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Attitudes Toward People With Intellectual Disability Associated With Integrated Sport Participation

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Direct, meaningful contact with people with intellectual disability, such as through integrated sport, may be related to positive attitudes. The current study aimed to compare implicit (unconscious) and explicit (conscious) attitudes between adults involved in integrated sport events and those in a comparison group who were not and examine the association between attitudes and degree of integrated sport involvement. An online survey measuring attitudes was completed by 295 adults without intellectual disability who participated in integrated sport activities and 450 adults who did not. Individuals involved in integrated sport reported less negative behavioral and affective attitudes relative to the comparison group, with mixed results for cognitive attitudes. Groups did not differ on implicit attitudes. Greater integrated sport involvement was related to some aspects of explicit attitudes. Involvement in integrated sport may be linked to how participants view intellectual disability, which has important implications for enhancing social inclusion and informing positive attitudes.

Keywords: beliefs, contact, integration, social inclusion

Individuals with intellectual disability (ID) demonstrate significant limitations in cognitive and adaptive functioning and typically require at least some degree of support with daily living skills. In addition to inherent functional limitations, adults with ID are more likely to exhibit physical and mental health conditions compared with the general population (Cooper et al., 2015). Participation in sport has

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important implications for the overall well-being of individuals with ID and has been linked to improved physical, psychological, and social outcomes, including greater self-worth and positive emotionality, as well as increased social skills, friendships, and perceived social acceptance (Tint et al., 2017). Beyond the individual benefit, sport may serve as a platform to shift societal attitudes toward people with ID and foster more supportive, inclusive communities (Special Olympics, 2003).

Individuals with ID are routinely stereotyped as a result of their disability, with negative attitudes by people without ID resulting in ostracism and a lower quality of life (Simplican et al., 2015). *Explicit* attitudes consist of accessible, voluntary evaluations about a subject. According to the tripartite model (Rosenberg & Hovland, 1960), explicit attitudes comprise cognitive, affective, and behavioral components. The cognitive component, which includes knowledge, beliefs, and stereotypes about a group, tends to form through *indirect* experience (i.e., experiences that do not involve face-to-face interaction with target group members). In comparison, the affective component (i.e., emotions associated with a group) develops through *direct* contact (Stangor et al., 1991) and is a stronger determinant of discrimination or exclusion toward minority groups than the cognitive component (Chaiken & Stangor, 1987; Jackson et al., 1996). The behavioral component encompasses how attitudes influence actions toward a group and can be used to make inferences about group attitudes when cognitions or affect appear equivocal (Jackson et al., 1996). For example, if a person has difficulty identifying or describing their beliefs about or emotional experience toward a particular group, the way in which they interact with group members may provide an indication of their attitudes. Unidimensional models emphasize the cognitive aspects of attitude; however, there is evidence to suggest that affective and behavioral components uniquely contribute to prejudice toward marginalized groups (Haddock et al., 1993).

In contrast, *implicit* attitudes occur automatically, without intention, and beyond conscious awareness (Greenwald et al., 1998; Wilson & Scior, 2015). Implicit attitudes toward minority groups have typically been assessed using implicit association tests (IATs) that aim to elucidate potential underlying biases (Greenwald et al., 1998). Meta-analytic findings indicate a significant range in the degree of association, from nonexistent to moderately positive, between one's implicit and explicit attitudes (Hofmann et al., 2005). Variation in correlation size may be attributed to the topic of interest (e.g., gender vs. race vs. disability; Nosek et al., 2007), conceptual consistency between measures, spontaneity of responses on self-report measures of explicit attitudes (Hofmann et al., 2005), and concern about social desirability of responses—that is, the tendency to portray oneself more favorably in social contexts (Greenwald et al., 2009; Nosek, 2005). Although implicit and explicit attitudes have been identified as distinct (but related) constructs, both are significant predictors of behavioral intention and judgment (Cameron et al., 2012) as well as discriminatory behavior toward minority groups (Greenwald et al., 2015).

There is limited understanding of implicit and explicit attitudes toward people with ID, and disabilities in general, relative to the amassed knowledge on attitudes about gender and race (Nosek et al., 2007). Scior (2011) reviewed research examining explicit awareness, attitudes, and beliefs regarding ID and found that younger age, higher education, and prior contact with a person with ID were generally found to predict more favorable attitudes. The majority of studies used descriptive survey methods involving undergraduate student samples. Although

explicit attitudes were largely proinclusion, they also included more negative behavioral intentions toward, and greater social distance from, people with ID compared with individuals with physical disabilities. Overall, discomfort and anxiety were associated with a greater reluctance to interact with people with ID. Gender differences were inconsistent, with some studies showing more positive attitudes in women and others showing no gender effects.

Five known studies have examined implicit attitudes toward ID, which have all revealed a moderate to strong degree of negative implicit attitude (Ferrara et al., 2015; Wilson & Scior, 2014). Notably, three of these studies focused on professional caregivers of people with ID as the participant, limiting generalizability of findings to the general population. One study examined implicit attitudes of 47 undergraduate students majoring in special education using an IAT with images of people with and without ID as test stimuli (Hein et al., 2011). The researchers found that students were more likely to associate ID with the negative attribute (i.e., "unpleasant"); however, because the IAT was based on images, findings may only apply for individuals with ID who have distinct physical features (e.g., those with Down syndrome) and may not be relevant for those who have an unremarkable physical appearance. A more recent study randomly assigned 194 undergraduate students to watch footage of either athletes with ID performing at the Paralympics or athletes without ID performing at the Olympics and had participants complete an IAT before and after viewing to assess attitude change (Ferrara et al., 2015). There was no difference found between groups regarding implicit attitude change; both groups showed more positive implicit attitudes after viewing the videos. However, the IAT stimuli used in this study were not specific to ID, and the experimental condition only included individuals with ID who have elite athletic abilities. Implicit attitudes may differ when considering individuals with ID who do not have some exceptional skillset.

