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ARTICLE

# 'But wait, that isn't real': A proof-of-concept study evaluating 'Project Real', a co-created intervention that helps young people to spot fake news online

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**Abstract**

As misinformation is one of the top risks facing the world today, it is vital to ensure that young people have the confidence and skills to recognize fake news. Therefore, we used co-creation to develop an intervention (called 'Project Real') and tested its efficacy in a proof-of-concept study. One hundred and twenty-six pupils aged 11–13 completed questionnaires before and after the intervention that measured confidence and ability to recognize fake news and the number of checks they would make before sharing news. Twenty-seven pupils and three teachers participated in follow-up discussions to evaluate Project Real. Quantitative data indicated that Project Real increased participants' confidence in recognizing fake news and the number of checks they intended to make before sharing news. However, there was no change in their ability to recognize fake news. Qualitative data indicated that participants felt that they had improved their skills and confidence in recognizing fake news, supporting the quantitative data.

**KEYWORDS**

co-creation, fake news, intervention, misinformation, young people

## BACKGROUND

Fake news is an intentionally fabricated news article that is verifiably false and which could mislead the audience (Tandoc et al., 2018). The World Economic Forum (2013) ranked the spread of misinformation as one of the top risks facing the world today. The 'fake news pandemic' (Rajan, 2020) impacts public views on topics as varied as climate change and vaccines, reducing the perceived seriousness of these issues and undermining both science and society (Lewandowsky et al., 2017; van der Linden, Leiserowitz,

et al., 2017; van der Linden, Maibach, et al., 2017). Fake news spreads six times faster online than the truth and, therefore, can reach more people quicker (Vosoughi et al., 2018). Furthermore, people believe in fake news around 75% of the time (Silverman & Singer-Vine, 2016), meaning that many millions of people may have been fooled by fake news (Allcott & Gentzkow, 2017). Indeed, YouGov (2017) found that while many people believe that they can tell the difference between real and fake news, only 4% of those surveyed could systematically differentiate the two. Furthermore, fake news impacts not only people's views but also their behaviour. Gunther et al. (2018) found that fake news affected how individuals voted during the 2016 US elections. Therefore, it is vital that we take steps to develop people's confidence and skills in recognizing fake news and that we help young people to develop these skills early.

Fake news is likely convincing online because of the methods we use to process it. According to the Systematic-Heuristic Model of Persuasion (see Eagly & Chaiken, 1993; Petty & Cacioppo, 1986), there are two routes for processing information. The systematic route is where information is deeply analysed, focussing on content and argument. The heuristic route relies on cognitive shortcuts, with a focus on the source of information (e.g. 'I trust my friends, so I trust what they share') and rules of thumb (e.g. 'experts are trustworthy'). When we have time to process information, we use the systematic route, but when we are online, we often rely on heuristics and superficial information processing (e.g. Metzger et al., 2010). This is because each piece of information is only briefly attended to before moving on to the next when we are 'scrolling' (Oulasvirta et al., 2012). This suggests that it should be possible to reduce belief in and sharing of fake news by encouraging people to use the system rather than heuristic route and think more deeply about the information being presented. This is supported by the fact that adults who show more analytical thinking and deeper processing of information, are less likely to believe and share fake news (Pennycook et al., 2020; Pennycook & Rand, 2021).

## Research on fake news with adults

There is a growing body of work exploring how to reduce the negative impacts of fake news on adults. Some researchers have suggested that fake news spreads like a virus (Budak et al., 2011; Kurcharski, 2016), therefore, they use the metaphor of 'inoculation' to give a 'vaccine' against fake news (van der Linden, Maibach, et al., 2017). Inoculating people with facts to protect them against the effects of misinformation can be effective (Cook et al., 2017; van der Linden, Leiserowitz, et al., 2017). This is likely because these facts may make them more deeply consider news which goes against this information. However, these facts are domain-specific, and it would be challenging to inoculate people with facts against all possible fake news stories in various domains. Thus, to ensure scalability and efficacy against a broad range of fake news rather than on specific topics, it may be more effective to focus on the processes people use when deciding if the news is genuine or fake (see Basol et al., 2020).

