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Megumi Gonno * and Noriyuki Kida

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Physical Contact in Sports: Discomfort Arising from Gender, Relationship, and Body Part

Megumi Gonno [1,2,*] and Noriyuki Kida [2]

[1] Department of Childhood Education, Faculty of Childhood Education, Nagoya Aoi University, 3-40 Shioji-cho, Mizuho-ku, Nagoya-City 467-8610, Japan

[2] Faculty of Arts and Sciences, Kyoto Institute of Technology, Hashikami-cho, Matsugasaki, Sakyo-ku, Kyoto 606-8585, Japan

* Correspondence: gonno@nagoya-aoi.ac.jp

Abstract

Physical contact is frequently used as a pedagogical tool in sports instruction. However, it may elicit discomfort owing to factors such as gender dynamics, relationship type, and contacted body parts. This study investigated how gender, relational closeness, and specific body parts influence the perceived discomfort of physical contact in sports-related scenarios. A within-subject questionnaire survey was administered to female university students in Japan. Participants rated the discomfort level of hypothetical physical contact scenarios involving the same sex or opposite sex, three relational contexts (close friend, unfamiliar friend, and teacher), and 11 body parts. Logistic regression and generalized estimating equations analyses revealed significant main effects for all three factors and significant two-way interactions. Notably, contact from male individuals, less close acquaintances, or male teachers evoked the highest discomfort. These findings support the intimacy congruence hypothesis, suggesting that comfort with physical contact depends on both the body part and the social congruity between initiator of contact and recipient of contact. Although physical contact may be normatively justified in sports coaching, complex social cues significantly shape reception. These findings highlight the importance of gender sensitivity and relational dynamics in physical instruction and suggest that educators should exercise nuanced judgment when using contact as a pedagogical method.

Keywords: physical contact; discomfort; gender; relationship; body part; sports instruction; intimacy congruence; coaching ethics

1. Introduction

In the field of sports instruction, physical contact between coaches and athletes is generally accepted to some extent when conducted for purposes such as technical guidance, support, and encouragement. However, growing attention has been paid to the psychological resistance and discomfort that such contact may provoke (Bruno et al., 2023; Drummond et al., 2007). In particular, studies have shown that a recipient's perception of touch can be significantly shaped by contextual factors such as the gender of the initiator of touch, the nature of the relationship, and the body part being touched (Schirmer et al., 2022; Suvilehto et al., 2015). These findings suggest the need to move beyond a purely technical interpretation of touch to approach it from a broader social and psychological perspective.

International efforts have been made to establish guidelines for physical contact in sports settings (Gaedicke et al., 2021; Krol et al., 2024). Policy or guidelines have been introduced to determine the appropriateness of touch-related behaviors in countries such as the United Kingdom and Australia (Child Protection in Sport Unit, 2021; National Youth Ballet, 2024; Sport Integrity Australia, 2023; Royal Ballet School, 2025). In Japan, measures to prevent harassment, including inappropriate physical contact, have been strengthened by organizations such as the Japan Sports

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Agency. These developments have renewed public and institutional attention toward the boundaries between educationally justified and inappropriate forms of touch. In this context, the accumulation of scientific knowledge regarding the acceptability of physical contact is critical for promoting ethical awareness and risk management in sports practice.

Recent studies have increasingly revealed that the acceptability of touch is significantly influenced by multiple factors, including the nature of gender of the person initiating the touch, the interpersonal relationship (i.e., degree of intimacy), and specific body part being touched (Drummond et al., 2007; Krol et al., 2024). For instance, Suvilehto et al. (2015) conducted a cross-cultural study demonstrating that the perceived touchability of different body parts varies systematically depending on the cultural background and gender. Notably, women were more likely to report discomfort when touched by members of the opposite sex in intimate body areas such as the chest or abdomen. Furthermore, the intimacy congruence hypothesis (Debrot et al., 2024) posits that when the intimacy of the relationship matches the level of touch, individuals tend to experience comfort; in contrast, incongruence between relationship closeness and the intimacy of touch is associated with heightened discomfort or resistance.

However, most of these studies have focused on touch within everyday and private interpersonal contexts, such as romantic partners, friends, and family members; there remains a marked lack of systematic research on the acceptability of physical contact within institutional and educational settings, such as sports coaching. In particular, it is still unclear how physical contact is perceived in the inherently asymmetrical relationship between coaches and athletes, and how such evaluations interact with other factors, such as the gender of the person initiating the contact and the body part being contacted. Addressing this gap is essential for clarifying what constitutes appropriate physical contact in sports settings, from both theoretical and practical perspectives.

