

Using the Implicit Relational Assessment Procedure to explore students' implicit age discrimination of toxic versus innocuous phrases

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ABSTRACT

The research literature remains unclear as to whether discrimination of bullying improves with age, thus the Implicit Relational Assessment Procedure (IRAP) was used to investigate if college students compared to post-primary students showed increased discrimination of phrases with bullying potential. Participants ($N= 60$; $n= 30$ post-primary and $n= 30$ university students) completed the IRAP in which trial-blocks alternately affirmed or denied innocuous v. toxic phrases as harmless or abusive. Shorter response latencies for particular trial-blocks meant participants responded more rapidly, thus indicating preference. Pre- and post-IRAPs were also conducted to determine if an intervention (government educational videos) increased participants' implicit preference for innocuous phrases as harmless, or decreased preference for toxic phrases. IRAP data showed a statistically significant implicit preference for innocuous phrases as harmless, for both post-primary and university students, with no statistically significant difference between these groups. There was no difference in IRAP results pre and post a brief educational intervention, thus the research did not support the intervention. Analysis of participants' explicit data (self-report questionnaires) indicated no age differences for prosocial behaviour or attitudes towards victims. Thus, age was not shown to improve discrimination of bullying in the current research.

Keywords: IRAP, bullying, post-primary students, university students.

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Novelty and Significance

What is already known about the topic?

- Attitudes towards bullying have been conducted mostly using self-report measures which have documented limitations.
- Bullying research has evaluated the effects of anti-bullying interventions with self-report measures. However further research is required to determine how to influence implicit processes and whether intervention techniques may impact on these processes.
- Research has suggested that a lack of understanding of harmfulness of bullying (due to immaturity or want of specific education) contributes to prevalence.

What this paper adds?

- The current study used implicit measures which are less susceptible to introspection and self-presentation limitations. This study was the first of its kind to investigate attitudes towards bullying by using the Implicit Relational Assessment Procedure.
- Immaturity (secondary versus university level students) was not influential.
- A specific and commonly used type of educational intervention was not found to be influential.

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Bullying is a problem for many students of all ages, schools and parents. The most common definition of bullying involves victimization when a child is exposed repeatedly and over time, to negative actions perpetrated by one or more individuals (Olweus, 1993). This can take many forms such as physical or verbal bullying as well as social exclusion and more recently, cyberbullying. The extant research literature on bullying clearly demonstrates that victimisation in the early or teenage years can lead to a range of internalising and externalising problems such as suicidal thoughts and/or violence in later life (Hinduja & Patchin, 2018; McMahon, Reulbach, Keeley, Peery, & Arensman, 2010; Ttofi, Farrington & Lösel, 2012). Negative effects are not only indicated for the victims, but those who bully and those who witness bullying can also suffer in terms of their psychological health (e.g., Rivers, Potteat, Noret, & Ashurst, 2009; Rivers, & Noret, 2013).

Ahmed and Braithwaite (2004) hypothesised that discrimination of a bully (and victim) was important; relatedly, the current research aimed to examine if students would discriminate bullying behaviour. Participants were students at different stages of educational development, and data were examined to determine if participants could distinguish between phrases that were considered toxic (i.e., bullying, harmful) versus innocuous phrases (harmless teasing). It should be noted that ethical considerations preclude conducting a functional analysis of bullying, or of these proxy measures. Ross and Horner (2009) note that historically, it has been difficult to conduct a functional analysis of bullying also because of the broad range of bullying behaviours and the hypothesised variables thought to be involved (e.g., intent to harm, power imbalance, and repeated confrontations). For similar reasons an operational definition of bullying is difficult to conceptualise for measurement (Griffin & Gross, 2004).

Bullying in Ireland is relatively common with one meta-analysis determining the rate of self-reported victimisation to be 11.8% for post-primary students (12-18 years old) and it has been found to independently increase visits to the doctor and mental health professionals in the country (Hayes *et alia*, 2018). It is difficult to determine if this rate continues into the college years as the research is scant with this population in Ireland. However, evidence does suggest that workplace bullying is also common across the country (e.g., Mannix McNamara, Fitzpatrick, MacCurtain, & O'Brien, 2018). Of the many types of bullying that is possible, verbal bullying (i.e., using language such as insults or teasing to hurt the target) is the most prevalent type of bullying between both siblings and peers in Ireland (Foody, Samara, & O'Higgins Norman, 2019).

Investigations of bullying, including verbal bullying, often utilise standard quantitative measures such as questionnaires that have been internationally validated -e.g., Olweus Bullying Questionnaire (Olweus, 1996) or The Bullying Prevalence Questionnaire (Rigby & Slee, 1993). While these tools are useful for investigating prevalence and may shed light on the cause and impact of the bullying, they are not without limitations. Because all types of bullying are considered socially unacceptable behaviours, data from self-report questionnaires (hereafter termed explicit data), can be contaminated by self-presentation effects (Nosek, 2005) and indeed are prone to well documented introspection problems (Gawronski & De Houwer, 2014). In addition, as these questionnaires have been created in international contexts, there is growing concern about their cross-cultural utility as interpretations of bullying behaviours can vary widely between countries, different ethnic groups and even age (Samara, Foody, Göbel, Altawil, & Scheithauer, 2019). Recent research has shown that studies investigating

prevalence rates of bullying and of attitudes towards bullying using explicit measures may involve a wide range of differing variables, such as if a definition of bullying is provided and the age range investigated (Foody, Samara, & O'Higgins Norman, 2017; Smith & López Castro, 2017).

