

A scoping review of technological interventions to address ethnicity-related peer aggression

Heidi Vandebosch^a, Alina Botezat^{b,*}, Anna Lisa Amodeo^c, Sara Pabian^{a,d}, Piotr Plichta^e, Zrinka Puharić^{f,g}, Jacek Pyżalski^h

^a University of Antwerp, Sint-Jacobstraat 2, 2000 Antwerp, Belgium

^b "Gh. Zane" Institute for Economic and Social Research, Romanian Academy Iasi Branch, Teodor Codrescu 2, 700481 Iași, Romania

^c Department of Humanities, University of Naples Federico II, Porta di Massa 1, 80138 Napoli, Italy

^d Tilburg University, Department of Communication and Cognition, Warandelaan 2, 5037, AB, Tilburg, the Netherlands

^e University of Wrocław, Faculty of Historical and Pedagogical Sciences, Institute of Pedagogy, Dawida 1, 50-529 Wrocław, Poland

^f University of Applied Sciences Bjelovar, Trg E.Kvaternika 4, 43000 Bjelovar, Croatia

^g Faculty of Dental Medicine And Health, University of Osijek, Crkvena 21, Osijek, Croatia

^h Adam Mickiewicz University, Faculty of Educational Studies, 61-712 Poznan, Poland

ARTICLE INFO

Keywords:

Technological interventions
Ethnic minorities youth
Peer aggression
Bullying
Cyberbullying
Scoping review

ABSTRACT

The past two decades have witnessed an increase in ethnicity-related peer aggression, driven by the intensification of the migration phenomenon and rise of information and communication technologies. The goal of the current study is to extend the scope of previous reviews on peer aggression to examine the emerging evidence on the role of technological tools in the prevention, detection, and handling of ethnicity-related peer aggression among young people. We have identified 14 relevant papers published between 2005 and 2020 that help us answer the following research questions: What forms of aggression among young ethnic minorities do these technological interventions try to address? What types of technological interventions are being used? The results indicate that the technological tools are being used to tackle both intergroup as well as intragroup peer aggression, in which ethnic minorities youth is involved (as a victim, perpetrator or bystander). Most studies have focused on adolescents and young adults in the US or in Europe. The technological tools reported on, include: online games, videos, social media, and chat-based programmes, or machine learning algorithms aimed at tackling online and offline peer aggression. They can be used either as stand-alone tools, or as part of intervention programmes (at the school, family or community level). These findings can be useful to improve and elaborate future digital technologies developed to address ethnicity-related peer aggression.

1. Introduction

International migration has increased worldwide. However, the current flows of people moving from one country to another, build on different migration histories (Citrin & Sides, 2008; Palladino et al., 2020). In Western societies, for instance, countries such as the United States, Canada and Australia are known as "settlers societies". They have witnessed repeated waves of immigrants for more than two centuries, leading to a diverse population with significant groups coming from different continents. In Europe, however, migration flows are from a more recent date. They started as a response to the consequences of the

second World War. Unlike in the United States, immigration is not part of the nationhood narrative of European states, instead these "states tend to define themselves in bounded ethnic terms" (Citrin & Sides, 2008, p. 34).

Both past and more recent migration have led to more ethnic diversity in countries worldwide. Ethnicity refers to "The social group a person belongs to and either identifies with or is identified with by others, as a result of a mix of cultural and other factors including language, diet, religion, ancestry and physical features traditionally associated with race." (Johnson et al., 2019, p. 86) Not all ethnic groups in a country have the same status. Ethnic minority groups (or minority

* Corresponding author.

E-mail addresses: heidi.vandebosch@uantwerpen.be (H. Vandebosch), botezat.alina@yahoo.com (A. Botezat), amodeo@unina.it (A.L. Amodeo), s.j.r.pabian@tilburguniversity.edu, sara.pabian@uantwerpen.be (S. Pabian), piotr.plichta@uwr.edu.pl (P. Plichta), zpuharic@vub.hr (Z. Puharić), pyzalski@amu.edu.pl (J. Pyżalski).

<https://doi.org/10.1016/j.avb.2022.101794>

Received 16 March 2022; Received in revised form 23 August 2022; Accepted 8 October 2022

Available online 13 October 2022

1359-1789/© 2022 Elsevier Ltd. All rights reserved.

ethnic groups) consist of “populations other than the dominant majority of a country. The word minority not only refers to numerical proportions but also indicates relative power positions in society” (Johnson et al., 2019, p. 86). In the United States “race” has often been used as an indicator of belonging to an ethnic majority or minority group (e.g. Whites versus Blacks, both historical immigrant groups). In Europe, on the other hand, a person's belonging to an ethnic minority has often been measured by considering their own or their parents' (recent) migration background (e.g. nationality, geographical origin) (Basilici et al., 2022). However, these measures are becoming increasingly inappropriate as (migration-related) minority populations in Western Europe grow in size, are increasingly native-born, or naturalise (Schneider & Heath, 2020).

While migration and ethnicity are strongly interwoven, they are not the same. For instance, some immigrants (i.e. returning children of expatriates) might have the same ethnic background as the (majority of the) people of their host country. On the other hand, there are also indigenous people who belong to an ethnic minority group (e.g. Roma in Europe). In addition, race has historically been linked with physical features of people (such as their skin colour and hair), and only in certain contexts have become a possible indicator of their ethnicity.

Ethnic diversity and (especially) belonging to an ethnic minority, comes with many challenges. A considerable amount of research has focused on ethnic minority youths' involvement in peer aggression, and particularly in bullying. Bullying is a specific form of peer aggression that is characterized by an intent to harm, a power imbalance and repetition (Olweus, 1993). Peer aggression (including bullying) can take place in offline settings, such as in a school context, but also online, such as on social media platforms (Hinduja & Patchin, 2009). In the latter case, terms such as online aggression and online, digital or cyberbullying are being used. Victimization, but also perpetration and bystandership are associated with a range of negative outcomes (Camerini et al., 2020; Zych et al., 2015). Moreover, they do not only have an impact on individuals, but also on groups (such as families, school classes), communities, and society as a whole.

The majority of studies on ethnic minorities and peer aggression seem to focus on comparing the prevalence rates for victimization and perpetration between migrant and non-migrant children and adolescents (Caravita et al., 2021; Comas-Forgas et al., 2017) or between children and adolescents with a different racial background (e.g. Whites versus Blacks). The first category of studies have typically been conducted in Europe, while the latter often originate from the US or Canada context (Basilici et al., 2022; Vitoroulis & Vaillancourt, 2018). Several of these studies suggest that ethnic minority youth have a higher chance of being victimized (Azeredo et al., 2015). Different factors might explain this. First of all, children and adolescents with an ethnic minority background score higher on certain general risk factors for (bullying) victimization (and perpetration), such as having parents with a lower educational background and a lower socio-economic status, compared to youth with an ethnic majority background (Von Marées & Petermann, 2010). Furthermore, their ethnic background might lead more directly to victimization, as it impacts their social status (and thus may contribute to a power imbalance that is especially typical for bullying) (Caravita et al., 2021; Pyżalski, 2012) and makes them different from the majority group (with regard to their looks, language, religion, etc.) (Maynard et al., 2016).

When people are specifically targeted because of their real or perceived belonging to a social (minority) group (based on characteristics such as their ethnicity, migrant background, race, gender, sexual orientation, etc.), the term “prejudice-based” or “biased-based” (peer) aggression or bullying is used. Given the fact that ethnicity, migrant background and race are not exactly the same, a distinction can also be made between ethnicity-based, migrant-based and race-based aggression or bullying. However, as someone's migration status or race is often times used as a proxy to measure their ethnic background (see supra) and because these different types of prejudiced-based aggression or

bullying are also treated the same from a policy perspective (Tippett et al., 2010), there is tendency in the academic literature to use the terms interchangeable (e.g. to refer to ethnic bullying or racist bullying, or to “ethnic/racist” bullying) (Kuldás et al., 2021) or to use the term ethnic aggression or ethnic bullying while explicitly acknowledging the links it has with race and migration. For instance, Palladino et al. (2020, p. 2) state that “Among the forms of prejudice-related bullying, bullying that targets the student's cultural background or identity is defined as *ethnic bullying* (McKenney et al., 2006). It includes overt (e.g. racial slurs, derogatory references to culturally specific customs etc.) and covert harassment (e.g., social exclusions) and can be extended to the student's immigrant status or the families background of immigration (Scherr & Larson, 2010).”

When studying peer aggression (or more specifically bullying) related to ethnicity, an implicit assumption is often that it is performed by members of the majority group and aimed at members of the minority group. However, peer aggression might also take place between members of different minority migration groups. Even among pupils with the same migration background, peer aggression is not uncommon and might relate to differences with regard to their acculturation orientations (e.g., some pupils with a migrant background might bully pupils of their ingroup because they are not adhering enough or too much to their heritage culture) (Mendez et al., 2012).

Research indicates that the risk of victimization among young people with an ethnic minority background, might also vary according to class- and school level variables (e.g., the degree of interculturality) (Azeredo et al., 2015), and societal forces (e.g., the strength of anti-migrant attitudes) (Carrera-Fernández et al., 2021). This might also explain why some studies actually find that victimization is more prevalent among ethnic majority compared to minority youth. For instance, Vervoort et al. (2010) found that in more ethnically diverse school classes, ethnic minorities were less victimized than were native Dutch, and bullied more. These authors suggested that in these environments, ethnic minorities might feel more confident about challenging the position of the ethnic majority group. Nikolaou et al. (2019, p. 336) also noted that it is “not uncommon for children and adolescents from minority cultural backgrounds to become bullies themselves as a response to the larger social environment, expressing intentional aggressive behavior towards native students. Although status and power are explanatory variables with respect to native students becoming bullies, for non-native students a key motive to bully native students appears to be a desire to be accepted and to be integrated into the majority group (Fandrem et al., 2010).”

Research on interventions addressing peer aggression or, more specifically bullying, has often focused on the role and the impact of school programs. It suggests that “whole school approaches”, which incorporate many different actions (with regard to prevention, detection and intervention) and involve different actors (pupils, teachers, parents, as well as actors from outside the school community) might be effective in reducing the prevalence and the impact of peer aggression and bullying (Cantone et al., 2015; Gaffney et al., 2019; Smith et al., 2004). However, several authors have stated that these programs show deficiencies and that there is still room for improvement. They mention, for instance, that many (anti-bullying) school programs operate on behaviorist theory and are unlikely to take the sociocultural contexts of bullying into account (Thomas, 2019). More concretely, they do not address the changing demographics of communities and fail to incorporate factors such as race, disability, and sexual orientation (Swearer et al., 2010). The incorporation of a factor such as race (or ethnicity or migration background) may pertain to both the “content” of the program (i.e. to what degree does it explicitly refer to this specific form of prejudice-based bullying?) as well as the target groups for selective prevention (e.g., to what degree does it consider children with another race, ethnicity or migration background as a vulnerable group for bullying/cyberbullying involvement and thus as an important group for more intensified and targeted actions?). Anti-aggression or, more specifically, anti-bullying

school programs should thus be more aligned or integrated with multicultural education programs in schools. These programs may not only focus on classroom learning approaches and the integration of multicultural content, but also on anti-racist education programs. The latter explicitly address barriers to cross-cultural friendships and empathy building. A meta-analysis of (Beelmann & Heinemann, 2014) that investigated the impact of such programs, revealed that they indeed succeed in generating a positive effect (e.g., promote empathy, perspective-taking and positive intergroup attitudes).