Direct, meaningful contact with individuals with ID has been associated with positive attitudes. The *contact hypothesis* (Allport, 1954) is a well-known theory of the determinants of attitudes, positing that bias or negative attitudes toward a group can be reduced through purposeful contact that includes cooperation and equal status between groups within a supportive environment. Greater *quality* of contact with people with ID has been shown to be related to more favorable attitudes regarding integration, social distance, and private rights and fewer negative attributes (McManus et al., 2011). *Quantity* of contact and greater *knowledge* have also been suggested to be associated with attitudes, though not to the same degree as quality (McManus et al., 2011). Emerging evidence supports the use of contact in interventions aimed at improving attitudes about ID, though the nature or type of contact is an important consideration when designing interventions (Seewooruttun & Scior, 2014).

Integrated sport experiences may be a meaningful context with which to explore attitudes. Research on physical disabilities has shown that people without disabilities report more favorable explicit attitudes about warmth and competence for people with disabilities who engage in sport compared with those who do not (Clément-Guillotin et al., 2018). Research examining contact within the context of Special Olympics (SO) has focused on event volunteers, suggesting that involvement is associated with positive self-reported perceptions and attitudes about the inclusion of people with ID (Li & Wang, 2013). The SO programs traditionally only include athletes with ID, whereas people without ID are involved in other ways, such as volunteering or coaching. There has been more recent growth of

integrated sport (i.e., Unified Sport), which involves athletes with and without ID practicing and competing together as teammates at a recreational level. In one small trial targeting attitudes, college swimmers were randomly assigned to an intervention involving integrated swim practices with SO athletes or a control group with no integration (Sullivan & Masters Glidden, 2014). At posttest, the intervention group reported more positive attitudes overall and greater comfort interacting with people with disabilities. In a qualitative study focused on the impact of Unified Sports (an SO integrated sport initiative), the authors described gradual attitude change in participants without ID regarding perceived athletic abilities of SO athletes, which then generalized to perceived abilities of individuals with ID in other domains unrelated to sport (Wilski et al., 2012). To date, no research has examined implicit attitudes or the tripartite model of explicit attitudes in relation to involvement in these kinds of sport events, nor has research considered large-scale community samples, or the many dimensions of involvement, instead looking at it as involvement versus no involvement.

The purpose of the current study was to examine the association between implicit and explicit attitudes and involvement in integrated sport in two ways: (a) to determine whether individuals who participated in integrated sport events would differ in their implicit and explicit attitudes about ID compared with a matched group of peers who have not had integrated sport experiences and (b) to determine how different indicators of involvement in integrated sport would be associated with attitudes. We focused on involvement in a large-scale integrated sport organization, *Motionball for Special Olympics*™ (Motionball), which aims to raise awareness and acceptance of ID by fostering positive sport experiences that involve people with and without ID ("Motionball," 2018). Participants with and without ID are encouraged to contribute equally as team players and work together during each game in a variety of day-long integrated sport competitions called Marathon of Sport (MOS). It was hypothesized that the Motionball group would have lower levels of negative implicit bias and explicit attitudes, across affective, behavioral, and cognitive domains, compared with a matched comparison group after controlling for demographic characteristics and other known predictors of attitudes. It was also hypothesized that a greater degree of involvement in Motionball, in terms of frequency of event attendance and interaction with athletes with ID at events, would be associated with lower levels of negative implicit and explicit attitudes.

Method

Participants

Motionball Group

Between October and December 2019, individuals who had registered and participated in any Motionball event were invited to complete an online survey about attitudes toward ID. To be included in the study, participants needed to be at least 16 years of age and to have participated in a Motionball MOS event in the previous 12 months. Only completed surveys were included. Of the 404 participants who consented to participate, 78 did not fully complete the survey, 31

indicated they had never participated in a MOS event, and nine reported not having participated in a MOS event in the previous 12 months. The final sample included 286 participants. Demographic information is presented in Table 1. On average, the sample was 29.68 years of age ($SD = 8.67$, range = 18–60), 60.8% were female, 83.9% identified as White, and 64.4% reported having achieved at least an undergraduate educational degree.