Attitudes towards and interpretations of bullying have been shown to change across age groups which can also influence the prevalence and type of bullying children and/or adolescents engage in. In particular, the research literature remains unclear as to whether discrimination of bullying improves with age. Byrne, Dooley, Fitzgerald, and Dolphin (2016) found that younger Irish students described the essence of bullying as 'mean', while older students were more aware of the negative feelings associated with the experience. In a parallel vein, Warwick and Purdy (2019) reported a more 'nuanced' understanding of what constituted bullying behaviour in older children (10-11 year olds) compared to younger children (6-7 year olds) in Northern Ireland. Very little research has focused on discrimination of bullying behaviour across older aged groups such as post-primary (secondary/high school) and college students, although one study has demonstrated a reduction in bullying rates for older students (Smith, 2016). In addition, there is some research indicating confusion around the understanding or meaning of bullying behaviours in the workplace and at university level (Rockett, Fan, Dwyer, & Foy, 2017). Also, in almost all contexts (i.e., school, college or workplace), it can be very difficult to determine where innocuous (harmless) teasing ends and toxic bullying begins (Swain, 1998). As such, one could argue that it may be worthwhile investigating whether older students readily discriminate harmless teasing compared to younger students, using an implicit measure to determine preference for innocuous teasing phrases versus more toxic hurtful phrases.

Implicit measures have been developed in which the behaviour of participants is measured, rather than their own reports of their behavioural dispositions in relation to a given social phenomenon. The most well-known of these is the Implicit Association Test (IAT; Greenwald, McGee, & Schwartz, 1998) which has proven utility in detecting stereotype or bias in socially-sensitive areas involving race, gender, appearance-bias and many others (e.g., Rezaei, 2011; Rudman & McLean 2016). The fundamental premise is that in time-pressured conditions, participants will more rapidly affirm trial presentations that they agree with compared to presentations to the converse. For example, when asked to alternately confirm and deny relations such as science-masculine/arts-feminine and science-feminine/arts-masculine, participants' responding may show more rapid affirmation of the former, which would be deemed an implicit bias favouring males for science. This type of time-pressured responding is often termed "automatic" and contrasted to more deliberative responding than self-report questionnaires may facilitate. Automatic responding may involve pre-experimentally learned relations, that are not modified by conscious deliberations such as "many women are competent scientists" or "I should not pre-judge based on gender".

The Implicit Relational Association Procedure (IRAP; Barnes Holmes *et alia*, 2006) is a behaviourally-based implicit measure that has been developed from Relational Frame Theory (Hayes, Barnes-Holmes, & Roche, 2001). The IRAP has allowed behavioural investigations in domains that were previously thought not to be amenable to such analyses, for example perspective-taking (Barbero, López, Luciano, & Eisenbeck, 2016) and obsessive beliefs (Nicholson, McCourt, & Barnes-Holmes, 2013). A large amount of the literature has also used the IRAP to investigate implicit beliefs regarding a range of socially sensitive topics such as racial-bias (Barnes-Holmes, Murphy, Barnes-Holmes, &

Stewart, 2010), attractiveness-bias (Murphy, Hussey, Barnes-Holmes, & Kelly, 2015) and ageism (Cullen, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009).

The current study used the IRAP to present phrases that were deemed innocuous/harmless teasing versus phrases that were toxic/hurtful, and two groups of participants (post-primary v. university students) alternately affirmed or denied the phrases as harmless/toxic. Shorter participant response latencies, or faster responding toward phrases presented as either harmless or toxic indicated agreement with that presentation. As the study was conducted in Ireland, some of the more colloquial phrases/ words may need to be explained, for example, “eedjit” is a derivation of the word “idiot” that may be considered less severe than the latter. For the purposes of the current research, certain phrases (e.g., “Just go die”) were considered abusive or toxic, while others (e.g., “Don’t be daft”) were considered as relatively innocuous teasing. It is important to note also, that these phrases were selected and hypothesised to be “toxic” or “innocuous” in a consultative process with a number of senior researchers. The hypothesised function of phrases deemed to be toxic was that in the context of social interaction, these would be intentionally abusive/harmful, while the hypothesised function of the phrases deemed to be innocuous was friendly ‘banter’ in the context of comradery (in Irish culture, people often engage in “slagging”, where they direct innocuous phrases such as ‘Go on ya fool’ at one another in a friendly context. “Slagging” can be an indicator of how friendly one is with another (one generally wouldn’t “slag” someone they don’t know or like). Those living in Ireland are very tuned into this and can easily distinguish the difference between an insult and an innocuous comment intended as “slagging”).

The IRAP four trial-type methodology involved trial presentations with the following relations: toxic-abusive-yes/ innocuous-abusive-no; innocuous-harmless-yes/toxic-harmless-no. If participants showed more rapid affirmation of toxic phrases as abusive v toxic phrases as harmless, this was deemed a discrimination of bullying potential behaviour, while converse relations (e.g., toxic-harmless-yes) indicated tolerance for bullying behaviour. Neutral responding (no difference in response latency data for the relevant IRAP trial-types), was deemed as a lack of discrimination of innocuous phrases as preferable, and of toxic phrases as potentially abusive.