Furthermore, a socio-ecological perspective on peer aggression and bullying suggests that because they do not only take place in schools (but also in sports clubs, youth clubs, online contexts, ...) and are also influenced by the wider cultural and political environment (e.g. general anti-migrant attitudes that are expressed by public figures and news media) not only efforts in the school context, but also in communities and in the general society are necessary (Huang & Cornell, 2019).

As indicated above, it seems crucial to more specifically address the multicultural dimension in interventions to tackle ethnicity-related peer aggression. In addition, it might be important to look at how technologies can help to prevent, detect or report, and solve this type of aggression among young people. Research indeed suggests that information and communication technologies have not only provided new platforms to act aggressively or to bully (and thus contribute to the problem), but may also be part of the solution (Nocentini et al., 2015; Vandebosch, 2019). For instance, serious games can be used as a general prevention tool in whole school programs to make pupils aware of how they could or should react when they encounter cyberbullying as a victim or a bystander (DeSmet et al., 2018); (anonymous) online reporting systems (within a school context or on social media platforms) might lower the threshold to report instances of peer aggression (Van Royen et al., 2014); and (help) websites or smartphone buddies might provide victims with emotional support and advice (Jacobs et al., 2014; van der Zwaan et al., 2012). In addition, several studies have pointed to the potential benefits of using technologies to automatically detect and react to online hate speech (for instance, towards immigrants, people of colour, persons with a certain religious background) online (Chetty & Alathur, 2018; Chung et al., 2019; Mathew et al., 2019). Online hate speech - which is sometimes also used and stimulated by political interest groups - can be regarded as one of the cultural influences on ethnicity-based aggression by pupils.

1.1. The current study

The aim of the current study is to map the existing literature on the role of technological tools in tackling ethnicity-related aggression among young people. In this way we take into account two important societal trends (increasing ethnic diversity in populations and the rise of information and communication technologies) that have significantly impacted ethnicity-related peer aggression, and will especially look at potential technological solutions. More in particular, we aim to answer the following explorative questions by conducting a scoping review:

1. What forms of ethnicity-related peer aggression do these technological interventions try to address?
 - a. Are they used to address both online and offline peer aggression?
 - b. What are the age and ethnicity (race or migration) background of the young people targeted by the technological interventions?
 - c. Are these technologies used to tackle intergroup aggression or intragroup aggression among ethnic minorities?
2. What types of technological interventions are being used?
 - d. What specific technologies are being used?
 - e. Are they used for prevention (general or more selected prevention), detection or reporting, and intervention (and indicated actions)?

- f. What are the exact target groups of the technological intervention, and how are ethnicity-related characteristics taken into account?
- g. Are these technological interventions part of (larger) intervention programs (school-based, family, community, or online) or stand-alone tools?
- h. What are the outcomes of the technological interventions?

2. Methods

A scoping review was conducted using the five-stages protocol of Arksey and O'Malley (2005). This framework is also in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.

2.1. Eligibility criteria

In this study, we decided to include scientific studies (conference papers and published papers) that mainly focused on technological interventions to prevent, detect or solve ethnicity-related aggression (including bullying) among young people (children, adolescents, young adults). The term "technological" was interpreted broadly, and could refer to tools (e.g., games, apps, websites, video clips) that were specifically created for general prevention or targeted actions with regard to ethnicity-related online or offline aggression and bullying, as well as to tools developed or implemented by platforms (e.g., Social Networking Sites) where cyberbullying is likely to take place (e.g., privacy settings, reporting buttons, etc.) (Vandebosch, 2019). We used a similar broad approach to define "ethnicity-related peer aggression": in this study we used the term to refer to all forms of aggression in which ethnic minority youth (using indicators such as "race" or "migration status") was involved (as a victim, perpetrator or bystander). It was thus not limited to (prejudice-based) aggression from members of other (minority or majority) groups aimed at them. Since bullying and cyberbullying are important forms of aggression, also publications that specifically focused on technological interventions to address ethnicity-related "bullying" were included.

The following studies were excluded: studies that mainly focused on the description of ethnicity-related aggression and did not (or very briefly) refer to the role of technological tools in addressing this problem, as well as studies that mainly focused on other specific forms of aggression (i.e. in the context of romantic relationships).

Only studies in English and published between 2005 and 2020 were included. We limited our search to this period because articles published before 2005, although few in number, presented technologies which, due to a high pace of technology development, may no longer be relevant today.

2.2. Search

To conduct our scoping review we defined keywords referring to migration ("Immigrant*" OR "ethnically diverse" OR "racial/ethnic" OR "ethnic" OR "racial" OR "migrant" OR "minority" OR "race"), traditional and cyberbullying (Bullying OR aggression OR violence OR peer-aggression OR cyberbullying OR cyber bullying OR cyber-bullying OR electronic bullying OR digital bullying OR online bullying OR internet bullying OR cybervictim* OR cyber-victim* OR cyber victim* OR online victim* OR cyber-aggres* OR cyberaggres* OR cyber aggres* OR online aggres* OR cyber-perpetrat* OR cyberperpetrat* OR cyber perpetrat* OR online perpetrat* OR online hate OR cyber racism OR cyber-racism OR online racism OR online prejudice OR cyber-prejudice OR cyber prejudice OR online harassment OR cyber harassment OR cyber-harassment), intervention (detection OR prevention OR intervention OR program OR tackling OR combatting OR counter-speech OR counter-narrative OR safety), technology (technolog* OR ICT OR game OR internet OR virtual OR helper programs OR online OR virtual learning

environment OR application OR simulation OR online OR social media OR automatic OR robots OR chatbots OR software OR Google OR Facebook OR Instagram OR Snapchat OR Whatsapp OR automatic detection OR AI OR artificial intelligence OR smartphone OR industry OR computer OR design), and young people (teens OR young* OR adolescents OR students OR pupils).

2.3. Information sources

This combined search was conducted in the following databases: PSYCHinfo, ERIC, PUBMED, Scopus, Medline, Web of Science (Science Citation Index Expanded, SocialSciences Citation Index, Arts & Humanities Citation Index, Conference Proceedings Citation Index- Science, Conference Proceedings Citation Index – Social Science & Humanities), Social Services Abstracts, Sociological Abstracts, and Communication Abstracts. The search was limited to title, abstracts and keywords and covered the period from 2005 to 2020.

2.4. Study selection and abstraction

The scoping review literature search was completed in March 2021. All search results were imported in Rayyan, (Demmrich & Akgül, 2020) a free web and mobile app, that helps expedite the initial screening of titles and abstracts for systematic reviews (Ouzzani et al., 2016). In order to assess inter-rater reliability two reviewers independently decided upon the eligibility of the articles. The agreement rate was high (96.1 %). The conflicts were discussed until full consensus was reached. Eligibility of the full-texts was again assessed based on the inclusion criteria.

For all of the included papers, the following data items were extracted:

1. Publication characteristics
 - a. Title
 - b. Year of publication
 - c. Type of article
2. Target group information
 - a. Age
 - b. Ethnicity/Race/Migration background
 - c. Country of study/residence
3. Type of ethnicity-related aggression
 - a. Type of peer aggression (general aggression or violence, bullying or cyberbullying, ethnicity-based aggression or bullying)
 - b. Intergroup or intragroup, online or offline peer aggression
4. Type of digital technology that is reported on
 - a. Specific technology (apps, games, social media platforms, videos, etc.)
 - b. Is the technology used to support: (general or targeted) prevention, detection or reporting, intervention (indicated actions when the aggression has already taken place).
 - c. What are the specific goals or aims of the technological intervention?
 - d. What are the exact target groups of the technological intervention, and how are their ethnicity-related characteristics taken into account?
 - e. Is the technological intervention part of a school-, family-, or community program? (Aimed at tackling aggression (or diverse risk behaviors) or at promoting multicultural education?)
 - f. What are the outcomes of the technological interventions?

2.5. Data synthesis

Studies were grouped in three large categories of technological interventions with regard to ethnicity-related peer aggression. The first group of studies focuses on intergroup aggression (including bullying and cyberbullying), and the way technologies could help to prevent or

address this type of behavior (e.g., by increasing empathy and theory of mind abilities, fostering intergroup communication and cohesion, and/or promoting positive bystandership). The second group of studies focuses on the detection of intergroup aggression, both in school as well as in online contexts, by means of technologies. The third group of studies focuses on (family and community) interventions specifically targeting ethnic minority youth, to prevent or diminish the impact of aggression involvement and other health-related risk behaviors.

3. Results

Of the 562 articles identified, 390 were assessed for eligibility. The final sample consisted of 14 peer-reviewed papers that met the inclusion criteria. Four of them discussed different aspects of the same intervention programme. The earliest study selected in our scoping review was published in 2010, and half of the papers were published after 2017. The flow of the paper selection is schematically displayed in a PRISMA diagram (Fig. 1).

Overall, the selected papers cover 3 types of ethnicity-related peer aggression among young people, as shown in Table 1. Almost half of the papers (43 %) addresses general aggression or violence. Four studies (29 %) look specifically at bullying (one paper) and cyberbullying (3 papers), while one study considers both online and offline bullying (7 %). The rest of selected research (21 %) refers to ethnicity-based aggression or bullying (3 papers).

Table 2 provides information on the young people with an ethnic minority background covered in the selected papers. Half of the studies present interventions delivered in USA, targeted population being Latino teenagers (57 %), as well as African-American, Hispanic and Asian adolescents (43 %). Four other papers address and describe interventions on various ethnic minorities (migrants, Thai Muslim and Thai Buddhist, Roma, Muslim and Christian groups) carried out in Spain, Thailand, Hungary, and Australia. Two papers do not report the countries in which digital interventions were delivered.

All the papers focus on young people, but the age range used to define the target group varies (between 12 and 26 years old), or was not specified at all. This is particularly the case in two studies that deal with cyberbullying and where the information on the age was difficult to obtain. In the other papers, instead of exact age, the authors use the terms “adolescents”, “school children”, or “undergraduate and graduate students” to describe the young target population.