Comparison Group

A comparison sample of 450 participants who had never participated in a Motionball event and have never had contact with SO completed the same online survey. The comparison group was acquired through the nationwide Qualtrics (Qualtrics, Provo, UT) sample, using a targeted recruitment strategy that would result in a comparison sample that matched the Motionball sample at the group level in terms of *mean* age (~28 years), educational attainment (~33% with at least college/university education), gender (~64% female), and ethnicity (~85% White). The Qualtrics sample was invited to complete the online survey between February and March 2020 with the aim of acquiring usable responses from 600 participants. An initial 1,295 consented to participate in the study. Data were only included for participants deemed "Good Completes" by the Qualtrics survey system ($n = 600$). Participants were excluded if they did not complete the survey in its entirety ($n = 384$), if responses failed Qualtrics' quality check ($n = 5$), if they indicated previous involvement with SO ($n = 104$) or Motionball ($n = 180$), or if they fell outside the bounds specified for targeted recruitment in terms of age ($n = 11$) or education level ($n = 11$). To ensure the distributions for levels of educational attainment were roughly equivalent between the Motionball and comparison samples, we employed stratified random sampling to make the Qualtrics sample more in line with Motionball group. We determined the Motionball distribution for each category of educational attainment and then randomly removed Qualtrics respondents at each stratum as required so that the final distributions were similar. This led to a total of 150 Qualtrics respondents being removed. The final comparison sample included 450 participants. Demographic information is presented in Table 1.

Measures

Implicit Attitudes Toward Individuals With ID

Participants' implicit attitudes toward people with ID were measured using *iatgen*, a survey-based IAT (Carpenter et al., 2018). The IAT is a computer-based task that measures the mental association between two target groups (i.e., ID and typical development) and two attribute concepts (i.e., good and bad). Variation in response time provides an indication of the strength of association between the target group and the attribute. For example, if individuals are quicker to respond when "intellectual disability" and "good" are paired versus "intellectual disability" and "bad," this would suggest a stronger mental association and indicate more positive implicit attitudes.

The few studies that have used IATs as a measure of implicit attitudes about ID have varied in terms of the type of test stimuli used (i.e., images vs. words) and the target comparison group (i.e., "normal" vs. "non-disabled" vs. single-test IAT with

Table 1 Descriptive Statistics of Demographic Variables and Known Predictors of Attitudes by Group ($N = 736$)

Measure	Motionball ($n = 286$) *M* (*SD*, median) or %	Comparison ($n = 450$) *M* (*SD*, median) or %	U^a or χ^2 (*df*)
Age (years)	29.68 (8.67, 27.00)	30.27 (8.75, 27.00)	63,838.00
Gender			1.41 (1, 731)[b]
Female	60.8%	64.4%	
Male	39.2%	34.4%	
Nonbinary/third gender	0.0%	0.4%	
Prefer not to disclose/missing response	0.0%	0.7%	
Ethnicity			0.19 (1, 730)[c]
White	83.9%	84.4%	
Visible minority	15.7%	14.4%	
Prefer not to disclose/missing response	0.3%	1.1%	
Education attainment			1.35 (5, 712)
High school graduate (incl. equivalency)	8.7%	9.3%	
Some college/university, no degree	17.5%	18.4%	
Associate degree	3.8%	3.8%	
Bachelor's degree (e.g., BA, BSc)	51.0%	49.3%	
Master's degree (e.g., MA, MSc)	12.9%	12.7%	
Professional school or doctoral degree (e.g., MD, JD, PhD)	3.8%	2.4%	
Prefer not to disclose/missing response	2.0%	4.0%	
SDRS-5	0.24 (0.27, 0.20)	0.21 (0.25, 0.20)	68,854.00
Known predictors of attitudes			
Family member with intellectual disability (% yes)	33.2%	23.8%	8.97 (1, 736)*
Knowledge	2.54 (0.71, 2.00)	2.24 (0.65, 2.00)	78,445.00**
Frequency of contact	2.74 (0.85, 3.00)	2.18 (0.83, 2.00)	86,497.50**

Note. SDRS-5 = five-item socially desirable response set.

[a]Mann–Whitney *U* test statistic (distributions for age, SDRS-5, knowledge, and frequency of contact were positively skewed for both groups). [b]Chi-square based on proportion of males to females. [c]Chi-square based on proportion of White to ethnic minority status.

*$p < .01$. **$p < .001$.

no comparison group; Wilson & Scior, 2014; Wilson & Scior, 2015). There does not yet appear to be a well-validated set of test stimuli or comparison group that is consistently used in ID IAT research. The current study settled on target stimuli by generating lists of words to describe "intellectual disability" and "typical development." Five community members and researchers with extensive experience with ID were shown a word list generated by the authors and were asked to provide feedback on the appropriateness and valence of each term and alternate terms that were thought to better describe the target groups. The authors then created a new set of words for each target group, again shared it with the researchers and community members, and finalized the attribute concepts, presented in Appendix.

Participants were presented with three practice blocks (Blocks 1 and 2, 20-trial blocks shown at beginning of task; Block 5, 40-trial blocks shown when target position switches to allow new positioning to be learned) and four test blocks (Blocks 3 and 6 [combined practice], 20 trials per block; Blocks 4 and 7 [combined critical], 40 trials per block), which were counterbalanced based on congruency (i.e., order of pairing between "intellectual disability" and "good" or "bad") and position (i.e., presentation of target category on left or right) across participants. Scoring was completed through the *iatgen* online program (https://applibs.shinyapps.io/iatui2/), which was created based on the scoring algorithm developed by Greenwald, Nosek, and Banaji (2003). Trials with response times under 300 or over 10,000 ms were scored as missing. Differences in average response times between Blocks 3 and 6, and between Blocks 4 and 7, were calculated for each participant. Difference scores were then divided by the pooled *SD* of all combined blocks, yielding two standardized *D* scores. These two scores were then averaged to provide a single IAT score. Positive values indicated stronger mental association between "intellectual disability" and "good," whereas negative values indicated stronger association between "intellectual disability" and "bad." For the current sample, the proportion of trials dropped due to excessive duration (i.e., timeout rate) was 0.10% for the Motionball group and 0.18% for the comparison group. Eight participants from the Motionball group and 24 participants from the comparison group were dropped due to excessive response speed. Estimated internal consistency based on split-half coefficient with Spearman–Brown correction was good for the Motionball group (0.85) and the comparison group (0.88).