Through a study, we aimed to examine how discomfort toward physical contact in the context of sports coaching is influenced by three social factors: (1) the gender of the person initiating the contact, (2) the relationship between the initiator and recipient, and (3) the specific body part being touched. We also sought to clarify how the interactions among these factors affect the judgment of discomfort. To this end, a questionnaire survey was conducted with female university students. Based on the findings, this study empirically elucidated how the acceptability of physical contact is shaped by social judgment processes within a context in which such contact is often institutionally legitimized. It also sought to derive practical implications from both educational and gender-sensitive perspectives (Gaedicke et al., 2021).

2. Materials and Methods

2.1. Participants

A total of 175 female university students participated in the study (mean age = 18.7; SD = 0.8). All participants received a full explanation of the study's purpose and procedures and provided written informed consent prior to participation. This study was approved by the Institutional Review Board of [Affiliated Institution] (Approval No.: XXX).

2.2. Study Design and Procedure

This study used a cross-sectional questionnaire-based design. A within-subjects design was used, in which all participants responded to all 66 conditions derived from a full factorial combination of three independent variables: (1) the gender of the person initiating contact (male or female), (2) the relational closeness of that person (close friend [non-romantic], unfamiliar friend, or teacher), and (3) the body part being touched (11 areas: head, face, neck/shoulders, chest, abdomen, back, lower back, buttocks, arm, hand, and leg/foot).

The survey was administered in person using a paper-based questionnaire. Participants were asked to imagine being touched during a sports activity and to indicate, for each of the 66 scenarios,

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whether they would feel "uncomfortable" or "not uncomfortable." The order of item presentation was identical for all participants.

2.3. Measures

The dependent variable was the presence or absence of discomfort, operationalized as a binary categorical response ("uncomfortable" or "not uncomfortable") for each of the 66 conditions. The independent variables consisted of the following three categorical factors: First, gender of the person initiating the contact (male or female); second, the relationship between the participant and the other person (close friend, unfamiliar friend, or teacher); and third, the body part being touched (11 body areas, as described previously). The responses across all 66 combinations of these variables were included in the analysis.

2.4. Statistical Analysis

As the dependent variable was binary and each participant provided responses to multiple conditions, logistic regression analysis using generalized estimating equations (GEE) was conducted to account for the within-subject dependency structure.

The model included the main effects of the three factors – gender, relationship, and body part – as well as all two-way and three-way interaction effects. A logit link function was applied, and the dependent variable was assumed to follow a binomial distribution. The working correlation structure for repeated measures within the participants was specified as exchangeable.

The significance of the effects was tested using the Wald chi-square test, and odds ratios (Exp [B]) and 95% confidence intervals (CIs) were computed for each effect. For categorical variables, the following reference categories were used: female for gender, close friend for relationship, and hand for body parts. The significance level was set at .05 for all analyses. All statistical analyses were performed using IBM SPSS Statistics Version 28.

3. Results

3.1. Proportion of Reported Discomfort

Table 1 summarizes the proportion of participants who reported discomfort in response to physical contact, stratified by the gender of the person initiating the contact (same-sex vs. opposite-sex), relationship (close friend, unfamiliar friend, teacher), and body part.

Table 1. Percentage of Participants Reporting Discomfort by Gender, Relationship Type, and Body Part.

	Female (Same-Sex)			**Male (Opposite-Sex)**		
	Close Friend	Unfamiliar Friend	Teacher	Close Friend	Unfamiliar Friend	Teacher
Chest	35.4	63.4	50.9	85.7	94.3	90.9
Buttocks	25.7	55.4	44.6	81.1	92.0	90.3
Abdomen	17.7	44.0	32.0	66.9	80.6	74.9
Face	12.0	43.4	28.0	51.4	76.6	72.0
Lower Back	8.0	30.3	20.6	58.3	76.6	71.4
Leg/Foot	7.4	33.7	17.1	50.3	68.6	61.1
Neck/Shoulders	5.7	25.7	12.0	37.7	65.1	56.6
Head	2.9	25.7	10.9	32.6	60.6	53.1
Back	2.9	24.6	11.4	32.0	58.9	54.3

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Arm	3.4	17.1	5.1	24.0	47.4	40.6
Hand	3.4	14.9	6.9	21.1	46.9	40.6

Note. This table presents the percentage of participants who responded that they felt "uncomfortable" with physical contact for each combination of the the gender of the person initiating the contact (female vs. male), relationship type (close friend, unfamiliar friend, or teacher), and body part. Values are presented as percentages (%).

