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ORIGINAL ARTICLE OPEN ACCESS

# Indirect Contact and Knowledge Interventions to Improve Relations in the Disabled-Nondisabled Intergroup Context: A Systematic Review

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## ABSTRACT

Stigma and prejudice towards individuals with disabilities is still prevalent in society today (Livneh, Chan, and Kaya 2014). Our aim was to evaluate the state of the research that tests interventions aiming to improve such attitudes, including uncovering which intervention methods can reduce this prejudice and identifying gaps in the research. Since a large proportion of nondisabled individuals will not have the opportunity for direct contact with disabled individuals, our systematic review focuses on non-direct-contact interventions, specifically knowledge-based and indirect contact techniques. Fifty-one studies published between 2001 and 2022 met all criteria, including the use of a comparison or control group. Overall, most studies did have a positive change on outcome measures, with some maintaining the effect weeks or months later. Despite intervention successes, trends indicating gaps in the research were uncovered including the focus on child and undergraduate student participants, and the lack of collaborative research with the disabled communities.

## 1 | Introduction

### 1.1 | Ostracism and Prejudice

The Equality Act passed by the UK government in 2010, states that individuals are classed as disabled if they “have a physical or mental impairment that has a ‘substantial’ and ‘long-term’ negative effect on their ability to do normal daily activities” (UK government 2010). Around 21% of the UK and 15% of the global population officially meet this criterion, but the true number is unknown due to unconfirmed diagnoses (Kirk-Wade 2022). Despite a worldwide increase in awareness and diagnosis of disabilities (Durkin 2019) relations between disabled and non-disabled peers can be strained (Kuppers 2011), with the result that people with disabilities remain one of the most ostracized groups in society (Shikha 2017).

This ostracism is evident throughout the life span. Observational and experimental studies with children and adolescents

suggest that children with a disability have increased levels of solitary play, receive increased verbal aggression from peers, are more likely to experience isolated mealtimes, and learning outside of the classroom (Blatchford and Webster 2018; Humphrey and Symes 2011). This trend extends into later life with higher levels of unemployment, poverty, workplace discrimination, and isolation and violence commonplace for disabled adults (Burt 2019; Papworth Trust 2018; Scope UK 2019).

### 1.2 | Intergroup Contact Hypothesis

The intergroup contact hypothesis states that meaningful interactions between members of different social groups should lead to a reduction in prejudice and more positive intergroup attitudes (Allport 1954). Indeed, over 70 years of research has shown intergroup contact, particularly friendship, to be a cornerstone of harmonious intergroup relations across a variety of

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intergroup contexts (Davies et al. 2011; Paolini, Hewstone, and Cairns 2007; Turner et al. 2007; Zezelj et al. 2019). Whilst direct contact interventions are considered the “gold standard” in efforts to improve relations between groups (Armstrong et al. 2017), factors such as intergroup anxiety, labor intensity, and time negatively impact the uptake and success of direct contact programs (Boin et al. 2021; MacInnis and Page-Gould 2015; White et al. 2021). The recent COVID-19 global pandemic has also revealed the increased need for remote interventions that can remain in place if direct contact is not an option (Demirtaş-Madran 2020). Therefore, it is important to explore indirect methods of promoting positive relations, including avenues such as indirect contact and knowledge-based interventions.

### 1.3 | Indirect Contact and Knowledge-Based Interventions

Indirect contact is the experience of contact without face-to-face intergroup interaction, typically through a medium such as TV or books, or imagination (Crisp and Turner 2009). The three types of indirect contact examined in this review are imagined, parasocial, and vicarious contact. Imagined contact is the mental simulation of an interaction with an outgroup member (Crisp and Turner 2009). In parasocial contact, the audience observes and connects with a member of the outgroup through outlets such as TV, film, or books (Paolini et al. 2018). Vicarious contact is similar, but the audience observes a fellow ingroup member interacting with someone of the outgroup, for example, a TV sitcom featuring friendly interactions between disabled and non-disabled characters (Schemer and Meltzer 2020).

These forms of indirect contact are thought to be useful, particularly in situations where direct contact is not possible, or tensions between groups are high (Haji and Noguchi 2020). Research fields beyond disabled-nondisabled relations have found successes of indirect contact for reducing intergroup anxiety (Drury, Hutchison, and Abrams 2016; Yetkili et al. 2018) and positively changing intergroup attitudes and intended behaviors in both adults and children (Birtel et al. 2019; Lemmer and Wagner 2015; Vezzali, Stathi, and Giovannini 2012).

Often taking place in school or workplace settings, the rationale for knowledge-based interventions is to promote positive intergroup relations by providing additional information or experiences concerning social groups. Knowledge-based interventions challenge stereotypes and misconceptions to improve intergroup attitudes and behaviors by providing additional information to counter-act stereotypes (Babik and Gardner 2021; McBride 2015). These knowledge interventions have met with success in improving intergroup attitudes (Özer et al. 2012), intended behaviors (Melville et al. 2006), and awareness of disability (Ison et al. 2010) via increased knowledge.

Effective prejudice reduction programs, especially those that can be completed when direct contact is not an option, are therefore a potentially fruitful technique for improving equality of opportunity and experience, increasing integration, and improving life opportunities for disabled individuals (Walker and

Scior 2013). To develop future intervention programs with maximal impact and advance this field of research, it is essential that we critically evaluate the state of evidence to date to determine features of effective interventions, but also to identify gaps in knowledge and to formulate future research questions. The current research aims to achieve this via a systematic review that synthesizes the last 22 years of research in this area to uncover the features of successful intervention, critically evaluate the robustness and methodological rigor of previous research in this field, and identify essential future areas of research. Specifically, the systematic review will consider sample characteristics (children, adults), the presence or lack of control group, baseline, potential moderators, and a wider range of outcome measures.