Explicit Attitudes Toward Individuals With ID

Explicit attitudes about ID were measured using the Attitudes Toward Intellectual Disability Questionnaire—Short Form (ATTID-SF; Morin, Valois, Crocker, & Robitaille, 2019). The ATTID-SF consists of 35 items for which participants provide ratings using a 5-point Likert scale ranging from 1 (*agree completely*) to 5 (*disagree completely*). The ATTID-SF is derived from the three-dimensional model (emotional, cognitive, and behavioral) and measures explicit attitudes using five subscales: (a) discomfort (emotional dimension), (b) knowledge of capacity and rights (cognitive dimension), (c) interaction (behavioral dimension), (d) sensitivity (emotional dimension), and (e) knowledge of causes (cognitive dimension). Average scores were calculated for each subscale, with higher scores indicating more negative attitudes. The 67-item ATTID full version has been used to assess

differences in attitudes and is the only measure validated for use with the Canadian population (Morin, Rivard, et al., 2013). The ATTID-SF has comparable psychometric properties compared with the full version (Morin, Valois, Crocker, & Robitaille, 2019). Internal consistency of the ATTID-SF subscales ranged from good to excellent (Cronbach's $\alpha = .80–.93$) for the current sample.

Known Predictors of Attitudes

Supplemental questions included in the ATTID-SF were used to assess factors known to be associated with explicit attitudes (Morin, Valois, Robitaille, & Crocker, 2019). Participants were asked (a) whether they had an immediate or extended family member with an ID ("Yes" or "No"), (b) their knowledge about ID (1 = "Nothing" to 4 = "A lot"), and (c) the frequency of contact with people with ID in their lifetime (1 = "Never" to 4 = "Very often").

Involvement With Motionball

Questions about past involvement with Motionball were adapted from previous research examining contact with individuals with ID (Wilson & Scior, 2015). Degree of involvement in Motionball was assessed with two questions. Participants were asked to indicate the number of Motionball events they participated in during the past 12 months ($M = 1.59$ events, $SD = 1.01$, median = 1.00, range = 1–7). If participants took part in MOS, they were asked to rate the percentage of time spent interacting with SO athletes during the event relative to their other teammates (1 = 100% of time with other teammates; 11 = 100% of time with SO athletes; $M = 6.27$, $SD = 2.19$, range = 1–11).

Social Desirability

To control for potential influence of socially desirable responding, participants completed the five-item Socially Desirable Response Set (SDRS-5; Hays et al., 1989). The SDRS-5 is an adapted version of the Marlowe–Crowne Social Desirability Scale—Form A (Reynolds, 1982). Items are rated on a 5-point Likert-type scale ranging from 1 (*definitely true*) to 5 (*definitely false*). Extreme responses (*definitely true* for Items 1 and 5; *definitely false* for Items 2, 3, and 4) are scored as 1, and all other responses are scored as 0. An overall score is computed by calculating the average of extreme responses across the five items (i.e., overall scores can range from 0.00 to 1.00), with higher overall scores indicating a more SDRS. The SDRS-5 has been found to have satisfactory internal consistency and test–retest reliability, with metrics nearly aligning with the 11-item Marlowe–Crowne Social Desirability Scale Form-A and the original 33-item MC (Hays et al., 1989). Internal consistency for the current sample was acceptable (Cronbach's $\alpha = .62$).

Procedure

This research received ethics review and approval by York University's Ethics Review Board. All measures were administered using an online survey system (Qualtrics). The survey link was first emailed to participants registered to Motionball's email listserv. Participants provided consent electronically prior to

participating in the research. At the end of the survey, Motionball participants were given the option to provide their email address for a $100.00 gift card raffle. Following completion of data collection for the Motionball group, Qualtrics was provided with demographic matching criteria, including the mean and range for age and frequency of gender, ethnicity, and education endorsements. Qualtrics then sampled their Canadian panels with the same online survey to acquire a similar profile with the provision that respondents must not have had any experience with Motionball and SO.

Measures were presented in the following order: (a) questions regarding demographics and Motionball involvement; (b) IAT; (c) ATTID-SF, including questions about prior knowledge of/contact with people with ID; and (d) SDRS-5. Although it is preferred to counterbalance implicit and explicit attitude measures across participants, measures could not be counterbalanced through the Qualtrics survey platform. Prior research has documented minimal order effects on measures of implicit and explicit attitudes (Nosek, 2005).

