation across a more diverse range of out-groups. Furthermore, these studies have not tested whether the effects of intergroup touch on attitudes towards the out-group are independent of the level of general intergroup contact, thus failing to test the specific role of PC in improving intergroup relations. Importantly, these studies have not examined the psychological mechanisms through which physical touch between members of different

groups leads to improved intergroup attitudes. The present group of studies aims at addressing these gaps.

1.2 | Touch and Inclusion of the Other in the Self

As previously mentioned, touch is a fundamental medium through which people enact and experience communal sharing relationships (Fiske 2004), it serves as a bonding mechanism with others (Suvilehto et al. 2015), likely fostering perceived closeness with others (Jakubiak and Feeney 2017). Perceived closeness refers to an overlap between the cognitive representations of others and the self (Aron et al. 1992; Wright et al. 2005). More specifically, perceived closeness is operationalized as the inclusion of the other in the self (IOS; Aron et al. 1991, 1992), indicating a type of relationship in which the individual 'acts as if some or all aspects of the partner are partially the individuals' own' (Aron et al. 1992, 598). When the representation of the others and that of the self overlap, positive feelings associated with the self extend to the other. Thus, as perceived closeness increases, the boundaries between personal self and the other become increasingly blurred, enhancing the perception of the other in a positive manner (Seger et al. 2014).

At the intergroup level, when positive contact between members of different groups occurs, the representation of the out-group members is included in the representation of the self, thus extending positive feelings to the out-group as a whole (Wright et al. 2005). This enhanced cognitive closeness between out-group members and the self leads to more positive attitudes towards the out-group (e.g., Stathi and Crisp 2010; Vezzali et al. 2014) and more favourable expectations for interactions with novel out-group members (Page-Gould et al. 2010). This trajectory has been widely acknowledged in the intergroup contact literature. Indeed, IOS has been regarded as a possible precursor of out-group attitudes, as it captures a sense of psychological closeness likely associated with more positive evaluations towards the out-group. In line with this reasoning, accumulated evidence shows the role of IOS as a significant mediator in the relation between contact and out-group attitudes both when considering direct (Cadieux et al. 2019; Liao et al. 2023; Stathi and Crisp 2010; Stefaniak and Bilewicz 2016) and especially indirect contact (e.g., Cameron et al. 2006; Vezzali et al. 2012, for a review see Vezzali et al. 2014; Turner et al. 2008). This suggests that contact is associated with positive intergroup attitudes because it brings the cognitive representation of the self and out-group closer. We believe that this sense of psychological closeness may be seen as somehow reflecting a form of self-categorization (Turner et al. 1987), specifically, the extent to which individuals include others (in our case, out-group members) within their self-definition. When this occurs, it is suggested that individuals will likely become more positively oriented towards one another (Jetten et al. 2017), likely affecting attitudes towards the other.

Although there is evidence that intergroup contact plays an important role in promoting IOS, studies focusing on the link between intergroup touch and closeness are still lacking. Yet, at the interpersonal level, it has been suggested that the physical overlap created by touch may blur the self-other distinction, leading to an enhancement of IOS (Jakubiak and Feeney 2017). Notably, in romantic relationships a significant association has

been evidenced between touch and self-reported feelings of self-other overlap (Ledbetter 2013). In addition, touch among group members fosters social bonding and is at the basis of communal sharing relationships, both of which likely enhance self-other closeness (Fiske 1992; Fiske et al. 2009).

Recasting this evidence within an intergroup frame, we reasoned that because PC constitutes a defining feature of communal sharing relationships—where individuals perceived a sense of 'oneness' (Fiske et al. 2009, 1295)—such interactions are likely to blur the self-other distinction ultimately leading to the inclusion of the out-group's representation in the self. In line with self categorization theory (Turner et al. 1987) when intergroup settings are made salient, individuals perceive themselves as interchangeable members of the in-group, whereas out-group members also come to be seen as very similar to each other (i.e., out-group homogeneity effect; see Judd and Park 1988). Following Seger et al.' reasoning (2014), we put forward that when touch occurs, this will blur the boundaries between oneself and another person, potentially extending this sense of closeness to the other's person social group. This provides a mechanism through which the positive effects of touch may generalize beyond the individual to the broader out-group.

Although such a conjecture has been already put forward (Seger et al. 2014), no study has directly tested the effect of intergroup touch on the overlap between the cognitive representations of the out-group and the self. By systematically examining the link between intergroup touch and perceived closeness (measured as IOS), we further contribute to the literature on the relationship between intergroup touch and out-group attitudes by exploring the social and cognitive underpinnings of this relationship. We propose that intergroup touch promotes more positive attitudes towards the out-group by increasing perceived closeness with out-group members. In this view, the enhanced sense of closeness (IOS) functions as a mediator linking PC to improved intergroup attitudes.

1.3 | Overview of the Present Research

We conducted three studies with the aim of providing evidence on the effects of intergroup touch on perceived closeness with the out-group and its potential mediating role in improving out-group attitudes. In line with relational models theory (Fiske 1992) and conformation theory (Fiske 2004; Fiske et al. 2009), we focused on inclusion of the out-group in the self as a key mediator because it directly reflects the sense of 'oneness' (Fiske et al. 2009, 1295) characteristic of communal sharing relationships, of which touch is one important mode of expression. By directly measuring perceived overlap between self and out-group members, we aimed at testing our prediction that the effects of touch on out-group attitudes will operate through a sense of perceived closeness with the out-group.

In Study 1, we longitudinally examined the effect of intergroup touch with foreign peers on perceived closeness (IOS) among young Italian adolescents. This study provided initial evidence on the contribution of PC as a key driver of self-other overlap. Study 2 replicated findings of Study 1 by using a cross-sectional design and focusing on a different intergroup setting, examining

how intergroup touch experienced by people without disabilities relates to perceived closeness (IOS) to people with disabilities. In addition, Study 2 included a measure of out-group attitudes for two distinct reasons. First, it allowed us to extend previous findings showing an improvement of out-group attitudes at increased levels of experienced IPC. Second, it allowed us to start investigating the hypothesized mediating role of IOS in the relation between PC and out-group attitudes. Finally, Study 3 sought to replicate findings of Studies 1 and 2 using an experimental design and a different intergroup context. Specifically, we tested the effects of IPC in the form of imagined touch with a gay man (vs. uncategorized person) on perceived closeness towards the group of gay men and attitudes towards this group. Importantly, as we sought to ascertain the unique contribution of PC, in each study we controlled for participants' contact with the out-group, as intergroup contact has been shown to promote *per se* perceived closeness with the out-group (see Vezzali et al. 2014; Wright et al. 2005) and intergroup attitudes (e.g., Brown et al. 2007; Pettigrew and Tropp 2006). In sum, in Studies 1–3, using different study designs and with diverse out-groups, we tested whether intergroup touch enhanced IOS with out-group members. In Studies 2 and 3, we further analysed whether intergroup touch improved attitudes towards the out-group. Moreover, in Studies 2 and 3, we tested the mediating role of IOS in the relation between IPC and out-group attitudes.