The majority of the studies (71 %) focus on intergroup aggression, while the four studies on the Adelante-program (29 %), focus on intragroup peer aggression among the Latino ethnic minority.

Details of the included technologies are available in Table 3. In the included articles, we identified different roles of the digital technological interventions addressing ethnicity-related peer aggression. These technologies are summarized in three categories: aimed at prevention, detection, and handling of ethnicity-related peer aggression among young people.

3.1. Preventing and addressing intergroup peer aggression

Five publications describe interventions that aim to prevent or address intergroup peer aggression. Cosmou et al. (2019), for instance, describe the theoretical rationale and a proposal for a randomized controlled trial for a computerized, gamified intervention training aimed at improving the social functioning of adolescents and young adults through the promotion of allocentric visual perspective-taking. More concretely they suggest developing an online tool that shows an avatar standing in a room, with a number of disks projected on the wall (s). The participant (or “user” or “gamer”) will then be encouraged to report the number of disks the avatar can see (which will differ from the number of disks they themselves can observe). The intervention would ideally take place across different sessions, and to encourage that, several gamification elements could be used (e.g. points and difficulty

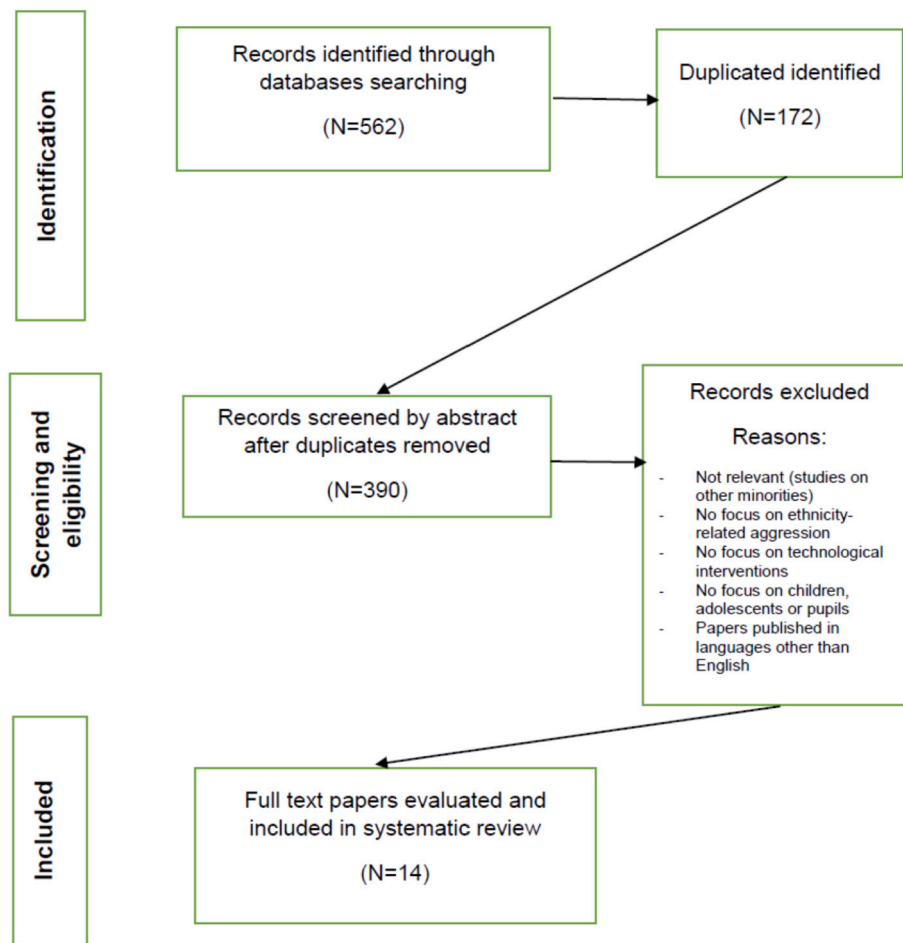


Fig. 1. Flow diagram of paper selection process.

Table 1

Types of ethnicity-related peer aggression addressed by the technological interventions.

Publication title references	Specificity of ethnicity-related peer aggression
Andrade et al. (2015)	General aggression or violence
Andrade, Evans, Barrett, Edberg, and Cleary (2018)	General aggression or violence
Andrade, Evans, Edberg, Cleary, et al. (2018)	General aggression or violence
Evans et al. (2019)	General aggression or violence
Lewis-Harris (2010)	General aggression or violence
Santisteban et al. (2016)	General aggression or violence
Alvarez-Bermejo et al. (2016)	Bullying and Cyberbullying
Cosmoiu et al. (2019)	Bullying
Kumar et al. (2019)	Cyberbullying
Dinakar et al. (2012)	Cyberbullying
Semangern et al. (2019)	Cyberbullying
Santacrose et al. (2019)	Ethnicity-based aggression or bullying
Simonovits et al. (2017)	Ethnicity-based aggression or bullying
White et al. (2015)	Ethnicity-based aggression or bullying

levels, feedback and badges, avatars and storylines, and leaderboards). The authors suggest that priming perspective-taking and allocentric biases could reduce prejudice, bias, stigma and bullying by increasing theory of mind and empathetic abilities. They think the intervention could therefore be an important asset in schools. It could not only benefit marginalized groups, but also the social climate of the class or school as a whole. Furthermore, they expect that this intervention could also reduce self-focused attention and consequently state anxiety

experienced in social situations (and related perceived ostracism and subsequent aggression). To facilitate the adoption in schools, the intervention could be developed in a mHealth format (allowing students to enter the intervention through their mobile phone). To increase perspective taking, VR (virtual reality) could be used.

The article of Simonovits et al. (2017) describes a RCT study that measured the effect of a single online role playing game that promoted perspective taking (i.e. being in a position of a Roma person in Hungary), on prejudice towards this specific minority group (as well as other social groups) and political preferences (i.e. intention to vote for extreme right). Measures were taken right after playing the game and one month later among respectively 579 and 385 respondents, aged 24–26, of mostly non-Roma origin. The study found that participation in the game led to a reduction in anti-Roma sentiment that persisted for at least one month. The effect also spilled over to attitudes towards refugees. Furthermore, the intervention led to a substantial reduction in voting intentions for the racist far right party. The study did not explicitly measure the impact of the intervention on intergroup aggression, but the authors implicitly suggest that the reduction of prejudice might also lead to less intergroup aggression (as “intergroup prejudice has been recognized as one of the most important social problems, leading to discrimination, inequality, and violence in countries across the world”).

The third study in this category is the one conducted by Santacrose et al. (2019). These authors tested the effect of a 20 min standalone online video (“Intervene”) on college students’ intentions to intervene on behalf of others in multiple problematic situations, such as racial bias, an alcohol emergency, emotional distress, hazing, intimate partner violence, sexual assault, and sexual harassment. The script for the video

Table 2
Young people with an ethnic minority background targeted by the technological interventions.

Publication title References	Target groups	Country of study/ residence	Age	Inter-/ Intragroup peer aggression
Alvarez-Bermejo et al. (2016)	Foreign students	Spain	Youth under 16 years	Intergroup
Andrade, Evans, Edberg, Cleary, et al. (2018)	Latino teenagers	USA	12–19 years	Intragroup
Andrade et al. (2015)	Latino teenagers	USA	14–18 years	Intragroup
Andrade, Evans, Barrett, Cleary, et al. (2018); Andrade, Evans, Barrett, Edberg, and Cleary (2018)	Latino teenagers	USA	12–19 years	Intragroup
Cosmoiu et al. (2019)	Various vulnerable groups	Not specified	15–25 years	Intergroup
Dinakar et al. (2012)	African-American, Hispanic and Asian minorities	Not specified	Adolescents and school children	Intergroup
Evans et al. (2019)	Latino and immigrant adolescents	USA	12–17 years	Intragroup
Kumar et al. (2019)	African-American	USA	Not specified	Intergroup
Lewis-Harris (2010)	African American students, European American students, and "newcomers" (new immigrants)	USA	7th and 8th grade students	Intergroup
Santacrose et al. (2019)	Not specified	Not specified	Undergraduate and graduate students	Intergroup
Santisteban et al. (2016)	Hispanic and Black Non-Hispanic	USA	12 to 15 years	Intergroup
Semangern et al. (2019)	Thai Muslim and Thai Buddhist groups	Thailand	Not specified	Intergroup
Simonovits et al. (2017)	Roma minority	Hungary	Young adults between 24 and 26 years old	Intergroup
White et al. (2015)	Muslim and Christian students	Australia	High school students	Intergroup

was informed by Bandura's social cognitive theory and the pro-social bystander behavior, and showed college-aged students going through a set of steps when deciding if and how to intervene. The overall goal of *Intervene* was to "portray concerns for others and willingness to intervene as socially normative responses to problematic situations". The intervention was tested in a RCT among undergraduate and graduate students of a US University (with a mixed gender and racial/ethnic background). The control group completed a baseline online survey and a follow-up survey 4 weeks later. The intervention group completed a

pre-video and a post-video survey online (in the same session), and a follow-up survey 4 weeks later. The results of the RCT showed that the video was effective at increasing students' self-reported intentions to intervene in all seven situations portrayed in the video immediately after viewing. For four situations (racial bias, hazing, intimate partner violence, and sexual harassment) the effects were still observable after 4 weeks. The video shows positive bystanders in different situations of aggression and in a case of "racial bias" (i.e. a scenario displaying a group of four female friends waiting in line to a party; when they reach the front door only the white women are invited inside and the black woman is denied access).

In a fourth publication (by Lewis-Harris, 2010), videos were also reported as a digital tool used to prevent ethnicity-related peer aggression. This time, however, they were part of a larger project that aimed to reduce student aggression among multiple nationalities. The project consisted of a wide range of curriculum activities (combining the Center for Human Origin and Cultural Diversity's (CHOCD) applied anthropology and cultural awareness curriculum in conjunction with the YWCA's conflict management program). A total of 24 coordinated classes were taught to 125 8th grade students in a school in South Saint Louis (USA) that was attended by 21 nationalities (among which many "newcomers"). The aim of the program was to: build student self-esteem, help students develop empathy and tolerance, help students to learn and use conflict management skills and to establish a student cohort of "cultural ambassadors" to teach other students these skills. The program addressed topics such as human origin theory; explored human universalities, physical commonalities found among all people on earth; and explored biological diversity or the concept of race. It also paid attention to the concept of culture, and explicitly compared components such as: belief systems, gender roles, beauty, rites of passage (e.g. by showing videos), clothing styles, language use and art styles. In this way the program developers aimed to help students and teachers see commonalities and build bridges. The program was not quantitatively evaluated (for appreciation by and impact on teachers and students). Lewis-Harris rather presents a qualitative evaluation based on her observations and discussions with students and teachers.