Analyses were conducted using SPSS Statistics (version 24.0; IBM Corp., Armonk, NY). To test the hypothesis that the Motionball group would have lower levels of negative implicit and explicit attitudes compared with the control group, hierarchical linear regressions were calculated with relevant demographic variables and known predictors of attitudes entered in the first block and group status dummy coded (comparison group = 0, Motionball group = 1) and entered in the second block. To test the hypothesis that the degree of Motionball involvement would be associated with implicit and explicit attitudes, hierarchical linear regressions were calculated with social desirability, relevant demographic variables, and known predictors of attitudes in the first block and Motionball involvement variables in the second block. Dichotomous variables included in the first block for both sets of analyses were dummy coded as follows: gender—male = 0, female = 1; family member with ID—no = 0, yes = 1. Statistical significance for analyses comparing the Motionball and comparison group was evaluated at the alpha .01 level given the large sample size (i.e., $n = 736$). To maintain sufficient power to detect small effect sizes, statistical significance was evaluated at the conventional alpha .05 level for analyses that only involved the Motionball sample (i.e., $n = 286$).

Results

Preliminary Analyses

As shown in Table 1, Motionball participants were more likely than the comparison group to have a family member with ID. Relative to the comparison group, Motionball participants reported significantly greater knowledge and frequency of contact with people with an ID in their lifetime. There were no significant differences between groups in social desirability. Distributions of scores for IAT, ATTID subscales, and Motionball involvement variables violated assumptions of normality for both groups. Assumptions of linear regression were tested and appeared to be met for each regression model that was computed.

Mann–Whitney *U* tests and Spearman's rho correlations were conducted to confirm whether demographic variables were associated with IAT scores, ATTID subscales, and/or indicators of Motionball involvement. Results are presented by

group in Table 2. Within the Motionball group, females demonstrated significantly higher IAT scores (median = –0.42) and lower ATTID interaction scores (median = 1.73) compared with males (IAT median = –0.54 and ATTID interaction median = 2.00). Within the comparison group, females demonstrated significantly lower ATTID discomfort (median = 2.00), ATTID interaction (median = 2.14), ATTID sensitivity (median = 2.83), and ATTID knowledge of capacity/rights scores (median = 2.00) compared with males (ATTID discomfort median = 2.25, ATTID interaction median = 2.40, ATTID sensitivity median = 3.17, and ATTID knowledge of capacity/rights median = 2.12).

Comparison of Attitudes Toward Individuals With ID Between Groups

After controlling for gender, age, family relative status, self-rated knowledge, and frequency of contact, group status significantly predicted ATTID discomfort, interaction, sensitivity, knowledge of capacity/rights, and knowledge of causes. The Motionball group exhibited lower scores on all ATTID subscales with the exception of knowledge of causes (Table 3) for which the comparison group had lower scores. Group status uniquely accounted for a small portion of variance in ATTID discomfort, $\Delta R^2 = .04$, $p < .001$; ATTID interaction, $\Delta R^2 = .02$, $p < .001$; ATTID sensitivity, $\Delta R^2 = .01$, $p = .001$; ATTID knowledge of capacity/rights, $\Delta R^2 = .03$, $p < .001$; and ATTID knowledge of causes, $\Delta R^2 = .04$, $p < .001$. In contrast, group status did not significantly predict IAT, $\Delta R^2 = .01$, $p = .03$. A strong, negative implicit bias was demonstrated by both the Motionball group (Cohen's $d = -1.26$) and comparison group (Cohen's $d = -1.27$). Means for Motionball participants' latencies were $M = 1{,}274.94$ ms ($SD = 665.46$) for the "intellectual disability + good" critical block and $M = 1{,}068.26$ ms ($SD = 561.21$) for the "intellectual disability + bad" critical block. Means for participants' latencies for the control group were $M = 1{,}293.34$ ms ($SD = 622.29$) for the "intellectual disability + good" critical block and $M = 1{,}053.15$ ms ($SD = 520.75$) for the "intellectual disability + bad" critical block.

Degree of Motionball Involvement and Attitudes Toward Individuals With ID

Results from hierarchical linear regressions are detailed in Table 4. After controlling for gender, age, social desirability, and known predictors of attitudes (i.e., family member with ID, knowledge, frequency of contact), degree of overall Motionball involvement significantly predicted IAT, $\Delta R^2 = .02$, $p = .03$; ATTID discomfort, $\Delta R^2 = .04$, $p = .001$; and ATTID interaction, $\Delta R^2 = .02$, $p = .02$. More specifically, the number of Motionball events attended in the past 12 months was a unique predictor of IAT ($p = .03$) and ATTID discomfort ($p = .01$). Percentage of time spent interacting with Special Olympic athletes was a unique predictor of ATTID discomfort ($p = .01$) and ATTID interaction ($p = .04$). Degree of Motionball involvement was not significantly associated with ATTID sensitivity, $\Delta R^2 = .01$, $p = .25$; knowledge of capacity/rights, $\Delta R^2 = .01$, $p = .32$; or ATTID knowledge of causes, $\Delta R^2 = .01$, $p = .45$.