Based on the idea that physical touch is a highly embodied cue of intimacy and connectedness, forming a core component of communal sharing relationships in which individuals experience a sense of unity and perceive one another as equivalent and undifferentiated (Fiske 1992, 2004; Fiske et al. 2009), we expected IPC to be linked to perceived closeness with the out-group, measured as IOS (H1; Studies 1, 2 and 3). We further hypothesized that IOS would be associated with out-group attitudes (H2; Studies 2 and 3). Based on previous studies (e.g., Shamloo et al. 2018a; Seger et al. 2014), we also put forward that IPC would be related to out-group attitudes (H3; Studies 2 and 3). Finally, and in line with previous studies, which have considered perceived closeness a precursor of attitudes towards the out-group and a mediator in the relation between contact and out-group attitudes (Turner et al. 2008; Vonofakou et al. 2007; Vezzali et al. 2012, 2014), we hypothesized that IOS would mediate the relationship between PC and out-group attitudes (H4; Studies 2 and 3).

The three studies were carried out in accordance with the recommendation of APA guidelines and were approved by the Ethics Committee of the Department of Human Sciences (University of Verona). All measures, manipulations, exclusions and data for all studies reported in this manuscript are disclosed in full and materials and data are available at the OSF repository: https://osf.io/2awt6/overview?view_only=ece4044b41be4b768b3a5057da19a735 Studies were not pre-registered.

2 | Study 1

The aim of Study 1 was to gain preliminary evidence on the relationship between PC and perceived closeness. Specifically, we investigated whether PC experienced by Italian young adolescents with foreign peers was associated with perceived closeness

with out-group members (i.e., foreign peers). We adopted a longitudinal design and controlled for quantity and quality of intergroup contact. Prior research has provided some evidence suggesting that closeness may be predicted by intergroup contact, but the latter has mainly been measured as a composite score of quantity and quality of contact (Cadieux et al. 2019; Stathi and Crisp 2010). In this study, quantity and quality were analysed as two separate control variables.

2.1 | Method

2.1.1 | Participants and Procedure

After obtaining informed consent from parents or guardians, students pertaining from six lower secondary schools located in Northern Italy were invited to fill out a questionnaire during school time. The questionnaire which lasted around 1 h was administered to students in two different time points, 6 months apart; the first one at the end of the school year (*T1*, April and May 2019) and the second one at the beginning of the following school year (*T2*, November and December 2019). The sample consisted of 550 Italian participants without a foreign origin (241 males and 309 females; *mean age at T1* = 11.81, *SD* = 0.73 and *range* = 10–14 years) at *T1* and 516 participants completed both waves (226 males and 290 females).

2.1.2 | Questionnaire

Before completing the questionnaire, participants read that children of foreign origin referred to those who came from a country other than Italy or who were born in Italy but whose parents came from another country.

2.1.2.1 | Quantity of Contact. Respondents were provided with four items created ad hoc tapping into contact with foreign boys and girls in different contexts. Examples of items included: ‘How much contact do you have with foreign boys and girls in your neighbourhood?’ and ‘How much contact do you have with foreign boys and girls at school?’. Answers ranged from 1 (*none*) to 5 (*a lot*), so that higher values indicated higher levels of contact with foreign boys and girls. Cronbach's alphas for this measure were 0.71 at *T1* and 0.76 at *T2*.

2.1.2.2 | Quality of Contact. Students were provided with a general question: ‘Thinking about the contact you have with boys and girls from foreign origin, how do you consider this contact?’. Six adjectives (e.g., cooperative, rude and friendly) were then presented and participants gave their answers ranging from 1 (*not at all*) to 5 (*very much*). Cronbach's alphas for this measure were 0.71 at *T1* and 0.73 at *T2*.

2.1.2.3 | Physical Contact. We used seven items adapted from Shamloo et al. (2018a) tapping participants' amount of experienced PC with the out-group (e.g., ‘How many times... have you shaken hands with foreign boy or girl?’ or ‘... given a high five to a foreign boy/girl?’ or ‘... put your hand on the shoulder of a foreign boy/girl?’). The items were selected to suit the intergroup context and to be appropriate for the age of participants. Answers ranged between 1 (*never*) and 5 (*very often*).