First, regarding gender differences, contact from males (opposite-sex) was rated as more uncomfortable than contact from females (same-sex) across all body parts. This tendency was particularly pronounced for intimate areas, such as the chest and buttocks, with discomfort reported by approximately 90% of participants. In contrast, female contact was associated with substantially lower discomfort, with some body parts, such as the hand or arm, eliciting discomfort in only about 10% of the responses.

Regarding the relationship differences, contact from unfamiliar friends or teachers was generally rated as more uncomfortable than contact from close friends, regardless of the gender of the person initiating the contact. Specifically, in cases involving males, contact from unfamiliar friends or teachers resulted in discomfort ratings exceeding 50% for all body parts except the hand and arm. Even among females, a non-negligible proportion (more than 10%) of participants reported discomfort for certain body parts when touched by an unfamiliar friend or teacher.

Interestingly, when comparing unfamiliar friends and teachers, contact from teachers was consistently rated as less uncomfortable across both genders, although the overall trend still reflected greater discomfort compared with close friends.

3.2. Main Effects

Table 2 presents the results of logistic regression analysis using GEE, focusing on the main effects of gender, relationship, and body part on perceived discomfort in response to physical contact.

Table 2. Results of Logistic Regression Analysis for Main Effects (Gender, Relationship Type, and Body Part).

Variable	**Odds Ratio (OR)**	**95% CI [Lower, Upper]**	***p***
Gender (vs. Female)			
Male	7.632	[6.127, 9.508]	< .001
Relationship Type (vs. Close Friend)			
Unfamiliar Friend	3.479	[2.848, 4.248]	< .001
Teacher	2.104	[1.763, 2.511]	< .001
Body Part (vs. Hand)			
Chest	14.640	[10.521, 20.372]	< .001
Buttocks	10.822	[7.904, 14.817]	< .001
Abdomen	5.614	[4.177, 7.544]	< .001
Face	4.221	[3.217, 5.540]	< .001
Lower Back	3.594	[2.747, 4.703]	< .001
Leg/Foot	2.829	[2.196, 3.644]	< .001
Neck/Shoulders	2.040	[1.586, 2.625]	< .001
Head	1.730	[1.407, 2.127]	< .001
Back	1.701	[1.344, 2.154]	< .001
Arm	1.047	[0.872, 1.256]	.623

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Note. The reference categories were female, close friends for relationship type, and hands for body part. The odds ratios (OR) reflected the likelihood of reporting discomfort during physical contact. The confidence interval (CI) was 95%.

First, the main effect of gender was statistically significant. Contact from male individuals significantly increased discomfort compared to contact from female individuals, with an odds ratio (OR) of 7.632 (95% CI [6.127, 9.508], $p < .001$).

Regarding the relationship factor, compared to contact from close friends, contact from unfamiliar friends (OR = 3.479, 95% CI [2.848, 4.248], $p < .001$) and teachers (OR = 2.104, 95% CI [1.763, 2.511], $p < .001$) both significantly increased the likelihood of discomfort.

For the body part variable, several regions showed notably elevated odds of discomfort compared to the hand (reference category). The chest yielded an odds ratio of 14.640 (95% CI [10.521, 20.372], $p < .001$), and the buttocks yielded 10.822 (95% CI [7.904, 14.817], $p < .001$), indicating substantial discomfort responses. In contrast, contact on the arm did not differ significantly from contact on the hand, with an odds ratio of 1.047 (95% CI [0.872, 1.256], $p = .623$).

3.3. Interaction Effects

Table 3 summarizes the results of the Wald chi-square tests examining the interaction effects among the three categorical variables: gender, relationship, and body part. First, a significant interaction was found between gender and relationship ($\chi^2 = 22.64$, $p < .001$), indicating that the degree of discomfort associated with interpersonal relationships varied depending on the gender of the person initiating contact. Significant interaction effects were also observed between relationship and body part ($\chi^2 = 34.13$, $p = .031$) and between gender and body part ($\chi^2 = 45.51$, $p < .001$). In contrast, the three-way interaction among gender × relationship × body part was not statistically significant ($\chi^2 = 20.00$, $p = .511$). Based on these findings, the analysis and interpretation in the following sections focus on the two-way interaction effects, which were significant.