To our knowledge, this is the first review to critically appraise knowledge and indirect contact interventions to improve prejudice, inclusion, attitudes, and knowledge in the non-disabled/disabled context focusing on both adults and children. Previous systematic reviews have focused either specifically on children (Armstrong et al. 2017), or on intellectual disability (Kármán et al. 2021; Seewooruttun and Scior 2014), or on autism spectrum conditions (ASC) (Morris, O'Reilly, and Nayyar 2021), and have concentrated predominately on explicit attitudes and knowledge as an outcome. By bringing together the most recent research from a broader systematic search across both children and adult populations, across disabilities, and using a wider range of outcome measures, we aim to provide a snapshot of the current literature to uncover the successes and limitations of these forms of intervention (indirect contact and knowledge) in order to identify successful intervention elements.

## 2 | Research Process

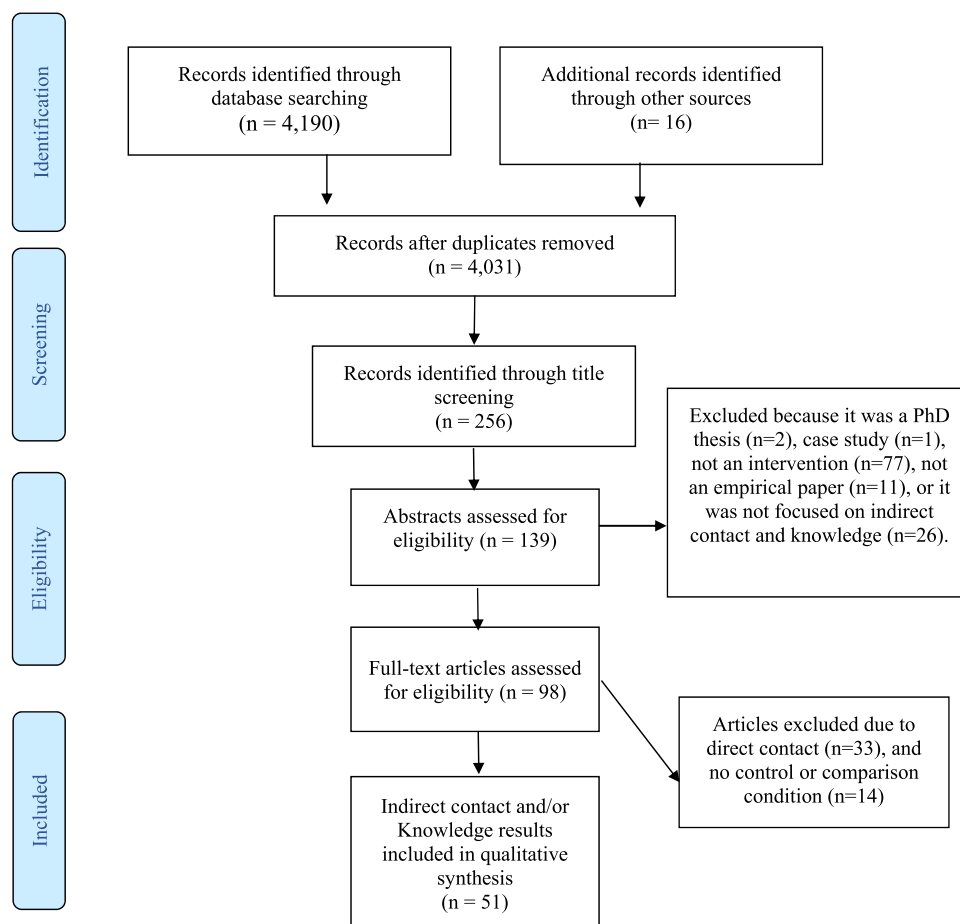
We performed a systematic review in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

### 2.1 | Search Method

A systematic literature search of PubMed, PsycInfo, and Google Scholar was conducted. This was followed by a secondary search of the bibliographies from the retrieved articles. Databases were searched from July 2020 to January 2023 and used the following keywords to locate relevant papers (see Figure 1 for the outcome).

### 2.2 | Keywords: Intergroup, Disability, Contact, Knowledge, Prejudice, Disabled

Keywords were used in conjunction with other connecting words such as improve, group, intergroup, non-disabled, intervention, social, relations, exclusion, intervention, prejudice, acceptance, inclusion, knowledge, awareness, education, program to create search terms such as “*education program to improve knowledge about disability*” and “*Contact intervention between disabled and non-disabled to reduce intergroup prejudice.*”



**FIGURE 1** | PRISMA flow diagram of result identification and selection.

In line with PRISMA guidelines, the criterion was pre-defined for results to ensure their validity to our research question.

### 2.3 | Inclusion and Exclusion Criteria

The inclusion criteria for this review were: (1) Published in English, (2) Published after 2001, (3) Used indirect contact and/or knowledge interventions with the sole purpose of improving disabled-nondisabled relations, (4) Analyzed primary data only and (5) Compared the target intervention either to a control group or to a group which experienced an alternative intervention.

### 2.4 | Data Extraction

Study selection was carried out by the first author, with a second reviewer (a research assistant) assessing a sub-sample. Each paper that met all inclusion criterion was read entirely before it was summarized, and key attributes (i.e., authors, date, participant number, and contact type) were entered in the results table (see Tables 1A and 1B). Significance values of pre- and post-test results for each study were extracted (if available) to help gain a better sense of intervention efficacy.

### 2.5 | Analysis

There was substantial methodological heterogeneity among the included research, which met our selection criteria.

## 3 | Results

As illustrated in Figure 1, our search yielded a total of 4204 results, of which 51 met all criteria and were included. Table 1A includes all results that have a pre-post design, while Table 1B incorporates results with no pre-post comparison.