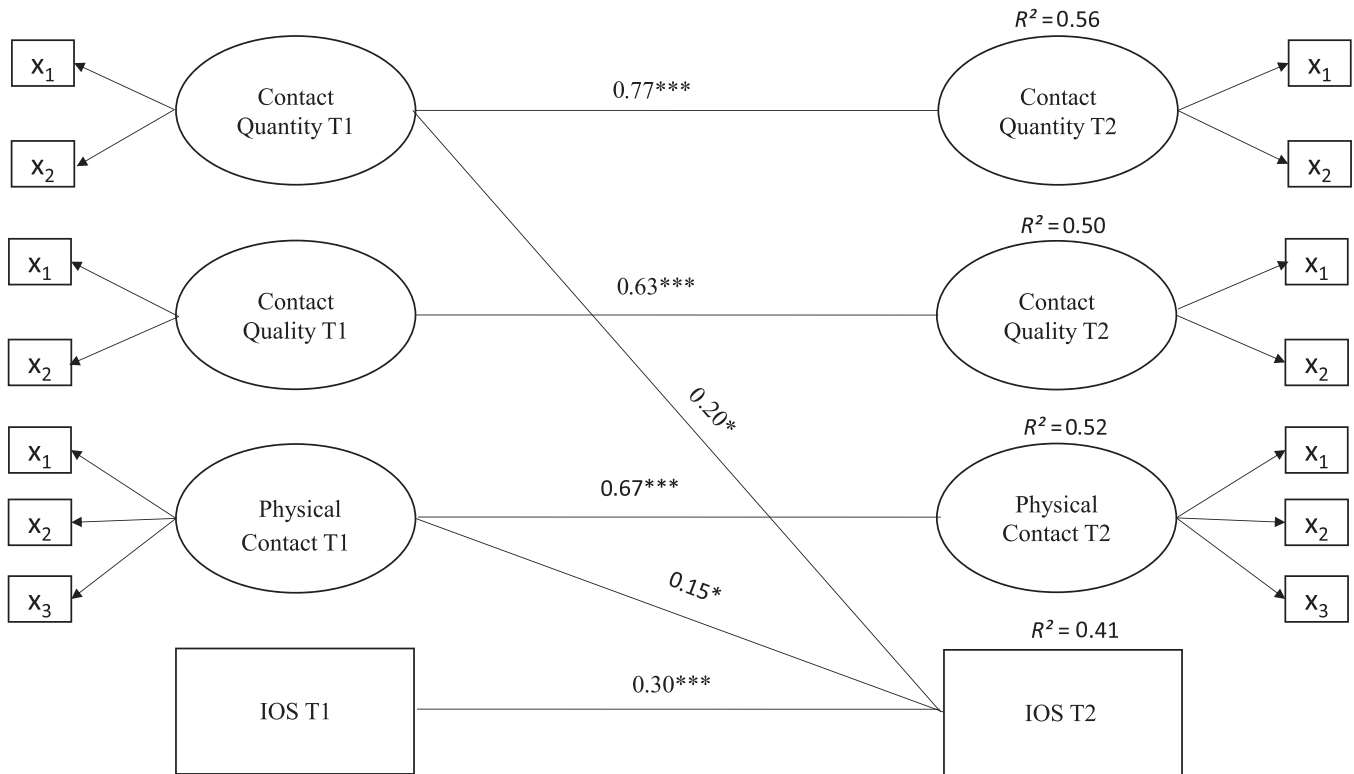


FIGURE 1 | SEM (cross-lagged) model with latent variables in Study 1. Only significant paths are presented. Standardized coefficients are reported. IOS, inclusion of the out-group in the self. * $p < 0.05$, ** $p < 0.01$, *** $p \leq 0.001$.

Higher scores indicated higher levels of experienced PC with foreign boys and girls. This measure showed very good internal consistency at both Times (Cronbach's alpha = 0.86 at T1 and 0.89 at T2).

2.1.2.4 | Inclusion of the Other in the Self (IOS). Perceived closeness was measured through IOS which consisted in one single item (see Aron et al. 1992). Participants were presented with five pairs of circles which differed in their degree of overlap between the two circles, one representing the self and one representing the group of foreign boys and girls. Their task was to select the pair of circles that best described their closeness to this group, with higher scores representing greater closeness.

2.2 | Results

2.2.1 | Analytic Strategy

Prior to the main analysis, we checked for attrition. We specifically tested whether participants who completed both waves differed from those who only completed the first wave (Vezzali et al. 2018). This was done by comparing the two samples through a multivariate analysis of variance (MANOVA) on the following variables: age, contact quantity, contact quality, PC and IOS. To test the main hypothesis that IPC at T1 would predict IOS at T2, we performed a structural equation model with latent variables using Mplus 8.3 (Muthén and Muthén 2017). Specifically, we included quantity and quality of intergroup contact, experienced PC and inclusion of the other in the self at T1 as predictors and

the same variables at T2 as the outcome variables. A cross-lagged model (see Figure 1) was used to test the temporal relationship between quantity, quality, IPC with foreign young adolescents and IOS. This model included: (a) the autoregressive paths (within constructs relationships over time), (b) the paths from contact measures at T1 to IOS at T2 and (c) the paths from IOS and contact measures at T2. Contact measures and IOS were allowed to correlate at T1 and T2.

To carry out the analyses we used parcels. Compared to separate items, parcels have higher reliability, greater communality, higher ratio of common-to-unique factor variance, lower likelihood of distributional violations, tighter and more equal intervals. Models with parcels have fewer parameter estimates, lower indicator-to-sample size ratio, lower likelihood of correlated residuals and fewer sources of sampling error (Little et al. 2013; Trifiletti et al. 2022).

Model fit to the data was evaluated using the cut-off values proposed by Hu and Bentler's (1999) and considered the comparative fit index (CFI), the root-mean square error of approximation (RMSEA) and the standardized root mean-square residual (SRMR). The model fit is satisfactory with a CFI value ≥ 0.95 , an RMSEA value ≤ 0.06 and an SRMR ≤ 0.08 . To proceed with the model testing, we first checked whether the measurement part of the model could be considered invariant across the two time points. Specifically, a model with freely estimated parameters (i.e., unconstrained model) was compared to a constrained model in which factor loadings were forced to be equal across the two time points.

TABLE 1 | Descriptive statistics and correlations between variables, Study 1 (N = 550).

Variable	M	SD	1	2	3	4	5	6	7	8
1. Quantity T1	2.83	0.83	—							
2. Quality T1	3.76	0.65	0.59***	—						
3. PC T1	2.62	0.88	0.62***	0.56***	—					
4. IOS T1	3.07	1.04	0.57***	0.56***	0.65***	—				
5. Quantity T2	2.92	0.85	0.59***	0.43***	0.49***	0.46***	—			
6. Quality T2	3.79	0.64	0.43***	0.55***	0.43***	0.42***	0.59***	—		
7. PC T2	2.74	0.92	0.46***	0.45***	0.64***	0.46***	0.64***	0.55***	—	
8. IOS T2	3.28	1.07	0.48***	0.45***	0.53***	0.58***	0.63***	0.60***	0.68***	—

Abbreviations: IOS, inclusion of the out-group in the self; PC, physical contact; T1, time 1; T2, time 2.

*** $p < 0.001$.

2.2.2 | Main Results

Overall, results did not show a multivariate difference between participants who only completed the first wave ($n = 34$) and participants who completed both waves ($n = 516$), $F(5, 526) = 1.25$, $p = 0.284$ and $\eta_p^2 = 0.01$. The only variable which differed between groups was IOS, $F(1, 530) = 4.09$, $p = 0.044$ and $\eta_p^2 = 0.01$, yet this difference was not large in magnitude, as suggested by the effect size value. In addition, the distribution of males and females did not differ between the two groups of participants, $\chi^2(1) = 0.01$, $p = 0.971$. For this reason, we decided to include the whole sample in the analysis. Missing data were managed using Full Information Maximum Likelihood (FIML). Table 1 presents means, standard deviations and correlations for the study variables at T1 and T2.

As far as the measurement part of the model, the chi-square difference test between the unconstrained model versus constrained model did not significantly differ from each other: $\Delta\chi^2(4) = 0.90$, $p = 0.925$, thus suggesting measurement invariance. Both models showed acceptable fit: $\chi^2(78) = 202.449$, $p < 0.001$, CFI = 0.98, RMSEA = 0.05 and SRMR = 0.02, for the unconstrained model, and $\chi^2(82) = 203.345$, $p < 0.001$, CFI = 0.98, RMSEA = 0.05 and SRMR = 0.03 for the constrained model.

As far as the longitudinal model (see Figure 1), all the autoregressive paths were significant. Furthermore, a significant longitudinal association emerged only between PC at T1 and IOS at T2 and quantity of contact at T1 and IOS at T2. A comprehensive table including all coefficients from T1 to T2 has been included the [Supporting Information](#).