Warning people about the possibility of misinformation can reduce its impact (Chambers & Zaragoza, 2001; Ecker et al., 2010; Jou & Foreman, 2007; Schul, 1993) and make people less likely to share fake news (Pennycook et al., 2020). These warnings are most effective when given before the misinformation rather than after (Chambers & Zaragoza, 2001; Ecker et al., 2010). This may be because we expect that any information we receive will be truthful, and these warnings may remind us that this is not always the case (Grice, 1975). Furthermore, Ecker et al. (2010) found that warnings are more effective when they explain the negative impact of misinformation rather than simply stating that misinformation may be present. Warnings may encourage us to treat incoming information as potentially suspect, considering it deeply rather than simply accepting it. This may suggest that they lead us to use a more systematic than heuristic processing route. Indeed, Schul (1993) found that people take longer to process information when they have received a warning about it. It is now common to encounter warnings about misinformation online. However, the quality and veracity of these warnings vary substantially, and some warnings about fake news are posted about true news, which can confuse matters further. Furthermore, if these warnings were present on every website, this would likely dilute their efficacy. It is therefore better to encourage people to develop a breadth of skills in digital literacy rather than relying on these warnings.

**Statement of contribution**

**Existing knowledge**

Misinformation is a key risk facing the world.

Interventions are often created for adults and are domain specific.

**Knowledge added by this paper**

Our co-created intervention, covering a range of topics, increased young people's confidence in recognizing fake news.

## Research on fake news with young people

While great strides are being made in the fight against online misinformation, much of the research on fake news is focused on adults, and less is known about young people. This is a notable blind spot as many young people (54%) get their news via social media (Common Sense Media, 2019). Young people report using social media as a source of news because they find traditional news boring and difficult to understand (Marchi, 2012). However, social media is notorious for spreading fake news, for example, Facebook leads to referrals to untrustworthy news sources over 15% of the time compared to authoritative news sources 6% of the time (Guess et al., 2018). As more than 71% of adolescents have a social media profile (Ofcom, 2019) and more than 60% of 12–15-year-olds report that they do not think about the credibility of news stories when on social media (Ofcom, 2018), it has been suggested that digital media literacy should be a pillar of education (Select Committee on Communications, 2017). In fact, the Commission on Fake News and Critical Literacy in Schools, National Literacy Trust (2018) found that only 2% of young people had the skills needed to ascertain whether the news was true and 60% reported that they trusted news less because of fake news. Furthermore, Herrero-Diz et al. (2020) found that young people cared less about the accuracy of news than its novelty or uniqueness and may not realize the damaging effect of sharing fake news. Thus, it is vital to increase young people's awareness, confidence and skills to help them recognize fake news online.

## Interventions to address fake news in young people: An understudied area

In a large-scale study, Kahne and Bowyer (2017) found that media literacy training in schools led young people to assess online information accuracy better. Those who received training were 26% more likely to recognize real and fake news. This suggests that interventions to help develop skills in identifying fake news can be effective. Another route to developing skills in spotting fake news is via gamification. For example, the 'Fake News Game' (Roozenbeek & van der Linden, 2019) involves participants creating fake news from the perspectives of different characters, such as the 'clickbait monger' who wants to spread the information as far as possible. Researchers found evidence that playing the game reduced the perceived reliability and persuasiveness of fake news articles about the refugee crisis. These interventions equip young people with skills to recognize strategies used in creating fake news, which means that they are likely to be effective against a broad range of fake news. However, many fake news interventions have not been co-created with users, meaning that they are less likely to reflect the needs and experiences of the group they purport to help. Our project sought to address this gap.

## Co-creating a fake news intervention for young people

Co-creation involves academics and partners working together to develop solutions to real-world problems. Co-created interventions are more engaging and impactful and have higher uptake than those developed solely by academics (Balazs & Morello-Frosch, 2013). This is because co-created interventions reflect a 'real-world' context and are more applicable to practice (Skipper & Pepler, 2020). For example, co-created interventions may be a better fit with existing practices or have a more realistic view of the resources and time available for intervention. Therefore, this collaborative approach is increasingly viewed as improving the rigour of research, increasing its relevance to community needs and interests, and extending its reach into new fields for community benefits (Balazs & Morello-Frosch, 2013). A co-created intervention to tackle fake news in young people is therefore likely to be more effective than one created by academics alone.