Table 2 Mann–Whitney *U* Test Statistics and Spearman Rho Correlations Among Demographic, Attitude, and Involvement Measures Within Groups

Measure	1	2	3	4	5	6	7	8
Motionball ($n = 286$)								
Gender	11,442.00**	9,994.00	7,953.50**	8,966.00	9,961.50	8,384.00	10,251.50	9,874.50
Ethnicity	5,790.00	5,702.00	5,607.00	5,629.00	4,954.50	5,936.00	5,299.00	4,973.50
Age (years)	−.18**	−.02	.09	.07	−.02	−.07	−.01	−.00
Education attainment	−.09	.01	.04	.05	−.06	−.01	−.07	.04
SDRS-5	−.03	−.28**	−.26**	−.27**	−.09	.01	.19**	.04
1. IAT	—	−.10	−.06	−.13*	−.14*	.08	.09	.07
2. ATTID discomfort		—	.43**	.51**	.28**	−.06	−.21**	−.24**
3. ATTID interaction			—	.26**	.39**	−.03	−.20**	−.21**
4. ATTID sensitivity				—	.14*	−.06	−.18**	−.18**
5. ATTID knowledge of capacity/rights					—	−.03	−.07	−.14*
6. ATTID knowledge of causes						—	−.04	.10
7. Percentage of time interacting with SO athlete							—	.15*
8. Number of events in past 12 months								—

(continued)

Table 2 ***(continued)***

Measure	1	2	3	4	5	6	7	8
Comparison ($n = 450$)								
Gender	21,043.00	18,470.50**	16,729.50**	17,438.00**	17,880.00**	20,799.00	N/A	N/A
Ethnicity	11,665.00	13,475.50	13,616.00	13,728.00	12,438.00	12,807.00	—	—
Age	−.11*	.03	.11*	.11*	.12**	−.02	—	—
Education attainment	−.05	−.04	.05	.01	−.01	−.02	—	—
SDRS-5	−.01	−.27**	−.25**	.01	−.18**	−.18**	—	—
1. IAT	—	.09	−.06	.02	−.04	.11*	—	—
2. ATTID discomfort		—	.49**	.50**	.25**	.14**	—	—
3. ATTID interaction			—	.16**	.51**	.19**	—	—
4. ATTID sensitivity				—	.08	.00	—	—
5. ATTID knowledge of capacity/rights					—	.15**	—	—
6. ATTID knowledge of causes						—	—	—

Note. ATTID = Attitudes Toward Intellectual Disability Questionnaire—short form; IAT = implicit association test; SDRS-5 = five-item socially desirable response set; N/A = not applicable; SO = Special Olympics.
*$p < .05$. **$p < .01$.

Table 3 Hierarchical Linear Regressions Predicting Attitudes by Group ($N = 736$)

Predictor	Unstandardized coefficient		F	Adjusted R^2
	B	*SE*		
IAT			4.55**	.03
Constant	–0.49	0.08		
Gender	0.06	0.03		
Age (years)	–0.01*	0.00		
Family member	–0.03	0.02		
Knowledge	0.03	0.02		
Frequency of contact	0.00	0.02		
Group	0.07	0.03		
ATTID discomfort			20.47**	.14
Constant	2.82	0.16		
Gender	–0.08	0.06		
Age (years)	0.00	0.00		
Family member	–0.01	0.07		
Knowledge	–0.21**	0.05		
Frequency of contact	–0.10	0.04		
Group	–0.37**	0.06		
ATTID interaction			30.02**	.19
Constant	2.85	0.12		
Gender	–0.17**	0.05		
Age (years)	0.01	0.00		
Family member	–0.03	0.05		
Knowledge	–0.18**	0.04		
Frequency of contact	–0.13**	0.03		
Group	–0.22**	0.05		
ATTID sensitivity			10.36**	.07
Constant	3.31	0.17		
Gender	–0.19*	0.07		
Age (years)	0.01	0.00		
Family member	0.01	0.08		
Knowledge	–0.19*	0.05		
Frequency of contact	–0.04	0.05		
Group	–0.22*	0.07		

(continued)

Table 3 ***(continued)***

Predictor	Unstandardized coefficient *B*	*SE*	*F*	Adjusted R^2
ATTID knowledge of capacity/rights			12.59**	.09
Constant	2.34	0.12		
Gender	–0.08	0.05		
Age (years)	0.00	0.00		
Family member	0.03	0.05		
Knowledge	–0.04	0.04		
Frequency of contact	–0.11**	0.03		
Group	–0.23**	0.05		
ATTID knowledge of causes			6.24**	.04
Constant	2.28	0.13		
Gender	–0.07	0.05		
Age (years)	0.00	0.00		
Family member	0.01	0.06		
Knowledge	–0.04	0.04		
Frequency of contact	–0.05	0.04		
Group	0.30**	0.05		

Note. Dummy coding: gender—male = 0, female = 1; family member with intellectual disability—no = 0, yes = 1; group—comparison group = 0, Motionball group = 1. ATTID = Attitudes Toward Intellectual Disability Questionnaire—short form; IAT = implicit association test.
*$p < .01$. **$p < .001$.

Discussion

This is the first study to examine implicit and explicit attitudes toward people with ID within the context of integrated sport experiences. Differences indicating small-sized effects emerged for explicit attitudes with Motionball participants reporting less discomfort (e.g., feelings of anxiety, fear toward individuals with ID) and sensitivity (e.g., feelings of sadness, pity) and more favorable attitudes about interaction (e.g., more likely to supervise a person with an ID at work, accept being advised by a person with an ID at a retail store) and knowledge of the capacity and rights of people that reflects more positive attitudes about ID compared with those who had not been involved with Motionball or SO. Given the small effect sizes commonly observed in research on attitudes (e.g., Greenwald et al., 2015), it is important that researchers recruit sufficiently large samples to have adequate statistical power to detect small effects.