Table 3. Results of Wald Chi-Square Tests for the Effects of Gender, Relationship Type, Body Part, and Their Interactions on Discomfort Toward Physical Contact.

Factor (Effect)	***Wald* χ^2**	***df***	***p***
Gender	104.58	1	< .001
Relationship Type	85.23	2	< .001
Body Part	314.90	10	< .001
Gender × Relationship Type	22.64	2	< .001
Relationship Type × Body Part	34.13	20	.031
Gender × Body Part	45.51	10	< .001
Gender × Relationship Type × Body Part	20.00	20	.511

Note. Wald chi-square statistics were computed using a generalized estimating equation (GEE) model. Each factor and interaction was tested for its contribution to perceived discomfort in physical contact. *df* indicates the degrees of freedom for each chi-square test.

Table 4 presents the ORs for each condition combination based on the two-way interactions. For the gender × relationship interaction, the reference category was female × close friend. All of the combinations involving male targets exhibited substantially elevated odds of discomfort. In particular, the male × unfamiliar friend interaction yielded an odds ratio of 24.835 (95% CI [11.062, 55.758], $p < .001$), and the male × teacher interaction showed an OR of 19.229 (95% CI [8.630, 42.848], $p < .001$), both indicating a nearly 20-fold increase in odds compared to the reference. Even for the male × close friend interaction, the odds of reporting discomfort were significantly higher (OR = 7.552,

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95% CI [3.527, 16.170], p < .001). In contrast, for female targets, the effect of relationship type was less pronounced. Compared with the interaction of female × close friend, discomfort was significantly higher for female × unfamiliar friend (OR = 4.915, 95% CI [2.279, 10.598], p < .001), while the increase for female × teacher did not reach statistical significance (OR = 2.074, 95% CI [0.968, 4.444], p = .061). These findings suggest that contact by male individuals is generally perceived as more uncomfortable and that the impact of relationship type differs depending on the gender of the person initiating contact.

Table 4. Odds Ratios from Logistic Regression Analyses for Two-Way Interactions among Gender, Relationship Type, and Body Part on Perceived Discomfort.

Condition	OR	95% CI (Lower-Upper)		p	Reference
Male × Unfamiliar Friend	24.835	11.062	55.758	<.001	Female × Close Friend
Male × Teacher	19.229	8.630	42.848	<.001	Female × Close Friend
Male × Close Friend	7.552	3.527	16.170	<.001	Female × Close Friend
Female × Unfamiliar Friend	4.915	2.279	10.598	<.001	Female × Close Friend
Female × Teacher	2.074	0.968	4.444	.061	Female × Close Friend
Male × Chest	22.378	13.628	36.747	<.001	Female × Hand
Male × Buttocks	16.049	9.975	25.822	<.001	Female × Hand
Male × Abdomen	7.524	5.037	11.239	<.001	Female × Hand
Male × Face	3.949	2.780	5.611	<.001	Female × Hand
Male × Lower Back	5.211	3.590	7.564	<.001	Female × Hand
Male × Leg/Foot	3.773	2.665	5.340	<.001	Female × Hand
Male × Neck/Shoulders	2.258	1.638	3.114	<.001	Female × Hand
Male × Head	1.802	1.324	2.452	<.001	Female × Hand
Male × Back	1.755	1.266	2.434	<.001	Female × Hand
Male × Arm	1.178	0.920	1.509	.195	Female × Hand
Female × Chest	15.454	6.843	34.903	<.001	Female × Hand