Furthermore, we did not simply want to co-create the ideas for the intervention, but also to have our partners contribute material to the project. This is because the *source* of a message can strongly impact whether people accept it as truthful. For example, Berinsky (as cited in Lawandowski et al., 2012) found that among Republicans, corrections of a myth were more effective when delivered by a Republican politician. This suggests that messages about fake news are more likely to be accepted when they come from trusted sources with whom participants feel connected. Indeed, many young people do not trust 'experts' and authority figures such as teachers (Midgley et al., 1991). However, they trust those they perceive as being like themselves (e.g. other young people). They also trust and identify with the influencers they follow (Neda John, 2021). We believe that this trust can be harnessed by inviting influencers to teach people about fake news (i.e. by recording short videos to be played in the classroom as part of the intervention). As such, it is likely that an intervention designed collaboratively with young people and people they trust in this online domain will result in an engaging and effective intervention.

Therefore, we designed a fake news intervention 'Project Real', in collaboration with young people and influencers, alongside support from teachers. We intended our intervention to encourage young people to use more systematic processing and consider online information more deeply. We also wanted to focus on developing skills to recognize fake news rather than on a specific topic. However, as a cornerstone of co-creation, we were very open on the format this would take, whether it would involve a game or participants creating their own fake news like other interventions.

# THE CURRENT STUDY

The current study is a proof-of-concept study which aimed to explore whether Project Real successfully developed young people's skills and confidence in recognizing fake news. We conducted the project in four schools, giving pupils questionnaires before and after the intervention to measure changes. We also conducted focus groups with pupils and interviews with teachers to learn more about their experiences with the project. We hypothesized that participating in Project Real would lead participants to

**H1.** become more confident in their ability to recognise fake news.

**H2.** show an increased ability to recognise fake news.

**H3.** intend to make more checks (e.g., checking the source) about news stories before sharing them.

We also included a question to explore which social media sites young people get their news from as an exploratory variable.

Our research question for the qualitative component was 'What was the impact of Project Real on participants?'

# METHOD

## Participants

One hundred and twenty-six participants from four schools completed both the pre- and post-test measures (retention rate of 70%). This included 13 in Year 7/S1 (aged 11), 45 in Year 8/S2 (age 12) and 68 in Year 9/S3 (aged 13). Seventy-five were female, 42 were male and 3 were non-binary, six preferred not to state their gender. Seventy-three were White, 28 were Asian or Asian British, 10 were Black, 11 were Mixed or from multiple ethnic groups and 4 were from other ethnic groups. A sensitivity analysis using G*Power (Faul et al., 2007) indicated that the final sample size ($n = 126$) allows us to have 80% power to detect a difference corresponding to a Cohen's $d > .0.2$ (with $\alpha = .05$).

Participants for the focus groups were 27 pupils from two schools. Three teachers from two schools participated in the interviews. We did not collect demographic information from the focus group participants, but they were all aged 11–13.

## Materials

### Intervention co-creation

Pupils and teachers from three schools in Glasgow, social media influencers and academics co-created the intervention. We advertised widely online for influencers to be involved in Project Real. While we aimed to recruit a diverse group, all applicants who indicated interest were female, but multiple ethnic groups and people with disabilities are represented. Co-creation took place online due to Covid-19 distancing restrictions. Each school group discussed fake news and developed general ideas about what topics should be covered in the project and its format. They decided to create hour-long sessions with Powerpoint slides, short videos from the influencers and interactive activities. They also decided to use the UK Government SHARE (Source, Headline, Analyse, Retouched, Errors) guidelines as a framework (HM Government, 2022). Each school then developed two sessions based on these agreed principles. The final topics were fake news, fake people, fake photos, fake stories (conspiracies) fake videos and finally keeping it real (where participants developed materials to teach other young people about fake news). Each session started with an opening question for discussion, some short videos (recorded by the influencers and academics) with the main activity, and a closing activity. The intervention materials are freely available (http://www.projectreal.co.uk), and a summary can be found in Table 1. The same schools participated in both the co-creation and evaluation elements, but the young people involved in the co-creation did not participate in the questionnaires or interviews.

### Online pre- and post-questionnaire

The questionnaires were completed on Qualtrics using laptops in the classroom.[1] To understand young people's *use of social media* to access news, we asked what websites they used for news. There were options such as Youtube and Instagram as well as space to give their own answer or to state they did not use social media for news.