### 3.1 | Participants

Just under half (47.1%) of the results recruited children and adolescents. A further 23 (45.1%) recruited adult undergraduate students. Three (5.9%) recruited adults from outside an educational setting, and one (2%) recruited both adults outside an education setting and undergraduate students.

### 3.2 | Baseline (Pre-Post) and Delayed Post-Test

Thirty-one results (Table 1A) included pre-post measures, and 20 (Table 1B) had no baseline measures, testing at post-test only.

**TABLE 1A** | Below reports the key design features, sample sizes, and outcome measures of those studies which included a comparison of pre- versus post-intervention.

<b>Author, year, and disability type</b>	<b>Sample characteristics</b>	<b>Study design</b>	<b>Method</b>	<b>Prior direct contact measured</b>	<b>Participant disability measured</b>	<b>Pre-post design</b>	<b>Delayed Post-test</b>	<b>Intervention effect in comparison to control (All significant at <math>p &lt; 0.05</math>)</b>
(Cameron and Rutland 2006)	67 children (27 M and 40 F) Age range: 5–10 y	Assigned to one of three experimental conditions. 1 Neutral ( $n = 20$ ), 2 Decategorisation ( $n = 25$ ), 3 Intergroup” ( $n = 22$ ).	Vicarious contact	N	N	Y	N	Y
Physical and Intellectual disabilities (Pitre et al. 2007)	144 children (64 M, 80 F). Age range: 8–11 y	RCT- assigned to either the intervention condition or control condition	Parasocial contact	N	N	Y	N	Y
Mental illness (Walker and Scior 2013)	925 adult participants (353 F, 169 M) Mean age: 26.3 y	Randomly assigned to intervention one or two.	Parasocial contact	Y	N	Y	Y One month	Y
Intellectual disabilities (Faign and Stein 2008)	303 College Students Age range: 18–40 y	RCT- assigned to intervention 1 direct contact ( $n = 81$ ), intervention 2 indirect contact ( $n = 99$ ), or control ( $n = 123$ )	Parasocial contact	Y	N	Y	Y One month	Y
Mental illness (Birtel and Crisp 2012)	29 Undergraduate students (4 M, 25 F) Age range: 18–38 y	Assigned to one of two experimental conditions	Imagined contact	N	Y	Y	N	Y
Schizophrenia (Penn, Chamberlin, and Mueser 2003)	163 Undergraduate students (91 M, 72 F) Average age: 18.85 y	RCT-assigned to one of three experimental conditions or the control.	Parasocial contact	N	N	Y	N	Y for stigma, N for attitudes and behavioral intentions
Schizophrenia (Giacobbe, Stukas, and Farhall 2013)	97 University Students (4 M, 93 F) Age range: 18–39 y	RCT-assigned to one of three experimental conditions or the control.	Imagined contact	Y	Y	Y	N	Y
Schizophrenia (Flevo (2014))	416 Adolescents Age range: 12–18 y	RCT-assigned to one of four conditions. 1 Contact/Descriptive 2 Presence/Descriptive (control) 3 Contact/Combined 4 Presence/Combined (control)	Imagined contact	Y	N	Y	N	Y for behavioral intentions N for attitudes.
Asperger Syndrome (AS)				Excluded	Excluded	Non-ASC only		

(Continues)

TABLE 1A | (Continued)

Author, year, and disability type	Sample characteristics	Study design	Method	Prior direct contact measured	Participant disability measured	Pre-post design	Delayed Post-test	Intervention effect in comparison to control (All significant at $p < 0.05$ )
(Godeau et al. 2010) Disabled	784 school pupils Age range: 12–13 years	RCT- assigned to intervention ( $n = 895$ ) or control ( $n = 614$ )	Trained staff to provide inclusive lessons	Y	N	Y	Y Eight months	N
(Adibbereshki, Tajrishi, and Mirzamani 2010) Physical disabilities	221 (105 M, 116 F) primary school aged children	RCT- assigned to either intervention ( $n = 110$ ) or control ( $n = 111$ )	Knowledge	N	N	Y	N	Y
(Holtz and Tessman (2007)), Tourette's syndrome (TS)	179 children (91 M, 88 F). Age range: 7–15 y	RCT- assigned to either intervention ( $n = 91$ ) or control ( $n = 45$ )	Knowledge	N	N	Y	N	Y
(Pivik et al. 2002) Physical disabilities	60 children (24 M, 36 F). Age range: 9–11 y	RCT- assigned to either intervention ( $n = 30$ ) or control ( $n = 30$ )	Knowledge	N	N	Y	N	Y for barriers N for attitudes
(Corrigan et al. 2002) Study 2. Mental illness	213 College students (63 M, 150 F) Age range: 18–80 y	RCT- assigned to one of four experimental conditions or a control.	Knowledge	N	N	Y	Y One week	Y (Although direct contact was better)
(Finkelstein, Lapshin, and Wasserman 2008) Mental illness	193 University Students	RCT- Assigned to one of three conditions: 1 Program group ( $n = 69$ ) 2 Reading group ( $n = 76$ ) 3 Control group ( $n = 48$ )	Knowledge	N	Y	Y	Y Six months	Y
(Mino et al. 2001) Mental illness	95 Medical students (71 M, 24 F)	RCT- assigned to intervention ( $n = 95$ ) or control ( $n = 94$ )	Knowledge	N	N	Y	N	Y
(Ventieri, Clarke, and Hay 2011) Mental illness	195 Primary school children Age range 9–12 y	RCT-assigned to intervention ( $n = 69$ ) or control ( $n = 126$ )	Knowledge	Y	N	Y	Y Four months	Y
(Hunt and Hunt 2004) Disabled	190 Undergraduate students	RCT-assigned to either experimental or control conditions	Knowledge	Y	Y	Y	N	Y

(Continues)