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Female × Buttocks	9.750	4.273	22.246	<.001	Female × Hand
Female × Abdomen	6.064	2.690	13.671	<.001	Female × Hand
Female × Face	3.841	1.657	8.906	.002	Female × Hand
Female × Lower Back	2.449	1.130	5.310	.023	Female × Hand
Female × Leg/Foot	2.260	1.048	4.874	.038	Female × Hand
Female × Neck/Shoulders	1.707	0.635	4.589	.289	Female × Hand
Female × Head	0.828	0.312	2.201	.706	Female × Hand
Female × Back	0.828	0.274	2.509	.739	Female × Hand
Female × Arm	1.000	0.437	2.290	1.000	Female × Hand
Unfamiliar Friend × Chest	0.643	0.297	1.391	.262	Close Friend × Hand
Unfamiliar Friend × Buttocks	0.731	0.336	1.591	.430	Close Friend × Hand
Unfamiliar Friend × Abdomen	0.743	0.341	1.617	.453	Close Friend × Hand
Unfamiliar Friend × Face	1.145	0.530	2.474	.730	Close Friend × Hand
Unfamiliar Friend × Lower Back	1.016	0.534	1.934	.960	Close Friend × Hand
Unfamiliar Friend × Leg/Foot	1.290	0.640	2.598	.477	Close Friend × Hand
Unfamiliar Friend × Neck/Shoulders	1.162	0.464	2.907	.748	Close Friend × Hand
Unfamiliar Friend × Head	2.395	0.902	6.356	.080	Close Friend × Hand
Unfamiliar Friend × Back	2.253	0.795	6.387	.126	Close Friend × Hand
Unfamiliar Friend × Arm	1.186	0.572	2.458	.647	Close Friend × Hand
Teacher × Chest	0.910	0.423	1.957	.808	Close Friend × Hand
Teacher × Buttocks	1.120	0.514	2.443	.775	Close Friend × Hand
Teacher × Abdomen	1.054	0.494	2.249	.891	Close Friend × Hand
Teacher × Face	1.375	0.634	2.986	.420	Close Friend × Hand
Teacher × Lower Back	1.436	0.675	3.057	.347	Close Friend × Hand

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Teacher × Leg/Foot	1.243	0.569	2.717	.585	Close Friend × Hand
Teacher × Neck/Shoulders	1.085	0.456	2.580	.853	Close Friend × Hand
Teacher × Head	1.997	0.779	5.117	.150	Close Friend × Hand
Teacher × Back	2.116	0.781	5.732	.141	Close Friend × Hand
Teacher × Arm	0.736	0.336	1.614	.445	Close Friend × Hand

Note. Odds ratios (OR) represent comparisons between each interaction condition and the designated reference category (shown in the "Reference" column). Analyses were conducted using Generalized Estimating Equations (GEE).

Regarding the gender × body part interaction, female × hand was set as the reference category. Among the male targets, several body parts were associated with substantially elevated odds of discomfort. In particular, the male × chest interaction showed an odds ratio (OR) of 22.378 (95% CI [13.628, 36.747], $p < .001$), and the male × buttocks interaction had an OR of 16.049 (95% CI [9.975, 25.822], $p < .001$), both exceeding 10, indicating highly pronounced discomfort. Other notable increases were observed in the following interactions: male × abdomen (OR = 7.524, 95% CI [5.037, 11.239], $p < .001$), male × face (OR = 3.949, 95% CI [2.780, 5.611], $p < .001$), male × lower back (OR = 5.211, 95% CI [3.590, 7.564], $p < .001$), and male × leg/foot (OR = 3.773, 95% CI [2.665, 5.340], $p < .001$), all of which were significantly elevated. By contrast, female targets elicited moderate increases in the odds for the same body parts. While the female × chest (OR = 15.454, 95% CI [6.843, 34.903], $p < .001$) and female × buttocks (OR = 9.750, 95% CI [4.273, 22.246], $p < .001$) interactions also showed elevated odds, these values were generally lower than those for male targets. Additional significant increases were observed in the female × abdomen interaction (OR = 6.064, 95% CI [2.690, 13.671], $p < .001$) and three other regions, although the effect sizes were smaller. However, some body parts showed no significant difference in discomfort when touched by female targets, such as in the female × neck/shoulders (OR = 1.707, 95% CI [0.635, 4.589], $p = .289$), female × head (OR = 0.828, 95% CI [0.312, 2.201], $p = .706$), and female × back (OR = 0.828, 95% CI [0.274, 2.509], $p = .739$) interactions. Additionally, arm contact had no significant effect in either gender. The odds ratio for the male × arm interaction was 1.178 (95% CI [0.920, 1.509], $p = .195$), and for the female × arm interaction, the OR was 1.000 (95% CI [0.437, 2.290], $p = 1.000$).

In the relationship × body part interaction analysis, the reference category was set as close friend × hand. Across most combinations, the odds ratios remained close to 1, and no statistically significant differences in discomfort were observed. However, certain combinations showed relatively elevated odds ratios despite not reaching statistical significance. For instance, the distant friend × head interaction had an odds ratio of 2.395 (95% CI [0.902, 6.356], $p = .080$), and the teacher × back interaction had an odds ratio of 2.116 (95% CI [0.781, 5.732], $p = .141$).