To examine how *confident participants were in identifying fake news*, we asked participants to answer the following three questions: 'How confident are you that you know what fake news is?' 'Generally speaking, how confident do you feel in identifying fake news?' 'I know how to tell fake news stories from real news stories'. These were answered on a 7-point scale, ranging from not at all confident/disagree to very

[1]A measure of conspiracy beliefs (Adolescent Conspiracy Beliefs Questionnaire [ACBQ], Jolley et al., 2021) was also included as part of a larger project, and thus not analysed as part of the current study.

**TABLE 1** Summary of activities.

| Topic | Opening | Main activity (includes video from an influencer) | Close |
|---|---|---|---|
| 1. Fake news | Discussion: Have you come across fake news? | Show news headlines, learners use SHARE to ascertain if they are true | Reflection: why should we care if people believe fake news? |
| 2. Fake photos | Activity: Spot the difference between 'real' and edited photos, why do you think they make that edit? | Create a poster to help others recognize fake images and understand why people might edit photos | Group quiz on edited photos |
| 3. Fake people | Discussion: What might you do to check if a person is real online? | Give examples of profiles. Facilitate small group discussions on whether they believe that profiles are real and trustworthy and why | Yes and No quiz on fake people |
| 4. Fake stories (conspiracies) | Discussion: What is a conspiracy theory? | Create a conspiracy and a fake news story, swap with others and see if you can spot the fake news and conspiracy | Discussion: What harm might be caused if people believed your conspiracy theory? |
| 5. Fake videos | Discussion: Have you seen fake videos? How did you know? | Watch videos and decide if they are real or fake | Group Quiz on fake videos |
| 6. Keeping it real | Discussion: What you have learned in Project Real? | Design an activity to teach younger people about a topic from Project Real | Individual Quiz covering all weeks |

confident/agree. As the items were high in face validity, we created a unique index of confidence in identifying fake news (Time 1 $a = .87$, Time 2 $a = .84$).[2]

To examine participants' *ability to identify fake news*, we took a task from Maertens et al. (2021). Participants were shown a series of news headlines in the format of a 'Tweet'. Each tweet showed the 'source' of the news and a few lines of text of a headline. We used the same tweets for all participants at Time 1. Different Tweets were used at Time 2, but these were the same for all participants. When we designed the questionnaire, the co-creation group of participants reviewed all the tweets used by Maertens et al. (2021) and told us how challenging it was to judge whether they were real or fake. We used this information when selecting which tweets to use in the questionnaire. There were four tweets in total at each time point, with two headlines being false (e.g. Raw News at 1: Scientists discovered a solution to greenhouse effect years ago but are not allowed to publish it, report claims), though participants were not told this. The other two were filler headlines to limit demand characteristics and were not analysed. For each tweet, participants were asked how accurate ('Please indicate how accurate you believe the news to be') and trustworthy the news headline was ('Please indicate how trustworthy you believe the news to be'). They were also asked how confident they were in assessing the news headline ('How confident are you that your view of the headline is correct?'). Finally, they were asked, 'Imagine your friends/family would be interested in this topic, how likely would you be to share this news with them?'. Each item was answered on a scale of 1 (*not at all*) to 7 (*very*) and we analysed the mean of the two tweets for each individual item.

We then asked participants what checks *they would make before sharing a news story* to ascertain their current behavioural practices. There were five options based on the SHARE guidelines, for example 'check if it was a trustworthy website' (Source) or 'read beyond the headline for the full story' (Headline). Participants selected all that applied to them (maximum score of 5). There was also an option for not making any checks.

### Focus groups with young people

A semi-structured interview schedule was developed, which included questions about whether and how Project Real had impacted their behaviours and confidence in recognizing fake news, for example 'What were your general impressions of Project Real?'

### Teacher interviews

A semi-structured interview schedule was developed which mapped onto the one for pupils. Teachers were asked their views about the impact of the project on their students, for example 'Have you seen any impact of the programme on your pupils?'

## Procedure

Consent was obtained from the headteacher. Opt-in consent was obtained from parents/guardians for their children to participate in the questionnaire, focus group, both or neither. Before the Project Real intervention, participants were given a link to an online Qualtrics survey. This showed an information sheet and asked them to give assent to participate. Participants then created a code to allow us to anonymously match their responses at different time points (Ripper et al., 2017). Participants completed demographic information (at Time 2 only), before answering the questions. Participants completed the measures in the following order: where they got news from (at Time 1 only), confidence in recognizing fake news, ability to recognize

[2]As part of the confidence questions, we also included the item 'Generally speaking, are you worried about being able to spot fake news?' (reversed coded); however, the scale's reliability was improved when this item was deleted (original 4-item Time 1 $\alpha = .72$, Time 2 $\alpha = .77$). This item was therefore omitted. The results do not differ with/without this item.

real and fake news and checks they make before sharing stories. Participants were then debriefed and able to ask questions. A similar procedure was repeated once they had completed Project Real. At Time 2 the Tweets used to measure ability to recognize fake news were changed.