TABLE 1A | (Continued)

Author, year, and disability type	Sample characteristics	Study design	Method	Prior direct contact measured	Participant disability measured	Pre-post design	Delayed Post-test	Intervention effect in comparison to control (All significant at $p < 0.05$ )
(Corrigan et al. 2002) Mental illness	152 College students (49 M, 103 F) Average age: 25.7 y	RCT-assigned to one of three experimental conditions or a control	Knowledge	N	N	Y	N	Y
<b>Interventions using a combination of indirect contact and knowledge from here-on</b>								
(Silton and Fogel (2012)), Autism (ASC)	158 Children Age range: 9–12 y	Randomly assigned to one of four experimental conditions	Parasocial + Knowledge	Y Excluded participants with contact	Y Non-disabled participants only	Y	N	Y for behavioral intentions N for attitudes
(Martinez & Carspecken 2006) Physical, intellectual, and developmental disabilities	78 children (34 M, 44 F) Age range: 8–10 y	RCT- assigned to either the intervention ( $n = 38$ ) or control ( $n = 40$ ) condition	Parasocial + Knowledge	Y	Y	Y	N	Y
(Corrigan et al. 2007) Schizophrenia	224 College Students (72 M, 171 F) Age average: 23.9 y	Assigned to one of two experimental conditions	Parasocial + Knowledge	N	N	Y	Y One week	Y
(Nguyen et al. 2012) Mental health	476 Undergraduate students Mean age: 21	Assigned to one of two experimental conditions	Parasocial + Knowledge	Y	N	Y	N	Y
(Woods (2002)) Tourette's syndrome (TS)	121 University Students (26 M, 96 F) Mean age: 20.5 y	RCT-assigned to either experimental or control conditions	Parasocial + Knowledge	Y Excluded	Y	Y	N	Y
(Walker and Read 2002) Mental illness	126 University Students (86 M, 40 F) Average age: 20.1 y	Assigned to one of three experimental conditions	Parasocial + Knowledge	N	N	Y	N	Attitudes = Y (for biogenetic) Behavioral intentions = N
(Ginevra et al. 2021) Sensory and intellectual	142 children (67 M, 75 F) Mean age 9.87 y	RCT-assigned to one of three experimental conditions or a control condition.	Imagined + Knowledge	Y Excluded participants with contact	Y Non-disabled	Y	N	Y

(Continues)

TABLE 1A | (Continued)

Author, year, and disability type	Sample characteristics	Study design	Method	Prior direct contact measured	Participant disability measured	Pre-post design	Delayed Post-test	Intervention effect in comparison to control (All significant at $p < 0.05$ )
disabilities and behavioral difficulties					participants only			
(Moore and Nettelbeck 2013)	156 Young Adolescents (156 M) Age range: 11–15 y	RCT-assigned to Intervention or Control	Parasocial + Knowledge	N	Y	Y	N	Y
(Krahé and Altwasser 2006)	70 Adolescents (26 M, 44 F) Mean age: 14.8 y	RCT-assigned to one of two experimental conditions or a control condition.	Parasocial + Knowledge	Y	N	Y	Y	N
Physical disabilities							Three months	
(Mann and Himelein 2008)	Study one: 53 University students (20 M, 33 F) Average age: 18.9 y Study two: 48 Students (16 M, 32 F) Average age: 20.2 y	Assigned to one of two experimental conditions	Parasocial + Knowledge.	N	N	Y	N	Y
Mental illness								
(Brown et al. 2010), Schizophrenia	143 Undergraduate students Age range: 18–24 y	RCT-assigned to one of two experimental conditions or a control condition.	Parasocial + Knowledge	N	N	Y	Y	Y
							One week	
(Reinke et al. 2004)	164 College students (54 M, 110 F) Average age: 24.7 y	RCT- assigned to one of four experimental conditions or a control condition.	Parasocial + Knowledge	N	N	Y	N	Y
Mental illness								
(Chan, Mak, and Law 2009)	255 Adolescents Age range: 13–18 y	RCT- assigned to one of two experimental conditions or a control condition.	Parasocial + Knowledge	Y	N	Y	Y	Y
Schizophrenia							One month	

Note: (See Supporting Information S1: Table 2A in Open Sciences Framework at [https://osf.io/v9z6f/?view\\_only=ee9ce364737448d2a20fe7ba2bda911c](https://osf.io/v9z6f/?view_only=ee9ce364737448d2a20fe7ba2bda911c) for more in-depth results).



**TABLE 1B** | Below reports the key design features, sample sizes, and outcome measures of those studies which DID NOT include a comparison of pre- versus post-intervention.

<b>Author, year, and disability type</b>	<b>Sample characteristics</b>	<b>Study design</b>	<b>Key features of the intervention</b>	<b>Previous contact</b>	<b>Participant disability</b>	<b>Pre-post</b>	<b>Delayed post-test</b>	<b>Intervention effect in comparison to control? (All significant at <math>p &lt; 0.05</math>)</b>
(Cameron et al. 2011) Physical disabilities	123 children (58 M, 65 F) Age range: 5–11 y	RCT- assigned to intervention ( $n = 63$ ) or control ( $n = 60$ )	Imagined contact	N	N	N	N	Y
(Cameron, Rutland, and Brown 2007), Physical disabilities and learning difficulties	71 children (35 M, 36 F) Age range: 6–9 y	RCT-assigned to one of two experimental conditions or a control condition.	Vicarious contact	N	N	N	N	Y
(Carvalho-Freitas and Stathi 2017) Physical disabilities	Study one: 300 Brazilian Engineering students (211 M, 89 F) Ages range from 17 to 36 y Study two: 138 Brazilian professionals; 52 males and 86 females. Ages range from 19 to 67 y	Study one: RCT-assigned to intervention or control Study two: RCT-assigned to intervention or control	Imagined contact	Y	N	N	N	Y
(Kallman 2017) Physical disabilities	180 university students (36 M, 134 F)	RCT- assigned to either the intervention or control condition	Parasocial contact	Y	Y	N	N	N for Communication Apprehension and Implicit biases Attitudes = Y Attitudes = Y intended behaviors = N Similarities = Y
(Swaim and Morgan (2001)) Autism (ASC)	233 children (ages 8–12 years)	Randomly assigned to one of three experimental conditions	Parasocial contact	Y Excluded participants with contact	Y Non-disabled participants only	N	N	
(Falvo et al. 2014), Intellectual disabilities	164 adults (109 F, 55 M) Age range: 18–65 y	RCT-assigned to intervention ( $n = 82$ ) or control ( $n = 82$ )	Imagined contact	Y	Y Non-disabled	N	Y One month	Y