2.3 | Discussion

Findings from Study 1 showed that the amount of PC young Italian adolescents had with foreign peers at T1 predicted IOS at T2. Hence, and supporting our hypothesis, the amount of experienced PC Italian young adolescents had with foreign young adolescents was longitudinally related to higher levels of perceived closeness. These results held after controlling for quantity and quality of intergroup contact, which have been previously tested as predictors of closeness. Hence, experienced

PC with out-group members allowed participants to increase the perceived closeness with them over time, independently from the contribution of intergroup contact on the construct of interest.

3 | Study 2

In Study 2, we examine whether the association between IPC and IOS extends to a different intergroup context, namely, people with disabilities and without disabilities. Importantly, Study 2 extends results of Study 1 by testing for the first time the mediating effect of IOS in the relationship between IPC and out-group attitudes. Based on prior research showing how cross-group friendship and extended contact are significant predictors of perceived closeness (e.g., Turner et al. 2008), we included these variables as controls, thus testing the unique role of PC in promoting perceived closeness with the out-group, independently of participants' amount of cross-group friendship and extended contact.

3.1 | Method

3.1.1 | Participants and Procedure

Participants were Italian adult individuals who were invited to participate in the present study through an online questionnaire. The total sample comprised $N = 387$ individuals. Among these participants, $n = 10$ were excluded from analysis because they declared they had a physical disability. Thus, the final sample comprised $N = 377$ participants without physical disabilities (225 females and 152 males). The sample's mean age was 30.12 years ($SD = 12.93$). Before completing the questionnaire, potential respondents were asked to provide consent to participate in the study. Sample size was established through a priori power analysis allowing a power of 0.8 to detect a small-to-medium effect size ($f^2 = 0.042$), employing structural equation models with four latent variables and one observed variable (Cohen 1988; Soper 2023). The minimum sample size to detect the effect was 342.

3.1.1.1 | Questionnaire. After providing demographic information (i.e., sex, age and nationality) and indicating the presence or absence of disabilities, participants completed the following measures related to their experiences with people with

TABLE 2 | Descriptive statistics and correlations between variables, Study 2 (N = 377).

Variable	M	SD	1	2	3	4	5
1. Cross-group friendship	2.01	1.24	—				
2. Extended contact	2.08	0.91	0.47***	—			
3. Physical contact	3.48	1.60	0.60***	0.36***	—		
4. IOS	4.43	1.64	0.32***	0.16**	0.41***	—	
5. Out-group attitudes	5.77	0.90	0.23***	0.16**	0.32***	0.42***	—

Abbreviation: IOS, inclusion of the out-group in the self.

*** $p < 0.001$.

** $p < 0.01$.

disabilities. Importantly, participants read that with the term disability we referred to physical disability rather than mental disability.

3.1.1.1.1 | Cross-Group Friendship. Respondents were provided with two items (adapted from Turner et al. (2008)). They were first asked: ‘How many friends with disabilities do you have?’ from 1 (*none*) to 7 (*more than 10*). The second question asked respondents how often they spent time with friends with disabilities (How often do you spend time with friends with disabilities?). The response scale ranged from 1 (*never*) to 7 (*very often*), so that higher values indicated higher levels of cross-group friendship. Pearson correlation between these two items was $r = 0.62$, $p = <0.001$.

3.1.1.1.2 | Extended Contact. Participants were provided with three questions (adapted from Turner et al. (2008)) which tapped into extended contact experienced with individual with disabilities (e.g., “How many of your friends without disabilities have friends with disabilities?”) on a scale ranging from 1 (*none*) to 7 (*more than 10*). Higher values represented higher levels of extended contact. Cronbach’s alpha was 0.74.

3.1.1.1.3 | Physical Contact. We used eight items adapted from Shamloo et al. (2018a). These were selected based on the relevance for the specific intergroup context considered in this study. Items tapped into participants’ amount of experienced PC in several situations with the people with disabilities (e.g., “How many times have you shaken hands with a person with disability?” or “How many times have you held the hand of a person with disability?”). Answers ranged between 1 (*never*) and 7 (*very often*). Higher scores indicated higher levels of experienced PC with individuals with disabilities. This measure showed very good internal consistency (Cronbach’s alpha = 0.95).

3.1.1.1.4 | Inclusion of the Other in the Self (IOS). Perceived closeness was measured with the same pictorial item used in Study 1 (Aron et al. 1992). Higher scores represented greater perceived closeness with people with physical disabilities.

3.1.1.1.5 | Out-Group Attitudes. Out-group attitudes were assessed by six bipolar adjectives pairs on a 7-point scale (e.g., warm–cold, negative–positive and friendly–hostile, adapted by Wright et al. 1997; see also Vezzali et al. 2023). Higher scores represented more positive attitudes towards people with disabilities. This measure also proved to be reliable (Cronbach’s alpha = 0.88).

3.2 | Results

3.2.1 | Analytic Strategy

Two structural equation models with latent variables were carried out using Mplus 8.3 (Muthén and Muthén 2017). We first tested a regression model to examine whether PC was a significant predictor of out-group attitudes while controlling for the effects of cross-group friendship and extended contact (in line with H3). We then proceeded by conducting a mediation model where experienced PC predicted perceived closeness (in line with H1), controlling for cross-group friendship and extended contact; perceived closeness, in turn, predicted out-group attitudes (in line with H2).

To carry out the analyses we used parcels. Model fit to the data was evaluated using the same cut-off values as in Study 1 (Hu and Bentler 1999).

Mediation effects for the model were tested with 95% bias corrected (BC) bootstrapping confidence intervals (5000 resamples).

3.2.2 | Main Results

Prior to the main analyses, to verify the distinctiveness of the measures used, we examined whether the predictor variable, mediator and outcome variable could be regarded as distinct measures¹.

Descriptive statistics and correlations are reported in Table 2. We then proceeded by testing the predicted mediation model (Figure 2), which also showed a good fit to the data: $\chi^2(29) = 63.48$, $p = < 0.001$; CFI = 0.98; RMSEA = 0.06; SRMR = 0.06. Supporting H1, PC predicted IOS towards individuals with physical disabilities. In turn, IOS was positively associated with attitudes towards the out-group, supporting H2.