A further aim of the research was to investigate if an educational intervention impacted on participant responding on the IRAP. Two brief educational videos made available to educators, and thereby endorsed by the Department of Education and Skills in Ireland, were used, and pre and post IRAP tests were conducted. Various studies in IRAP literature have adapted the use of intervention techniques in order to assess and compare IRAP data both at baseline and proceeding from the implementation of an experimentally induced state on its participants. However, the use of intervention techniques to determine an influential effect on implicit processes in relation to bullying is currently limited. An empirical investigation of effects of these educational videos to determine any positive impact on students’ implicit attitudes related to bullying (e.g., increased implicit preference for innocuous phrases evident in IRAP data), may therefore be beneficial toward validation (or otherwise) of these educational resources. The investigation could be relevant to other jurisdictions in demonstrating that interventions based on laudable intentions may be inadequate if they remain empirically untested for beneficial impact on student audiences.

A total of sixty students with two groups: $n = 30$ senior cycle post-primary students (aged 16-18 years) and $n = 30$ university students (aged 19-25 years) completed an IRAP before and after an educational video intervention. Participants also completed

self-report explicit measures including the Bullying Prevalence Questionnaire (BPQ; Rigby, & Slee, 1993) and the Revised Pro-Victim Scale (Rigby, 1997). Implicit and explicit data from both methods may be complementary and may facilitate a more comprehensive perspective. A tentative hypothesis was that older university students would show greater anti-bullying bias compared to the younger (post-primary-school) based on previous research indicating that levels of bullying are reduced in older children. It might also be expected that educational videos would produce increased preference for innocuous phrases (shorter response latencies for innocuous-harmless-yes/toxic-abusive-yes v innocuous-toxic-no/ toxic-abusive-no).

METHOD

Participants

Eighty university students were initially recruited for the current study. The data of twenty participants were discarded because they did not meet speed and accuracy inclusion criteria for the IRAP (detailed below). Thus, data were analysed from a final sample of sixty participants which included two groups of participants that differed by age and level of education. The group of post-primary students included 30 (15 males and 15 females) participants aged between 16 and 18 years ($M/SD= 17.1/1.09$) who attended post-primary school. The second group was composed of 30 university students (15 males and 15 females) aged between 19 and 25 years ($M/SD= 21.6/1.63$). Informed parental consent was obtained for all post-primary students taking part in the research, and participants themselves volunteered. Written informed consent was obtained from all individual participants included in the study. The research received prior approval from the first authors university and all procedures were conducted in accord with current ethical standards in psychology.

Materials

The IRAP software was operated on a standard laptop computer. The version was 2014, and the software was written in Microsoft Visual Basic 6.0. The IRAP programme controlled all aspects of stimulus presentation and the recording of accuracy and latency data for participant responses. The stimuli employed in the study consisted of twelve textual phrases -six of which were deemed innocuous, (e.g. 'Don't be daft', 'Go on ya fool') and six of which were deemed to be toxic (e.g. "Dirty mean scum", "Just go die"). These were collected by asking six male and six female Irish adolescents to write down different phrases that they or their peers had heard of in the past, that they had found to be either distressing and hurtful, or light-hearted and 'not a big deal'. The researcher selected six toxic and six harmless textual phrases/statements (Table 1). Thus, all textual phrases were in keeping with a vocabulary that was current for teenagers and young adults in Ireland and as such were considered to be culturally representative of verbal bullying/teasing.

Video clips. All participants were presented with two brief educational videos about the negative and lasting effects of bullying which were taken directly from the Irish Department of Education and Skills website. The video intervention lasted for approximately 10 minutes. The first video clip was a video titled 'Stand Up! -Don't Stand for Homophobic Bullying (<https://www.youtube.com/watch?v=lrJxqvalFxm>), and it focused on a story about standing up to homophobic bullying. The video portrays

a group of school students standing up for their peer in response to a different group of males publicly taunting him. The second video clip was a slideshow that was directly focused on cyberbullying which was freely available from the Department of Education and Skills (Ireland) website (http://www.education.ie/en/PressEvents/Events/cp_anti_bullying). The slide show highlighted some of the dangers of cyber bullying and the lasting effects it can have, all of which were displayed through various images and messages on-screen. The video clips were expected to make bullying behaviour salient to participants as socially unacceptable behaviour; pre and post assessment using the IRAP aimed to detect any influence exerted by exposure to the anti-bullying videos.

Explicit questionnaire materials. Three explicit measures were utilised to determine explicit attitudes to bullying and its prevalence for all participants. The Bullying Prevalence Questionnaire (BPQ; Rigby & Slee, 1993) has three subscales and provides assessments of the prevalence of behaviours and attitudes (e.g., “I give soft kids a hard time”), referred to as the Bully subscale; proneness to being bullied by others (e.g., “I get picked on by other kids”), referred to as the Victim subscale; and tendency to act pro-socially (e.g. “I share things with others”), referred to as the Pro-social subscale. Participants were asked to respond to 20 unique statements using a four-point Likert scale (Never= 1, Once in a while= 2, Pretty Often= 3, Very Often= 4). Higher scores indicated greater bullying tendencies on the Bully subscale, more proneness to being bullied on the Victim subscale, and a greater tendency to act pro-socially on the Pro-social subscale. The second explicit measure was the Revised Pro-Victim Scale (RPVS; Rigby, 1997) designed to assess the extent to which students are sympathetic to the plight of victims (“It makes me angry when a kid is picked on without reason”) or tend to support bullying behaviour (e.g., “Kids who get picked on usually deserve it”). Participants were asked to respond to ten unique statements using a three-point Likert scale (Agree= 1, Unsure= 2, Disagree=3). Scores ranged from 10 to 30 and a higher score indicated a positive attitude toward victims not bullies.