(Continues)

TABLE 1B | (Continued)

Author, year, and disability type	Sample characteristics	Key features of the intervention			Delayed post-test	Intervention effect in comparison to control? (All significant at $p < 0.05$ )	
		Study design	Previous contact	Participant disability			
(Cocco et al. 2022) Physical disabilities	122 children (69 M, 53 F) Age range: 6–9 y	RCT-assigned to intervention ( $n = 62$ ) or control ( $n = 60$ )	Imagined contact	N	Y	Distance = N Contact intentions = Y	
(Birtel et al. 2019) Study 1 Physical disabilities	81 Children (39 M, 42 F) Age range: 4–6 y	RCT-assigned to intervention ( $n = 43$ ) or control ( $n = 38$ )	Imagined contact	N	N	Y	
(Vezzali et al. 2020) Physical disabilities	215 Elementary school children (106 M, 109 F) Age range: 5–11 y	RCT-assigned to intervention ( $n = 107$ ) or control ( $n = 108$ )	Imagined contact	N	N	Y for most Helping intentions and reaction to name calling behavior had no significant = N	
(Greenwood et al. 2016) Study 1 Mental Health	42 children (22 M, 20 F) Age range: 7–8 y	RCT-assigned to intervention ( $n = 21$ ) or control ( $n = 21$ )	Vicarious	Y	N	Y	
(Stathi, Tsantila, and Crisp 2012), Schizophrenia	57 Undergraduate students (21 M, 36 F) Age range: 18–48 y	RCT-assigned to intervention or control	Imagined contact	N	N	N	
(West, Holmes, and Hewstone 2011) Schizophrenia	Undergraduate students (33 M, 54 F) Age range: 18–21 Study two: 99 Undergraduate students	Studies one to four: RCT-assigned to intervention or control	Imagined contact	N	N	N	Anxiety and attitudes = Y

(Continues)

TABLE 1B | (Continued)

Author, year, and disability type	Sample characteristics	Study design	Key features of the intervention	Previous contact	Participant disability	Pre-post	Delayed post-test	Intervention effect in comparison to control? (All significant at $p < 0.05$ )
	(46 M, 53 F) Age range: 18–25 Study Three: 38 Undergraduate students (8 M, 30 F) Age range: 17–21 Study Four: 47 Undergraduate students (16 M, 31 F) Age range: 18–26							
(Smedema, Ebener, and Grist-Gordon 2012) Physical disabilities	133 undergraduate students (76 M, 57 F) Age range: 18–60 y	RCT-assigned to Intervention 1 serious film ( $n = 44$ ), intervention 2 humorous film ( $n = 45$ ), or Control ( $n = 44$ )	Parasocial contact	Y	N	N	N	Y But also moderation effect
(Cocco et al. 2021) Disabled	292 elementary school children (152 M, 140 F) Age range: roughly from 6 to 9 years old (exact ages not available)	RCT-assigned to one of three conditions: 1) Video ( $N = 107$ ), 2) Reading ( $N = 86$ ), 3) Control ( $N = 99$ )	Vicarious contact	N	Y Non-disabled participants only	N	N	Y
(Bast et al. (2020)) Autism (ASC)	Study one: 56 undergraduate students (28 M, 28 F) Mean Age: 22.92 y Study two: 69 undergraduate students (40 M, 29 F) Mean age: 22.03 y	Study one RCT: assigned to intervention or control. Study two: assigned to one of two experimental conditions	Knowledge	Y Study two only	N	N	N	N
(Campbell et al. (2004)) Autism (ASC)	576 Children (294 M, 282 F) Age range: 8–12.5 y	RCT-assigned to one of two experimental conditions or a control	Knowledge	N	Y Excluded those with ASC	N	N	Y

(Continues)

TABLE 1B | (Continued)

Author, year, and disability type	Sample characteristics	Study design	Key features of the intervention	Previous contact	Participant disability	Pre-post	Delayed post-test	Intervention effect in comparison to control? (All significant at $p < 0.05$ )
(Lindau et al. 2018) Intellectual disabilities	401 participants (261 F, 140 M). Age range: 18–66 y	Quasi random allocation to one of six experimental conditions (1 $n = 51$ , 2 $n = 78$ , 3 $n = 71$ , 4 $n = 58$ , 5 $n = 80$ , 6 $n = 63$ )	Parasocial + Imagined	Y	N	N	Y Four to six weeks	Y
(Nabors and Larson 2002) Physical disabilities	262 children (131 M, 131 F). Age range: 3–9 y	RCT- assigned to one of two experimental conditions or a control.	Parasocial + Knowledge	Y	N	N	N	Y
(Jones, DeBrabander, and Sasson (2021)) Autism (ASC)	238 undergraduate students. Age range: 18–57 y.	RCT- assigned to one of three conditions: 1) Autism Acceptance Training ( $n = 77$ ), 2) Mental Health Training ( $n = 77$ ) 3) Control ( $n = 84$ ).	Parasocial + Knowledge	Y Excluded participants with family contact	Y Non-disabled participants only	N	N	Y for explicit N for implicit
(Woods and Marcks (2005)) Tourette's syndrome (TS)	170 College students (35 M, 135 F) Mean age: 22.33 y	RCT- assigned to one of two experimental conditions or a control	Parasocial + Knowledge	Y Excluded	N	N	N	Y

Note: (See Supporting Information S1: Table 2B in Open Sciences Framework at [https://osf.io/v9z6t/?view\\_only=ee9ce364737448d2a20fe7ba2bda911c](https://osf.io/v9z6t/?view_only=ee9ce364737448d2a20fe7ba2bda911c) for more in-depth results).