The fifth and final article (by White et al., 2015) also focuses on the promotion of intergroup harmony, by reducing intergroup bias. More in particular it describes how electronic communication tools allow pupils from physically segregated minority and majority groups to synchronously interact online. The authors present their DIEC ("Dual Identity, Electronic Contact") Program, that engaged 92 Muslim high-school students and 96 Christian students (attending segregated schools) in a structured and synchronous dialogue over 50 min online sessions (via a text-only chat forum) over eight consecutive weeks. The program was based on Gaertner and Dovidio's (2005) Dual Identity Recategorization theory (where both similarities and differences between groups are discussed) and Allport's (1954) Contact Hypothesis (including the facilitating conditions: equal status; common goals; cooperation and support from authority). The programme assessed changes in out-group attitudes longitudinally across 4 waves (pretest, two-weeks posttest, 6 months posttest and 12 months posttest) and observed a bias reduction from wave 1 to wave 4. The authors also studied the role of several mediating (e.g. intergroup anxiety) and moderating (e.g. ingroup identification, outgroup friendship). Finally, they warn of how and when E-contact can go wrong and lead to negative interactions (e.g. facilitated by factors inherent in the online environment, such as the more anonymous nature or the lack of supervision). They also suggest a continuum of contact strategies (from distal forms of contact, to e-contact, to direct (face-to-face) contact), and mention how e-contact itself can take different forms (e.g. also include audio and video).

3.2. Detecting intergroup peer aggression

The second group of studies focuses on the detection of (intergroup) bullying and cyberbullying among young people. The article of Alvarez-

Table 3
Types of technological interventions.

Publication title References	Specific technology	Aims of technology	Target groups	Level of intervention	Outcomes
Alvarez-Bermejo et al. (2016)	A cell phone app (PREVER, Prevention of Racial Stigma) combined with an interactive augmented reality game	To detect racial-based bullying (online and offline)	Native and multiracial students	School intervention (stand-alone)	Discrimination for racial stigma was detected within the class group.
Andrade, Evans, Edberg, Cleary, et al. (2018)	Use of social media platforms and websites to promote <i>Adelante</i> social marketing campaign messages	To reach Latino immigrant youth to prevent risk behaviors	Latino immigrant youth	Part of a community intervention	Formative study resulting in youth-guided selection of campaign features and engagement strategies, including message/visual content, stylistic elements, and a mixed language approach. The aim of the campaign is to prevent risk behaviors (including violence).
Andrade et al. (2015)	An Entertainment-Education (E-E) intervention: a 6-episode web novela (part of the <i>Adelante</i> program)	To reach Latino immigrant youth and disseminate positive and key prevention messages.	Latino immigrant teens	Part of a community intervention	Formative study (conducted in and outside school) that provides scenarios and characters for web novela aiming at increasing online engagement of Latino teens in the <i>Adelante</i> program, and disseminating prevention messages about topics such as violence.
Andrade, Evans, Barrett, Cleary, et al. (2018); Andrade, Evans, Barrett, Edberg, and Cleary (2018)	<i>Adelante</i> Facebook fan page	To increase engagement within <i>Adelante</i> program aimed at supporting youth immigrants	Latino immigrant teens	Part of a community intervention	The findings reveal that social media represents a promising strategy to reach young immigrants. However, the <i>Adelante</i> Facebook fan page only encourages passive consumption of content and tends to decrease users' engagement.
Cosmoiu et al. (2019)	Idea for an online game aimed to train participants to selectively attend to the visual perspective of an animated avatar, instead of their own	To improve the social functioning and anxiety symptomatology of adolescents and young adults through the promotion of allocentric visual perspective-taking.	Adolescents and young adults	Not specified	Priming perspective-taking and allocentric biases can reduce prejudice, bias, stigma and bullying by increasing theory of mind and empathic abilities. By training visual perspective-taking, attention will be implicitly directed towards the other, thus reducing self-focused attention and, consequently, state anxiety experienced in social situations by adolescents and young adults.
Dinakar et al. (2012)	State-of-the-art natural language processing and <i>AnalogySpace</i> common sense reasoning technique for cyberbullying detection. Connected to this: an "air traffic control"-like dashboard for moderators and social networking sites, targeted educational material for victims, reflective interfaces (for potential perpetrators)	Cyberbullying detection on Youtube and Formsprings Cyberbullying intervention by moderators. Supporting cyberbullying victims. Preventing people from becoming cyberbullies. Cyberbullying prevention by exposing (potential) perpetrators to reflective interfaces.	Racial minorities (African-American, Hispanic and Asian) among other target groups	Online intervention	The technology identifies 80 % of potentially cyberbullying messages. Adding intelligence to an interactive interface can make social network applications more effective in maintaining positive social norms.
Evans et al. (2019)	Social marketing campaign (<i>Adelante</i>) using Web, video and social media channels (Facebook, Twitter and Instagram)	To promote positive youth development and to reduce violence risk behaviors	Latino immigrant teens	Part of a community intervention	The findings reveal that the pro-violence attitude improved as a function of campaign exposure.
Kumar et al. (2019)	Machine learning algorithms: k-Nearest Neighbor, Random Forests, Sequential Minimal Optimization, Naïve Bayes for analyzing 7962 comments from around 60 YouTube videos	To detect the presence or absence of cyberbullying in YouTube video comments.	African American	Online intervention	The highest accuracy (83 %) is achieved using k-Nearest Neighbor, followed by Random Forest, Naïve Bayes and Sequential Minimal Optimization technique.
Lewis-Harris (2010)	Short video on rite the passage and tattooing in Papua New Guinea and Samoa (ethnicities not represented at school)	The project combines applied anthropology, cultural awareness curriculum and technology to reduce student	African American students, European American students, and "newcomers" (new immigrants and political	Part of a school intervention	The researchers suggest (based on a qualitative evaluation) that the program succeeded in closing down the gap between "us" and "them" and expanded students'

(continued on next page)

Table 3 (continued)

Publication title References	Specific technology	Aims of technology	Target groups	Level of intervention	Outcomes
Santacrose et al. (2019)	A 20-min video entitled <i>Intervene</i> , available online for free, which provides examples of pro-social behavior in problematic situations (including racial bias) within interpersonal relationships.	aggression among multiple nationalities. To promote pro-social behavior by increasing the likelihood that college students will increasingly engage to help others in situations implying racial bias issues.	refugees) USA Not specified	School intervention (stand-alone)	(and teachers') knowledge of world culture. By watching the <i>Intervene</i> video, students' self-reported likelihood to intervene in racial bias scenarios increases immediately post-viewing as well as after 4 weeks. Female students were more likely to intervene than males were.
Santesteban et al. (2016)	Technology-assisted intervention (Immediate Computer Assisted CIFFTA - Culturally Informed and Flexible Family-Based Treatment for Adolescents) for minority adolescents and their families	To treat behavior problems and family conflict in young minority children and their families.	Hispanic and Black Non-Hispanic families that reported at least two areas of behavioral or mental health problems	Family intervention	Positive effects on mitigating behavioral problems among adolescents using a computer delivered intervention that mimics face-to-face psycho-educational sessions; positive effects on family cohesion; no effects on parenting style and family conflict.
Semangern et al. (2019)	Machine learning algorithms to classify textual messages and a visualization tool that shows how often an individual experienced attacks over time.	To identify the risk of cyberbullying on social media (here Twitter).	Thai Muslim and Thai Buddhist groups (among others)	Online intervention	The method and accompanying tool can help to monitor the potential risk of cyberbullying for an individual on social media (here Twitter).
Simonovits et al. (2017)	An online role-playing game, which reproduces a story and facilitates through some interactive features the perspective taking of a member from an ethnic minority group (Roma person).	To reduce prejudice against the Roma minority.	Participants of the Hungarian Life Course Survey (HLCS) – 579 individuals in the first wave and 385 in the follow-up survey	Online intervention	Participation in the game had a positive effect on people's attitudes towards the Roma minority.
White et al. (2015)	Online interaction via chat between physically segregated groups within the DIEC (Dual Identity, Electronics Contact) Program	To improve intergroup relations and reduce bias	Muslim and Christian high-school pupils	Stand-alone (inter-) school intervention	Example of a best-practice E-contact framework provided: Dual-Identity, Electronic-Contact' (DIEC) programme. The programme observed a bias reduction from the first to the last wave.

Bermejo et al. (2016) describes a “system to detect racial-based bullying through gamification”. More concretely, the researchers developed a free app (PREVER, Prevention of Racial Stigma), that students could download on their mobile phones. The app represented an interactive augmented reality game that could be played within the class context. Students were, for instance, asked by the app to perform a specific task with a group of classmates (e.g. organize a football game) and could consequently allow or exclude specific classmates with a movement of the phone. Based on these inclusion and exclusion data, a sociogram of interactions within the class group could be created, allowing teachers to detect potential discrimination or bullying (of local youth under 16 towards foreign-born peers). The PREVER-app was tested among 151 students from five schools in Spain that were selected because they had multiracial populations and reported “co-existing problems”. The authors suggest that the analysis of interactions indeed revealed that students were often clustered on the basis of their origin. It is not clear, however, why the authors believe these (game-based) data on users interactions help to detect potential (real-life) discrimination or bullying of local youth under 16 towards foreign-born peers (i.e. the main goal the system was designed for).

The three other studies in this category focus on the automatic detection of cyberbullying related to race on social media platforms. The study of Semangern et al. (2019) developed and tested several machine learning algorithms to classify textual messages (expressed on Twitter in the Thai context) into four cyberbullying categories, i.e. race and religion, sexual harassment, insult and threat, and intelligence, appearance and social status. The authors also describe a supporting visualization tool that shows how often a specific individual experienced (which types of) attacks over time. The method and tool are regarded as a means to

identify the “risk” of cyberbullying (as contextual elements, such as the power imbalance between the perpetrator and the victim, may actually determine whether these acts constitute real cyberbullying or not). Furthermore, the algorithms do not seem to explicitly take into account the perpetrator and the victim's group of belonging or age, making it unclear whether potential racial or religious forms of cyberbullying are performed by majority or minority groups and aimed at minority or majority groups, are taking place between different minority groups or even within a minority group, and whether the cyberbullying actually involves “young people”. In addition, it is unclear whether they succeed in taking into account the relationship between perpetrators and victims (do they know each other in real life or not, and is their relationship characterized by a power imbalance or not?).

The study of Kumar et al. (2019) also tested several machine learning strategies (i.e. Random Forest, k-Nearest Neighbor, Sequential Machine Optimization, and Naive Bayes) in order to detect the presence or absence of cyberbullying in YouTube video comments. The data were gathered from YouTube videos involving sensitive topics like race, culture, gender, sexuality and physical attributes. Again, it can be questioned whether screening comments alone, suffices to really detect (racial or cultural) “cyberbullying” (as the context in which these verbal acts take place are important to really determine whether the act constitutes cyberbullying: i.e. was the comment intended to hurt, part of a repetitive pattern and targeting someone with less power), between young people belonging to different (majority or minority) groups.