To test H3, we ran a model in which out-group attitudes were regressed on IPC (with extended contact and cross-group friendship as control variables). This showed a good fit: $\chi^2(21) = 46.05$, $p = 0.001$; CFI = 0.99; RMSEA = 0.06; SRMR = 0.03. In line with H3, PC significantly predicted attitudes towards people with disabilities ($\beta = 0.33$, $p < 0.001$), whereas extended contact ($\beta = 0.06$, $p = 0.474$) and cross-group friendship ($\beta = -0.01$, $p = 0.953$) were also accounted for in the model. Finally, the bootstrapping analyses showed that PC had a significant indirect

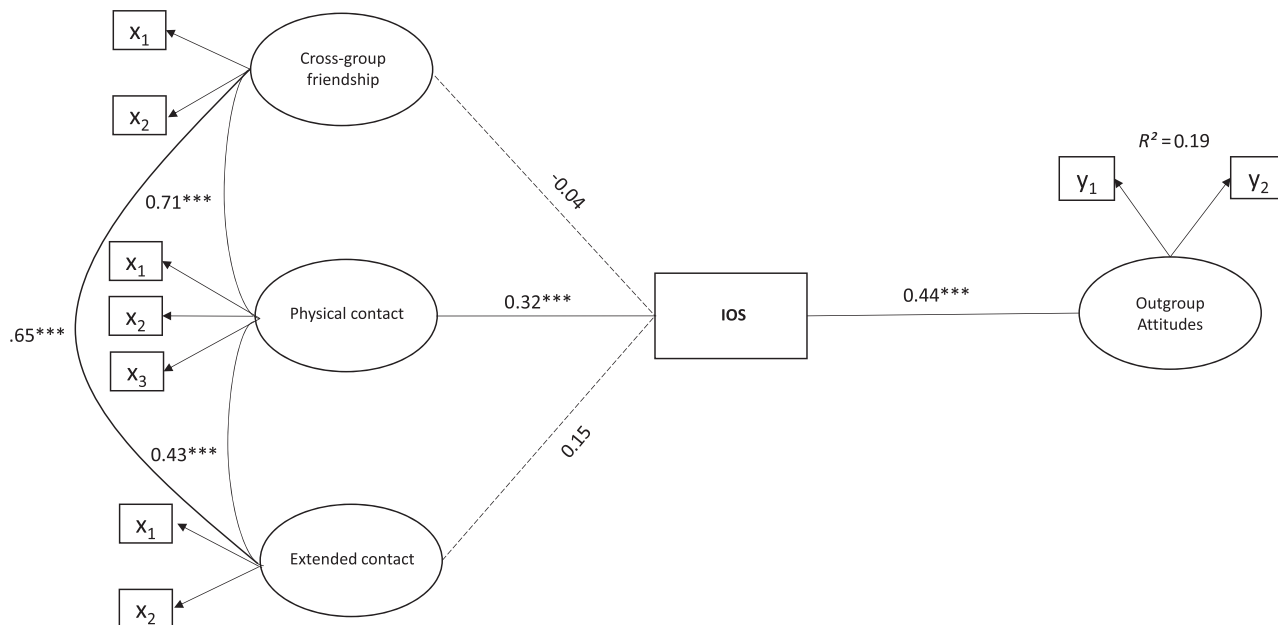


FIGURE 2 | SEM model with latent variables in Study 2. Dotted arrows indicate non-significant paths. Standardized coefficients are reported. IOS, inclusion of the out-group in the self. * $p < 0.05$, ** $p < 0.01$, *** $p \leq 0.001$.

effect on attitudes via IOS ($\beta = 0.14$, $SE = 0.04$, 95% BC CI [0.03, 0.11]), in line with H4.

3.2.2.1 | Alternative Mediation Model. In order to reach a better understanding of the relations between constructs, an alternative model was tested where mediator and outcome variable were switched. Thus, IPC was included as the predictor, out-group attitudes as the mediator and IOS as the outcome. In this reverse model, the indirect effect of attitudes was significant: $\beta = 0.16$, $SE = 0.05$, 95% BC CI [0.07, 0.26], thus supporting the plausibility of the reverse model. The fit of the model was adequate ($\chi^2(29) = 87.748$, $p = < 0.001$; CFI = 0.97; RMSEA = 0.07; SRMR = 0.07), yet it did not show a better fit compared to the original model. In addition, we compared the two models based on the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). The reverse model showed higher values (AIC = 10332.28; BIC = 10473.841) reflecting a poorer model fit compared to the original model (AIC = 10308.01; BIC = 10449.571).

3.3 | Discussion

Findings supported our hypotheses and showed that the amount of experienced PC with people with disabilities was related to higher levels of perceived closeness. This result held after controlling for two forms of contact (both direct and indirect), previously used in studies regarding intergroup contact and closeness. Indeed, not only the link between PC and closeness was significant, but it turned out to be the only significant predictor.

Thus, findings of Study 2 replicated those of Study 1 and provided support for the idea that PC with out-group members functions as a bond facilitator leading to develop feelings of closeness with others, even within intergroup contexts. In line with previous results, this study provides further support for the link between

PC and intergroup attitudes. Importantly, IPC was related to attitudes via IOS. Nevertheless, the reverse model in which IOS was included as an outcome variable and attitudes as the mediator showed that this relationship is also plausible, despite the model fit being poorer. Thus, these findings suggest that attitudes and perceived closeness are closely associated, highlighting the potential for a bidirectional relationship.

To enhance the internal validity, we performed a third study and experimentally tested the effect of IPC on IOS and out-group attitudes. We decided to focus on a different out-group (gay men), thus reinforcing the external validity of the results.

4 | Study 3

In this study, we aimed at experimentally testing the effect of touch with an out-group member (i.e., a gay man) and perceived closeness, thus allowing to test our hypothesis in another intergroup context. Importantly, using an experimental design provided us with the very opportunity to ascertain the causal relationship between IPC and perceived closeness. Finally, we further gathered additional evidence on the mediating role of IOS in accounting for the impact of intergroup touch on attitudes towards the out-group. To reach this aim, we made use of the imagined contact paradigm which has been shown to exert positive effects on intergroup relations (Crisp and Turner 2012; Shamloo et al. 2018b).

4.1 | Method

4.1.1 | Participants and Procedure

Before the start of the study, we obtained informed consent from participants. They were told that researchers were interested in the way people imagined social situations. Heterosexual

participants were randomly assigned to one of two experimental conditions in which they were asked to either imagine touching the hand of an individual (non-categorized) or touching the hand of a gay man (categorized), for 1 min. During the task they were asked to imagine feeling at ease and of experiencing a positive contact where they discovered unexpected things (see Husnu and Crisp 2010; Turner et al. 2007 for a similar procedure). To guide participants' imagery activity and enhance the vividness of the scenario, we presented a printed picture of the physical encounter (i.e., two touching hands). We added this visual cue as we aimed at guiding participants in imagining a specific PC situation rather than leaving participants free to imagine any touch. Being PC prone to the possibility of being perceived as intrusive and not appropriate when occurring in certain body zones (see Suvilehto et al. 2015), guiding participants in imagining a specific and exact type of touch through a visual cue assured they imagined the same type of non-intrusive touch. In line with the imagined contact paradigm, following this manipulation 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. Once they completed this task, they answered the rest of the questionnaire. At the end of the study, participants were thanked and fully debriefed. Informed consent was collected again at the end of the experiment.