Table 1. Stimulus Arrangements and Word groups presented by the IRAP (NB. “feck” is an Irish colloquialism that may be considered as a milder version of another common four-letter word; “eedjit” is a version of “idiot”; “skank” is an unpleasant person).

Label 1	Label 2
Rot in hell	Ah shut up
Ugly fat slut	G’way you ejit
Evil little shit	You fecken idiot
Dirty mean scum	Go on ya fool
Horrible rotten skank	Don’t be daft
Just go die	Just feck off
<hr/>	
Targets deemed consistent with Label 1	Targets deemed consistent with Label 2
ABUSIVE	HARMLESS
Response Option	Response Option
Yes/No	Yes/No

Settings and Procedure

Post-primary students completed the research in a quiet classroom. The university students completed the experiment in a private and quiet experimental lab cubicle at the first author’s university.

Participants were provided with verbal instructions on how to complete the IRAP task in various stages using a pre-written script (Hussey *et alia*, 2016). For example, participants were first told that they were going to be asked to respond to a number of different phrases that might sound like something they had heard before (e.g., ‘ah shut up’). They were told that on a particular trial, one of these phrases would appear in the top portion of the screen, along with a target word (e.g., abusive/harmless) in the centre of the screen.

They were informed that this task simply required that they follow a rule when responding, and that this rule would be provided to them onscreen. They were also told

that they were required to respond to relations presented onscreen with either ‘Yes’ or ‘No’ by pressing the ‘d’ key or the ‘k’ key, and the required response would alternate across trial-blocks (see Figure 1). The instructions for the IRAP were also presented visually to participants. All screens displayed a black background with coloured text. Before commencing practice or test blocks, participants were presented with the instructions in white text (See Appendix).

All procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

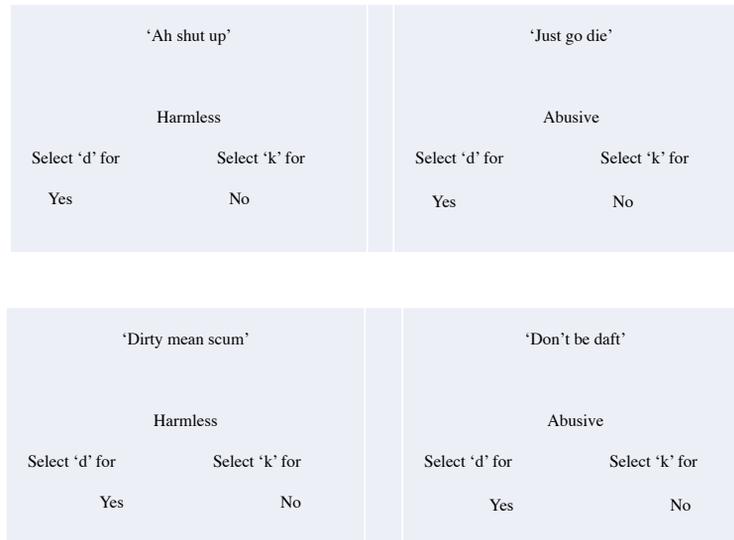


Figure 1. Examples of the four IRAP trial-types. The labels (toxic phrases or innocuous phrases), target words (“Abusive” or “Harmless”), and response options (“Yes” or “No”) appeared simultaneously on each trial.

Each block of the IRAP consisted of 24 trials with the twelve label stimuli (6 toxic phrases and 6 innocuous phrases) presented twice in quasi-random order, once in the presence of each of the two target stimuli. In each trial, one of the 12 textual phrases (e.g., ‘ah shut up’) was presented at the top centre of the screen, a target stimulus was presented below, in the middle of the screen (either “Harmless” or “Abusive”), and two response options (“Yes” and “No”) were presented at the bottom, one on the left and the other on the right. As specified in the IRAP instructions, the location of each response option was fixed across trials for the entire duration of the task. Participants had to respond as fast and as accurately as possible in each trial. A correct response led to a 400ms inter-trial interval where the screen went blank, followed by the presentation of another trial. An incorrect response produced a red “X” that remained in the middle of the screen until the participant gave the correct response for that trial. Participants were required to affirm consistent relations when following rule A (e.g., toxic-abusive-yes/toxic-harmless-no/innocuous-abusive-no/innocuous-harmless-yes) and inconsistent relations when following rule B (e.g., toxic-abusive-no/toxic-harmless-yes/innocuous-abusive-yes/innocuous-harmless-no) on alternative trial-blocks.