The article of Dinakar et al. (2012) does not only describe different types of methods to automatically detect explicit and more implicit forms of cyberbullying (including racial and ethnic slurs) on platforms such as YouTube but also on Formsprings (a social networking site that

was popular with teenagers). These authors also go one step further and suggest that the detection software can also provide a basis for intervention. They propose, for instance, the development of an “air traffic control”-like dashboard for moderators of social networking sites. This dashboard could alert them about large-scale outbreaks of cyberbullying and help them prioritize their actions. On the side of the users of social networking sites, “reflective interfaces” could make people think twice before actually posting a cyberbullying post. Victims of cyberbullying, on the other hand, could be provided with educational materials that inform them about how to cope with the situations and be directed to others who can offer them emotional support.

3.3. Interventions focusing on ethnic minorities youth

With regard to interventions focusing on peer aggression among young people with an ethnic minority background, five studies address and discuss outcomes of various approaches. Four of them present a series of innovative strategies developed as part of a community-based youth development program called *Adelante* that seeks to increase engagement and reduce risk behaviors (prevent substance abuse, sexual risk, and interpersonal violence) among Latino youth living near Washington, DC.

The first study (Andrade et al., 2015) presents and discusses an Entertainment-education (E-E) intervention developed within the *Adelante* branding strategy. The intervention consists of filming and online streaming of an innovative 6-episode webnovela titled Victor and Erika, which conveys violence prevention messages targeting Latino immigrant youth. The Entertainment-education (E-E) approach has two dimensions: on the one hand, it promotes the values of the *Adelante* branding strategy; on the other hand, it engages Latino youth in the webnovela production process and, through the content of the script, disseminates positive and key prevention messages. The authors of the study point out that the strategy of online engagement of Latino immigrant youth through webnovelas can be very successful in promoting prevention topics. Being online, it can address a large number of young people. The video format of the intervention also makes it easier to deliver key messages for young people. Besides this, a webnovela represents a cultural product close to Latino culture, which brings the delivery of messages closer to the Latino immigrant audience.

The second study (Andrade, Evans, Barrett, Cleary, et al., 2018) presents the formative research process for a social marketing campaign that includes digital technologies to reach immigrant Latino youth with prevention messaging. Online access (website, blogs, YouTube) and use of social media (Facebook, Twitter, Instagram) were used both as a dissemination channel and as a strategy to boost online engagement. The authors note that the social campaign was more successful in social media, as young people were less likely to regularly access the program website. As campaign components, *Adelante* included text messaging with prevention messages, contests on social media, video-based dramatization including personal success stories of immigrant youth, and blog posts. Using visual imagery, multimedia and interactive formats, the authors conclude that digital networks represent an efficient intervention strategy to approach ‘hard-to-reach’ immigrant youth in order to engage them in health- and behavior-related programs.

An example of how social media can be used as a strategy for reaching young immigrants with prevention messaging is provided by Andrade, Evans, Barrett, Edberg, and Cleary (2018) in their study. Within the same *Adelante* program, the authors analyze the extent to which *Adelante* Facebook page can be used to reach people and boost engagement among young immigrants. Further, they identified and tested which post content leads to a greater impact. The target population represented fans of the *Adelante* Facebook page, which mainly included Latino immigrant adolescents aged 12 to 19 years. Posting activity on this page was monitored for one year (September 2015 to September 2016) and comprised disseminating information related to events, educational and health resources, interpersonal violence

prevention messages, etc. To increase interaction, the social marketing campaign used the *Adelante* Facebook fan page to post videos, links to blogs, success stories, websites, and other resources. The authors then used Facebook Insights metrics to measure the number of page fans, number of posts, as well as the number of those who posted, commented, or shared content. The findings of this study reveal that social media represents a promising strategy to reach youth immigrants. However, the authors notice that Facebook page fans tend to use this page passively, preferring to interact with posts through clicks and likes rather than commenting or sharing content with their peers. The results also show that preventing messaging regarding violence-bullying was statistically significant associated with users' engagement, while the correlation between violence-fighting topics and post engagement was not statistically significant. Further, the post engagement was higher when posts were either bilingual or in Spanish, or included photos.

The fourth study from this category (Evans et al., 2019), which also relates to the *Adelante* program, examines the link between self-reported exposure to the *Adelante* social campaign and various positive youth development outcomes, including pro-violence attitude of Latino youth immigrants. The social campaign had been developed as an intervention for reducing risk behaviors among Latino youth near Washington, DC and included both outdoor advertising and web, videos, and social media channels (Facebook and Instagram) to promote preventing messaging. To assess the link between exposure to campaign and change in outcomes, data were collected in three waves over 2 years on the intervention and a similar comparison community. The results confirm former findings that the *Adelante* social marketing campaign increases knowledge and awareness of the branded messages among Latino immigrant youth. In addition, the findings reveal a positive relationship between exposure and pro-violence attitude: the greater the self-reported exposure to campaign, the greater improvement in the pro-violence attitude.

The last study (Santisteban et al., 2016) from this category investigates the efficacy of a technology assisted intervention that applies at family level. The aim of this digital intervention is to treat behavioral problems and family conflict in young Hispanic adolescents and their families, by offering Computer Assisted CIFFTA (Culturally Informed and Flexible Family-Based Treatment for Adolescents), which traditionally takes place offline, in an office setting. In a randomized clinical trial, families assigned to an Immediate Computer Assisted CIFFTA (treatment group) have been compared to families assigned to Delayed Computer Assisted CIFFTA (control group). The results reveal that immediate CIFFTA led to fewer behavior problems, less socialized aggression, fewer youth self-reports externalizing problems, and greater gains in parent-adolescent cohesion than delayed CIFFTA. Overall, this study shows that behavior problems, such as violence or bullying, can be corrected by a computer delivered intervention that mimics face-to-face psycho-educational sessions. The advantage of a computer-assisted intervention is that it allows the parent to first become familiar with the material and then to guide the interaction with the child based on the material provided digitally. Despite the success of such an intervention, the authors highlight that a successful intervention should combine both forms of counseling: face-to-face and computer-assisted.

4. Discussion

This is the first scoping review that examines the role of technological tools in tackling ethnicity-related peer aggression among young people. We used the term “ethnicity-related aggression” to not only refer to ethnic minority youth's involvement (as a victim, perpetrator or bystander) in intergroup aggression, but also in intragroup peer aggression. We furthermore included all forms of peer aggression: general or specific (i.e. bullying), taking place offline or online (e.g. on social media), and explicitly referring to the victims' perceived or real belonging to an ethnic group (i.e. prejudice-based aggression or bullying) or not. In total, we identified 14 studies assessing the role of

technological tools in the prevention, detection, and solution of ethnicity-related peer aggression.

We observed that many studies were not very clear about the exact aggression behaviors they were aiming to tackle (e.g. inter- or intra group, prejudice-based or not). For instance, in the publication on the Adelante intervention, reference was made to Latino immigrants' experiences with violence (such as gang violence, bullying), without going into detail about the type of bullying that was addressed. Moreover, in the publications on "cyberbullying", some authors appeared to use this term to actually refer to online aggression in general, not taking the criteria of harmful intent, repetition and power imbalance into account. Future studies should try to be more explicit about the exact type of behaviors they would like to prevent, detect or handle, as this will help to set concrete goals for the intervention and will increase the comparability between studies.

With regard to the ethnic minorities that were studied, we observed that most of the selected publications focused on the situation in the United States (with, for instance, Latino and Black "racial minorities" and "newcomers") and in Europe (e.g., immigrants in countries such as Spain, or indigenous ethnic minorities such as Roma in Hungary). In the publications on online detection of racial, ethnic, cultural "slurs" it was not clear which ethnic groups could be the potential target (or source) of these expressions. The studies on the Adelante intervention demonstrate that it is important to take into account the specific cultural background (e.g., language, values, symbols, ...) of the ethnic groups involved when designing interventions, as they might influence their effectiveness. Hence, we would like to recommend future studies to be clear about the exact target group for which the technological intervention was developed (and supposed or proven to be efficient in which context).

The digital technologies presented in the selected articles included a wide range of tools: online games (Alvarez-Bermejo et al. (2016); Cosmoiu et al., 2019; Simonovits et al., 2017), videos (Andrade et al., 2015; Lewis-Harris, 2010; Santacrose et al., 2019), social media (Andrade, Evans, Barrett, Cleary, et al., 2018; Andrade, Evans, Barrett, Edberg, & Cleary, 2018; Dinakar et al., 2012; Evans et al., 2019; Kumar et al., 2019), and chat-based programmes (White et al., 2015), which all could be consulted or used via mobile phones or computers. These tools could be stand-alone tools (cfr. The videos promoting positive bystander behaviors) or part of a larger intervention programme (cfr. The Adelante intervention). Some other papers did not focus on technologies that could be directly used by the target groups, but instead on (back-end) machine learning algorithms aimed at identifying and detecting cyberbullying (Kumar et al., 2019; Semangern et al., 2019).

We note that the type of technology implemented differs depending on the type of ethnicity-related aggression targeted. In the case of ethnicity-related *cyberbullying*, all the technologies created were based on natural language processing (Dinakar et al., 2012) and machine learning techniques (Kumar et al., 2019; Semangern et al., 2019) and aimed only at *detecting* forms of cyberbullying displayed on different online platforms (YouTube, Twitter, Formsprings). But to prevent and detect *bullying*, online gaming-based technologies were suggested (Alvarez-Bermejo et al. (2016); Cosmoiu et al., 2019). Peer aggression manifested through *violence*, *fighting* or *aggression* was addressed, either through social media campaigns (Andrade, Evans, Barrett, Cleary, et al., 2018; Andrade, Evans, Barrett, Edberg, & Cleary, 2018; Evans et al., 2019) or videos (Andrade et al., 2015; Lewis-Harris, 2010) that are designed to convey certain awareness messages about violence and cultural differences. Compared to other forms of aggression, the range of digital tools aimed to tackle *intergroup bias* (based on race or ethnicity) is more diverse. In this case, with a predominantly preventive role, technological interventions were carried out either through online games (Simonovits et al., 2017), videos (Santacrose et al., 2019) or chat-based programmes (White et al., 2015).

These technologies were thought to be particularly effective because of the following factors: First, with the proliferation of Social Networking Sites and the expansion of Information and Communication

Technologies, online communication is largely used and increasingly preferred by young people. Second, compared to offline tools, digital technologies seem to be more effective in approaching hard-to-reach people, such as ethnic minorities. Particularly in health and risk behavior interventions, young people with an ethnic minority background are difficult to reach and engage, which explains why digital technologies seem to be the handiest, inexpensive, and direct ways to connect and deliver prevention messages. Third, digital technologies have the advantage that they can be linguistically and culturally adapted to the profile of the target ethnic group, which enhances the overall communication.