We initially recruited $N = 105$ participants; $n = 5$ did not give consent to use data and $n = 1$ was underage, thus they were not allowed to proceed with the study; $n = 3$ participants were eliminated as it was not possible to determine the experimental condition they had been assigned to due to participants' error when completing the study, and other $n = 3$ participants were eliminated from analyses as they self-identified as homosexual individuals. In addition, we eliminated participants who did not complete the imaginary task ($n = 7$). The final sample comprised $N = 86$ participants. A sensitivity analysis was conducted to determine the minimum detectable effect size for an analysis of covariance (ANCOVA) with one between-subjects variable (condition) and one covariate (measure of contact with gay men), given a fixed sample size of 86 participants. The sensitivity analysis indicated that we would have been able to detect a minimum effect size of $d = 0.61$ (with a power of 0.80 and α err. prob = 0.05). According to Cohen's (1988) conventions, this effect size may be considered an intermediate effect (see Lenhard and Lenhard 2022).

The sample's age ranged between 19 and 62 years (*mean age* = 29.91, *SD* = 10.28; $n = 4$ unknown). We were not able to collect information regarding gender of participants due to an error on the measurement of this variable. As far as the experimental conditions, $n = 39$ participants were included in the IPC condition, and $n = 47$ were included in the PC condition (PC).

4.1.1.1 | Questionnaire.

4.1.1.1.1 | Inclusion of the Other in the Self (IOS). Perceived closeness was measured as in Studies 1 and 2 (see Aron et al. 1992; Capozza et al. 2014). Higher scores represented greater perceived closeness with gay men.

4.1.1.1.2 | Quantity of Contact. Quantity of contact was measured through a single item asking participants how many

gay men they knew (adapted from Vezzali and Giovannini 2012). Responses ranged from 1 (*none*) to 7 (*more than 10*).

4.1.1.1.3 | Attitudes Towards Gay Men. We used 12 items from the Modern Homonegativity Scale (MHS) developed by Morrison and Morrison (2003), which measures contemporary negative attitudes towards gay men. Participants were asked to report the degree to which they agreed with the items from 1 (*not at all*) to 7 (*a lot*). Examples of items are the following: 'Many gay men use their sexual orientation so that they can obtain special privileges' or 'Gay men seem to focus on the ways in which they differ from heterosexuals, and ignore the ways in which they are the same'. Higher scores indicated more positive attitudes towards gay men. This measure showed very good internal consistency (Cronbach's $\alpha = 0.90$).

4.2 | Results

4.2.1 | Analytic Strategy

A multivariate analysis of covariance (MANCOVA) was used to examine the effect of the condition (IPC vs. PC) on IOS and out-group attitudes, while controlling for quantity of contact. Specifically, we included the condition as the independent variable, IOS and attitudes as the dependent variables and contact quantity as a covariate. The model initially also included an interaction term between condition and contact quantity. The interaction was not significant for either dependent variable ($ps > 0.241$), indicating that the effect of condition did not vary as a function of contact quantity. Therefore, the interaction term was removed, and the model was re-estimated including only the main effects of condition and contact quantity.

To test the mediation effect of IOS, we used Hayes' PROCESS macro version 4.0 for SPSS (Model 4; Hayes 2017) and tested a model in which we included the condition (PC = 0; IPC = +1) as the independent variable, IOS as a mediator and attitudes as an outcome variable, while controlling for contact quantity. The mediation was tested with 95% BC bootstrapping confidence intervals (5000 resamples).

4.2.2 | Main Results

4.2.2.1 | Inclusion of the Other in the Self. Results showed that there was a significant effect of condition on IOS: $F(1, 83) = 5.88, p = 0.017, \eta_p^2 = 0.07$. Inspection of the means showed that participants perceived higher IOS when prompted to imagine touching the hand of a gay man ($M = 4.03, SD = 2.01$) compared to when they touched the hand of an uncategorized individual ($M = 2.94, SD = 2.11$), supporting H1. Contact quantity was not significantly associated with IOS in this sample: $F(1, 83) = 0.39, p = 0.536, \eta_p^2 = 0.01$.

4.2.2.2 | Attitudes Towards Gay Men. Results showed that there was a significant effect of condition on attitudes towards gay men $F(1, 83) = 8.09, p = 0.006, \eta_p^2 = 0.09$. Participants showed more positive attitudes when prompted to imagine touching the hand of a gay man ($M = 5.32, SD = 1.23$) compared to when they touched the hand of an uncategorized individual ($M = 4.55,$

SD = 1.27), supporting H3. Again, the number of known gay men was not significant in predicting more positive attitudes in this sample $F(1, 83) = 1.64, p = 0.204, \eta_p^2 = 0.02$.

4.2.2.3 | Mediation Analysis. Prior to the mediation analyses, to verify the distinctiveness of the measures used, we examined whether the mediator and outcome variable could be regarded as distinct measures².

We then proceeded by carrying out the mediation analyses. As hypothesized, IPC was associated with enhanced IOS ($\beta = 0.51, p < 0.017$). IOS, in turn, was associated with more positive attitudes towards gay men ($\beta = 0.39, p < 0.001$). Finally, results showed that IPC compared to the control condition predicted more positive out-group attitudes via IOS ($\beta = 0.20, SE(\text{boot}) = 0.09, 95\% \text{ BC CI} = 0.03, 0.40$), thus confirming the significant indirect effect of IOS and supporting H4.

4.2.2.4 | Alternative Mediation Model. As in Study 2, an alternative model was tested where mediator and outcome variable were switched. Thus, out-group attitudes were included as mediator and IOS as the outcome. Results showed that IPC compared to the control condition predicted enhanced IOS via attitudes ($\beta = 0.24, SE = 0.10, 95\% \text{ BC CI} = 0.07, 0.45$), thus supporting the plausibility of the reverse model. In addition, we estimated model fit using Mplus 8.3 (Muthén and Muthén 2017), which showed that the reverse model was adequate ($\chi^2(2) = 1.87, p = 0.39; CFI = 1.00; RMSEA < 0.001; SRMR = 0.04$) and showed a better fit compared to the original model ($\chi^2(2) = 5.16, p = 0.08; CFI = 0.88; RMSEA = 0.14; SRMR = 0.07$). We also compared the two models based on the AIC and the BIC. The reverse model showed a better fit (AIC = 645.81; BIC = 662.99) compared to the original model (AIC = 649.10; BIC = 666.28).

4.3 | Discussion

Results from Study 3 showed that imagining having a positive experience while touching the hand of a gay man compared to that of an uncategorized individual led to an enhanced perception of closeness with gay men and to more positive attitudes towards the group as a whole. The observed results held after controlling for the number of known out-group members, suggesting that touch may work above and beyond quantity of contact in this sample.