Findings are in line with what has been found in previous research on integrated sport. There is promising evidence that interventions that incorporate interactions with people with ID can improve attitudes (Seewooruttun & Scior, 2014), and qualitative studies suggest that involvement in integrated sport allows

Table 4 Hierarchical Linear Regressions Predicting Attitudes by Degree of Motionball Involvement ($n = 286$)

Predictor	Unstandardized coefficient *B*	*SE*	*F*	Adjusted R^2
IAT	—	—	3.90***	.08
Constant	–0.57	0.12		
Gender	0.12**	0.04		
Age	–0.01*	0.00		
SDRS-5	–0.12	0.08		
Family member	0.06	0.05		
Knowledge	0.02	0.04		
Frequency of contact	0.00	0.03		
Percentage of time interacting with SO athlete	0.01	0.01		
Number of events in past 12 months	0.05*	0.02		
ATTID discomfort	—	—	8.61***	.17
Constant	2.71	0.22		
Gender	0.19*	0.08		
Age	–0.00	0.00		
SDRS-5	–0.49***	0.14		
Family member	–0.10	0.08		
Knowledge	–0.22***	0.06		
Frequency of contact	0.02	0.06		
Percentage of time interacting with SO athlete	–0.04*	0.02		
Number of events in past 12 months	–0.09*	0.04		
ATTID interaction	—	—	8.25***	.17
Constant	2.58	0.19		
Gender	–0.06	0.07		
Age	0.01	0.00		
SDRS-5	–0.46***	0.12		
Family member	–0.07	0.07		
Knowledge	–0.19***	0.05		
Frequency of contact	–0.01	0.05		
Percentage of time interacting with SO athlete	–0.03*	0.02		
Number of events in past 12 months	–0.06	0.03		

(continued)

Table 4 ***(continued)***

Predictor	Unstandardized coefficient *B*	*SE*	*F*	Adjusted R^2
ATTID sensitivity	—	—	5.46***	.11
Constant	3.72	0.28		
Gender	–0.02	0.10		
Age	0.00	0.01		
SDRS-5	–0.51**	0.18		
Family member	–0.02	0.10		
Knowledge	–0.30***	0.08		
Frequency of contact	–0.02	0.07		
Percentage of time interacting with SO athlete	–0.03	0.02		
Number of events in past 12 months	–0.02	0.05		
ATTID knowledge of capacity/rights	—	—	1.85	.02
Constant	2.15	0.19		
Gender	0.05	0.07		
Age	–0.00	0.00		
SDRS-5	–0.25*	0.13		
Family member	0.03	0.07		
Knowledge	–0.13*	0.06		
Frequency of contact	0.05	0.05		
Percentage of time interacting with SO athlete	–0.00	0.02		
Number of events in past 12 months	–0.05	0.03		
ATTID knowledge of causes	—	—	0.62	.01
Constant	2.43	0.25		
Gender	–0.12	0.09		
Age	0.00	0.01		
SDRS-5	–0.07	0.16		
Family member	0.07	0.10		
Knowledge	0.02	0.07		
Frequency of contact	–0.02	0.07		
Percentage of time interacting with SO athlete	–0.02	0.02		
Number of events in past 12 months	0.02	0.04		

Note. Dummy coding: gender—male = 0, female = 1; family member with intellectual disability—no = 0, yes = 1. ATTID = Attitudes Toward Intellectual Disability Questionnaire—short form; IAT = implicit association test; SDRS-5 = five-item socially desirable response set; SO = Special Olympics.
*$p < .05$. **$p < .01$. ***$p < .001$.

for positive relationships to form (Grandisson et al., 2012; McConkey et al., 2013). Results of the current study were exclusively correlational and cross-sectional in nature, and it may be that integrated sports involvement can address preconceived biases against people with ID or that those with more positive attitudes about ID to begin with would seek out and be more willing to participate in the Motionball activities. The current study provides justification for program evaluation using more rigorous study designs, such as a pre–post or randomized controlled trial, to experimentally assess the hypothesis that this kind of contact can favorably impact attitudes.

Unexpectedly, the comparison group had more positive scores in regard to knowledge of causes compared with the Motionball group. The *Knowledge of Causes* subscale of the ATTID asks participants to rate the extent to which they agree about specific causes of ID. Although scores on this subscale are believed to reflect the cognitive component of attitudes, it is possible that scores may actually reflect *confidence* in knowledge of potential causes. For example, as people without ID interact with and get to know more about people with ID, they may become more aware of the diverse array of causes and complex interactions between biological and environmental factors that can contribute to the development of ID. Thus, those who have had more direct experience with people with ID may feel less confident reporting strong agreement for any specific cause. Previous studies that have used the ATTID as a measure of attitudes toward ID have similarly shown a negative, albeit small, association between the *Knowledge of Causes* subscale and the behavior and affective subscales (Morin et al., 2013; Morin, Valois, Crocker, & Robitaille, 2019), suggesting that knowledge of causes may differ conceptually from other indicators of positive attitudes. Additional research is needed to understand the relation between knowledge or beliefs about causes, stigma, and social exclusion of people with ID (Scior, 2011).