Pupils with parental consent to participate in the focus group were provided with information about the research and they gave verbal assent. We then began recording the group and worked our way through the questions giving each person the chance to share their views. Participants were thanked and debriefed.

We gave information sheets to teachers who had delivered Project Real and they approached us if they wanted to participate. We began by obtaining informed consent. We then worked our way through the questions. Teachers were thanked and debriefed.

## RESULTS

We considered data from all schools together and did not explore differences at a school level. We uncovered that YouTube (78%), followed by Instagram (64%), Snapchat (60%), Tiktok (55%), Twitter (33%), Facebook (21%), Reddit (20%), Twitch (18%) and Tumblr (6%) were the most reported platforms that young people used to access news, 15% reported using 'other' sites. Only 7% of participants reported not getting news online.

For each inferential analysis, we employed paired sample *t*-tests, comparing responses at Time 1 to responses at Time 2. These were tested against a Bonferroni-adjusted alpha level of .008 (.05/6) when interpreting the t-tests. Descriptive and inferential statistics can be found in Table 1.

H1 predicted that young people would feel *more confident* in recognizing fake news after the intervention. Our findings support this hypothesis, as we found that young people became more confident in their ability to recognize fake news.

H2 predicted that participants would also become better at *recognizing fake news* (when participants were exposed to tweets that contained fake news) and be less likely to share fake news. We found no difference in responses to these variables. Therefore, this hypothesis was not supported. While participants felt more confident in their ability to spot fake news, when confronted with fake news items, they were no better (or worse) at spotting fake news (i.e. no difference in trust, accuracy, confidence or sharing).

Finally, H3 predicted that participants would intend to make more *checks about news before sharing it*. We calculated the total number of checks participants said that they would make at Time 1 and again at Time 2 (maximum score of 5). Our hypothesis was supported as the number of checks participants intended to make significantly increased after the intervention. Of interest, in secondary analysis using a Chi-squared test, we also found that the number of participants, who indicated that they would make no checks at Time 1 ($n = 22$), was significantly reduced at Time 2 ($n = 8$), $\chi^2$ (1, $N = 126$) = 5.86, $p = .016$. This is a further indication that the intervention was successful in improving the use of the SHARE checklist (Table 2).

### Qualitative data: confidence and awareness of fake news

A content analysis was conducted to analyse data from the focus groups and interviews. We first identified common ideas across transcripts, for example 'learned a new skill' or 'increased confidence'. Then, for each category, we quantified the number of times it was raised by participants in the pupil focus groups and teacher interviews.

As shown in Table 3, the qualitative data support the quantitative data as it suggests that Project Real increased confidence and skills in recognizing fake news. Participants found the content interesting and valued that the materials were created by influencers and their peers (co-creation). Teachers found the materials easy to use. However, participants also suggested that some videos were too long and they wanted more interactive elements. Furthermore, according to teachers, some lessons were also a little

**TABLE 2** Descriptive and inferential statistics comparing results before and after participating in Project Real.

| Variables | Time 1 *M* | Time 1 *SD* | Time 2 *M* | Time 2 *SD* | Inferential statistics[a] |
|---|---|---|---|---|---|
| Confidence in recognizing fake news (H1) | 4.82 | 1.13 | 5.47 | 0.86 | $t(123) = -6.64$, $p < .001$, $d = .60$ |
| Fake news exposure: Trustworthiness of the fake news (H2) | 3.09 | 0.99 | 3.02 | 1.08 | $t(117) = 0.60$, $p = .549$, $d = .06$ |
| Fake news exposure: How accurate was the fake news (H2) | 3.14 | 0.97 | 3.09 | 1.07 | $t(117) = 0.49$, $p = .627$, $d = .05$ |
| Fake news exposure: Confidence that their view of the fake news was correct (H2) | 3.98 | 1.20 | 3.90 | 1.22 | $t(117) = 0.84$, $p = .400$, $d = .08$ |
| Fake news exposure: Likelihood of sharing the fake news (H2) | 3.12 | 1.47 | 2.83 | 1.38 | $t(117) = 1.76$, $p = .081$, $d = .16$ |
| Number of checks would they make before sharing online news (H3) | 2.27 | 1.79 | 3.06 | 1.85 | $t(125) = -4.06$, $p < .001$, $d = .36$ |

[a]Tested against a Bonferroni-adjusted alpha level of .008 (.05/6) when interpreting the *t*-tests.

long. We, therefore, slightly edited the materials before developing the final version of Project Real (e.g. shortening some videos and highlighting that some tasks could be optional/extensions), which is available now.