Differently from Studies 1 and 2, which relied on a correlational design, Study 3 took a step further by experimentally testing whether positive touch on the hand of an out-group member—in the form of imagined contact—could affect participants' perceived closeness as well as participants' attitudes, extending previous studies on the effect of intergroup touch on intergroup relations (Seger et al. 2014; Shamloo et al. 2018a; Shamloo et al. 2018b). Specifically, previous studies show that both imagined and real intergroup touch, compared to a no-touch condition, improve intergroup attitudes (Seger et al. 2014; Shamloo et al. 2018b). In addition, the effects of touch have also been found when comparing it with a passive-view condition, in which participants merely observed touch involving an out-group member without engaging in the mental simulation of touch or imagined an interpersonal touch (Shamloo et al. 2018b). Study 3 adds further

support and extends these results by showing that imagining to touch the hand of a gay man compared to that of an uncategorized individual improved attitudes and enhanced perceived closeness towards gay men as a whole. Future studies could jointly examine the effects of imagined PC (touch vs. no-touch) and target group (out-group vs. uncategorized targets) to test their interactive effects and provide a more comprehensive understanding.

Importantly, in line with our hypothesis, the indirect effect of IOS was significant, showing for the first time that PC may improve out-group attitudes via inclusion of the out-group in the self. Nevertheless, a reverse mediation model, where attitudes were entered as mediator and IOS as the outcome variable, showed that the indirect effect of attitudes on IOS was significant. In this case, model comparison using AIC and BIC indicated that the reverse model provided a better fit to the data than the original model, suggesting that improvements in intergroup attitudes may, in some circumstances, precede enhancement of perceived closeness.

Finally, although the present article did not aim to address gender differences, it is worth mentioning that, especially when considering gay men as an out-group target and PC as a means of interaction, gender effects may come into play. Men are known to be less prone to engage in PC with other men and perceive touch more aversely than woman, due to stronger homophobic attitudes (for a discussion, see Kite and Whitley 1996). Future research should delve into this issue explicitly, thereby offering a more nuanced understanding of when and for whom IPC is most effective.

5 | General Discussion

Although a vast literature recognizes the importance of the use of touch within interpersonal contexts (Gallace and Spence 2010), little evidence exists on the role played by touch in intergroup contexts. Moreover, the few studies carried out so far have dealt with racial and ethnic out-groups, raising questions about the effectiveness of IPC in fostering harmonious relations in different intergroup contexts. More importantly, the psychological mechanisms that might explain how intergroup touch improves attitudes remain largely unexplored. We aimed to show that perceptions of closeness play a mediating role in this respect. We conducted three studies with the aim of providing evidence on the effects of intergroup touch on perceived closeness with the out-group and out-group attitudes.

First, based on Fiske's contribution (1992, 2004), which emphasizes physical touch as a core feature of communal sharing relationships—characterized by intimacy, a sense of unity and the perception of others as equivalent and undifferentiated—our results further underline the link between touch and closeness. Specifically, we showed that touch enhanced closeness by specifically producing a merging of the self with the out-group. These findings align with studies showing how touch enhances communal feelings in interpersonal contexts (Simão and Seibt 2015). Furthermore, they also support the physical-cognitive overlap assumption suggested by several authors (Jakubiak and Feeney 2017; Seger et al. 2014), although, to our knowledge, never been empirically tested so far. Indeed, our results provided

evidence on the association between IPC and IOS (Studies 1, 2 and 3) and showed that the positive effects of intergroup touch persist over time (Study 1), supporting the idea that the use of PC facilitates lasting changes in how intergroup relationships are perceived. Importantly, as we relied on both longitudinal and experimental designs, this research provided initial evidence on the directionality of the relationship between PC and closeness (Studies 1 and 3), thus contributing to a more detailed understanding of its effects.

This work further informs previous research on the importance of IOS in positively shaping intergroup attitudes (e.g., Abu-Rayya and Brown 2023; Turner et al. 2008) by highlighting one mechanism through which positive IPC improves out-group attitudes—namely, by enhancing the inclusion of the out-group in the self (Studies 2 and 3). This should be regarded as a major and novel aspect of the current work as it represents the first attempt, to our knowledge, of clarifying the mechanism at the basis of the link between IPC and out-group attitudes.

Results supporting our hypotheses were found across three studies, each employing different research designs (longitudinal, cross-sectional and experimental) and different target out-groups (foreign young adolescents, people with disabilities and gay men). The consistent replication of findings contributes to build up confidence regarding the observed effect of PC on enhancement of closeness and out-group attitudes.

In addition, by including measures of intergroup contact (cross-group friendship and extended contact, as well as contact quantity and quality), our findings provided robust evidence of the effects of intergroup touch on perceived closeness also after controlling for majorly investigated forms of intergroup contact. Although not a focus of this article, it is worth noting that differently from studies which have found significant links between direct and indirect measures of contact and closeness (see Stathi and Crisp 2010; Turner et al. 2008), we did not fully replicate these findings. Nevertheless, this does not undermine the validity of previous studies which generally found support for these links. It may be that, in some contexts, closeness is mainly explained by the amount of PC experienced with an out-group member while in other contexts, different forms of direct contact may emerge as key predictors of closeness, likely depending on individual, situational and cultural factors. Further research is needed to test this assumption. These results also call for an in-depth analysis and further clarification of what intergroup contact measures actually measure. Indeed, although studies typically differentiate direct forms of interaction, the specific characteristics and perception of what that direct contact measure is actually measuring may somehow vary from one person to another. Future studies should aim at clarifying this.

In sum, these results confirm previous results on the relationship between the use of positive IPC and intergroup attitudes (Shamloo et al. 2018a) and extend previous studies on the effects of IPC both in real (Seger et al. 2014) and imagined forms (Shamloo et al. 2018b). Specifically, these results expand previous research by (a) including diverse out-groups (b) providing evidence that the effects of intergroup touch on intergroup dynamics are independent of the level of general intergroup contact (c) providing evidence on a possible psychological mechanism

(i.e., IOS) through which physical touch is linked to out-group attitudes.

In conclusion, these studies provide additional evidence on the potential PC holds for relating to others, and specifically within intergroup contexts. Nevertheless, it should be acknowledged that we referred specifically to positive forms of PC, both when considering past experiences and when imagining a PC encounter, as we strongly believe that encounters should be positive in order to promote the desired effects, especially when considering imagined contact experiences (see Crisp and Turner 2012, for a similar rationale). By reducing the distance, both in physical and cognitive terms, positive PC experiences may create more harmonious and cooperative environments through perception of closeness with others. This may, in turn, also create the basis for enhanced trust, empathy and willingness to enter into contact with others. Future studies should delve into this aspect.

6 | Limitations and Future Directions

Notwithstanding the theoretical contribution of the current research project, there are also several limitations. First, we relied on recall of past contact experiences and on imagined touch rather than actual touch. Although this allowed us to take into consideration specific (i.e., imagined touch) as well as accumulative evidence of PC experiences (i.e., recall of past experiences) between individuals, our research did not test a real world touch situation. Nevertheless, we believe our results are indicative of the effects of real positive contact experiences. Specifically, neuroimaging research using functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) has demonstrated that mental imagery recruits brain networks similar to those engaged during perception, memory, emotion and motor control (Kosslyn et al. 2001). As also discussed in Turner et al.'s (2008) work, mental simulation of an experience may lead participants to activate processes very similar to the ones involved in real situations.