Games were one specific category of technological tools that were quite often used to tackle ethnicity-related aggression (cfr. the perspective taking game, the Roma game and the mobile phone game with augmented reality). Compared to other digital tools, online games have several advantages. Firstly, they allow young people to learn about issues in a fun way and in a safe environment. Furthermore, they promote interaction rather than passive participation and drive engagement through different challenges, different levels, and adapted feedback. Moreover, online games can simulate daily life experiences and mimic one's own will and actions (e.g. by using an avatar). However, when the online game is used as a means of interaction in a real physical environment (as in the study by Alvarez-Bermejo et al. (2016), when students play online, while also interacting in a real classroom context), the safe haven that is offered by other (purely fictitious) game environments, may no longer be guaranteed. In fact, because the game challenges ask players to select or exclude other players (who are also "present" in their offline environment), these online behaviors might not only represent players' "normal" interaction choices, but also strengthen them.

Videos represent another category of digital tools used to mitigate ethnicity-related peer aggression. They present visual examples of real-life situations and are an increasingly popular product used by the younger generation. Actually, using educational films has a long tradition in peer aggression prevention and has been utilized in many well-known programmes (Alsaker & Nägele, 2008). Videos can be effective means to change behaviors through "modeling". They can, for instance, show bystanders how to act correctly in certain situations (as in Santacrose et al., 2019). Even fictional stories that entertain, can also educate at the same time (Entertainment-education approach) as shown with the Adelante program (Andrade et al., 2015). Documentary videos that incorporate cultural elements specific to certain nations can also be used in order to show what it means to live in a different culture, creating thus a platform for discussions about similarities and differences between groups of people with various migrant backgrounds (Lewis-Harris, 2010).

Chat-based programmes were seen as an ideal means to stimulate safe conversations between students who are physically separated, hence also allowing contact between members of different groups and cultures (White et al., 2015). The authors mentioned, however, that it was important to structure these chat conversations (i.e. organize supervision, provide tasks that focus on collaboration), as they might otherwise also lead to negative interactions between members of different cultural groups. Computers appeared to be technologies that could support a Culturally Informed and Flexible Family-Based Treatment for Adolescents (CIFTA), by providing the participating families psychoeducational videos (and links to several external websites) and ways to communicate privately with their therapist, in-between face-to-face sessions (Santisteban et al., 2016).

Social media sites are increasingly preferred networking platforms for young people. They allow for community building and represent an efficient strategy to approach 'hard-to-reach' individuals. Through social media, intervention developers (like the Adelante promoters) can more easily disseminate preventing messages and interact with their target users (Andrade, Evans, Barrett, Cleary, et al., 2018; Evans et al., 2019). Shared content can be monitored (Andrade, Evans, Barrett,

Edberg, & Cleary, 2018) and adapted according to audience interest and engagement. In addition to their role as dissemination and interaction channel, social media sites also represent a venue for online bullying. In this case, other digital tools have been developed, such as machine learning algorithms, to detect the presence or absence of cyberbullying on Twitter (Semangern et al., 2019), YouTube (Dinakar et al., 2012; Kumar et al., 2019), or Formspings (Dinakar et al., 2012). Therefore, detection and intervention techniques aimed to reduce peer aggression can be effectively done by combining the features of various digital tools.

As suggested by health intervention approaches such as the Intervention Mapping Protocol (Bartholomew Eldridge et al., 2016) or the Precede - Procede Model (Green & Kreuter, 2005), the creation of evidence-based interventions requires the formulation of clear programme, behavioral and change objectives (based on an analysis of the problem) and the use of theory-informed methods as a basis for the creation of practical techniques that help to reach these objectives. Different evaluation methods can then help to assess whether these objectives were reached. In the studies we selected, it was not always clear how the technological intervention built on existing theoretical and empirical insights (for instance in the augmented game study of Alvarez-Bermejo et al., 2016) or what its precise objectives were. The methods that were used to evaluate the technological tools described in the selected papers varied widely. One publication only mentioned an idea for a technological tool, based on an assessment of several theoretical and empirical insights (without already creating the technology itself) (Cosmoiu et al., 2019). Another publication described how user feedback was collected in a formative study, to create interventions that resonated best with the needs and the desires of the target group (Andrade, Evans, Barrett, Cleary, et al., 2018). Still other papers measured process and effect outcomes of the technological interventions in a qualitative or quantitative field study or in an implementation study.

In our scoping review, we focused on technological interventions that tried to address ethnicity-related aggression among young people. The results indicate that the existing studies focus on secondary school children, college students, and young adults. It is not clear why this is the case, especially given the fact that many general aggression interventions are also focusing on primary school children (Leff et al., 2001). Furthermore, it is important to notice that it might be especially difficult for developers of automatic detection systems of ethnicity-related aggression on social network sites to specifically address the problem among this age group, as it does not suffice to study platforms that are often used by this age group (as people from other age groups might also be present) and because the age of the sender and/or the recipient is not always (correctly) mentioned on SNS (but could be, for instance, be deduced from the specific language and emoticons or emojis that are being used). Finally, it is clear that focussing on interventions to tackle ethnicity-related aggression among young people does not automatically mean that the interventions themselves should have young people as their main target group (as adults, such as parents or teachers, could be important environmental agents and could help to prevent this behavior or support youngsters when they are victimized). Even when “young people” are the main target group, they can either belong to a “minority group” or a “majority group” and be addressed in their (potential) role of victim, bully and/or bystander.

5. Limitations and new avenues for future research

Besides being the first scoping review to cover the literature on the role of technological tools in tackling ethnicity-related aggression, our study has also revealed some shortcomings and follow-up research questions, which need to be addressed.

First, we have noticed a non-standardization of the terms used in the reviewed papers. The scoping review reveals that the existing literature uses many different concepts to refer to general or specific forms of peer

aggression (e.g. bullying), to ethnic minority groups, and technological interventions. These concepts are often not defined, or defined and measured in different ways, making it very difficult to compare studies. Hence, the field would benefit from the use of standardized definitions.

Another limitation is that the efficiency and effectiveness of the digital technologies presented in our review cannot be compared with each other. This is due to the fact that they have been implemented either for groups of minority youth from different cultures and contexts or in different peer aggression situations, which cannot allow comparisons with each other. In addition, the studies included in the review are mainly descriptive, and do not include quantitative measures (e.g., effects) that could be assessed and compared. Moreover, interventions using technologies have been in some cases a part of a broader programme, that makes measurement of the specific impact difficult. For the advancement of research, more data are needed, preferably longitudinal data, which would also allow for causal analyses of the impact of digital technologies on detecting, preventing or reducing peer aggression.

Third, our synthesis reflects evidence mainly from the USA, with some results being reported from Spain, Hungary, Thailand or Australia. Future studies need to also assess interventions employed in other countries that represent destinations for a large number of migrants, such as Germany, France or Belgium. Given that the objectives, experiences, beliefs and expectations of an ethnic group are closely linked to the characteristics of the host country, the digital technologies developed to tackle aggression must also consider the specificity of the origin - destination country binomial. Thus, certain technologies applied in one cultural and linguistic context may not work in other countries. From this reason, to better understand the effectiveness of certain digital technologies against peer aggression, potential future studies should contain more data on the socio-economic characteristics of the target group (e.g., first or second generation of migrants, time since arrival in the host country, family structure, living in rural/urban areas etc.), which are important confounding variables.

A related observation is that our scoping search did not lead to publications on (general) anti-bullying or anti-cyberbullying interventions (e.g., school-based anti-bullying programmes, such as KiVA, the Zero Program (Roland & Mithassel, 2012)) or general programmes that promote interculturality, although the role of technologies has also been studied within these strands of literature. This might actually suggest that peer aggression interventions indeed pay (too) little attention to ethnicity-related aggression and that interventions that try to promote multiculturalism pay (too) little attention to the possible problem of peer aggression. We therefore suggest future research to seek for connections and cross-fertilization between the fields that study peer aggression, multiculturalism, and technology.

Fifth, as already mentioned above, our study focused on papers addressing technological tools to tackle ethnicity-related aggression among young people. In this sense, additional reviews are needed to determine whether our findings apply also to other age groups.

Finally, another limitation of our study consists of the fact that we only selected peer-reviewed papers, and hence, other types of papers were not taken into account (such as PhD dissertations, working papers, other manuscripts). Also, our literature review uses databases containing mainly articles and abstracts and thus, did not include sources like books, editorials, op-eds or reports issued by various public and private organizations. Another shortcoming is that we only consulted sources published in English. However, this shortcoming is minor, given that, after screening, we excluded only one study published in another language (in Portuguese).

6. Concluding remarks

Despite these limitations, this scoping review contributes pivotal knowledge regarding digital tools that are currently being used to prevent, detect and mitigate ethnicity-related peer aggression among youth

people. Given the proliferation of Information and Communication Technologies, and the fact that young people are increasingly using digital devices (e.g., smartphones, tablets, and computers) and are spending more and more time online, this study has shown what technologies have been developed so far and how effective and diversified the tools that made use of the digital affordances are.

This scoping review lies at the intersection of four emerging strands of literature that link peer aggression (including bullying and cyberbullying) and ethnic minorities. There are systematic reviews on cyberbullying (including on risk-factors for victimization and perpetration, such as belonging to an ethnic group) (Chun et al., 2020; Lozano-Blasco et al., 2020). A handful of systematic reviews (Evangelio et al., 2022; Rosa et al., 2019; Zych et al., 2015) document bullying and cyberbullying interventions (specifically focusing on technologies in these interventions). There are also scoping and systematic reviews on peer aggression and cyberbullying among ethnic minorities/migrant youth (Albdour & Krouse, 2014; Hamm et al., 2015; Vitoroulis & Vailancourt, 2015), as well as on programmes promoting interculturality (Elias & Mansouri, 2020). By addressing the role of (digital) technologies in preventing, detecting, and reducing ethnicity-related peer aggression, our scoping review connects all these fields together and also indicates where cross-fertilization might be possible.

Our study also reveals some follow-up research questions needed to expand current knowledge on digital technologies to better match the specifics of each type of online or offline bullying. The findings of our study have important implications for policy and the elaboration of future digital technologies developed to tackle ethnicity-related peer aggression.

CRediT authorship contribution statement

Conceptualization and supervision: Heidi Vandebosch.

Data curation and formal analysis: Heidi Vandebosch, Alina Botezat, Anna Lisa Amodeo, Sara Pabian, Piotr Plichta, Zrinka Puharić, Jacek Pyżalski.