4. Discussion

4.1. The Impact of Gender

This study systematically examined how three key social factors—the gender of the person initiating the physical contact, the interpersonal relationship, and the body part being touched—influence female university students' perceptions of discomfort in response to physical contact in the context of sports activity, in which such contact is relatively common. The results of the logistic regression analysis demonstrated significant main effects for all three factors, along with multiple

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significant two-way interactions. In the following sections, we interpret the main and interaction effects in light of theoretical frameworks and prior research and discuss practical implications for ethical and gender-sensitive practices in sports settings.

In the present study, the gender of the person initiating physical contact exerted a significant main effect on participants' evaluations of discomfort. Specifically, across conditions, female participants reported substantially higher levels of discomfort when touched by a male compared to a female. This tendency is consistent with findings from previous research that has shown that women tend to evaluate touch from unfamiliar men more negatively than from women or familiar others (Burgoon et al., 1992; Heslin et al., 1983; Russo et al., 2020; Suvilehto et al., 2015). Similarly, Hall and Veccia (1990) found that opposite-gender physical touch was more likely to elicit feelings of discomfort and inspiration than same-gender interactions. These findings collectively indicate that even in the context of sports instruction − where physical contact is often framed as functional or pedagogical − the recipient's emotional response is strongly shaped by the gender of the initiator, reinforcing the view that physical touch is not interpreted solely as a technical act but as a socially mediated experience (Hall et al., 2019; Hertenstein et al., 2006; Saarinen et al., 2021).

Moreover, the results of this study demonstrate that the effect of gender remains salient, even in the structured and institutionalized context of sports coaching, underscoring its practical significance. In sports settings, physical contact is often unavoidable as part of instructional techniques, and such interactions are frequently legitimized under the premise of technical necessity. However, when male coaches make physical contact with female athletes, there is a potential risk of psychological discomfort or resistance, irrespective of the coach's instructional intent. Recent discussions have highlighted that physical contact initiated by male coaches has become a social concern, especially when viewed in relation to power dynamics and the risk of sexual misconduct (Gaedicke et al., 2021). These findings emphasize the critical need for increased awareness and sensitivity regarding gender in instructional interactions. Rather than underestimating such risks, coaches must engage in gender-conscious communication and decision making, especially in contexts involving physical contact.

4.2. Effect of Relationship Closeness

This study also revealed that the type of relationship between the participant and the initiator of physical contact had a significant impact on discomfort ratings. Specifically, physical contact from unfamiliar friends of teachers was rated as significantly more uncomfortable than contact from close friends. This tendency aligns with previous findings suggesting that the acceptability of physical touch is largely shaped by the degree of interpersonal closeness (Debrot et al., 2013; Sorokowska et al., 2021; Suvilehto et al., 2015). In other words, psychological proximity is closely correlated with the perceived acceptability of physical proximity, and emotional reactions to touch are influenced by the social distance between individuals. However, one notable finding was that physical contact initiated by teachers was perceived as less uncomfortable than contact from unfamiliar friends. At first glance, this result may suggest that contact from teachers is relatively tolerated. However, this interpretation may be misleading. Given the coaches' position of authority, participants may have suppressed their discomfort or rationalized the contact internally (Derlega et al., 1989; Hall et al., 2019), believing it to be part of legitimate instruction, even if they found it unpleasant (Fiske, 1993). Such tendencies may be especially pronounced in sports contexts, in which physical contact is institutionally legitimized. In hierarchical, collectivistic settings such as Japanese extracurricular sports clubs (bukatsu), coaches' behaviors are often accepted as correct or justified. Consequently, athletes may face social pressure to avoid expressing negative emotions, potentially creating conditions in which subjective discomfort is overlooked or silenced.

The influence of relationship type observed in this study—specifically, the distinction between teacher and friend—suggests that evaluations of physical contact are informed not merely by interpersonal closeness but also by social roles and normative expectations. For example, formal policies for appropriate physical contact have been developed in domains such as classical ballet

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instruction (National Youth Ballet, 2024; Royal Ballet School, 2025), in which such contact is widely regarded as a necessary and legitimate method of skill acquisition. Furthermore, previous studies have reported that tactile instruction is often perceived as more effective than non-contact methods (Assandri, 2019). These perspectives, prevalent in broader sports and performance domains, may contribute to a greater acceptability of physical contact when initiated by coaches.