At commencement, a message appeared on screen which advised the participant that they were going to complete practice trial-blocks first. Participants had to achieve specific criteria (80% correct responding and a median latency under 2000ms) in each practice block (of the same pair of consistent/inconsistent trial-blocks) in order to advance to the six test blocks. In a typical IRAP preparation, a minimum of two practice blocks are presented, followed by six test blocks. If they failed to meet the criteria on the first two practice blocks, they were re-exposed to practice blocks up to a maximum of six pairs. If participants still failed to reach criteria, they finished their participation and their data were discarded. When participants completed the IRAP practice blocks they moved on to the IRAP test blocks. Once all test blocks were completed, a message appeared on the screen that the experiment was finished and to please alert the researcher.

Educational Video Intervention

When participants completed the first IRAP procedure they were presented with two brief educational videos about the negative and long-lasting effects of bullying. The videos lasted for approximately 10 minutes altogether.

Post-intervention IRAP

Immediately after the anti-bullying videos were shown, participants completed the IRAP a second time. This was identical to the first IRAP presented.

RESULTS

The primary data produced by the IRAP programme are raw latency scores representing time in milliseconds elapsed between the onset of the trial to the emission of a correct response by the participant. Consistent with previously published studies employing the traditional IRAP, the data were screened before being subjected to statistical analyses. If accuracy fell below 78% or the median latency exceeded 2000ms during a test block this was taken to indicate that the participant had not maintained performance at a level close to that required to pass the practice blocks. Consistent with Nicholson and Barnes-Holmes (2012), if participants failed to maintain these criteria for one or both test blocks from a given pair (1 & 2, or 3 & 4, or 5 & 6), the data from those two blocks were excluded and the data from the remaining two blocks were analysed. If participants failed to maintain the criteria across two or more pairs of blocks all of the data from that participant was excluded from further analysis. The data for four participants were removed on this basis. Following a standard procedure to control for individual variation (Barnes-Holmes, Waldron, Barnes-Holmes, & Stewart, 2009), the response latency data for each participant were transformed into standardised difference scores, or *D*-scores, using an adaptation of the Greenwald, Nosek, and Banaji (2003) *D*-algorithm (see Cullen & Barnes-Holmes, 2008; Vahey, Barnes-Holmes, Barnes-Holmes & Stewart, 2009). IRAP *D*-scores are the standardised mean differences in response latencies between consistent and inconsistent trial-blocks across three pairs of test trial-blocks. The steps involved in calculating the *D*-IRAP scores were as follows: (1) only response latency data from test blocks were included; (2) latencies above 10,000 ms were not included; (3) if participants' data contained more than 10% of test block trials with latencies less than 300 ms, they were removed; (4) standard deviations for the

four trial types were calculated: four for the response latencies from test blocks 1 and 2, four for the response latencies from test blocks 3 and 4, and four for the response latencies from test blocks 5 and 6; (5) 24 mean latencies were calculated for the four trial-types in each test block; (6) difference scores for each of the four trial-types were calculated for each pair of test blocks by subtracting the mean latency of the consistent block from the mean latency of the corresponding inconsistent block; (7) each difference score was then divided by its corresponding standard deviation from step 4, yielding 12 *D*-IRAP scores, one score for each trial-type for each pair of test blocks; (8) four overall trial-type *D*-IRAP scores were calculated by averaging the three scores for each trial-type across the three pairs of test blocks.

Data analysis was conducted at group level in accordance with the guidelines published by Hussey, Barnes-Holmes & Barnes-Holmes, (2015). Specifically, to allow for appropriate statistical comparisons to be made between the trial-types, trial-types 3 and 4 were inverted for analysis. Following data transformations, positive *D*-scores on the *toxic-abusive* and *toxic-harmless* trial-types and negative *D*-scores on the *innocuous-abusive* and *innocuous-harmless* trial-types show that participants responded more quickly during consistent versus inconsistent blocks for each trial-type (see Figure 2). Table 2 and Figure 2 display pre and post-intervention mean *D*-IRAP scores for each group of participants across the four trial-types.

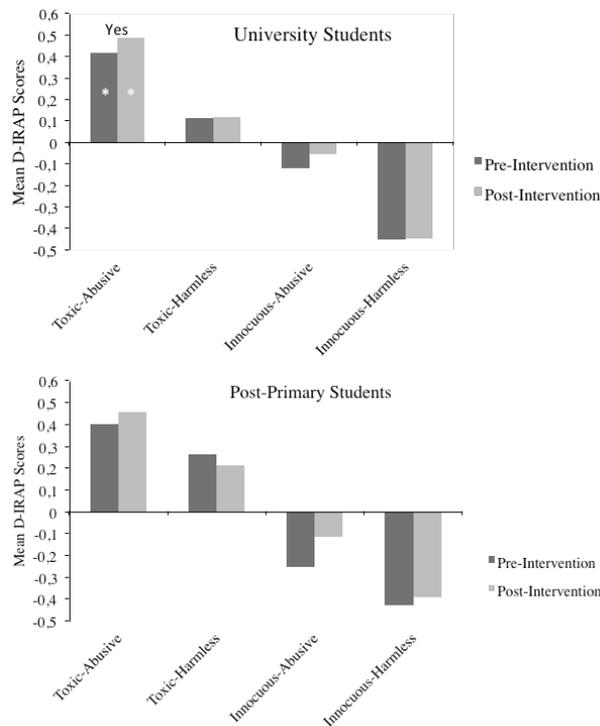


Figure 2. Shows the mean *D*-IRAP scores across the four trial-types and indicates that participants responded faster during consistent versus inconsistent trial-blocks. The asterisks denote trial-type responses that were significant from zero. The graphs are separated to show data for university students (upper panel) and post-primary students (lower-panel), as per Table 2.