Among Motionball participants, degree of involvement was associated with affective and behavioral attitudes, even after considering demographic variables, social desirability, and their overall contact with and knowledge of people with ID. A greater number of Motionball events attended in a 12-month period was associated with less discomfort, including less endorsement of anxiety or fear about interaction with people with ID, with a small effect size. As well, participants who spent a greater percentage of time interacting with SO athletes reported significantly less discomfort and more favorable attitudes. Previous research examining the relation between contact and explicit attitudes has found similar results (Hein et al., 2011), including that quality of contact is a robust predictor of less intergroup *anxiety* and exclusion of people with ID (Keith et al., 2015). Notably, degree of Motionball involvement did not significantly predict sensitivity toward individuals with ID, nor did it predict knowledge of capacity and rights and knowledge of causes. Earlier research has shown that affective and behavioral aspects of attitudes are more likely to change as a result of direct contact compared with cognitive components (Stangor et al., 1991). Although the present study was not designed to assess attitude change, these previous findings may explain the lack of association found between Motionball involvement and cognitive attitudes. Less is known about how contact may impact sensitivity (i.e., feelings of pity or sadness) toward a marginalized group or how these emotions influence the way a person interacts with marginalized group members. Future research may look to

examine direct contact in relation to change in the various aspects of attitudes (i.e., affective vs. behavioral vs. cognitive) using pre–post designs and mechanistic roles of various emotional experiences in the connection between contact and social inclusion/exclusion.

In regard to implicit attitudes, the current results suggest minimal differences between groups or associations with contact-related variables. Based on IAT results, both groups demonstrated strong negative implicit bias; magnitudes consistent with previous research examining implicit attitudes toward individuals with ID (Wilson & Scior, 2014). To date, there is limited research exploring implicit attitudes toward individuals with ID and how contact is related to implicit attitudes. One study found that greater contact was associated with less negative implicit attitudes (Enea-Drapeau et al., 2012), whereas another study found quality and quantity of contact were not significant predictors (Hein et al., 2011). More recent research has also demonstrated mixed findings. While Keith et al. (2015) found small correlations between quality of contact and implicit attitudes using a go/no go task, Murch et al. (2018) found that neither frequency of contact nor closeness predicted implicit attitudes as measured using an IAT. Further research into implicit attitudes toward individuals with ID is evidently needed and should consider how implicit attitudes are measured, the role of contact, and societal implications of implicit attitudes in terms of prejudice and exclusion.

The differences found when considering implicit versus explicit attitudes were not entirely unforeseen. Gawronski and Bodenhausen's (2006) associative-propositional evaluation model explains why, relative to explicit attitudes, implicit attitudes may be less impacted by direct contact. Because explicit attitudes are founded on *propositional* processes (i.e., logical reasoning based on relevant information), they can function independent of, and can put into question, automatic emotional responses to events or stimuli. Interacting with SO athletes through integrated sport may offer direct experience that is inconsistent with an existing negative proposition and provide opportunity to challenge and alter existing explicit attitudes. In contrast, implicit attitudes are thought to involve *associative* processes (i.e., an automatic emotional response paired with a stimulus) and may require longer periods of time to shift as they are founded on principles of conditioning.

Limitations

There are several limitations with the current study that should be taken into consideration. First, this study employed a cross-sectional, matched-comparison design. Data collection was conducted at a single time point with different recruitment pathways (one via Motionball and the other via Qualtrics). The comparison group was matched to the Motionball group based on average values and frequency distributions for the overall sample (i.e., group-level vs. individual-level matching), which may provide an oversimplified estimate of whether groups are comparable and not account for within-group variability. Groups were matched on several demographic variables (i.e., age, gender, ethnicity, education) but may differ on other important factors that were unaccounted for, such as political orientation or participants' disability status (Nosek et al., 2007). The correlational

design limits the capacity to infer a directionality or causality between Motionball involvement and attitudes. Second, the current sample largely identified as White, and there was a restricted range in terms of educational attainment, making explorations of the role of these two variables difficult. Third, there were differences in the degree to which the two groups had family members with ID and overall knowledge about ID. While these were statistically controlled for in testing our hypotheses, it nonetheless reflects group differences that could be matched on in future research (i.e., ensuring that participants did not have a family member with an ID). Finally, the online platform used to administer the survey did not allow for the presentation of explicit and implicit measures to be counterbalanced.

Conclusion

Taken together with previous research findings, the current results offer some evidence in support of the contact hypothesis and the use of direct, meaningful contact as potential means for reducing negative explicit attitudes toward individuals with ID. Integrated sport provides an opportunity for interaction, under the key contact conditions, by having individuals with and without ID play as teammates (i.e., equal status) and compete as a team in group sports (i.e., common goals and intergroup cooperation) through an organization promoting social inclusion of individuals with ID (i.e., support from authorities). Contact under these conditions may serve to change attitudes, albeit in a minor way, after considering other drivers of attitudinal change (such as overall knowledge of ID or prior contact with ID outside of this kind of initiative). Inclusive sport may be "the perfect backdrop" to promote friendships among participants with and without ID (Wilski et al., 2012) and, in so doing, aid in the process of shifting societal attitudes and inclusion.

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Appendix: The IAT Categories and Words

Category	Words
Good[a]	Enjoy, happy, cheerful, friend, and excitement
Bad[a]	Angry, disaster, selfish, annoyed, and sadness
Intellectual disability	Intellectual challenge, special needs, impaired ability, atypical development, and supported living
Typical development	Intellectual ability, standard needs, average ability, usual development, and standard living

Note. IAT = implicit association test.
[a]Category words derived from Project Implicit Societal Attitudes, Disability IAT (https://implicit.harvard.edu/implicit/index.jsp).

Erratum: Albaum et al. (2022)

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