Methodology: Heidi Vandebosch, Alina Botezat, Anna Lisa Amodeo, Sara Pabian, Piotr Plichta, Zrinka Puharić, Jacek Pyżalski.

Writing – original draft: Heidi Vandebosch, Alina Botezat.

Writing – review & editings: Heidi Vandebosch, Alina Botezat, Anna Lisa Amodeo, Sara Pabian, Piotr Plichta, Zrinka Puharić, Jacek Pyżalski.

All authors contributed to the article and approved the submitted version.

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Acknowledgement

This paper is based upon work from COST Action CA18115 - *Transnational Collaboration on Bullying, Migration and Integration at School Level* (TRIBES), supported by COST (European Cooperation in Science and Technology).

References

- Albdour, M., & Krouse, H. J. (2014). Bullying and victimization among African American adolescents: A literature review. *Journal of Child and Adolescent Psychiatric Nursing*, 27(2), 68–82. <https://doi.org/10.1111/jcap.12066>
- Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Perseus Books.
- Alsaker, F., & Nägele, C. (2008). Bullying in kindergarten and prevention. In D. Pepler, & W. Craig (Eds.), *PrevNet publication series: Vol. 1. Understanding and addressing bullying: An international perspective* (pp. 230–248).
- Alvarez-Bermejo, J., Belmonte-Urena, L., Martos-Martinez, A., Barragan-Martin, A., & Simon-Marquez, M. (2016). System to detect racial-based bullying through gamification. *Frontiers in Psychology*, 7, Article 1791. <https://doi.org/10.3389/fpsyg.2016.01791>
- Andrade, E. L., Evans, W. D., Barrett, N., Edberg, M. C., & Cleary, S. D. (2018). Strategies to increase Latino immigrant youth engagement in health promotion using social media: Mixed-methods study. *JMIR Public Health and Surveillance*, 4(4), Article e71. <https://doi.org/10.2196/publichealth.9332>
- Andrade, E. L., Evans, W. D., Barrett, N. D., Cleary, S. D., Edberg, M. C., Alvarero, R. D., Kierstead, E. C., & Beltran, A. (2018). Development of the place-based Adelante social marketing campaign for prevention of substance use, sexual risk and violence among Latino immigrant youth. *Health Education Research*, 33(2), 125–144. <https://doi.org/10.1093/her/cyx076>
- Andrade, E. L., Evans, W. D., Edberg, M. C., Cleary, S. D., Villalba, R., & Batista, I. C. (2015). Victor and Erika Webnovela: An innovative generation @ audience engagement strategy for prevention. *Journal of Health Communication*, 20(12), 1465–1472. <https://doi.org/10.1080/10810730.2015.1018648>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32. <https://doi.org/10.1080/1364557032000119616>
- Azeredo, C. M., Rinaldi, A. E. M., de Moraes, C. L., Levy, R. B., & Menezes, P. R. (2015). School bullying: A systematic review of contextual-level risk factors in observational studies. *Aggression and Violent Behavior*, 22, 65–76. <https://doi.org/10.1016/j.avb.2015.04.006>
- Bartholomew Eldridge, L. K., Markham, C. M., Ruiters, R. A. C., Fernández, M. E., Kok, G., & Parcel, G. S. (2016). *Planning health promotion programs: An intervention mapping approach* (4th ed.). Hoboken, NJ: Wiley.
- Basilici, M. C., Palladino, B. E., & Menesini, E. (2022). Ethnic diversity and bullying in school: A systematic review. *Aggression and Violent Behavior*, 65, Article 101762. <https://doi.org/10.1016/j.avb.2022.101762>
- Beelmann, A., & Heinemann, K. S. (2014). Preventing prejudice and improving intergroup attitudes: A meta-analysis of child and adolescent training programs. *Journal of Applied Developmental Psychology*, 35(1), 10–24. <https://doi.org/10.1016/j.appdev.2013.11.002>
- Camerini, A.-L., Marciano, L., Carrara, A., & Schulz, P. J. (2020). Cyberbullying perpetration and victimization among children and adolescents: A systematic review of longitudinal studies. *Telematics and Informatics*, 49, Article 101362. <https://doi.org/10.1016/j.tele.2020.101362>
- Cantone, E., Piras, A. P., Vellante, M., Preti, A., Daníelsdóttir, S., D'Aloja, E., Lesinskiene, S., Angermeyer, M. C., Carta, M. G., & Bhugra, D. (2015). Interventions on bullying and cyberbullying in schools: A systematic review. *Clinical Practice and Epidemiology in Mental Health*, 11(Suppl 1 M4), 58–76. <https://doi.org/10.2174/1745017901511010058>
- Caravita, S. C. S., Papotti, N., Gutierrez Arvidsson, E., Thornberg, R., & Valtolina, G. G. (2021). Contact with migrants and perceived school climate as correlates of bullying toward migrants classmates. *New Directions for Child and Adolescent Development*, 2021(177), 141–157. <https://doi.org/10.1002/cad.20400>
- Carrera-Fernández, M. V., Cid-Fernández, X. M., Almeida, A., González-Fernández, A., & Lameiras-Fernández, M. (2021). Me and us versus the others: Troubling the bullying phenomenon. *Youth & Society*, 53(3), 417–438. <https://doi.org/10.1177/0044118X19857868>
- Chetty, N., & Alathur, S. (2018). Hate speech review in the context of online social networks. *Aggression and Violent Behavior*, 40, 108–118.
- Chun, J., Lee, J., Kim, J., & Lee, S. (2020). An international systematic review of cyberbullying measurements. *Computers in Human Behavior*, 113. <https://doi.org/10.1016/j.chb.2020.106485>
- Chung, Y.-L., Kuzmenko, E., Tekiroglu, S. S., & Guerini, M. (2019). CONAN - COunter NArratives through Nichesourcing: A multilingual dataset of responses to fight online hate speech. In *Proceedings of the 57th Conference of the Association for Computational Linguistics* (pp. 2819–2829). <https://www.aclweb.org/anthology/P19-1271>.
- Citrin, J., & Sides, J. (2008). Immigration and the imagined community in Europe and the United States. *Political Studies*, 56(1), 33–56. <https://doi.org/10.1111/j.1467-9248.2007.00716.x>
- Comas-Forgas, R., Sureda-Negre, J., & Calvo-Sastre, A. (2017). Characteristics of cyberbullying among native and immigrant secondary education students. *International Journal of Cyber Behavior, Psychology and Learning*, 7(1), 1–17.
- Cosmou, A. M., Nedelcea, C., & Podina, I. R. (2019). A computerized, gamified intervention training visual perspective-taking. theoretical rationale and proposal of a randomized controlled trial. *eLearning & Software for Education*, 1, 91–97. <https://doi.org/10.12753/2066-026X-19-011>
- Demmrich, S., & Akgül, S. (2020). Bullying experience among adolescents with a Turkish migration background in Germany: Ethnic class composition, integration, and religiosity as protective factors? *International Journal of Environmental Research and Public Health*, 17(13), 4776. <https://doi.org/10.3390/ijerph17134776>
- DeSmet, A., Bastiaensens, S., Van Cleemput, K., Poels, K., Vandebosch, H., Deboutte, G., Herrewijn, L., Malliet, S., Pabian, S., Van Broeckhoven, F., De Troyer, O., Deglorie, G., Van Hoecke, S., Samyn, K., & De Bourdeaudhuij, I. (2018). The efficacy of the Friendly Attac serious digital game to promote prosocial bystander behavior in cyberbullying among young adolescents: A cluster-randomized controlled trial. *Computers in Human Behavior*, 78, 336–347.
- Dinakar, K., Jones, B., Havasi, C., Lieberman, H., & Picard, R. (2012). Common sense reasoning for detection, prevention, and mitigation of cyberbullying. *ACM Transactions on Interactive Intelligent Systems*, 2(3). <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84983569734&doi=10.1145%2F22362394.2362400&partnerID=40&md5=5e67e02831f67af86bd83222ce502501> <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84983569734&doi=1>