Fifteen studies (29.4%) included a delayed follow-up, with the majority (21.6%) ranging from 1 to 6 weeks. However, four results (7.8%) had longer-term follow-up ranging from 3 to 8 months. Interestingly, of these four, only one found any positive effects of the intervention months later. The other three either had mixed or no positive changes from baseline.

### 3.3 | Control and Comparison Conditions

Twenty (39.2%) results included only a control condition, whereas 11 (21.6%) results had a comparison or alternative intervention condition. A further 20 (39.2%) incorporated both control and alternative conditions.

### 3.4 | Moderators

The main potential moderators focused on for this review were: (1) Participants' previous contact with disability and (2) Participants' official diagnosis of disability. Increased direct contact and experience with a disability are linked with less prejudice towards this group. Therefore, participants with higher existing levels of contact and/or experience may have encountered a reduced intervention effect.

Tables 1A and 1B show that just under half (49%) of studies measured participants' previous contact with disability and only a third (33.3%) asked participants if they were disabled themselves. Of these studies, nine (17.7%) excluded participants with previous contact with disability and 11 (21.6%) excluded participants who reported an official disability diagnosis.

Of the 25 studies that measured previous contact, seven studies (13.7%) assessed previous contact to ensure that levels of contact were comparable between conditions, and one (1.9%) analyzed participant disability as a potential covariate.

### 3.5 | Intervention Types

Indirect contact was more common than knowledge-based interventions with 11 (21.6%) focusing on imagined contact, seven (13.7%) on parasocial contact and four (7.8%) on vicarious contact. Knowledge interventions accounted for 12 (23.5%) of results and 17 (33.3%) used a combination of both indirect contact and knowledge.

As can be seen from Tables 1A and 1B above, the vast majority of intervention studies reported at least some positive effects relative to a control group. While this pattern might be in part the result of publication bias (i.e., studies are more likely to be published if they have some statistically significant findings), it is at least possible to say that there are some benefits of knowledge-based and intergroup contact interventions for improving relations in the disabled/non-disabled intergroup context. (For more specific details regarding intervention methodology and findings, see Supporting Information S1: Tables 2A and 2B on Open Science Framework.)

### 3.6 | Outcome Measures

While 26 distinct outcome measures were identified across these results, the majority of these focused on self-report measures of outgroup orientation, for example, intentions for future interaction with disabled individuals or explicit attitudes towards disabled individuals and knowledge. Other common measures of intergroup contact research, such as acceptance, anxiety, and similarity, were evident but at a much-reduced level, thus leaving the impact of these interventions on wider outcomes less well understood. Across the 51 studies, the vast majority (90.2%) relied solely on explicit self-report measures. The remaining five (9.8%) had a combination of explicit self-report measures, implicit measures such as the IAT and less direct measures of behavior.

## 4 | General Discussion

This review identified and summarized findings from 51 papers that delivered "indirect contact" and knowledge interventions designed to improve relations in the disabled/non-disabled context. Overall, the majority of the studies found at least some positive effects when compared to the control or alternative interventions at immediate post-test, but in the few where long-term effects were examined, these effects were often not maintained months later. The results varied in the use of pre-post design, consideration of moderating factors and participants used.

With regards to the methodological quality of the included studies there were trends observed that point to gaps within the research and areas of future development. These include:

### 4.1 | Design

It has been argued that using both an alternative and no intervention control conditions is the gold standard RCT design (Zabor, Kaizer, and Hobbs 2020). This allows researchers to limit any placebo effects and directly compare one intervention type to another (Bondemark and Ruf 2015). Only 20 (39.2%) results achieved this, with the rest comparing to either an alternative or no intervention control. In addition to the type of control, another design consideration is the collection of baseline data. Twenty (39.2%) of the results in this review did not include baseline measures. Pre-post designs can be useful in detecting any changes over time but do not allow researchers to attribute any changes to the intervention. In order to support the causality effects of the intervention, especially over time these two design aspects (pre-post design with gold standard RCT) should be the aim of any future research to increase confidence in the observed effects of the intervention.

### 4.2 | Demand Effects

Another design element to be noted is the timing of post-intervention measures. Thirty-six studies appear to have assessed any outcome measures immediately after the intervention, leading to the possibility of demand effects. These demand effects may have been amplified in the 31 studies that included a pre-post design. Participants in studies that utilized

the pre-post method may have perceived an expectation to adjust their responses following an intervention. Fifteen studies included in this review attempted to mitigate these demand effects through strategies such as implicit measures and delayed follow-up assessments. This inconsistency raises concerns that some findings may reflect participants' compliance with perceived expectations rather than genuine attitudinal shifts. To strengthen the reliability of future research on this topic, it is essential to adopt methodological practices that reduce demand effects. These could include double-blind procedures, the inclusion of both active and inactive control groups, or the use of indirect outcome measures.

Furthermore, the application of pre-post designs should be approached with caution unless supplemented with strategies such as these to mitigate demand effects, as their overuse without could compromise the validity of conclusions regarding intervention efficacy.