In light of the above considerations, the relatively lower level of discomfort reported in response to physical contact from teachers may reflect not absence of discomfort per se, but rather a suppression of negative effect mediated by internalized cognition and institutional justification on the part of the recipient. That is, even if the contact was actually perceived as unpleasant, it may have been reinterpreted as acceptable under such assumptions as "because it is part of instruction" or "there was no choice but to accept it." These findings suggest that within the context of sports instruction, the institutional authority and perceived legitimacy of the coaches' role may inhibit athletes' emotional expression and evaluative autonomy. This highlights the need for a renewed critical examination of gendered power dynamics surrounding physical contact in instructional contexts.

4.3. Effects of Touched Body Parts

The degree of discomfort varied significantly depending on the specific body part that was touched. Particularly, body regions with high physical intimacy, such as the chest and buttocks, elicited markedly greater discomfort than other areas. Conversely, body parts that are more commonly involved in everyday social interactions, such as the hands and arms, tended to generate relatively lower levels of discomfort, reflecting their higher social acceptability and frequency of public contact.

This finding supports the categorization of body parts along a gradient of perceived tactile intimacy and public accessibility. Specifically, the results appear to align with a four-tiered grouping: (1) highly intimate areas (e.g., chest, buttocks), which are strongly avoided; (2) moderately intimate areas (e.g., abdomen, face, lower back), which elicit discomfort depending on context; (3) ambiguous or variable areas (e.g., leg/foot, neck/shoulder, head, back), which may be perceived differently based on relational or cultural cues; and (4) publicly acceptable areas (e.g., arm, hand), where touch is more likely to be socially and psychologically tolerated.

These gradations suggest that judgments of physical contact in sports instruction are strongly mediated by sociocultural norms related to bodily privacy and physical accessibility. Even in contexts where contact is functionally justified, such as during skill instruction, the acceptability of touch appears to be filtered through the cultural meanings attributed to specific body parts. This suggests that even technically motivated physical touch is filtered through culturally embedded somatosensory meanings (Gallace & Spence, 2010).

This pattern is consistent with Jourard (1966), who proposed a hierarchical structure of "touchability" among body parts in everyday interpersonal contexts. According to his findings, certain body regions, such as the hands and arms, are more socially acceptable for touch, whereas others, such as the chest and abdomen, are typically avoided, particularly in public or formal settings. More recent studies have further supported these observations by highlighting that differences in social meaning attributed to specific body parts may be associated with the underlying neural mechanisms related to bodily self-perception (Morrison et al., 2010; Suvilehto et al., 2015). These findings suggest that even within the highly specialized and institutional context of sports instruction, culturally and psychologically grounded norms shape the perceived acceptability of bodily contact depending on the area being touched.

From the perspective of sports instruction, the findings of this study suggest that, even when physical contact is intended for technical guidance, athletes' psychological responses may vary significantly depending on the body part being touched. In other words, physical contact with the same instructional intent may be interpreted as either supportive and appropriate or as intrusive and inappropriate, depending on the specific area of contact. This highlights the importance of

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recognizing that physical contact in sports instruction is not merely a mechanical or functional act, but also a communicative behavior embedded with social meaning. Accordingly, coaches must be sensitive to how their actions may be perceived by athletes and consider both the physical and psychosocial dimensions of physical contact in their instructional practices.

Furthermore, differences in perceived discomfort associated with physical contact across various body parts are likely rooted in socially constructed perceptions shaped by individual experiences and cultural contexts. In particular, in cultural settings such as Japan—where physical contact tends to be more restricted in everyday life—there may be more rigidly defined boundaries regarding which areas of the body are considered acceptable for physical contact. Therefore, in the context of sports instruction, justifying physical contact solely based on technical necessity is not enough (Gallace & Spence, 2010; Sorokowska et al., 2021). Coaches must adopt an approach that carefully considers how such contact is interpreted by athletes, recognizing that the legitimacy of physical contact depends not only on the intention of the giver but also on the perception of the receiver.

4.4. Interactions Between Factors and Theoretical Implications

The present study demonstrated significant two-way interactions between gender and relationship, relationship and body part, and gender and body part. These findings suggest that the acceptability of physical contact is not determined by a single factor alone but rather is shaped by a combination of multiple social attributes and situational contexts. This is particularly relevant in the context of sports instruction, in which physical contact is often institutionally justified as part of technical guidance. Even under such legitimized conditions, the results of this study reveal that gender, relational closeness, and the specific body parts involved interact in complex ways to significantly influence the psychological responses of those being touched.