Table 2. Mean (*M*), Standard Deviation (*SD*), one-sample *t*-test statistic (*t*) and *p*-value (*p*) for each IRAP trial-type for university and post-primary students before and after a brief educational video intervention.

		Pre-intervention				Post-intervention			
		<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>P</i>
Toxic-Abusive	University	0.416	0.377	6.041	<.001	0.487	0.399	6.677	<.001
	Post-primary	0.402	0.408	5.393	<.001	0.457	0.336	7.454	<.001
Toxic-Harmless	University	0.114	0.433	1.448	.158	0.121	0.395	1.676	.104
	Post-primary	0.263	0.383	3.763	.001	0.214	0.456	2.565	.016
Innocuous-Abusive-	University	-0.119	0.416	-1.567	.128	-0.054	0.491	-0.601	.552
	Post-primary	-0.251	0.366	-3.748	.001	-0.113	0.440	-1.409	.170
Innocuous-Harmless	University	-0.450	0.395	-6.247	<.001	-0.446	0.367	-6.663	<.001
	Post-primary	-0.428	0.311	-7.540	<.001	-0.392	0.342	-6.279	<.001

One sample *t*-tests were conducted to examine differences in participant responding across trial types for each group (Table 2). For the university students, the trial-types *toxic-abusive* and *innocuous-harmless* were significantly different from zero at pre-intervention ($t = 6.041, p < .001$; $t = -6.247, p < .001$, respectively) and at post intervention ($t = 6.677, p < .001$; $t = -6.663, p < .001$, respectively). For the post-primary students, all four trial-types were significantly different from zero at pre-intervention (*toxic-abusive*: $t = 5.393, p < .001$; *toxic-harmless*: $t = 3.763, p = .001$; *innocuous-abusive*: $t = -3.748, p = .001$; *innocuous-harmless*: $t = -7.540, p < .001$), and three of the four trial-types were significant at post-intervention (*toxic-abusive*: $t = 7.454, p < .001$; *toxic-harmless*: $t = 2.565, p = .016$; *innocuous-harmless*: $t = -6.279, p < .001$). The remaining trial-types were not significantly different from zero (see Table 2).

A 2x2x2x4 mixed repeated measures analysis of variance (ANOVA) was conducted to examine gender differences and investigate the effect of the video intervention on *D-IRAP* scores. The within participant repeated measures independent variables (IVs) were trial-type (4 IRAP trial-types) and time (pre and post-intervention), and the between participant IVs were group (university vs. post-primary) and gender (female vs. male). The dependent variable was the *D-IRAP* scores. Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated; therefore, the Greenhouse-Geisser statistics are reported for the within-participant analysis. There was no statistically significant main effect for group $F(1, 59) = 0.137, p = .713$, for gender $F(1, 59) = 1.811, p = .184$, or for time $F(1, 59) = 1.991, p = .164$, and no significant interaction effects between any of the variables (all p 's $> .10$). A statistically significant main effect was identified for IRAP trial-type, $F(2.085, 41.005) = 68.569, p < .001$. Post-hoc pairwise comparisons adjusted for multiple comparisons indicated that all four trial-types differed significantly from one another (all p 's $< .001$). The data indicated that, overall, participants more rapidly affirmed the relations *toxic-abusive/innocuous-harmless* rather than converse (i.e., *toxic-abusive-yes/toxic-harmless-no/innocuous-abusive-no/innocuous-harmless-yes* v. *toxic-abusive-no/toxic-harmless-yes/innocuous-abusive-yes/innocuous-harmless-no*).

The mean scores for the BPQ subscales and the RPVS for both groups are presented in Table 3. The BPQ is used to assess the prevalence of forms of bullying behaviour in an education setting and consists of three sub-scales, namely the bully scale, victim scale, and pro-social scale. Results on the BPQ indicated that participants in both groups rated themselves as pro-social (post-primary students $M = 12.0, SD = 2.24$; university students $M = 12.4, SD = 1.57$) rather than as a bully or as a victim to bullying. Students' attitudes towards victims is assessed using the Revised Pro-victim Scale (RPVS); a higher score on the RPVS represented a positive attitude towards victims of bullying as opposed to a positive attitude towards bullies. Mean scores on the RPVS for post-primary students

($M= 28.4$, $SD= 1.22$) and University students ($M=28.6$, $SD=1.69$) represents a positive attitude towards victims of bullying as opposed to a positive attitude towards bullies.

Scores were shown to be very similar across both participant groups. A series of independent t -tests showed no significant differences between the group data (all p 's $> .27$) or for gender (all p 's $> .114$) on any of the explicit measures including subscales.

Table 3. Mean and standard deviation of explicit measure sub-scales for University Students and Post-Primary Students.