- 0.1145%2f2362394.2362400&partnerID=40&md5=5e67e02831f67af86bd83222ce502501.
- Elias, A., & Mansouri, F. (2020). A systematic review of studies on interculturalism and intercultural dialogue. *Journal of Intercultural Studies*, 41(4), 490–523. <https://doi.org/10.1080/07256868.2020.1782861>
- Evangelio, C., Rodríguez-González, P., Fernández-Río, J., & González-Villora, S. (2022). Cyberbullying in elementary and middle school students: A systematic review. *Computers & Education*, 176. <https://doi.org/10.1016/j.compedu.2021.104356>
- Evans, W. D., Andrade, E. L., Barrett, N., Snider, J., Cleary, S., & Edberg, M. (2019). Outcomes of the Adelante community social marketing campaign for Latino youth. *Health Education Research*, 34(5), 471–482. <https://doi.org/10.1093/her/cy016>
- Fandrem, H., Ertesvåg, S. K., Strohmeier, D., & Roland, E. (2010). Bullying and affiliation: A study of peer groups in native and immigrant adolescents in Norway. *European Journal of Developmental Psychology*, 7(4), 401–418. <https://doi.org/10.1080/17405620820335075>
- Gaertner, S. L., & Dovidio, J. F. (2005). Categorization, recategorization, and intergroup bias. In J. Dovidio, P. Glick, & L. Rudman (Eds.), *On the nature of prejudice: Fifty years after Allport* (pp. 71–88). Malden, MA: Blackwell Publishing. <https://doi.org/10.1002/9780470773963.ch5>
- Gaffney, H., Farrington, D. P., Espelage, D. L., & Ttofi, M. M. (2019). Are cyberbullying intervention and prevention programs effective? A systematic and meta-analytical review. *Aggression and Violent Behavior*, 45, 134–153. <https://doi.org/10.1016/j.avb.2018.07.002>
- Green, L. W., & Kreuter, M. W. (2005). *Health program planning: An educational and ecological approach*. New York: McGraw-Hill.
- Hamm, M. P., Newton, A. S., Chisholm, A., Shulhan, J., Milne, A., Sundar, P., Ennis, H., Scott, S. D., & Hartling, L. (2015). Prevalence and effect of cyberbullying on children and young people: A scoping review of social media studies. *JAMA Pediatrics*, 169(8), 770–777. <https://doi.org/10.1001/jamapediatrics.2015.0944>
- Hinduja, S., & Patchin, J. W. (2009). Bullying beyond the schoolyard. In *Preventing and responding to cyberbullying*. Corwin Press.
- Huang, F. L., & Cornell, D. G. (2019). School teasing and bullying after the presidential election. *Educational Researcher*, 48(2), 69–83. <https://doi.org/10.3102/0013189X18820291>
- Jacobs, N. C. L., Völlink, T., Dehue, F., & Lechner, L. (2014). Online Pestkoppenstoppen: Systematic and theory-based development of a web-based tailored intervention for adolescent cyberbully victims to combat and prevent cyberbullying. *BMC Public Health*, 2014(14). <https://doi.org/10.1186/1471-2458-14-396>
- Johnson, M. R. D., Bhopal, R. S., Ingleby, J. D., Gruer, L., & Petrova-Benedict, R. S. (2019). A glossary for the first World Congress on Migration, Ethnicity, Race and Health. *Public Health*, 172, 85–88. <https://doi.org/10.1016/j.puhe.2019.05.001>
- Kuldas, S., Dupont, M., & Foody, M. (2021). Ethnicity-based bullying: suggestions for future research on classroom ethnic composition. In 1. *The Wiley Blackwell handbook of bullying: A comprehensive and international review of research and intervention* (pp. 252–272).
- Kumar, A., Nayak, S., & Chandra, N. (2019). Empirical analysis of supervised machine learning techniques for cyberbullying detection. rayyan-78083568. In , Vol. 56. *Lect. Notes Networks Syst.* Springer. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85063517954&doi=10.1007%2f978-981-13-2354-6_24&partnerID=40&md5=cededf8b44e442ec8ab7fc0ba28d979b
- Leff, S. S., Power, T. J., Manz, P. H., Costigan, T. E., & Nabors, L. A. (2001). School-based aggression prevention programs for young children: Current status and implications for violence prevention. *School Psychology Review*, 30(3), 344–362.
- Lewis-Harris, J. A. (2010). In *Making sense in a chaotic space, race, gender & class* (pp. 58–71). <https://www.jstor.org/stable/41674725> <https://www.jstor.org/stable/41674725>
- Lozano-Blasco, R., Cortes-Pascual, A., & Pilar Latorre-Martinez, M. (2020). Being a cybervictim and a cyberbully - The duality of cyberbullying: A meta-analysis. *Computers in Human Behavior*, 111. <https://doi.org/10.1016/j.chb.2020.106444>
- Mathew, B., Saha, P., Tharad, H., Rajgaria, S., Singhania, P., Maity, S. K., Goyal, P., & Mukherjee, A. (2019). Thou shalt not hate: Countering online hate speech. In 13. *Proceedings of the International AAAI Conference on Web and Social Media* (pp. 369–380).
- Maynard, B. R., Vaughn, M. G., Salas-Wright, C. P., & Vaughn, S. (2016). Bullying victimization among school-aged immigrant youth in the United States. *Journal of Adolescent Health*, 58(3), 337–344. <https://doi.org/10.1016/j.jadohealth.2015.11.013>
- McKenney, Katherine S., Pepler, Debra, Craig, Wendy, & Connolly, Jennifer (2006). Peer victimization and psychosocial adjustment: the experiences of Canadian Immigrant Youth. *Electron. J. Res. Educ. Psychol.*, 4(2), 239–264. <https://doi.org/10.25115/ejrep.v4i9.1189>
- Mendez, J. J., Bauman, S., & Guillory, R. M. (2012). Bullying of Mexican immigrant students by Mexican American students: An examination of intracultural bullying. *Hispanic Journal of Behavioral Sciences*, 34(2), 279–304. <https://doi.org/10.1177/0739986311435970>
- Nikolaou, G., Kaloyiour, C., & Spyropoulou, A. (2019). Bullying and ethnic diversity: Investigating their relation in the school setting. *Intercultural Education*, 30(4), 335–350. <https://doi.org/10.1080/14675986.2019.1582208>
- Nocentini, A., Zambuto, V., & Menesini, E. (2015). Anti-bullying programs and Information and Communication Technologies (ICTs): A systematic review. *Aggression and Violent Behavior*, 23, 52–60. <https://doi.org/10.1016/j.avb.2015.05.012>
- Olweus, D. (1993). *Bullying at school: What we know and what we can do*. Vol. null (null, Ed.).
- Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan—A web and mobile app for systematic reviews. *Systematic Reviews*, 5(1), 1–10. <https://doi.org/10.1186/s13643-016-0384-4>
- Palladino, B. E., Nappa, M. R., Zambuto, V., & Menesini, E. (2020). Ethnic bullying victimization in Italy: The role of acculturation orientation for ethnic minority adolescents with differing citizenship statuses. *Frontiers in Psychology*, 11. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85082728836&doi=10.3389%2fpsyg.2020.00499&partnerID=40&md5=683feacc1613521436c7c266cf685ebc> <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85082728836&doi=10.3389%2fpsyg.2020.00499&partnerID=40&md5=683feacc1613521436c7c266cf685ebc>
- Pyzalski, J. (2012). From cyberbullying to electronic aggression: Typology of the phenomenon. *Emotional and Behavioural Difficulties*, 17(3–4), 305–317. <https://doi.org/10.1080/13632752.2012.704319>
- Roland, E., & Midthassel, U. V. (2012). The zero program. *New Directions for Youth Development*, 2012(133), 29–39. <https://doi.org/10.1002/ya.20005>
- Rosa, H., Pereira, N., Ribeiro, R., Ferreira, P. C., Carvalho, J. P., Oliveira, S., Coheur, L., Paulino, P., Simão, A. V., & Trancoso, I. (2019). Automatic cyberbullying detection: A systematic review. *Computers in Human Behavior*, 93, 333–345. <https://doi.org/10.1016/j.chb.2018.12.021>
- Santacrose, L. B., Laurita, A. C., & Marchell, T. C. (2019). Intervene: Modeling pro-social bystander behavior in college students through online video. *Health Communication*, 35(4), 397–409. <https://doi.org/10.1080/10410236.2018.1564956>
- Santisteban, D. A., Czaja, S. J., Nair, S. N., Mena, M. P., & Tulloch, A. R. (2016). Computer informed and flexible family-based treatment for adolescents: A randomized clinical trial for at-risk racial/ethnic minority adolescents. *Behavior Therapy*, 48(4), 474–489. <https://doi.org/10.1016/j.beth.2016.11.001>
- Scherr, T. G., & Larson, J. (2010). Bullying dynamics associated with race, ethnicity, and immigration status. In S. R. Jimerson, S. M. Swearer, & D. L. Espelage (Eds.), *Handbook of bullying in schools. An international perspective* (pp. 223–234). New York: Routledge.
- Schneider, S. L., & Heath, A. F. (2020). Ethnic and cultural diversity in Europe: Validating measures of ethnic and cultural background. *Journal of Ethnic and Migration Studies*, 46(3), 533–552. <https://doi.org/10.1080/1369183X.2018.1550150>
- Semangern, T., Chaisitsak, W., Senivongse, T., Ao, S. I., Douglas, C., & Kim, H. K. (2019). Identification of risk of cyberbullying from social network messages. In , 2019. *Lect. Notes Eng. Comput. Sci* (pp. 276–282). <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85083381937&partnerID=40&md5=324cae4c75acce8435e471d3a602ec1b> <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85083381937&partnerID=40&md5=324cae4c75acce8435e471d3a602ec1b>
- Simonovits, G., Kézdí, G., & Kardos, P. (2017). Seeing the world through the other's eye: An online intervention reducing ethnic prejudice. *American Political Science Review*, 112(1), 186–193. <https://doi.org/10.1017/S0003055417000478>
- Smith, J. D., Schneider, B. H., Smith, P. K., & Ananiadou, K. (2004). The effectiveness of whole-school antibullying programs: A synthesis of evaluation research. *School Psychology Review*, 33(4), 547–560.
- Swearer, S. M., Espelage, D. L., Vaillancourt, T., & Hymel, S. (2010). What can be done about school bullying?: Linking research to educational practice. *Educational Researcher*, 39(1), 38–47. <https://doi.org/10.3102/0013189X09357622>
- Thomas, R. (2019). Identifying your skin is too dark as a put-down: Enacting whiteness as hidden curriculum through a bullying prevention programme. *Curriculum Inquiry*, 49(5), 573–592. <https://doi.org/10.1080/03626784.2019.1687258>
- Tippett, N., Houlston, C., & Smith, P. K. Great Britain, Equality and Human Rights Commission, Research Team. (2010). *Prevention and response to identity-based bullying among local authorities in England, Scotland and Wales*. Equality and Human Rights Commission. http://www.equalityhumanrights.com/uploaded_files/research/6_4_identity_based_bullying.pdf
- van der Zwaan, J., Geraerts, E., Dignum, V., Jonker, C., Wiederhold, B. K., & Riva, G. (2012). User validation of an empathic virtual buddy against cyberbullying. *Annual Review of Cybertherapy and Telemedicine*, 2012(181), 243–247. <https://doi.org/10.3233/978-1-61499-121-2-243>
- Van Royen, K., Poels, K., Daelemans, W., & Vandebosch, H. (2014). Automatic monitoring of cyberbullying on social networking sites: From technological feasibility to desirability. *Telematics and Informatics*. <https://doi.org/10.1016/j.tele.2014.04.002>
- Vandebosch, H. (2019). Cyberbullying prevention, detection and intervention. In H. Vandebosch, & L. Green (Eds.), *Narratives in research and interventions on cyberbullying among young people* (pp. 29–44). Springer International Publishing. https://doi.org/10.1007/978-3-030-04960-7_3
- Vervoort, M. H. M., Scholte, R. H. J., & Overbeek, G. (2010). Bullying and victimization among adolescents: The role of ethnicity and ethnic composition of school class. *Journal of Youth and Adolescence*, 39(1), 1–11. <https://doi.org/10.1007/s10964-008-9355-y>
- Vitoroulis, I., & Vaillancourt, T. (2015). Meta-analytic results of ethnic group differences in peer victimization. *Aggressive Behavior*, 41(2), 149–170. <https://doi.org/10.1002/ab.21564>
- Vitoroulis, I., & Vaillancourt, T. (2018). Ethnic group differences in bullying perpetration: A meta-analysis. *Journal of Research on Adolescence*, 28(4), 752–771.
- Von Marées, N., & Petermann, F. (2010). In , 31. *Bullying in German primary schools: Gender differences, age trends and influence of parents' migration and educational*

- backgrounds (pp. 178–198). UK: London, England: School Psychology International, Sage Publications Sage. <https://doi.org/10.1177/0143034309352416>.
- White, F. A., Harvey, L. J., & Abu-Rayya, H. M. (2015). Improving intergroup relations in the internet age: A critical review. *Review of General Psychology, 19*(2), 129–139. <https://doi.org/10.1037/gpr0000036>
- Zych, I., Ortega-Ruiz, R., & Del Rey, R. (2015). Systematic review of theoretical studies on bullying and cyberbullying: Facts, knowledge, prevention, and intervention. *Aggression and Violent Behavior, 23*, 1–21. <https://doi.org/10.1016/j.avb.2015.10.001>