Regarding the interaction between gender and relationship, participants reported significantly higher discomfort when touched by unfamiliar male friends or male teacher than when touched by close female friends. This finding suggests that the acceptability of physical contact is not determined solely by the level of relational closeness but is also shaped by adjustments in interpersonal distance based on the gender of the person initiating the contact. Such tendencies are especially salient in sports instruction contexts where asymmetrical relationships, such as those between male coaches and female athletes, may heighten psychological resistance to physical contact (Alexander et al., 2011). These results indicate that the combination of low relational intimacy and opposite-gender interaction can amplify discomfort rather than merely exerting additive effects.

A clear interaction between gender and body part was also observed. Particularly, physical contact from men on body areas associated with high physical intimacy, such as the chest and buttocks, elicited significantly greater discomfort than the same contact from women. This finding suggests that the perceived meaning of being touched on certain body parts is closely linked to the gender of the person initiating contact, with opposite-gender contact being more likely to evoke sensations of physical intrusion or threat. These results support the concept that comfort is maintained when the intimacy of physical contact matches the intimacy of the relationship, whereas a mismatch between the two leads to heightened discomfort— a notion encapsulated in the "intimacy congruence hypothesis" (Debrot et al., 2024). While this hypothesis has traditionally been supported in studies of intimate interpersonal contexts, such as romantic or familial relationships, the present study extends its theoretical applicability to the educational and institutional contexts of sports instruction.

As demonstrated, the evaluation of physical contact is shaped by a complex interplay of multiple factors, including the gender of the initiator, the nature of the relationship, and the specific body part involved. This judgment is inherently multifaceted and cannot be reduced to a single dimension. In the context of sports coaching, in particular, coaches need to be aware that even in situations where physical contact may appear to be "institutionally sanctioned," latent discomfort or psychological resistance may still arise. Even if physical contact is functionally effective for technical instruction,

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one-sided interventions that disregard athletes' emotional and interpretive perspectives carry the risk of undermining their trust. The present study reaffirms that physical contact in coaching is a socially and psychologically embedded act and underscores the necessity for its careful and context-sensitive implementation.

4.5. Limitations and Future Directions

This study has several limitations and challenges. One notable finding was that discomfort regarding physical contact from teachers was relatively lower than that from unfamiliar friends. However, this does not necessarily imply that contact from teachers is truly accepted. Rather, suppression of expression, social desirability bias, or evaluative restraint due to hierarchical relationships may have influenced the responses. In other words, participants may have internally felt discomfort but reinterpreted and accepted the situation due to the context.

This remains a matter of speculation, and empirical verification is needed. Furthermore, the study targeted a relatively homogeneous and limited population of female Japanese university students. Given that the acceptability of physical contact likely varies significantly by gender, age, and cultural background, the generalizability of the findings to other age groups or male participants is limited. Future studies should include participants with more diverse attributes to examine these issues more comprehensively. Future studies could also incorporate standardized instruments for assessing individual differences in touch avoidance, such as the Touch Avoidance Questionnaire (Casetta et al., 2020).

Despite the aforementioned limitations, this study represents a significant first step toward clarifying both the necessity and current state of physical contact in sports instruction. By elucidating the influence of multiple social factors on the evaluation of contact behaviors, it provides an essential foundation for future developments in both practical application and theoretical understanding.

5. Conclusions

This study reveals that female Japanese university students' perceptions of physical contact in sports activities are shaped by a complex interplay of gender, relationship, and body parts. Notably, contact from males elicited greater discomfort than from female counterparts, and even though teachers were rated as less discomfort-inducing than unfamiliar friends, this may reflect internalized deference to authority rather than true acceptance. Moreover, discomfort followed a clear somatosensory hierarchy, with body parts forming four distinct clusters based on social acceptability: (1) highly intimate areas (e.g., chest, buttocks), (2) moderately intimate areas (e.g., abdomen, face, lower back), (3) ambiguous or variable areas (e.g., leg/foot, neck/shoulders, head, back), and (4) publicly acceptable areas (e.g., arm, hand). These findings emphasize that physical contact in coaching is not a neutral instructional tool, but a socially loaded act requiring careful, gender-sensitive, and context-aware implementation.

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