Sub-Scales	University Students		Post-Primary Students	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
BPQ bully	6.6	1.0	6.93	1.28
BPQ victim	6.6	1.85	6.73	1.87
BPQ pro-social	12.4	1.57	12.0	2.24
RPVS	28.6	1.69	28.4	1.22

Each of the four D -IRAP scores pre-intervention were entered into a correlation matrix with the four explicit measure sub-scales. Preliminary analyses showed no violation of the assumptions of normality, linearity and homoscedasticity. The relationship between trial types and explicit bullying attitudes was therefore investigated using Pearson product-moment correlation coefficient. There was no statistically significant correlation identified between IRAP trial types and the 4 explicit sub-scales for the Secondary School Student sample (all p 's $> .05$). In the University Student sample, there was a statistically significant correlation identified between *toxic-harmless* and the pro-social sub scale in the BPQ ($r= 0.4$, $p= .03$), indicating that. A statistically significant correlation was also identified between *innocuous-harmless* and the pro-social subscale ($r= 0.4$, $p= .03$, see Table 4).

Table 4. Correlations between IRAP trial-types and explicit measures.

IRAP Trial-type	Explicit Measure				
	BPQ Bully	BPQ Victim	BPQ Pro social	RPVS	
University Students	Toxic-Abusive	-.138	-.146	-.053	.028
	Toxic-Harmless	-.006	.121	-.390*	-.154
	Innocuous-Abusive	.196	.200	.065	.172
	Innocuous-Harmless	.069	.011	-.408*	-.084
Secondary School Students	Toxic-Abusive	.048	-.087	.112	.208
	Toxic-Harmless	.078	.119	.299	.125
	Innocuous-Abusive	-.176	-.341	-.094	.082
Innocuous-Harmless	-.090	-.290	-.066	.012	

Notes: BPQ Bully, BPQ Victim, and BPQ Pro Social= Bullying Prevalence Questionnaires' Bully, Victim and Pro social Subscales respectively; RPVS= Revised Pro-Victim Scale. For ease of interpretation, correlations among the IRAP trial-types are not included here; * $p < .05$.

For the University Student sample, there was a statistically significant correlation between the bully and victim subscales on the BPQ ($r= .598$, $p= .000$). This statistically significant correlation was also evident for the Secondary School Student sample ($r= .422$, $p= .02$).

Results from the IRAP analysis showed that both groups of participants [post-primary students ($n= 30$) v. university students ($n= 30$)] responded more rapidly (shorter response latencies) during trial blocks requiring affirmation of *toxic-abusive/innocuous-harmless* v. *toxic-harmless /innocuous-abusive*. Participant responding thus showed discrimination of harmless v. hurtful phrases, and a bias favouring innocuous phrases as harmless and toxic

phrases as abusive. For university students, the *t*-tests indicated significant responses for *toxic-abusive-yes* and *innocuous-harmless-yes* trial-types at pre-and post-intervention. For post-primary students, the *t*-tests indicated that responding was significant on all trial-types except *innocuous-abusive-no* at post-intervention. Despite these group differences at the individual trial-type level, no statistically significant differences were identified between groups in the ANOVA. There was no significant difference between pre and post-intervention *D*-scores for any IRAP trial-type, thus, the educational intervention did not impact participant responding and effectiveness was not supported by the current research. Thus, the current study, like many behavioural studies across many decades, points toward the utility of using empirically validated interventions to avoid wasting time and resources. There were statistically significant correlations between the Pro-Social subscale and inconsistent *toxic-harmless* and *innocuous-abusive* IRAP trial types. The BPQ Bully and Victim subscales also showed statistically significant correlations with IRAP results for both groups. Gender analyses ($n = 30$ male, $n = 30$ female) showed no statistically significant difference.

DISCUSSION

The IRAP detected an effect, or implicit bias, favouring innocuous-harmless v. toxic-abusive relations for post-primary students ($n = 30$) and university students ($n = 30$) in the current study. The results showed this IRAP bias to be statistically significant. Thus, post-primary students in the current study were not shown to be indifferent or less aware than university students, when discriminating toxic textual statements as being harmful and abusive, and dissimilar to innocuous casual banter.

Both participant groups in the current research showed similarly high prosocial scores on the BPQ indicating that participants saw themselves as pro-social within their own social circles. When comparing mean scores of post-primary and university students on the BPQ and RPVS, no significant differences were identified. Eslea and Smith (2012) found similar results in that participants generally expressed positive, pro-social attitudes when explicitly asked about bully/victim problems at school. This is also consistent with Rigby and Slee's (1991, 1993) previous findings that Australian students ($N = 700$) aged from 6-16 years were likely to sympathise with victims and be disapproving of bullies.

Correlational analyses between IRAP trial types and the explicit sub-scales revealed a statistically significant correlation between the toxic-harmless and innocuous-harmless trial type and the pro-social subscale of the BPQ for University Students. Rigby and Slee's (1993) BPQ provided assessments of the prevalence of behaviours and attitudes among students that reflect a tendency to bully others, be bullied by others, and to act pro-socially. For the pro-social subscale to correlate with these IRAP trial-types suggests that University Students who rated themselves as more pro-social were more likely to affirm innocuous-harmless-true and toxic-harmless-false. This suggests that University Students who rate themselves as more pro-social recognise innocuous phrases as simply harmless 'banter', and recognise that more severe and toxic phrases are abusive/not just harmless fun. Thus, their understanding of what is "toxic" and what is "innocuous" might make them more inclined to be reflective of a tendency to act pro-socially. This also reaffirms the hypothesis that participants had more of an anti-bullying bias as opposed to a casual/dismissive attitude. This is in keeping with the broader bullying literature which suggests that pro-social behaviour can be an indication of the role individuals

play in bullying situations. For example, research with a sample of over 2000 Irish adolescents showed that bullies had significantly less pro-social behaviour compared to those not involved in bullying (Foody, Samara & O'Higgins Norman, 2019).