### 4.3 | Participants

The majority of studies (47.1%) focused on either child participants (where prejudice is known to be more susceptible to intervention) and university students (45.1%). This makes generalizability of the findings across populations difficult and limits our understanding of adult intergroup relationships in the disabled/non-disabled context, especially outside of an educational setting. We know from previous intergroup work (Abrams 2010) that adult attitudes and beliefs are often more ingrained and harder to shift than those of children, and therefore, further intervention studies with adult participants are sorely needed.

### 4.4 | Outcome Measures

This review identified a significant bias towards explicit measures of outgroup orientation. This is problematic since explicit measures are known to be susceptible to social desirability effects (Anderson 2019). To avoid this bias, it is possible to use measures that rely less on self-report, such as measures of implicit attitudes (Dunham, Baron, and Banaji 2016; Paluck and Green 2009), less direct measures of behavior (MacInnis and Page-Gould 2015) and physiological measures of intergroup anxiety (West, Turner, and Levita 2015). However, it is essential to consider modern perspectives on implicit measures before recommending their increased use.

For instance, the Bias of the Crowds Model (Payne, Vuletich, and Lundberg 2017) highlights the contextual sensitivity of implicit measures, suggesting that they may reflect situational norms more than stable personal biases. Furthermore, a meta-analysis conducted in 2019 (Forscher et al. 2019) suggests that while implicit measures can be changed through interventions, these changes tend to be small and contextually driven, with limited evidence linking such changes to sustained behavior change.

Our systematic review found that only three studies measured implicit biases and attitudes (Bast et al. 2020; Jones, DeBrabander, and Sasson 2021; Kallman 2017) and two

behavioral change through observation (Cocco et al. 2022) or charity donation (Corrigan et al. 2002). Importantly, the intervention studies that utilized implicit measures or less direct measures of behavior had a mix of positive and no intervention effects on these outcomes but did have some positive shift for explicit outcomes. This suggests the impact of these interventions on implicit measures may be more limited compared to explicit outcomes. This aligns with contemporary findings that implicit measures are not static and can be influenced by contextual factors, which may limit their ability to capture the enduring impact of interventions.

Given that implicit attitudes and biases are powerful predictors of behavior and intergroup relations (Greenwald et al. 2009), their inclusion remains valuable. However, future research should integrate these modern perspectives to better understand the context-dependent nature of implicit measures and to design interventions that address both explicit and implicit components of intergroup prejudice. By doing so, researchers can better assess how interventions influence the deeper, often unconscious, processes that drive positive intergroup relations.

Similar to the overreliance of explicit measures was the strong focus on behavioral intentions. There is some evidence from a variety of domains that behavioral intentions and behavior are positively correlated (Conner and Norman 2022), particularly where participants report specific (rather than generic) behavioral intentions (Silton and Fogel 2012). However, it is likely that more personally costly behaviors are harder to shift than attitudes (Morris-Drake et al. 2019). Therefore, measures of actual behavioral change, as well as more specific and precise measures of behavioral intentions are recommended to evaluate interventions effectively.

Another potential outcome measure that we might have expected to see but was not utilized by any of the 51 studies is contact self-efficacy, which is defined as one's motivation and confidence for engaging in interactions to form and maintain cross-group friendships (Bagci et al. 2020), and intergroup contact behaviors (Kauff et al. 2021). Indeed, contact self-efficacy has been shown to reduce intergroup anxiety and increase willingness to engage in intergroup contact (Stevenson, Turner, and Costa 2021) so should be something incorporated in future research.

A further notable outcome to mention is intergroup anxiety. There is a consistent lack of investigation of intergroup anxiety as a moderator or outcome variable across these 51 results. This was surprising as intergroup anxiety has been shown to be a vital element of contact between groups (Stephan 2014), including outgroup attitudes (Riek, Mania, and Gaertner 2006) and contact avoidance (Paolini et al. 2018).

Last is the lack of inclusion and disability justice measures. As seen in this review, the majority of indirect intergroup contact research has focused on attitudes and knowledge. Whilst these are vital measures, we question whether they can translate to wider prejudice reduction and current trends outside of academia and research. Although recognizing the importance of psychological mechanisms such as attitudes, behavioral intentions, and knowledge of disability, many charities, advocates,

and organizations now focus on disability-related justice and inclusion. This simply is the focus and prioritizing of advancing access and inclusion for disabled people. As it stands, we do not fully understand the relationship between traditional intergroup measures and inclusion and social justice, nor are these commonly used measures across intergroup and knowledge research. Some preliminary research in 2022 found small but significant correlations between attitudes toward inclusive education and perceptions of social justice (Shyman 2022).

From this, we suggest that indirect contact with disability and education research needs to incorporate more measures of actual behavior, self-efficacy, intergroup anxiety, inclusion, and disability justice. Moreover, how these and other traditional outcomes, such as attitudes and intended behaviors, relate and predict social justice and inclusion. These outcomes are examined in direct contact research and other domains and are likely to be important outcomes of indirect and knowledge-based interventions.

#### 4.5 | Disability Status/Contact With Disability as Moderators

Nearly half of the results measured previous contact with disability and a third asked participants if they were disabled themselves. Some did recognize the moderating impact of this and took steps such as excluding participants with high levels of contact (see Tables 1A and 1B), but the overall extent to which this was overlooked was surprising. Previous work (Satchidanand et al. 2012) has suggested that those with previous experience with disability will not benefit as much from the interventions compared to those with no prior experience, leading to potential false negatives or positive effects (Lindau et al. 2018). Likewise, intergroup research has found evidence of out-group favoritism (preference of the outgroup) in members of the disabled community (Essien, Otten, and Degner 2020), which again could overshadow the true effects of the intervention. If participants are not asked about their disability status and they exhibit out-group favoritism, the intervention's effectiveness may be misrepresented, potentially leading to false negative results. This highlights the importance of considering participants' disability status to accurately assess the impact of the intervention. Therefore, it is recommended that future research take account the effects of prior contact, biases, preference, and exposure to the outgroup in intergroup relations.