Second, the study focused on a specific context, Italy, known for being a culture where touch is more often used compared to other contexts such as northern Europe (Remland et al. 1995). Cultural norms regarding touch vary significantly across cultures, so future studies should investigate whether the effects of PC found in Italian contexts are generalizable to other cultural settings, where touch is less commonly used in daily interactions.

Third, when considering touch, we did not differentiate between different types of touch experiences, this is receiving and giving touch. Studies on the effects of touch have usually focused on the effect of receiving touch (but see Shamloo et al. 2018a, 2018b) or have failed to differentiate the effects of giving from receiving it (see Schirmer et al. 2023). Yet, the two forms of contact should be differentiated as giving and receiving touch may convey different meanings and perceptions of others (Schirmer et al. 2023), possibly also affecting levels of perceived closeness with others.

Fourth, we focused exclusively on positive touch, this is forms of touch which are usually included in friendly interactions

(Suvilehto et al. 2015). Importantly, in the case of Study 3, in line with the imagined contact paradigm (Crisp and Turner 2012) participants were specifically guided to imagine a positive and nonintrusive touch. Indeed, it is extremely important to envisage a positive contact experience, especially when PC is considered. There are different situations in which touch may be perceived negatively or inappropriate and this depends on the specific part of the body that has been touched but also on the specific characteristics of the person initiating the touch (e.g., Lee and Guerrero 2001; Saarinen et al. 2021). For example, studies have shown how close others (i.e., partners) are allowed to touch basically any body part, whereas strangers are limited to touch neutral zones of the body such as the hands (Suvilehto et al. 2015). In addition, touching patterns are also related to status, such that higher status individuals usually initiate touch more often than minority status individuals (Henley 1973) and touch from minority status groups can be perceived as less pleasant or more discomforting, especially among majority-group members with higher prejudice (see Saarinen et al. 2021 for a review). Based on this, future studies should investigate how positive and negative forms of intergroup touch (e.g., touch on different body zones) differently affect perceived closeness and intergroup relations in general, building on the broader literature on intergroup contact which has recognized the importance of studying the effects of both positive and negative contact (Graf et al. 2014) as well as differences in contact effects between minority and majority groups (e.g., Tropp and Pettigrew 2005).

Last but not least, we only focused on IOS as a key variable linked to touch. Although we believe it to be an important mechanism through which touch affects attitudes towards others, we acknowledge that other processes may be possible. Indeed, when individuals interact through touch, this has the power of making people feel connected and possibly helps build trust towards others (Valori et al. 2024). In addition, we argue that touch may also be linked to empathy. This conjecture stems from the idea that people use touch to convey multiple forms of information (see Gallace and Spence 2010), including affective states and relational cues. By processing such information, receivers are likely to make inferences about the toucher's feelings and thoughts. Consistent with this notion, research shows that individuals can understand others' emotions simply by observing interactions that involve touch (Hertenstein et al. 2009; Peled-Avron and Woolley 2022). This link between touch and empathy may extend beyond interpersonal relationships, also influencing responses in intergroup interactions. In sum, touch, at times even more powerful than words (Jones and Yarbrough 1985), may represent a privileged channel through which to connect to others, thus facilitating empathy. Regarding the role of IOS as a predictor of out-group attitudes, it is worth noting that, as we did not manipulate IOS in our studies, it remains unclear whether greater IOS leads to more positive attitudes or vice versa. Although a bidirectional relationship is likely possible, as also shown by the analyses testing the reverse mediational pattern (i.e., attitudes as a mediator and IOS as an outcome variable), future studies should be carried out to clarify the directionality of the relationship. This would expand the literature on IOS in intergroup settings which has been largely conceptualized as a predictor of attitudes without generally testing causal inferences (see, e.g., Cadieux et al. 2019; Stathi and Crisp 2010; Vezzali

et al. 2014). Finally, moving from contextual to individual aspects, future studies should investigate potential moderators of touch (e.g., Saarinen et al. 2021). People may differ in terms of being prone to touch, depending on their comfort for interpersonal touch (Webb and Peck 2015). As mentioned in the introduction, there are several studies showing the positive effects of touch on different domains, yet the same studies also show that these effects are not universal and that they may depend on individuals' touch proneness (Webb and Peck 2015). Thus, individual preferences in touch sensitivity should be considered as this could help clarify the effects of intergroup touch in fostering closeness and ameliorate intergroup relationships.

7 | Conclusions

In sum, these results offer a new perspective on positive PC, by considering touch as a peculiar form of intergroup contact able to enhance closeness and improve attitudes towards the out-group. These results pave the way to possible future interventions and programs aimed at increasing positive intergroup physical interactions between members of different groups with the aim of improving intergroup relations. Institutions should thus consider the use of positive intergroup touch in different contexts such as interventions in educational settings which may ultimately help develop stronger connections and relationships between peers, especially in terms of closeness with others. These results may also inform other contexts such as health-related ones in which touch between patient and practitioners is common. Similarly, breaking barriers and enhancing social connections through intergroup positive touch should also be considered within community initiatives, as, for example, through the use of activities which naturally include positive PC. Importantly, any implementation must adhere to ethical standards: Contact should be structured to be voluntary, positively perceived, non-intrusive and culturally sensitive. Indeed, for some minority group members, touch may carry negative connotations—particularly when it does not align with cultural values—so it can be quickly perceived negatively if these factors are overlooked. Taking into consideration all these aspects is therefore essential to promote interactions that are positive oriented, safe, respectful and inclusive.

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The authors have nothing to report.

Ethics Statement

These studies were approved by the Research Ethics Committee of the Department of Human Sciences of the University of Verona.

Consent

Participants themselves and parents/legal guardians (for underaged individuals) gave written consent for participation in the studies.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

All materials, data, and analysis scripts are available at the OSF repository: https://osf.io/2awt6/overview?view_only=ece4044b41be4b768b3a5057da19a735

Endnotes

¹We used the approach suggested by Rönkkö and Cho (2022) and computed bootstrap confidence intervals (CIs) of factor correlations. CIs did not include 1: $r = 0.42$ [0.318, 0.485] for the correlation between physical contact and IOS and $r = 0.44$ [0.337, 0.542] for the correlation between IOS and attitudes. These findings support the claim that the factors were statistically distinguishable.

²Bootstrap CI for the correlation between IOS and out-group attitudes did not include 1: $r = 0.48$ [0.274, 0.636], thus supporting the claim that the two factors are distinguishable.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Supporting File 1: ejsp70061-sup-0001-SuppMat.docx