## DISCUSSION

After completing Project Real, participants rated themselves more confident in recognizing fake news (H1). They also intended to make more checks on the news before sharing it, such as checking if the news story was on a trustworthy website (H3). However, their ability to recognize fake news did not significantly improve (H2). Qualitative data from teachers and pupils indicated that Project Real subjectively increased their confidence in recognizing and their awareness of fake news. They also valued that the project had been co-created with young people and influencers.

Our findings show that Project Real increased participants' confidence in recognizing fake news and intentions to make more checks before sharing news. This builds on previous research, which suggests that analytical thinking (Pennycook & Rand, 2021) and warnings about fake news (e.g. Ecker et al., 2010) can make people less likely to share misinformation. Encouraging people to treat incoming information as potentially suspect, rather than assuming that all communication is truthful (Grice, 1975), leads us to spend longer processing information, making us more likely to spot fake news (Schul, 1993). Indeed, our results also suggest that following Project Real, participants were thinking more deeply about the information they received and, thus, likely using the systematic processing route (see Eagly & Chaiken, 1993; Petty & Cacioppo, 1986), rather than relying on heuristics. In line with Pennycook et al. (2020), who found that priming accuracy beliefs led people to be more careful about sharing fake news (see also Pennycook et al., 2020), our project seems also to have heightened awareness and led participants to intend to make more checks before sharing online news.

However, Project Real did not increase participants' ability to recognize fake news. One potential reason for this was a measurement issue, as participants could not do any checks before responding to the questionnaire. The intervention was built around using the SHARE checklist to help participants identify fake news, but our measure did not allow them to do this. Had we allowed participants to make

**TABLE 3** Content analysis of qualitative data evaluating Project Real.

| Skill | Example quotation pupil | Example quotation teacher | Pupil comments | Teacher comments |
|---|---|---|---|---|
| Learned new information/ skills | 'I now know how to identify fake news where before I did not'. | 'I genuinely think I could see lightbulb moments when we were chatting about things, and they were understanding it' | 21 | 7 |
| Interesting, useful and important | 'I think it was really interesting'. | 'I think that it's really important, because we chat about it at times, but now you are providing another kind of expert view on it'. | 9 | 11 |
| Increased confidence | 'Yeah, it definitely made me more confident myself. I know what to do now'. | 'definitely become more aware of the news around them and confident using social media, especially when using fake profiles and accepting invitations from somebody that might be fake'. | 8 | 2 |
| Videos too long/not enough interaction | 'But sometimes, like just watching videos, it got like kinda boring' | 'the length, because some of the videos were slightly too long for them, particularly for the first years who are quite, excitable, and get bored easily'. | 5 | 2 |
| Co-creation | 'people on social media like helped because they know more about it and they know like why it's bad and like cause in some places it could be good'. | 'the videos from the Instagram influencers, that was really good to relate it to the real world, especially when this is becoming a quite an aspiring career to get into'. | 4 | 2 |
| Length | N/A | 'I was kind of trying to get through it'. | N/A | 2 |
| Easy to use | N/A | 'easy to kind of manage. I loved having the videos, links and things like that really helpful for speaking through things' | N/A | 3 |

checks before giving their answers or asked what their behavioural intentions were (i.e. asking what checks they would do before sharing this specific piece of news), we may have found improvements in their ability to recognize fake news. Indeed, we found that they *intended* to make more of these checks before sharing news after the intervention. Therefore, in future research, we recommend using a more ecologically valid measure of actual behaviour when presented with news, such as allowing participants to research news and exploring how they came to their decisions about whether it was real or not. While this may mean that the questionnaire would take longer to complete, so the number of news items may need to be reduced, this would improve the validity of the measure.