#### 4.6 | Focus on Positive Interactions and Experiences

All the indirect contact papers included in this review framed the intergroup contact in a positive way, and those in the knowledge interventions would read a positively worded story or video. Whilst positive intergroup contact is key for changing attitudes, it is not always reflective of real-life interactions. Both positive and negative experiences are often seen within intergroup interaction (Árnadóttir et al. 2018), so the inclusion of more neutral or even negative conditions of contact is crucial to provide more realistic examples of disabled/non-disabled interactions to better prepare them for real-life interactions.

#### 4.7 | Recognizing Intersectionality

Intersectionality is the acknowledgment that everyone has their own unique experiences of discrimination and that the interconnected nature of social categories such as race, class, and ethnicity can create overlapping and interdependent systems of prejudice and discrimination (Taylor 2019). In the context of social psychology research, intersectionality would assume that intergroup relations in the disabled/non-disabled context can not be fully understood without considering other elements of oppression and prejudice. However, the vast majority of intergroup and knowledge research, particularly in the disabled/non-disabled context, has not done this, often focusing on disability as a single identity. Some new research (Saia et al. 2023) has called for action on this and for research to incorporate theoretical frameworks that illuminate the experiences of multiply-minoritised people. In line with this call for action, it is recommended that all social researchers should make a commitment to reimagine current research practices to incorporate intersectionality and meet the needs of diverse individuals and communities.

To effectively incorporate intersectionality, researchers should consider the diverse and intersecting social identities of participants, such as race, gender, and socioeconomic status. This could be achieved by ensuring diverse participant samples, developing intersectional measures of prejudice, and tailoring interventions to reflect specific cultural and identity-based contexts. Furthermore, future data analysis should account for the interaction of multiple social identities in shaping prejudice reduction outcomes. The adoption of more mixed-methods approaches could also provide deeper insights into the experiences of different identity groups. Additionally, research questions could be framed to explore how intersecting identities influence attitudes toward disability, and interventions should be informed by ongoing feedback from diverse communities.

#### 4.8 | Collaborative Research With Disabled Communities

Intertwined with the need for intersectionality is the call for collaborative research with disabled communities. Notably, none of the results in this review mention working in collaboration or consulting with disabled individuals/communities during the research process. Securing input from disabled people in the design and evaluation of interventions is essential. This would allow a better understanding of the perspective, needs, and priorities of disabled people and help create and deliver better-quality research. This collaborative process would identify the best choice of research topics, determining relevant and appropriate research questions, and improve the accessibility of fieldwork and dissemination of findings (Farmer and Macleod 2011). People with disabilities experience indignities, exclusions, and prejudice regularly (Alavi et al. 2012), and in order for research to avoid reinforcing these barriers, it is essential that disabled voices are included in the research process (Isaacson 2021). Therefore, collaboration in future work is recommended to identify appropriate education interventions, but also most important outcome variables to measure the success and impact of interventions.

## 5 | Limitations, Implications, and Recommendations for Future Research

There are some limitations to review. (1) Only articles that were written in English or had an available translation were included. Other vital and important results may have been found in research beyond this criterion. (2) The search may not have picked up on studies where the improvement of attitudes and or knowledge may have been a secondary focus of research.

While both knowledge and indirect contact interventions demonstrated success for improving relations in the disabled/non-disabled intergroup context, this review found insufficient evidence to clearly favor one type of intervention over the other. To determine definitively which intervention type is more effective, further analyses, such as meta-analyses, are required. The primary aim of this review was not to make definitive comparisons but to provide an overview of the current literature, identifying both the strengths and limitations of these interventions and uncovering effective elements that may enhance their impact. Some common features of successful interventions emerged, including tailoring content to the participant sample, promoting emotional engagement (e.g., inducing empathy), and creating opportunities for participants to learn new, positive information about individuals with disabilities. These features appear to contribute to intervention efficacy and should be prioritized in future research.

At the same time, the review highlighted significant gaps in literature. For example, inconsistencies in the design, measures, and reporting of studies inhibit direct comparisons between intervention types. Additionally, while interventions have been successful in certain contexts, their application in more diverse and realistic settings, especially with adults outside educational environments, remains underexplored.

Therefore, our recommendations for future work are as follows: (1) Diversify and expand the repertoire of measures of impact used by utilizing a wider range of outcomes including disability justice and inclusion, intergroup anxiety, contact self-efficacy, and behavioral measures of both intended and actual behaviors, as well as more implicit measures. (2) Further consideration of potential moderators including diagnosis of disability and previous contact with disability. (3) Utilizing the pre-post design and control or alternative intervention conditions. (4) Consider more realistic indirect intergroup contact interventions including negative and/or neutral conditions of contact. (5) Design and test interventions with adults, especially outside of an educational setting. (6) More use of delayed post-test evaluations to determine the long-term effect of interventions. (7) Recognize intersectionality and (8) Co-production of research with the disabled community.

### Final Conclusions

This review aimed to provide an overview of the current literature on knowledge-based and indirect intergroup contact interventions designed to improve outcomes such as knowledge and attitudes towards those with disabilities. The findings from the 51 studies that met our inclusion criteria demonstrate that

both intervention types show promise in improving relations between disabled and nondisabled individuals. However, this review also highlights that research in this area is still in infancy. Key limitations include a lack of diversity in participant samples and a narrow focus on outcome measures, both of which require significant expansion. Addressing these gaps through future research will be crucial for advancing the field and developing more robust, evidence-based interventions to reduce prejudice toward individuals with disabilities.

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### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

The authors have nothing to report.

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### Supporting Information

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