Pre and post-intervention *D*-IRAP data showed no statistically significant difference in participant responding, thus, the educational videos failed to gain empirical support for effectiveness in increasing implicit anti-bullying bias. This finding does not support the recommendation of these materials to school Principals, and is disappointing given that a recent study evaluated school principals' perceptions of the National Action Plan (2013) on bullying in Ireland, and found that schools were struggling to find effective anti-bullying programmes (Foody, Murphy, Downes & O'Higgins Norman, 2018).

Research suggests that the relevant associations on bullying may be more strongly activated after seeing a prime, with former research finding that implicit attitudes predicted behaviour (only) after using a prime (Perugini & Prestwich 2007; Schoenmakers, Wiers, & Field, 2008). A prime is a stimulus presented to participants prior to a test and is a means through which external sources (e.g., a video intervention clip) automatically activate relevant evaluative associations in memory, such as implicit attitudes (van Goethem, Scholte, & Wiers, 2010). Bullying literature is extremely advocative of anti-bullying policies and intervention programmes such as movies or video clips. For example, in a study by van Goethem *et alia* (2010) a bullying movie was presented to participants in an attempt to activate relevant bullying concepts that were subsequently assessed by the IAT. They found that the relevant associations on bullying were more strongly activated after seeing a movie than when no prior movie was presented. These types of interventions are deemed paramount in delivering a powerful message on the damaging effects of bullying. A priming effect on implicit attitudes has also been shown in other domains, for example in research on suicidal cognitions using a video with suicidal and non-suicidal stimuli as a prime (Rustad *et alia*, 2003), as well as in alcohol research using an alcohol prime (Schoenmakers *et alia*, 2008).

In line with this, the current study aimed to determine if anti-bullying intervention videos, which were developed by the Anti-Bullying Forum of the Department of Education and Skills in Ireland, would impact implicit attitudes towards bullying. We observed no statistically significant pre-post intervention differences in implicit attitude scores among University Students or Secondary School Students following the presentation of these videos. This may suggest that the video prime used was not effective at further activating relevant bullying concepts and associations in participants that were assessed by the IRAP. However, there was no pro-bully bias identified in the first instance, hence the intervention could not exert influence. It is possible that if a pro-bully bias was evident, that the intervention may have reduced this bias. Future research could further explore this by determining the relative strength of the intervention technique where a pro-bullying bias was evident in participant responses in the first instance.

Successful content elements of an intervention technique should target the entire school population as opposed to just focusing on those who bully and/or those who are victimised (Smith *et alia*, 2004) and should also demonstrate effectiveness in reducing bullying. Future studies could therefore identify specific groups (e.g. bully, victim, neither) and examine the impact of anti-bullying interventions for each separately. Studies might also consider aligning the IRAP stimuli to the intervention content to perhaps create a more sensitive measure, and could measure actual instances of bullying behaviour pre and post (e.g. participants state the number of times they have seen/ heard/ been exposed to verbal abuse since the intervention).

An in-depth analysis of the elements involved in the videos was not conducted, and it is possible that there was little to no relationship between the focus of the educational videos and the concepts assessed via the IRAP. Equally, it is possible that the video portrayal of bullying as harmful did not function to increase aversiveness of bullying for participants and thus no effect was shown on the second IRAP. It may be that the participant's history of social interactions would be influential to effects shown, however, the data were analysed at group level and there was no analysis of the historical profile of individual participants. Future research might seek to discover if participants had been personally affected by bullying, or if they had seen someone else negatively affected by bullying, to determine if this was influential in their responding either with the IRAP or with the questionnaire data.

Many anti-bullying interventions rely on self-report data from students and school staff (e.g., Friendly Schools Programme; Cross *et alia*, 2018), and though it would have been interesting to compare pre and post explicit data, in the current research, a limitation is that due to time constraints self-report measures were not administered on a second occasion. On balance, this is not a major problem, because self-report measures of this type may be vulnerable to participant reactivity potentially confounding any experimental effect found. Due to the rapid nature of responding required in implicit measures, they are thought to be less prone to such effects.

The study focused specifically on verbal bullying as this is the most common type of bullying; ecological validity was facilitated by using phrases written by students themselves based on their own thoughts and experiences. However, future IRAP research could focus more specifically on cyberbullying by also employing ecologically relevant pictorial stimuli, for example, textual IRAP stimuli could be framed to look like a phone-screen which may enhance ecological validity. A limitation was that it was not possible to conduct a functional analysis to determine if the phrases actually functioned as bullying or harmless in the manner hypothesised, and instead, the phrases selected were judged to be "toxic" or "innocuous" in a consultative process with a number of researchers and post-graduate researchers.

In summary, the IRAP was used as an implicit measure to determine if participant evaluations of textual statements showed discrimination of phrases that were harmless or abusive. Results showed that post-primary students and university students showed an implicit and explicit bias that was anti-bullying, and more rapidly affirmed *toxic-abusive* and *innocuous-harmless* relations. IRAP findings for both groups were replicated in a second, post-intervention IRAP, which, however, did not show any impact from a brief educational video intervention.

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