Nonetheless, our findings support those from other interventions, such as Bad News (Basol et al., 2020) and the Fake News Game (Roozenbeek & van der Linden, 2019), which suggest that interventions can be effective in helping participants to develop their skills in recognizing fake news. However, these interventions were not co-created with users, meaning that they are less likely to reflect the needs and experiences of the group they purport to help. In fact, as previously discussed, co-created interventions tend to have higher uptake than those developed by academics alone (Balazs & Morello-Frosch, 2013). Our project is novel in that we worked with young people and influencers to co-create an intervention in the format and with the content they chose to tackle fake news, which was ultimately shown to be successful in building skills. Further evidence is that in the last 10 months, the Project Real website had been visited by 33,000 users, and 15% of those visitors have downloaded all resources. While most users have been in the UK, there has been interest internationally. Therefore, those considering the development of similar interventions may also want to utilize co-creation to maximize their reach and impact.

In addition, our intervention did not consist of a single game or activity but six different hour-long sessions with various interactive activities. This is likely to help participants develop a range of skills around fake news, for example spotting fake sources, videos and photos. This is important as while some interventions have targeted fake news on specific topics such as the refugee crisis (Roozenbeek & van der Linden, 2019) or in a specific way, for example understanding why people may create fake news (Basol et al., 2020), these may only have limited efficacy and be specific to this area or topic. By focussing on a range of skills, participants will have a varied toolkit from which to draw when deciding if a piece of news is real or fake. Such a series of lesson plans also fit well into the school curriculum. Indeed, teacher feedback indicated that the lessons worked well with PSHE (Personal, Social, Health and Economic) but also with classes such as computing and history.

The variety of activities as part of the intervention is also important as technology is rapidly evolving. A Senate Select Committee Intelligence (2019) report concluded that malicious actors would continue to weaponise information and 'develop increasingly sophisticated tools for personalizing, targeting, and scaling up the content' (p. 41). Therefore, we must continue developing interventions to help people—particularly younger populations—understand and recognize the impact of fake news. While research suggests that fake news spreads six times quicker than the truth (Vosoughi et al., 2018), if we can reduce this spread, fake news will have much less reach and impact. This also means that interventions must be regularly revisited to include the most up-to-date technology. These updates should also be co-created.

While our investigation had several strengths, some improvements can be made. For example, future research should include a control group. While it is not uncommon in action-type, positive youth development research such as this to not include a control group (Leman et al., 2017), control groups are important as they allow us a baseline from which to compare our results (Skipper & Douglas, 2012). Though it is unlikely that skills in spotting fake news would change over 6 weeks without intervention, future research including a control group would allow us to ascertain this. We had initially intended to have a control group in this study, but as this research took place when schools returned to teaching in person after the Covid-19 pandemic, the schools felt that this was such an important topic for their pupils that they did not want to wait to allow some groups of pupils to access it. Nonetheless, by including a repeated measures design in this proof-of-concept study, we were able to explore changes over time for those who did complete the intervention.

Furthermore, in future research, it would be wise to use familiar stimuli to the measure of ability to recognize fake news. In our sample, only 33% reported accessing news from Twitter. As our stimuli were Tweets, it might be helpful to include stimuli in the style of a news platform that young people

use more often, such as Instagram. Furthermore, future research could explore at which age the intervention is most successful. We know that age 14 is when conspiracy beliefs emerge (Jolley et al., 2021). Thus, research exploring at which age developing skillsets offers the best protection would be timely. Interventions such as Project Real could be targeted at that specific age group.

In summary, this research provides proof of concept that classroom-based interventions can positively impact students' confidence and behavioural intentions around fake news. This is important as interventions such as Project Real are scalable and can fit into traditional school content rather than requiring extensive training and time out of traditional content to deliver. This means that interventions such as this can be used to help meet the UK Select Committee on Communication's (2017) recommendation that digital literacy is a pillar of education and help to combat the 'fake news pandemic' (Rajan, 2020).

## AUTHOR CONTRIBUTIONS

**Yvonne Skipper:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; writing – original draft. **Daniel Jolley:** Conceptualization; formal analysis; funding acquisition; methodology; writing – review and editing. **Joseph Reddington:** Conceptualization; software.

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## CONFLICT OF INTEREST STATEMENT

None to declare.

## DATA AVAILABILITY STATEMENT

The materials and data are available on the Open Science Framework https://osf.io/czwmf/?view_only=2b708759d32a4f758051413204edb76d.

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